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A special thank you to the Community Wildfire Protection Plan Steering Committee who dedicated their time and effort to this project while continuing to carry out the duties of their everyday jobs.

Recognition also goes to the many citizens of Union County and to local, state and federal government organizations that assisted in this planning effort by providing historical and technical information for the project.

Signature Page

The Union County Wildfire Protection Plan provides a framework for assessing the current wildland urban interface wildfire risks, multiagency firefighting resource response shortfalls, and community preparedness levels using both best available data and local knowledge. The plan identifies methods of reducing human ignitions, large fire potential and mitigating wildfire risks through implementation of the three Cohesive Wildfire Strategy elements of creating fire adapted communities, restoring resilient landscapes and improving wild fire response.

The Union County Board of Commissioners approved this plan and its contents with agreement from local wildland firefighting agencies, Rural Fire Districts, and the County's structural fire protection services. The plan contents should be revisited annually and projects may be revised and updated as necessary. All recipients are requested to advise Union County Emergency Services of any changes that might result in its improvement or increase its usefulness.

Steve McClure, Union County Commissioner

Jack Howard, Union County Commissioner

Donna Beverage, Union County Commissioner

Larry Wooldridge, Union County Fire Chief

J.B. Brock, Union County Emergency Manager

Joe Hessel, District Forester, Northeast Oregon District, Oregon Dept. of Forestry

I. Introduction

Plan Overview and Development

The Union County Community Wildfire Protection Plan (CWPP) was updated to be consistent with changing federal, state, and local level policies, and to meet the needs of changing county demographics, such as population, economics, expanding wildland-urban interface, recreational interests, stakeholder concerns, and fire protection concerns.

Data from numerous sources was used to prepare the plan. The Community Wildfire Protection Plan for Union County is the result of detailed analyses, professional contribution, collaboration and wildfire risk assessments. Contributed information was analyzed with the intent to reduce the potential for wildfires that threaten people, structures, infrastructure, and values in Union County. Because of the different sources and data reference periods, the transition between data sets is not always fluid and there are occasional gaps in data collection. Where relevant, these gaps are identified and all sources are cited.

The county's goal is to provide the best protection for those living in and near wildland-urban interfaces where private and public lands intersect. This CWPP also expands risk assessment to include middle ground landscapes beyond the homes to restore forest resiliency on both sides of the public/private divide. It is also the intent of this plan to identify the roles and responsibilities of all those that represent Union County including, but not limited to, county, state, and federal agencies, cooperators, and private land owners. The hope is to create increasingly fire-adapted communities, resilient landscapes, and appropriate wildfire response.

The CWPP emphasizes ongoing development of robust relationships between all agencies, local landowners and communities to prepare and protect lands from devastating wildfires. It recognizes shared responsibility toward fire prevention, fire adapted communities, and resilient landscapes.

In January of 2014 the CWPP steering committee began meeting to initiate the revision of Union County's CWPP. Subsequent meetings (*see Chapter V, Community Participation*) were held to establish a county wildfire mission (this included developing goals, objectives, and evaluation process for the county's wildfire risks), identify and prioritize communities at risk; organize community workshops; provide guidance on plan content and organization; and prioritize risk reduction projects.

Plan Compliance

The Union County Commissioners, with cooperation and input from the Community Wildfire Protection Plan Steering Committee, endorse this plan. These representatives mutually agree to the final contents of the plan. The plan is not regulatory and does not create or place mandates or requirements on individual jurisdictions. This plan does not bypass the individual rules and procedures that govern the participating agencies, organizations, and individuals.

Wildfire on the landscape is common, particularly in fire-prone ecosystems. With steady increases in home dwellings in forested areas, fires in the wildland-urban interface are also becoming commonplace with unfavorable results. Understanding what, where, and why to apply fire protection measures allows fire managers the flexibility to assist homeowners in an all-inclusive approach of shared responsibilities. Although some actions are voluntary, agencies must comply with existing management direction.

Since the 2005 CWPP was written, several concerns have arisen to cause fire management at all levels to reconsider fire in and near wildland-urban areas. As a result, new approaches are being used to preserve landscape aesthetics, sustain site productivity, increase forest health, and expand defensible space. High growth in homes near forest areas has further raised the financial stakes in the event of a wildland fire. Recognizing the need to get all landowners involved in conducting management activities on their property, the CWPP promotes collectively reducing risks and helping keep fire budgets and fees low (PNW 2010).

This plan attempts to comply with local, state, and federal direction in meeting the needs of a Community Wildfire Protection Plan and incorporating current information when assessing communities and landscapes at risk. The role of the plan is to serve as a working document to coordinate fire and land managers and their efforts in Union County. It is the intent of this document to guide both private landowners and agency managers in meeting the Community Wildfire Protection Plan goals and objectives while incorporating reference to several guiding documents. This community wildfire protection plan has been prepared in compliance using local, state and federal direction as directorial information.

National Cohesive Wildland Fire Management Strategy (CWS), April 2014. The CWS provides guidelines that can be tailored to meet local and regional needs. Priorities in the Cohesive Wildfire Strategy include safe and effective fire response to wildfires, vegetation and fuels management, engaging homeowners and communities to be proactive prior to a wildfire, and emphasis on programs and activities designed to meet local needs in an effort to prevent human caused ignitions. The three goals of the Cohesive Wildfire Strategy include: restore and maintain landscapes, develop fire-adapted communities, and improve wildfire response preparedness.

The 2009, Guidance for Implementation of Federal Wildland Fire Management Policy.
This policy directs federal fire directors to work collaboratively with state, local, tribal fire managers, members of the public, and nongovernment organizations to foster better understanding and support for the complexity of wildland fire management. It also directs the federal fire directors to revise or develop accountability standards, performance measures, and tracking systems to assess if resource and protection objectives are met during the course of management on all wildland fires.

Oregon Senate Bill 360 (The Act of 1997)
This act enlists the aid of all property owners to achieve the goal of converting fire-susceptible urban and suburban properties into less volatile zones where firefighters may more safely and effectively defend homes from wildfires. The law requires property owners in identified forestland-urban interface areas to reduce excess vegetation, which may fuel a fire, around structures and along driveways. In some cases, it is also necessary to create fuel breaks along property lines and roadsides. (For more information, http://www.oregon.gov/odf/pages/fire/sb360/sb360.aspx)

Healthy Forests Restoration Act, 2003. This act is designed to achieve several goals, including:
1) Reducing wildfire risk to communities, municipal water supplies, and other at-risk Federal land through a collaborative process of planning, prioritizing, and implementing hazardous fuel reduction projects.
2) Authorizing grant programs to improve the commercial value of forest biomass (which would otherwise contribute to the risk of catastrophic fire or insect or disease infestation) for producing electric energy, useful heat, transportation fuel, and petroleum- based product substitutes, and for other commercial purposes.
3) Enhancing efforts to protect watersheds and address threats to forest and rangeland health, including catastrophic wildfire, across the landscape.
4) Enhancing forest ecosystem components.

The incentive for communities to engage in comprehensive forest planning and prioritization was given new momentum with the enactment of the Healthy Forests Restoration Act (HFRA) in 2003. The language in HFRA provides maximum flexibility for communities to determine the substance and detail of their plans and the procedures they use to develop them. HFRA emphasizes the need for federal agencies to work collaboratively with communities in developing hazardous fuels reduction projects. The act also places priority on treatment areas identified by communities themselves in a community fire plan.

The NE Oregon Regional Natural Hazard Mitigation Plan, 2014.
The natural hazards mitigation plan is intended to assist Northeast Oregon reduce the impacts from natural hazards by identifying resources, information, and strategies for risk reduction.

Federal Register, 2001.
This provides an update to the initial list of urban-wildland interface communities in the vicinity of federal lands that are at high risk from wildfire, published in the Federal Register on January 4, 2001. It is important to note that the urban-wildland interface is not limited to communities in the vicinity of Federal land. Many states have submitted revised community lists that include all interface communities in their State, regardless of their relationship to Federal land.

Fiscal Year 2015 Budget Overview, United States Department of Agriculture.
To meet the daunting challenges ahead, the FY 2015 President's Budget for the Forest Service focuses its efforts in three key areas: restoring resilient landscapes, building thriving communities, and managing wildland fires.

Oregon Administrative Rules Chapter 477, *Fire Protection of Forests and Vegetation*. ORS 477.025 recognizes that the forestland-urban interface in Oregon varies by condition, situation, fire hazard and risk. Different forestland-urban interface fire protection problems exist across the state because of this variability, and these different problems necessitate varied fire prevention and protection practices. In order to give recognition to such differences and their effect on the accomplishment of the public policy stated in ORS 477.023 (Fire protection system), certain classifications of the forestland-urban interface within the State of Oregon are established by ORS 477.027 (Rules for classification of lands), and the Oregon Department of Forestry, Division 44, Criteria for Determination of Wildfire Hazard Zones.

Plan Endorsement and Development

The CWPP revision is being led by Union County, with the assistance of several local, state, and federal fire management agencies coming together as the CWPP steering committee. The steering committee full-time members include representatives from the Oregon Department of Forestry, Local Rural Fire Departments, Union County Emergency Services, Bureau of Land Management, and U.S. Forest Service, as well as a member of the local Blue Mountain Cohesive Wildfire Strategy Team. The Wildfire Protection Plan Steering Committee endorses this plan.

The Union County Commissioners, with cooperation and input from the Community, Cooperators, and Fire Management Agencies, agree to produce a document that will provide future guidance in fire prevention, protection, and risk reduction. These representatives mutually agree to the final contents of the plan. The plan is not regulatory and does not create or place mandates or

requirements on individual jurisdictions. This plan does not bypass the individual rules and procedures that govern the participating agencies, organizations and individuals. This plan acknowledges existing rules and regulations and makes recommendations to improve public and fire fighter safety, emergency fire response, and landscape and ecosystem resiliency in a fire prone environment.

Through increased knowledge of wildfire prevention and mitigation in a fire-prone region, the methods outlined in the CWPP will seek to create fire-resilient landscapes – healthy stands of timber and underbrush – which provide the beauty and solitude people seek when living and recreating in the forest. This plan recognizes the economic importance of fire protection of rangeland, forests and communities as well as the economic importance of jobs, products, and new opportunities through fire risk mitigation measures.

Summary

The project steering committee began meeting in January 2014 to revise the 2005 Union County Community Wildfire Protection Plan. The CWPP revision is designed to accomplish a number of tasks including:

- incorporate and meet new policies
- update changes to WUIs and their boundaries
- review the need to update the CWPP mission
- reinforce goals and objectives to be consistent with the Cohesive Wildfire Strategy
- develop a fire risk assessment utilizing best available data
- identify and prioritize WUIs
- strengthen all agencies and community collaboration encouraging involvement through organized community workshops
- maintain oversight and guidance on plan content and organization
- prioritize risk reduction projects and incorporate new treatment tool options
- establish priority mitigation action items within each WUI and the County as a whole.

Plan design is focused on better serving the communities in improved wildfire assessment and protection, incorporating new community members in the process, evaluating economic opportunities, and increasing local competitiveness for fire protection funding sources.

Data used in this Plan is denoted and referenced in the bibliography.

The planning committee, made up of collaborating partners, is responsible for implementing this project and includes:

J.B. Brock	Union County Emergency Services	Co-chair
Joe Hessel	Oregon Department of Forestry	Co-chair
Jenny Reinheardt	Wallowa Resources	member
Katy Nesbitt	Wallowa Resources	member
Mike McDonnell	La Grande FMO	member
Brett Thomas	Umatilla National Forest	member
Larry Wooldridge	La Grande Rural Fire District	member
Mark Jacques	Oregon Department of Forestry	member
Mitch Williams	Oregon Department of Forestry	member
Scott English	BLM	member

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Oregon State University; University of Idaho; Washington State University, 2010. A Pacific Northwest Extension Publication. *Reducing Fire Risk on Your Forest Property*, PNW 618 October 2010

II. Mission, Goals and Objectives

Mission Statement

Union County, the Oregon Department of Forestry, the Union County Fire Defense Board, the USDA Forest Service and the Bureau of Land Management are dedicated to implementing a Community Wildfire Protection Plan (CWPP) utilizing the Cohesive Wildfire Strategy (CWS) as a strategic and operational foundation.

The county's first priority is the protection and safety of community members and firefighters prior to and during wildfire response. Through the creation of the CWPP the county has crafted a plan to successfully meet the challenges of wildland-urban interface protection. The CWPP identifies fire risk mitigation strategies to reduce human ignitions, create opportunities to advance landscape resiliency through vegetation and fuels manipulation, and provide fire-adapted community education, outreach, and partnership development.

The Union County CWPP stresses the need to promote a fire resilient landscape, fire-adapted communities, and improve wildfire response while putting safety in the forefront.

Union County and partnering agencies mission;

> "Commitment to creating a meaningful Community Wildfire Protection Plan (CWPP) that serves to coordinate wildland fire agencies resources and communities through education and activities that promote fire risk mitigation, fire threat reduction, and fire prevention methods while endorsing healthy resilient landscapes for the future."

National Strategy

Recent decades show an upsurge of citizens moving into urban areas accompanied by an increase in large wildfires exhibiting extreme fire behavior. This trend has gained the attention of landowners, interest groups, and representatives from Federal, State, and Local agencies. These fires pose significant safety risk to fire suppression and emergency resources as well as the local populace. Rising expenses, including an increase in annual fire suppression costs and monetary and environmental loss to communities in terms of property and landscapes have triggered a Congressional mandate for action (CWS 2014).

In 2009 the "Federal Land Assistance, Management, and Enhancement Act of 2009" (FLAME Act of 2009) was created. The FLAME Act of 2009 directed the Secretary of the Interior and the Secretary of Agriculture to work together to

develop a report for Congress that would provide a cohesive wildfire management strategy. In April of 2014, "The National Strategy," The Final Phase in the Development of the National Cohesive Wildland Fire Management Strategy (CWS), was completed. The CWS identifies four priority guidelines and three strategic goals under a national vision for wildland fire management. In designing Union County's CWPP emphasis was given to the priorities and goals within the CWS.

The four guidelines in the CWS establish priorities for agencies working through the challenges of establishing procedures and planning activities. The primary emphasis is on safe and effective response to wildfire. The plan and resulting actions must acknowledge the importance of being prepared for wildfire response in both structural protection and wildfire prevention.

1) Response to an incident must maximize advanced preparedness for full effectiveness (CWS 2014).

2) Fuels and vegetation management, the most challenging priority, includes the analysis, design, and prioritization of treatments. Guidance should include strategic placement of fuels treatment, increasing the use of all approaches to further advance toward resilient forests and rangelands, and leveraging the use of wildland fire to meet resource objectives (CWS 2014).

3) Designing programs focused on preparedness through working with homeowners and communities in proactive approaches prior to wildfires (CWS 2014). Homeowner and community involvement is essential for successful landscape preparation in advance of potential wildfires.

4) Programs and activities must be designed to meet the needs of the local population and strengthen efforts to prevent human-caused ignitions (CWS 2014).

Using these four guidelines while keeping safe and effective wildfire response in mind, the CWS outlines three primary goals to consider when developing a Community Wildfire Protection Plan:

- Restore and maintain landscapes
- Fire-adapted communities
- Wildfire response (CWS 2014)

Wildfire suppression will continue to be a priority mission. There is a need for preparation in advance of wildfires through agencies' and landowners' proactive actions toward structure composition and landscape scheme, adjacent vegetation treatments, and infrastructure design. With safety and proactive measure in mind the Cohesive Wildfire Strategy's vision is to:

> *"Safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire."*

Goals and Objectives

Wildland fires do not distinguish between property lines of ownership or land management agencies, they burn where and when conditions are favorable. National guidance allows for local areas to take a prudent but broad approach when addressing the three priority goals, with the highest priority being safe and effective response to wildfires (CWS 2014). With this in mind, a larger-scale approach to reduce fire threat and increase protection opportunities was considered appropriate. Recognizing immediate threats to communities as the most important issue to address, landscapes with significant deviation from pre-fire suppression conditions create additional challenges to protection by contributing to increased fire intensities and unprecedented fire behavior.

In order to meet a broad-scale approach, an expansion of the analysis area is needed to provide a "middle ground" treatment (CWS 2014). This provides new opportunities for the implementation of strategically placed fuels treatments to interrupt fire spread prior to reaching a community. For this reason individual Wildland Urban Interface WUI areas have been dissolved into an all-encompassing WUI Zone to better address landscape fire risks. The wildland-urban interface zone (WUIZ) is,

> *"An area strategically identified that provide effective wildfire defense for communities, infrastructure, and other values at risk that meet or intermingle with wildland fuels and offer opportunities for broadened mitigation measures. These measures are designed to interrupt wildfire spread and modify wildfire behavior in order to protect social, economic, and environmental interests".*

The goals and objectives of this plan are designed with the CWS in mind. Objectives were initially framed by the plan committee with gradual refinement using input obtained during community workshops.

Using these goals as the foundation, the Union County CWPP planning committee designed county-specific goals pertinent to the local area that incorporate the best available science as well as local knowledge and experience. Consistent with the highest priority of the CWS, Union County also considers life and property the utmost priority. Through local geographic assessments, mitigation measures can be identified to meet the overriding goals of the CWS and Union County CWPP. Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters (NWCG 2014). Union County CWPP group identifies mitigation as an effort that reduces loss of life,

property, infrastructure, and natural resources through a variety of tools and actions.

The plan committee prioritized the overarching CWS goals based on identified needs within Union County. Using the three goals of the CWS, the county has listed below in order of priority opportunities to move the landscape and communities closer to desired conditions while recognizing that restoring historical conditions is neither practical nor desirable in some locations. Land management objectives and community values will help in determining the degree to which wildfires and fuels management can be tolerated.

Fire-adapted communities, wildfire response, and landscape restoration and maintenance are not stand-alone goals. In order for one goal to be achieved, results are necessary in the other two. Through landscape restoration and maintenance, wildfire behavior will be altered, allowing for a higher probability of success in wildfire response. In order to achieve landscape restoration it is imperative that communities, landowners, and fire managers share ownership in planning and treatment implementation across boundaries.

Wildfire Response

Goal: *All jurisdictions participate in making and implementing safe, effective, efficient response to wildland fire.*

Existing Efforts

Large wildfires in the western states continue to pose significant challenges to fire management agencies authorized with protecting lives, property, and natural resources. Increasing growth in the number of housing units appearing in forested areas is complicating the efforts put forth by fire management resources.

Wildfire response takes into consideration fires of all scale and size. From a national perspective, large fires often pose the primary challenges regarding suppression response, causing issues to be centered on surrounding large, long-duration wildfires (CWS 2014). Locally, the likelihood of fire starts and origin of ignition source play an important role in committing and prioritizing fire management resource responses.

Human-caused fires have the same potential of becoming large scale based on environmental conditions, but because they are typically a single source event there is a higher possibility of fire suppression efforts being successful. Multiple fire starts occur when dry summer thunderstorms travel across NE Oregon counties leaving numerous fire starts in their wake, causing fire managers to prioritize both fire suppression resources and fire starts. These storms require regional, state, and local fire authorities to evaluate priorities for “initial attack” with focus on fires that pose the greatest threat to life and property. One of the

worst situation occurred in 1989 when Union County experienced a thunderstorm that left approximately 41 ignitions on the landscape between July 26th and July 31st. This was followed by another thunderstorm in August that added an additional 35 ignitions between the 10th and 14th. These multiple ignitions events continue to occur creating a draw down in fire suppression resources.

Since 2005 there have been ongoing efforts to address several wildfire response issues. 1) Increase Union County wildfire response capacity by acquiring and updating newer equipment needs. Through a Memorandum of Understanding (MOU) with the Forest Service, local rural fire departments have obtained several pieces of equipment. 2) The county's co-op prevention program has higher multi-protection agencies participating in the school and community programs, but loss of funding may jeopardize the program. 3) Efforts are being made to build upon rural fire department training needs, regarding wildland fire qualifications, to increase opportunities for a coordinated approach.

Opportunities for Improvement

There is increasing need for investment in firefighting capacity at the local level. Capacity from all entities with fire response responsibilities must be commensurate with the workload need and risks posed by wildfire, which in many areas is increasing.

Most lightning fires start on public lands and burn onto private lands. This is compounded by the finite amount of fire protection resources. Vast expanses of the West have less than one fire station per 100 square miles. This leads to extended response times in rural areas—areas often characterized by Federal ownership, steep slopes, beetle-killed trees, and poor road access (CWS 2014).

Wildfire movement is without borders moving across boundaries regardless of landownership. For this reason there is increasing need for an all hands all lands approach to fire suppression with supporting MOU's in order to facilitate the most effective response. State and rural fire departments are often the first defense against a fire starting in the Wildland Urban Interface (WUI) while State and Federal fire personnel are first to respond to areas beyond the WUI areas into the middle ground locations. It is important that local responders be efficient and swift in containing wildfires to reduce potential impacts to the public.

Improving upon a combined effort approach to fire response provides many long term benefits:

- It improves training through programs designed to meet rural fire department needs. Provides locally based trainers and creates a cooperative interagency support venue between structure and wildland fire training standards.
- Investment in the fully trained firefighting workforce provides well-qualified firefighters on the ground to mitigate risk and hazards on local risk

projects. Increases opportunities to maximize funding resources in order to address specific needs of rural fire departments. Results in interagency compatibility of technology, communication networks, common terminology, and response protocols.

- This will also result in improved interagency protection and suppression response capabilities. Through increased interagency coordination and advances in fire preparedness long term improvements of all wildland firefighting efforts will occur that continue to increase the overall initial attack success.

Capabilities of all agencies with fire response responsibilities must be appropriate to meet the fire ignition volume and risks posed by wildfire, which in many areas is on the rise. Through a combined interagency effort the rural communities of Union County will ultimately benefit.

Using the Cohesive Strategy wildfire response goal, Union County has highlighted several areas of improvements that would move the area toward an improved wildfire response workforce.

Objectives:

It is important to increase the protection of life, property, and natural resources through improved emergency **wildfire response**. In order for safe wildfire response we must reduce risk to firefighters and the public through fire management activities (CWS 2014). Unless stated otherwise an annual review of the proposed objectives is needed to insure they are in alignment with the goal of fire response. Objectives to achieve the goal of Wildfire Response include:

a. Identify local equipment and training needs on an annual basis with emphasis in promoting rural capabilities.
b. Promote cooperation and relationships among agencies, organizations, jurisdictions, and communities through a multiple of venues including public meetings, simulations, agreements, boots on the ground, pilot projects, field trips.
c. Improve interagency and community communications before, during, and after emergency situations.
d. Improve pre-suppression planning strategies among all agencies with protection responsibilities.
e. Prevent human caused ignitions through education by increasing fire prevention awareness (CWS 2014).
f. Design strategies where human populations and infrastructure can withstand a wildfire without loss of life and property (CWS 2014).
g. Improved awareness of the WUI homeowners' responsibilities in being prepared for wildfire.
h. Continued emphasis in implementing the goals of the Cohesive Wildland Fire Management Strategy in Union County.

Fire Adapted Communities

Goal: Strive toward and environment where: *Human populations and infrastructure can withstand a wildfire without loss of life and property.*

Existing Efforts

Technological advancements and declining household size coupled with the desire for privacy have motivated homeowners to relocate from metropolitan areas to more rural settings. Wildland-urban interface areas have seen dramatic population increases, escalating the wildfire problems due to new residents, many of which may have little or no experience with wildfire on the landscape.

During the time span from 1940 to 2000, the number of housing units for WUI areas more than tripled (R.B.Hammer et al. 2009). Over the past 50 years there have been 220 million acres identified as WUI in the United States, with populations exceeding 120 million people residing in 50 million housing units. This has created a growth rate of 300% in the WUI, more than the general population growth rate for the same time period (IAWF 2013).

Residences knowledge and understanding of wild risk is essential to public involvement in mitigating wildfire and responses during a wildfire event. This public knowledge is often a result of education or personal experience with and about wildfires. Educating communities on all aspects of wildfire including how to prepare for, what environmental conditions influence the occurrence and behavior of a wildfire, and how they can assist when an evacuation occurs will provide them with the ability to understand and cope with most wildfire incidents. Considerations they should take into account in all stages of a wildfire (preparation in advance, during a fire, after a wildfire has occurred) provides community members with the ability to cope particularly during and after a wildfire.

Motivations for community action are often driven by an understanding of firefighting resource capabilities, the various attributes of risk that contribute to wildfire behavior, or their personal experience with wildfire such as having been evacuated or knowing someone that has, loss or damage to properties, even the feeling that the threat is imminent can change ones perception.

Through the 2005 CWPP Union County has introduced programs such as FIREWISE, Living with Fire, and Fire Prevention School Programs, I'm Concerned, Cost-Share Grant Programs, and other workshops to the communities in an effort to increase public awareness and responsibility.

Although few in numbers some residences in the county have initiated actions to increase chances for successful fire response in and around their homes.

Defensible space and home protection measures have occurred to varying extents in many of the wildland urban interface communities in Union County. These measures include treatments such as surface fuels reduction, stand density reduction, defensible space clearing and increasing the distance of the

crown base height above the surface vegetation. Significant work has been accomplished in some of the counties communities. A map of treatments near communities is provided in Chapter X.

Union County's fire prone ecosystem underscores the need for creative approaches for communities to work with fire managers and share responsibility for protection of life and property. Understanding that community is not limited to homeowners but is all inclusive toward people, businesses, infrastructure, agencies and government officials, and interest groups is the first step toward fire adapted communities. With firefighter and public lives as the highest priority it is important for community members to take action in wildfire preparedness well in advance of a fire incident. Fire managers in Union County are reliant on local residences to assist in meeting the fire adapted community goal.

Preparation through actions cannot occur until education of wildfire risk and wildfire preparation precedes it. Fundamentals education defining fire adapted communities is key to the success of getting the public involved in wildfire defense efforts, reducing post fire effects both in and out of the WUI areas, as well as education of the possible situations communities could experience. Education and understanding of the potential for emotional impacts for both responders and residence can prepare involved parties with skills to communicate, act, and cope in high stress situations such as wildland fires.

Opportunities for Improvement

It is the desire of the county to use this CWS goal as the foundation for further promoting wildfire education, preparation, and prevention. Using collaboration as a tool for education and knowledge sharing can catalyze follow-through toward implementation in which property owners share responsibility in saving lives and mitigating fire affects. Through fire-adapted communities, fire emergency resources can partner with community members and cooperators in ensuring long-term sustainability of their investments and efforts.

Understanding that becoming a fire adapted community is a process that includes building characteristics such as the ones listed from the Fire Adapted Communities web site will increase public acceptance of their role as a partner. A fire-adapted community should have the following characteristics:

- It is in or near a fire-adapted ecosystem, often associated with high fire occurrences.
- It has adequate local fire suppression capacity to meet most community protection needs.
- Its structures and landscaping are designed, constructed, retrofitted and maintained in a manner that is ignition resistant.
- It has local codes [building, planning, zoning, and fire prevention codes] that require ignition-resistant home design and building materials.
- Fuels on land near and inside the community are treated and maintained for safety and easy suppression
- It has and uses a community wildfire protection plan and continues to implement the plan into the future

- It has built other safety features such as buffers between fuels and the community; safe designated evacuation routes; and safe zones in the community when evacuation is not advisable (FAC 2014).

Additionally, Union County believes fire-adapted community should also include:

- A program and prevention coordinator who's primary position would be designed to work with both agencies and communities in areas such as education, fire prevention, emergency situations, and tracking CWPP accomplishments.
- Mutual understanding between communities and fire manager concepts relating to risks, potential results of mitigation efforts, and potential outcomes.
- Provide a clear distinction between protection priorities and opportunities prior, during and post wildfire.
- Operate under common terminology and understanding of living in fire dependent environments and know how proactive actions can set a course of living with fire.
- Understand missions and limitations of firefighting resources, making wildfire mitigation a tool for suppression resources.

Although the term "fire-adapted communities" was established in 2014, Union County efforts since the 2005 CWPP release have worked towards meeting fire-adapted communities through a combined effort of community members and agencies across landownership. New strategies in meeting this goal are part of our CWPP revision in hopes of accelerating the pace.

Objectives

It is Union County's goal to develop **fire-adapted communities** in Wildland Urban Interface areas by coordinating risk reduction strategies and treatment of hazardous fuels using a collaborative landscape approach. The intent of this plan is to improve the ability of ecosystems and communities to respond to natural events that have the potential for producing increased risk of a wildfire and design strategies where human populations and infrastructure can withstand a wildfire without loss of life and property (CWS 2014).:

a. Identify and share data and use a common set of base information for risk assessment, concepts of "defensible space" and fire-adapted communities.
b. Provide knowledge of wildfire conditions by sharing the analysis results of risk assessment and use common terminology at all levels.
c. Create and maintain partnerships among agencies and citizens.
d. Provide opportunities for science, community, and local knowledge input on analysis results, as one means of information verification.
e. Utilize fire threat, effects, and risks to help prioritize geographical areas in the WUI Zone of the CWPP as well as determine recommended management actions within the outlying WUIs.

f. Identify economic opportunities to supply forest product needs, ranging from biomass to higher valued products (CWS 2014, USDA 2015). Make efforts to utilize biomass material whenever appropriate. Utilize fuel reduction material where suitable and cost-effective.
g. Identify economic opportunities to offset costs during treatments and to supply local areas with forest products, ranging from biomass to higher valued material (CWS 2014).
h. Maintain and improve our forest products and manufacturing infrastructure by supplying material during appropriate protection strategy activities to preserve local ability to conduct restoration activities
i. Develop a process for monitoring the needs for maintenance of treated areas overtime, in order to preserve the benefits of forest health already achieved (HFRA 2003, revisions 2014). Schedule periodic maintenance of treatment areas based on HFRA Section 102, (g) regulations.
j. Develop wildfire mitigation strategies that take into account protection of community infrastructure and values such as municipal watersheds, cultural assets, view sheds, parks, transportation and utility corridors (CWS 2014). Include FIREWISE, Ready-Set-Go, etc.
k. Encourage investments in ecological restoration and outdoor recreation that result in job opportunities (FS 2015).
l. Design treatments based on ecosystems health, landowner input, highest potential for wildfire protection success combined with ecosystem benefits where appropriate, and increased funding opportunities.
m. Identify opportunities for across-boundary funding sources to increase pace and scale of planning and implementation.
n. Expand fire-adapted communities to include preparing fire management and public members in terms of potential social and personal reactions to evacuation protocols and events.

To promote consistency and common standards, it is important to design mitigation measures with a county-wide approach that still allows flexibility of application at the local district and municipalities. Full effects of Fire-Adapted Communities will require corresponding attention by local home and business owners in combination with management efforts to ensure successful wildfire preparedness and protection.

Restore and Maintain Landscapes – Resiliency

Goal: *Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.*

Existing Efforts

Resilient landscapes are often defined as having the ability to sustain, resist, and recover from disturbance. Landscape resiliency is essential in promoting defensible strategy options for fire suppression resources, sustainable healthy

ecosystems in fire prone areas, and long-term reduced costs of doing business. One of the purposes of the CWPP is the prioritization of landscape investments and fire suppression resource utilization with the intent to reduce risks to life, property, and ecosystems over time.

The CWPP's primary focus of disturbance is wildfire. Union County is a high fire frequent area based on the West Wide Wildfire Risk Assessment (WWRA) of fire starts, the CWS, and fire history studies conducted locally. Emily Heyerdahl estimated median fire return intervals of large fires (1000 – 4999 acres) to be 23, 25, and 11 years in her study plots surrounding Union County. These were considered conservative estimates due to plot size, tree bark thickness and number of trees sampled (see Chapter VI). Kathleen Maruoka estimated, in her study of 15 plots in and around Union County, to have mean fire return intervals as low as 9.9 years up to 30.8 years depending on the plot location (see Chapter VI).

The WWRA's fire occurrence was based on past fire start information; the aim is to use this information to define areas of uniform probability of an acre igniting. Fire ignition rates were measured in fires per 1000 acres per year (WWRA). Additional information regarding the county's fire occurrence can be found in Chapter VI.

The CWS recognizes Union County as predominately having historical fire history falling within a fire regime group of I, II, and III, with the area predominately a fire regime I. Fire regime I supports a relatively high frequency of fires averaging 35 years or less between fire events and includes fire-adapted forests and rangeland types (CWS 2014). Historically, fire regime I burned with low-severity resulting in post fire conditions of less than 25 percent of the dominant overstory vegetation experiencing mortality, with some areas experiencing mixed-severity with potential to replace up to 75 percent of the overstory (CWS 2014). Large fires were frequent prior to suppression, but historically these fires often benefited the ecosystems and resulted in retention of the overstory on the landscape. Union County's CWPP recognizes that fire is a frequent visitor of our local forests and management approaches should be taken with community protection and resilient landscapes in mind.

Undertakings of treatments for protection of community and landscape have occurred on both private and public lands. These treatment locations can be found in Chapter X.

Under the 2005 CWPP individual WUI areas apply for and receive funds. These dollars cannot be distributed toward multiple locations. This results in multiple applications for revenue for each separate geographic location even though the management objectives and the priority levels are the same. Competing for funds between geographic areas reduces opportunities for landscape applications and results in duplication of efforts.

Opportunities for Improvement

National, regional, and local management objectives will be part of the guiding principles in fuels and vegetation management. Developing a broader landscape approach provides a higher degree of flexibility for treatment locations and type, with the ability to extend beyond communities boundaries into the "middle ground" areas. This model begins to address the large landscape-scale changes needed to alter wildfire behavior, improve landscape resiliency, minimize wildfire loss, and ensure protection of life and properties (CWS 2014). Focusing investments in areas where multiple objectives can be achieved provides the maximum benefit of funding.

Analysis of a broad-scale WUI zone approach eliminates the need for funding to be concentrated in a single location, allowing for geographically prioritizing large-scale areas. This provides fire managers with the ability to apply multiple treatments concurrently, utilizing one financial source, in several areas of the WUI zone.

It is the intent of the new CWPP to consider larger landscape scale management, restoration, and fuels treatment projects that promote across jurisdictional and ownership boundaries. This revision eliminates small, isolated Wildland Urban Interface parcels and recognizes an all-inclusive "WUI Zone" that takes into consideration areas outside of the "communities and residential developed areas" to include the landscape between communities and the more distant wildlands. Given the number and size of wildfires, the West needs large landscape-scale changes in vegetative structure and fuel loadings to significantly alter wildfire behavior, reduce wildfire losses, ensure firefighter and public safety, and improve landscape resiliency (CWS 2014). Opportunities to treat areas should not limited to just the WUI Zone but should be proactive in inclusion of all areas in Union County.

One of the tasks put forth in the Northern Blue Mountain Cohesive Strategy 2013 is to encourage large scale management, including restoration and fuels treatment projects, that embrace sustainability by recognizing the social, environmental and economic benefits derived through applying the three goals of the Cohesive Strategy on the ground across all ownerships.

The resilient landscape goal provides opportunity for Union County to:

- Create sustainable ecosystems through hazardous fuels management to reduce the extent, severity, and intensities of wildfire in the county, with urgency given to priorities within the WUI Zone areas.
- Alter fire behavior characteristics through manipulation of fuel and vegetation by strategically placing treatment areas and utilizing new and innovative tools.

- Promote local economic opportunities while addressing forest fuel, forest health conditions, and debris removal needs.
- Develop a reasonable process of funding distribution where county and WUI Zone geographic areas meet criteria regarding prioritization, condition, and need for treatment.

Active management of public and private land holdings is important, including harvesting and thinning operations to reduce hazardous fuels in and around communities and in the middle ground (CWS 2014). Through the acknowledgment of a larger WUI Zone, agencies and communities can provide complementary and supportive actions that promote landscape scale management.

Objectives

Union County strives to restore and maintain landscapes through creating ecosystems that are sustainable and resilient to disturbance. It is important when evaluating local conditions of ecological and human needs and interaction to find a balance for managing wildfire for ecological resource objectives (CWS 2014). It recognizes the value in restoring the functions and processes characteristic of healthier, more resistant ecosystems. Creative approaches can be used to achieve desired results.

a. Develop opportunities for increasing community understanding of how resilient landscapes benefit communities through sustainable multiple-use management of the national forests and grassland (FS_2015).
b. Identify economic opportunities to supply forest product needs, ranging from biomass to more highly valued products (CWS 2014, USDA 2015). Make efforts to provide accurate information on biomass material availability. Utilize fuel reduction material where suitable and cost-effective.
i. Develop a process for monitoring the needs for maintenance of treated areas overtime in order to preserve the benefits of forest health already achieved (HFRA 2003, revisions 2014). All lands should be evaluated when considering maintenance of investments.
j. Increase and identify opportunities for economic expansion in forest- and grassland-dependent communities (CWS 2014). Develop economically-viable treatments that provide return revenue in order to accomplish fuels reduction at a landscape scale and to reduce overall fire risk in the County.
k. Invest in ecological restoration and outdoor recreation that result in job opportunities (FS 2015).
l. Design treatments based on ecosystems health, landowner input, and highest potential for wildfire protection success, combined with ecosystem benefits where appropriate, and increased funding opportunities.

m. Identify opportunities for across-boundary funding sources to increase pace and scale of planning and implementation. Recognize pace and scale must increase in order to effectively protect communities and landscapes.
n. Develop new approaches for application of monies within the WUI Zones. Eliminate funding application to one location and allow for allocation of dollars to multiple areas that meet request criteria.
o. Encourage revenue-producing (i.e. commercial timber harvest) projects that, in turn, can help support increased restoration and forest management activities while providing some economic benefits to our local communities (Northern Blue Mountain Cohesive Strategy {NBMCS} 2013).
p. Promote increased utilization of the "Good Neighbor Policy" and Stewardship contracting authority to accomplish forest management and restoration activities (NBMCS 2013).
q. Integrate with local forest collaborative groups to capitalize on mutual efforts that support the intent of landscape treatments and fire risk mitigations. Identify conditions where fire is placed within a broader vision with multiple jurisdictions of responsibility.

Communication and Collaboration

Northern Blue Mountain Cohesive Strategy Goal: *Ensure the coordinated implementation of the Cohesive Strategy among all stakeholders and partners in the Pilot Project Area.*

Although fire managers play a significant role in addressing wildland fire in terms of management, operations, and Wildland Urban Interface areas, it requires people working together toward a common mission and mutual understanding of what it means to live in fire-dependent ecosystems. The importance of collaboration throughout the Cohesive Strategy effort, of hearing all the voices, and involving all the partners cannot be overemphasized (CWS 2014).

Existing Collaboration

During the 2005 CWPP development a series of meetings were held to inform citizens about the progress of the CWPP development. Topics included discussion of the risk assessment involved in determining high hazard areas around the county, discussion of Union County Emergency Services operations related to wildfire response, and involvement of citizens in defining wildland-urban interface boundaries using hazard, risk, and values that may be affected by threat of wildfire (Union County CWPP 2005).

Since the 2005 CWPP, several collaboration efforts have led to a variety of accomplishments including in-woods projects, improvements to bridges, fire response improvements, and community education. Projects were developed in

coordination with local residence and agencies to begin creating defensible space and improving fire response capabilities. A number of private landowners have acquired funding for fire proofing their properties with assistance from state agencies.

Collaboration with the local rural fire departments provided opportunities to create surplus equipment agreements to acquire excess fire equipment from federal surplus. Additional collaboration groups have evolved that would benefit the CWPP concepts including the Wallowa-Whitman Forest Collaborative group, Umatilla Forest Collaborative and the Northern Blue Mountain Cohesive Strategy group (NBMCS).

The Wallowa-Whitman Forest Collaborative group mission is, *"To improve the social, economic, and ecological resiliency of the Wallowa-Whitman National Forest and local communities. through collaboration by a diverse group of stakeholders."* This mission is consistent with the CWPP's commitment in meeting the Cohesive Strategy's three goals.

The NBMCS is a pilot project tiered off the National Cohesive Wildfire Strategy with identified goals and actions that support the CWS. The Blue Mountain pilot project contains a description of actions and tasks that are necessary for implementing a successful Cohesive Wildland Fire Management Strategy (a.k.a. Cohesive Strategy) in the Pilot Project area (NBMCS 2013). One example is that during public meetings, the CWPP committee educates and informs the stakeholders/partners in the Pilot project area on the Cohesive Strategy (NBMCS 2013). Organized meetings with the rural fire chiefs, local cooperators, and members of the general public have all been designed for this purpose.

Opportunities for Improvement

In meeting the goals and desired conditions within the CWPP, Union County is also able to support the Forest Collaborative mission of social, economic, and ecological resiliency during "all hands all lands" (cross boundary) projects. Coordination with the Forest Collaborative provides an opportunity for project recognition and diverse support; potential increased funding, project creativity and design, while improving increased awareness of fire risks in Union County.

Emphasis is also being placed on creating and maintaining lasting partnerships among agencies and populaces. Agency activities include, but are not limited to, local, state, tribal, and Federal agencies showing support for one another through wildfire response, engagement in collaborative planning and decision-making processes that take into account all lands and recognize the interdependence and statutory responsibilities among jurisdictions (CWS 2014).

The CWPP is a key platform to which fire managers, cooperators, and community members can align roles and responsibilities to promote organized

approaches in fire management across all jurisdictions. Since the 2005 Union County CWPP fire managers have recognized advancements in wildfire risk assessments, treatment approaches, and science research. Public learning of how this information can be used in developing fire adapted communities will lead to collective actions toward wildfire protection.

Using the WUI Zone model designed for a landscape approach allows expansion beyond the classic communities at risk in Union County and increases opportunities for additional participatory roles that may otherwise not be considered. Through the use of an inclusive approach that addresses other values at risk of fire such as scattered farm/ranch communities, dwellings, and infrastructure improvements such as watersheds, communication sites, and critical habitats (CWS 2014), the CWPP is more representative of a landscape approach. Potential partners were identified using the three goals of the CWS and action items described in the Northern Blue Mountain Cohesive Strategy with an understanding that ALL Union County citizens play an important role in the success of these goals.

Partnership centered on the following characteristics:

a. Ability to provide skills and participate in the wildfire assessment and development of the CWPP.
b. Expertise and capabilities in the implementation of mitigation action items in the CWPP.
c. Protection capabilities and capacity to provide assistance in suppression and protection efforts.
d. Key infrastructure areas that may benefit efforts to implement actions, prepare for, and respond to wildfires.
e. Key infrastructures areas that may contribute to potential threats or pose additional safety issues in the event of a wildfire.
f. Ability to assist the community in pre, during and post wildfire evacuation.
g. Property owner(s) within identified WUI Zone are key participants in wildfire protection, acknowledging that all property proprietors within the county play a role in the event of a large wildfire.
h. Stakeholders with an interest in the CWPP mission.

Development and implementation of a communication process creates an essential link between fire managers and citizens. Emphasis on good public relations will promote sustained collaboration by producing informed communities, consistent partnerships among stakeholders, and a guide toward future efforts. A transition plan outlining community participation that progresses from development, to implementation, to post-treatments is essential for a successful collaborative effort and informed communities. This approach is in alignment with the CWS concepts to improve and expand communications of diverse groups within communities to ensure best science and proven professional practices are used. Diverse groups include scientists, program managers, specialists, and stakeholders (CWS 2014).

Through community outreach, essential information was compiled on structures, roads, and water resources throughout the WUI Zone. Community involvement is crucial for successful wildfire planning. County citizens are the best source of information when developing planning opportunities toward public safety and mitigations of wildfire risks. Outreach within the community encourages and supports a continuous, rolling, and collaborative dialog among stakeholders and across regions to enhance shared understanding, roles, mutual trust, and willingness to pool resources and take joint actions (CWS 2014).

Education and community outreach were a primary focus when creating this community fire protection plan. The CWPP efforts include fostering widespread collaboration and consistent support of the Community Wildfire Protection Plan. One priority is to create and maintain partnerships among agencies and citizens by combining efforts in developing a range of ideas and actions designed for wildfire protection and ecosystem health. Through these efforts the following can be accomplished:

a. Use the CWPP as a coordinated resource tool, educational piece, and building block or protection efforts.
b. Create strategies that make an effort to hear all voices and involve all partners; this is vital for success (CWS 2014).
c. Build upon fire prevention programs that focus on education and ignitions. Identify funding mechanism and improve landowner assistance through various grant sources.
d. Coordinate communication and education efforts to provide consistent and comprehensive messages.
e. Implement CWPP action items within WUI Zone areas. Motivate individual community members and key community interests to take positive action (BMCWS 2013).
f. Provide CWS's vision, goals, and national direction to increase knowledge and understanding of guiding principles, core values, and national priorities (CWS 2014).
g. Build an interagency approach to implement Firewise in at risk fire communities.
h. Work to educate and assist residents in at-risk fire communities in meeting their individual and collective responsibilities of preparing their homes and properties for the possibility of fire (BMCWS 2013).
i. Explore opportunities for Fire Adapted Community demonstration sites as a Pilot Project to use as an educational tool.

Funding and Economic Assistance

Overview

Successful fire suppression over the last eight decades has created landscape conditions that would have historically been treated by natural fire disturbance. Overstocked stands have subsequently created increasing suppression difficulty, which also increases costs of doing business. This, in combination with an upsurge of new home disbursement in and near forested areas has driven up the cost of doing business on a regular basis.

Unfortunately, *suppression* costs are associated with a wildfire that is already actively burning, thereby removing opportunities toward pre-fire preparation for risk reduction. The cost of fire suppression has grown from 13 percent of the U.S. Forest Service agency's budget just 10 years ago to more than 40 percent in 2014 (USFS, 2014). Recent studies have found a positive correlation between firefighting expenditures and the presence of housing and private lands (Gebert and others 2007, Liang and others 2008). Average annual fire suppression expenditures by the U.S. Forest Service alone totaled $580 million from 1991 to 2000, and more than doubled to $1.2 billion annually from 2001 to 2010 (USDA Forest Service 2011c). The National Association of State Foresters (NASF) conducted a biannual survey of State Forestry agencies on wildfire protection, prevention, and suppression (including Federal funding expended by State agencies), and found more than $1.6 billion dollars was spent annually; more than doubling the amount from 2000 to 2010 (NASF 2010). Also, local governments are estimated to average close to $1 billion dollars per year during the 2000s (IAWF 2013). This does not take into account the cost associated with property damage or devaluation, rehabilitation of properties and ecosystems, human health, or impacts to local businesses. Of highest value, where monetary measures cannot compare, is loss of life or injury.

Not only are suppression costs increasing, so too are the number of structures lost per year per decade since 1960. The following graph was recreated from the WUI FACT SHEET issued by the International Association of Wildland Fire (IAWF) in August of 2013. Based on 2012 U.S. Census statistics, approximately 46 million homes are located in WUI, of which 21 million or 46 percent of the existing homes are less than 10 years old (IAWF 2013).

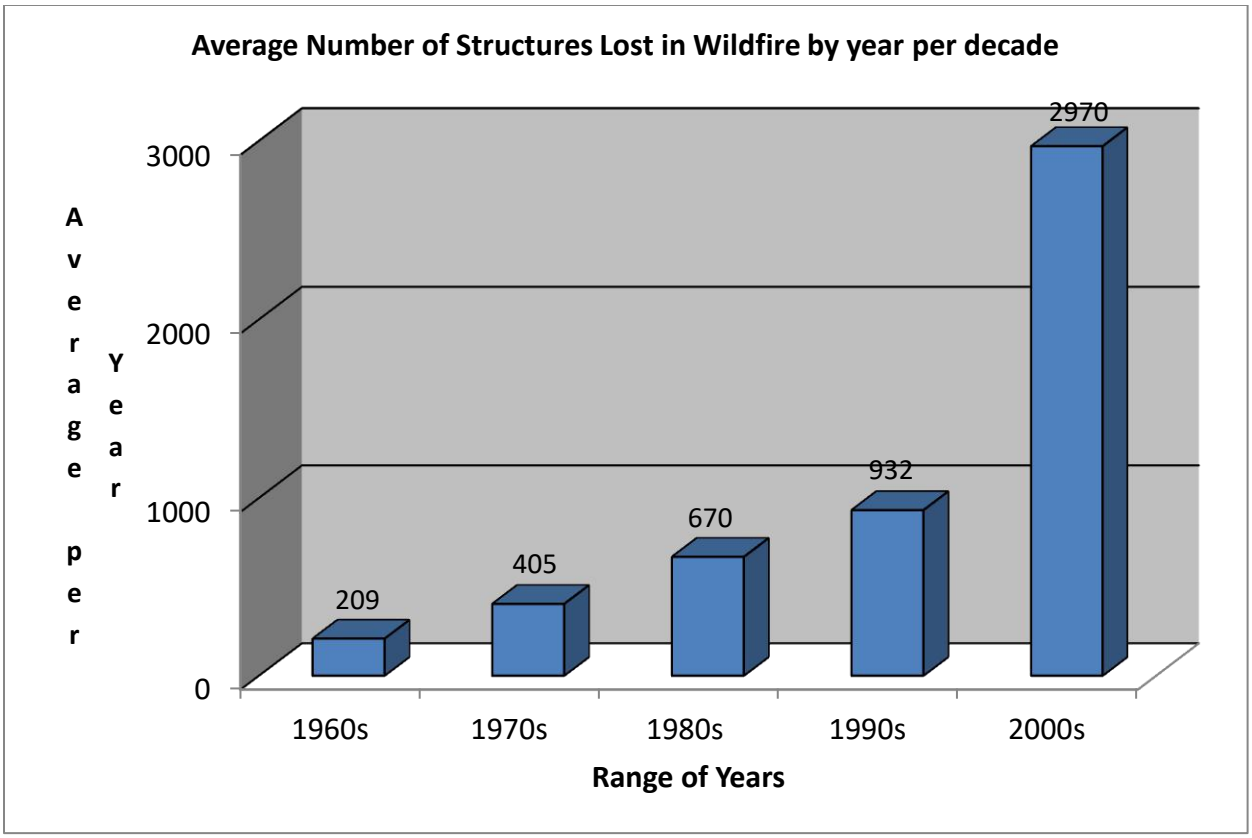

Figure II – 1. Structures Lost by Decade. Graph demonstrates the gradual increase in structure loss until the year 2000 where number of structures lost is 3 times higher than the 1990's. Data from International Association of Wildland Fire 2013.

The financial and social costs of wildfires demonstrate the need to reduce fire impact on lives and property through prevention and protection methods. Assessment of the short- and long-term economic and environmental consequences from large-scale wildland fires indicates that cost savings can be realized through preparedness and risk reduction. This includes a coordinated effort of planning for fire protection and implementing activities among local, state, and federal agencies, the private sector, and community organizations.

Recent fire seasons bring the wildland interface problem and the problem of overabundant dense forest fuels to the forefront. The forest fuels issue is a major and continuing problem that has received national attention. Work is underway to reduce fuels in WUI areas by way of community involvement and funding from the *National Fire Plan* and the goals of the Cohesive Wildfire Strategy. National Fire Plan goals are to:

- Ensure sufficient firefighting resources for the future.
- Rehabilitate and restore fire-damaged and fire-adaptive ecosystems.
- Reduce fuels (combustible forest materials) in forests and rangelands at risk, especially near communities.
- Work with local residents to reduce fire risk and improve fire protection.

As with many programs, funding is critical to success. Funding sources are not always straightforward; knowledge of mechanisms to acquire revenue increases the likelihood of participation and program success. Potential for cost savings can be achieved through coordinated efforts in prevention, preparedness, and risk reduction.

Community Assistance grants and other grant opportunities to aid in achieving these goals are available through National Fire Plan (NFP) and the Cohesive Wildfire Strategy. Efforts toward these goals represent a substantial amount of work, and their ultimate success will depend on involved landowners, agencies, and organizations working in concert. The CWS recognizes that western landscapes are generally more vast, steep, and limited-access. For this reason, the CWS recommends landscape scale changes are needed in vegetative structure and fuel loadings to significantly alter wildfire behavior, reduce wildfire losses, ensure firefighter safety, and improve landscape resiliency (CWS 2014). No agency or group working alone can achieve the CWS and the NFP's goals.

Applying funds on the ground within the WUI Zone in advance of a wildfire event is anticipated to reduce costs of suppression and loss of properties when a fire event happens. Practices such as harvesting and thinning, prescribed burning (where appropriate), and fuel reduction throughout the WUI Zone are key to mitigating wildland fire effects as well as threats of insect and disease. Vigorous cross-boundary management on both public and private land holdings is key to addressing the interdependence and statutory responsibilities among jurisdictions.

Opportunities for Improvement

It is the desire of the CWPP to provide resource funding mechanisms in order to apply prevention and protection efforts on the landscape in advance of a wildland fire occurring. Grant and funding mechanisms are listed in Appendix I, identifying what avenues are available to access revenue for treatment and prevention and implementing needed treatments on private, state and federal lands. Collective participation is imperative for acquisition of revenue for not only private entities but also for all wildfire management agencies. The CWS offers tremendous opportunities when applying the, “all hands, all lands” principles and implementation efforts toward its goals of fire response, restore and maintain landscapes, and fire-adapted communities. The CWPP holds these three goals as part of its measure of success in meeting the desired condition in wildfire protection efforts.

In a survey of Colorado homeowners examining willingness to pay for prescribed fire, thinning, and fire suppression, Kaval et al. (2006) also found support for reducing fuels now, and showed that those who had conducted defensible space activities were more willing to pay for thinning on public lands (Kaval and Loomis 2008).

In Oregon, all land that is zoned Forest Resource by the state is automatically subject to wildfire mitigation requirements to protect adjacent property. In addition, because mapped wildfire areas are often done at a general level and may contain errors, many communities require that a site-specific wildfire analysis be done for proposed projects in a mapped area to make sure that wildfire measures are, in fact, necessary and justified (NFPA 2013). The CWPP is designed to accomplish a wildfire analysis of Union County. The Oregon Legislature boosted national forest restoration, allocating $2.88 million in state lottery funds to accelerate projects in eastern Oregon (Andersen 2014). This allows for implementation of restoration projects with "boots on the ground" by local forest collaborative groups working together on complex forestry issues. Additionally, it has enabled the U.S. Forest Service a number of opportunities for acquiring funds to accelerated thinning and restoration projects for various reasons, including fire risk reduction (Andersen 2014).

Oregon continues to be proactive in emergency preparedness and wildfire mitigation efforts. As part of the movement toward cross-boundary treatments, several funding mechanisms have been made available in an attempt to support community and fire management activities.

Oregon is home to the HB 2050 Wildfire Protection Act that is designed to control and equally distribute costs in Oregon's wildfire protection system, which combines state and landowner resources to protect forest and communities (ODF 2013). This legislation is designed to increase capacity to extinguish fires rapidly, before they become large and costly (Oregon.gov 2014).

Oregon Senator Ron Wyden's office has made available *A Guide to Federal Grants,* which provides details regarding grant names, purpose and description, eligibility, web site, contacts and any matching funds requirements (Appendix I). Specific grants within the Public Safety section are designed to assist firefighting in communities.

The Grants.gov Program Management Office offers numerous federal funding opportunities in a centralized location. The site is designed to provide a common website for federal agencies to post discretionary funding opportunities and for grantees to find and apply to them (Grants.gov 2014). This site allows for easy search criteria to be used to identify grants with specific purposes. This avenue of grants awards more than $500 billion dollars annually, centralizing more than 1000 grant programs across all 26 federal grant-making agencies.

Cost-Share Grant Programs through National Fire Plan

ODF provides homeowners within the WUI areas of Union County a free home site inspection. After the inspection, technical advice is shared with the homeowner as to what can be done to lessen the structural ignitability rating of

the home. The amount and type of vegetation to be removed varies depending on the amount of survivable space needed to protect the home. This could entail a substantial cost to the homeowner; however there may be grant funds available to share in the cost of the project. (See Appendix I Funding Mechanisms)

In addition, there is a separate program for larger landowners that have land within a Union County WUI. The large block landowners become an even higher priority if located in a WUI and adjacent to federal land. This program offers cost-share incentives for pre-commercial thinning, slash removal, brush removal, and/or ladder fuel removal. Contact ODF in La Grande at (541) 963-3168 to find out more about these programs.

Funding is highly competitive across the counties and states. This CWPP is intended to provide increased leverage by addressing multiple fire issues and concerns through a highly collaborative process. Issues and opportunities outlined in the following chapters are developed with this approach in mind.

During the development of this plan, several collaborative meetings occurred including: a fire management meeting with rural fire chiefs, a cooperators meeting with local companies that could either contribute to successful outcomes or posed additional concerns during wildfires, and three community workshops with homeowners, businesses, and other interested members of the public. The workshops allowed the steering committee an opportunity to discuss the plan completion timeline, the high hazard area risk assessment, values threatened by wildfire risk, and any additional concerns related to emergency services and fire agency response. The community workshops were held in La Grande, Elgin, and Union. Discussion topics included the importance of the planning effort, the local risk assessment and emergency operations related to wildfire events, formulation and rationale of WUI Zone, boundaries, and potential projects (see Chapter V for Community Workshop Summaries).

Summary

As the home of the third largest city in eastern Oregon, Union County is dedicated to developing a CWPP that addresses the concerns of the National Fire Plan and embraces the new Cohesive Wildfire Strategy's three goals of fire response, fire-adapted communities, and restoring and maintaining local landscapes. Through committed, coordinated efforts with fire agencies, cooperators, and communities the county strives to educate on fire response, prevention, and risk mitigation.

Recognizing that fire knows no boundaries, the Union County CWPP strives to create a broad-scale approach when addressing the counties wildland fire conditions. Through an "all hands all lands" stance, joint efforts of landowners will provide much needed improved forest conditions; the aim is to intercept wildfire spread by slowing forward progress and reducing fire behavior,

generating increased suppression success. Living in a fire-prone environment requires an understanding of inherent risks, fire dependent ecosystems, and actions in fire planning from landowners. Current efforts are designed to meet desired future conditions such as:

- Increased response capacity of local fire management resources through improved training, equipment, and facilities.
- Developing fire-adapted communities through public awareness and involvement supports the cross boundary approach.
- Having common missions and terminology to aid both the public and fire management agencies in understanding the desired results for fire risk mitigation.

When living in a landscape dependent on fire disturbance, it must be recognized that creating resilient landscapes is key to sustaining healthy ecosystems while reducing long term costs of doing business. Historical fires burned through the forests of Eastern Oregon creating an area prone to low fire severity with occasional mixed severity results.

Collaboration is essential to achieving the mission and goals of this document. These proposed communication efforts build upon existing methods to improve not only social facets but also to recognize the importance of community economics and ecological functions. Creating and maintaining lasting partnerships makes success of the CWPP goals a likely outcome. Meetings designed to hear all voices and consider all options create a sense of ownership toward goal attainment. Collaboration and combined efforts on the ground increase opportunities to obtain funding; many funding mechanisms today often inquire about collaborative efforts occurring on adjacent lands. Partnerships in mitigation measures increase the probability of awarded monies, thereby increasing the likelihood of successful fire suppression efforts.

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III. Wildland-Urban Interface Planning

Wildland-Urban Interface Zone

Union County rests in the northeast corner of Oregon State, supporting the area's third largest city (La Grande) and encompassing one of the largest enclosed valleys in the state. This area was a haven for many Native American tribes such as the Nez Perce, Cayuse, Umatilla, Walla Walla, and Shoshone, who often spent their summers in the valley (Wikipedia.org 2014).

Prior to Oregon Trail settlement, the La Grande valley was a stopping point for many settlers headed toward the Willamette Valley. The first permanent settlement other than Native Americans' occurred in 1861 by an Englishman named Benjamin Brown (Wiipedia.org 2014). The discovery of gold and the construction of railroads were the turning point for population growth in the 1800s. Today, several communities established during the long-ago boom continue to exist with some additional smaller communities.

Currently, these and many communities in Union County are considered Wildland Urban Interface areas (WUIs), with a high percentage of the structures within or adjacent to forested lands. In 2001, the Federal Register provided a comprehensive list of communities identified as Urban Wildland Interface in the vicinity of Federal lands that were considered at risk from wildfire. Union County communities in the federal register include: Anthony Lakes Resort, Camp Elkanah, Cove, Elgin, Hilgard, Medical Springs, Morgan Lake, Mount Emily, Palmer Junction, S. Fork Catherine Creek, Starkey, and Union. It is important to note that the urban wildland interface is not limited to communities in the vicinity of Federal land. Many states submitted revised lists for communities within their State regardless of their relationship to Federal land (Federal Register 2001). In an assessment, *Communities at Risk,* conducted by the state of Oregon in 2006, the cities of La Grande, Island City, North Powder, and Summerville were also identified as at risk (ODF 2006). Additional areas of concern not listed by the Federal or State records that are of high concern for the county are: Blue Springs, Perry, Kamela, and Spout Springs Ski Area, including multiple resort cabins.

Western states contain vast forested landscapes that are often remote and steep. With a finite amount of fire protection resources, these states are recipients of natural lightning starts that annually burn an average of 4,666,030 acres from wildfires based on data between 2008 and 2012 (CWS 2014). In addition to natural lightning starts, each year wildfire growth is further compound by centuries of fire exclusion, long-extended drought, and increasing insect and disease mortality. As a result, fire suppression resources have become less effective and wildfire behavior more extreme. Union County is no exception, with the majority of the forested acres located along the foothills of the valley often with limited access due to either inadequate or poor road conditions, making it impassable for some suppression equipment.

The Cohesive Wildfire Strategy (CWS) acknowledges these issues and the potential threats they pose by recommending *large landscape-scale* changes in vegetative structure and fuel loadings in order to significantly alter wildfire behavior, reduce wildfire losses, ensure firefighter and public safety, and improve landscape resiliency (CWS 2014).

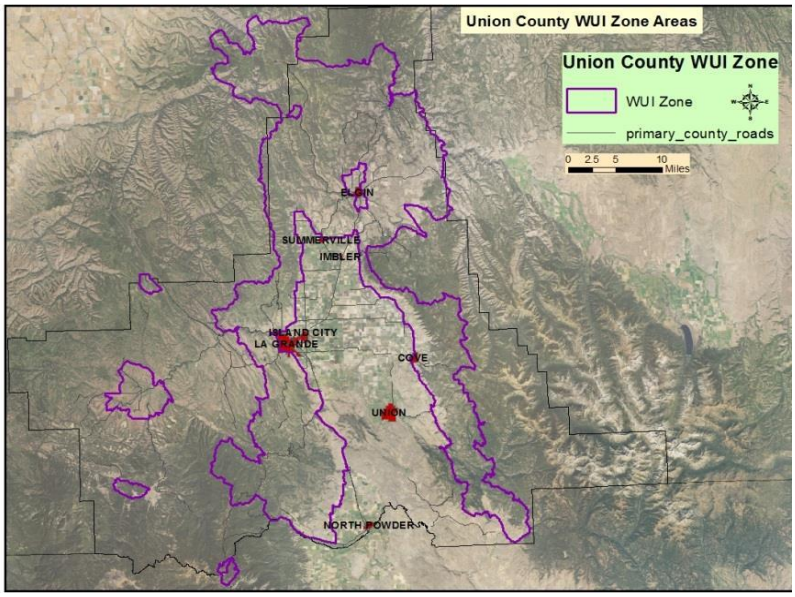

Figure III-1. Union County's new WUI Zone

The 2005 CWPP identified and prioritized sixteen WUI areas in Union County. The new 2016 revision recognizes the need, based on "middle ground" landscape treatment concepts, to further expand the size and number of WUI areas. The term "middle ground" refers to the areas between communities and the more distant wildlands (CWS 2014). These middle ground areas play a significant role in altering wildfire behavior in advance of reaching communities. Through multiple discussions on best methods for addressing additional acreage and the high number of contiguous WUIs, the CWPP committee agreed that a new approach was appropriate.

As a result the group merged all neighboring WUIs into one large WUI Zone (WUIZ) while leaving outlying WUIs as separate small WUI Zones. There were several positive aspects identified for this model:

1. It addresses the all hands-all lands concept where high fire occurrence areas have the need to involve both landowners near communities and landowners where large fires can develop posing a threaten to life and property. It dissolves property lines when it comes to fire threats, acknowledging fire has no boundaries and approaching across-boundary treatments as a whole instead of isolated units.
2. It allows for a holistic approach to treating large acreages, recognizing the need for both first entry risk reduction as well as maintenance of previous investments, thereby addressing treatments in a temporal and spatial approach. It is important to include treatment of lower priority areas and maintenance of previously treated areas, particularly when that ground separates two high priority areas on the landscape. There is a growing need to balance previously completed activities with new treatment areas to protect earlier investments.
3. Previous individual WUIs were rated against each other, resulting in competition between communities. This new approach recognizes that although some communities may be of higher risk and need, it does not eliminate opportunities

for landowners in moderate or low risk areas to initiate or continue to promote risk reduction measures.

4. Defensible space is no longer limited to land immediately adjacent to homes and structures but now includes lands that provide an extended treatment buffer between general forest and communities, thereby creating an opportunity to stop the fire in the middle ground. Designing projects that improve wildfire buffers between large forest blocks and private lands increases management options, while preserving ecosystem integrity in the event of a wildfire. It also provides opportunities to consider large-scale application using a variety of tools which otherwise would not be applicable and/or cost effective at a smaller scale.
5. The WUIZ allows natural resources to also be considered as values to protect during treatment endeavors, where and when appropriate. It increases fire managers' ability to protect important community values and investment in locations that meet multiple resource management objectives.
6. Creates opportunities to protect areas that may otherwise not be considered. Provides options within the WUIZ to seek out areas considered of value to county citizens that are not necessarily associated with a specific threatened community, but individuals still have a sense of ownership toward these values such as: favorite recreation sites, viewpoints, forested byways, historic sites, visual and scenic resources, etc.
7. Provides opportunities for increased participation by county residents not directly at risk to provide input on their forest and valued interests.
8. Enables possibilities of assisting multiple landowners with risk reduction treatments through a single funding source. Distribution of funds would not be limited to one "WUI" area but to the entire WUIZ that meet the criteria of the funding source. This approach eliminates the competition for funding between priority WUIs.
9. Eliminates the need to separate the three national Cohesive Strategy goals. The WUIZ approach allows for achieving multiple goals in the same location, creating a synergy or mutually reinforcing positive effect (CWS 2014).

The WUIZ method helps address issues with reduced budgets, declining forest management staff, increased wildfire potential and their combined impacts on risk and safety. Uniting agencies and public efforts creates additional avenues for funding acquisition at all levels that may otherwise be unattainable.

The rationale for a WUIZ is further supported by the Management Options outlined in Chapter 3 of the Cohesive Strategy. Applying a "one size fits all" wildfire risk mitigation solution is not realistic for all counties in Oregon. The WUIZ allows each county to focus on attributes specific to their area. These options can be designed to either change wildfire extent and intensity, number of human caused ignitions, or to alter risk by changing the degree of exposure (CWS 2014) of both firefighting personnel and local values.

The CWPP committee was then tasked with creating an appropriate definition that fit the rationale for creating a WUIZ. The following final definition was developed after much discussion. The wildland-urban interface zone is:

> *"An area strategically identified that provides effective wildfire defense for communities, infrastructure, and other values at risk that meet or intermingle with wildland fuels and offer opportunities for broadened mitigation measures designed to interrupt wildfire spread and modify wildfire behavior in order to protect social, economic, and environmental interests".*

The National Fire Plan and the Ten-Year Comprehensive Strategy for Reducing Wildland Fire Risks to Communities and the Environment place a priority on working collaboratively within communities in the WUIZ to reduce their risk from large-scale wildfire. **The Cohesive Wildfire Strategy places strong emphasis on community and agency involvement early in the process to create a sense of ownership by all parties.** For this reason by developing the WUIZ, it is intended to emphasize an "in it together" approach for reducing wildfire threat. It creates opportunity to draw into discussions county residents who may not have land or structures at threat but place a high value on recreational and/or local natural resources.

Plan Review Schedule and Mechanisms

Plan maintenance will be directed by Union County Emergency Services and coordinated with the plan's steering committee members, a core group of who have agreed to be a standing committee to assist with monitoring and evaluation. Proposed plan maintenance will be set at minimum of annually and will consist of a plan review, priority action item re-evaluation, and progress evaluation, with a total plan revision as needed based on evolving local, state, and national strategies, funding opportunities and local conditions.

Plan revision is recommended as the infrastructure needs of Union County change. Specific considerations during revisions include: population fluctuations, land use changes, completion of fuels reduction projects, emergency service improvements, computer software/hardware updates, new and revised data, and extreme wildfire hazard fluctuations. Revisions should be directed in part by applicable policies and guidelines at all jurisdictional levels regarding matters such as: Land Management, Fire Management, Rural Housing Development, etc.

Annual evaluation of strategies and recommendations will be necessary as changes to wildfire risks become altered or circumstances (if less than a year) make it necessary to re-evaluate the plans progress and intent. Given the dedicated time, collaborative effort, and cost to revise the CWPP it is vital that follow-up monitoring and evaluation of the plan occur. Understanding that communities change, infrastructure needs are adjusted, and forests are dynamic, the risk of wildfire to communities cannot be viewed as static.

At a minimum the CWPP committee should meet to complete an annual progress report of accomplishments and challenges. A form to record progress is located in Appendix L.

Each participant must maintain an ongoing commitment to work through the plan with community, cooperators, and fire agencies in Union County. Community outreach and education is a continuous process of building on established relationships and developing new affiliations whenever possible. Details of possible outreach opportunities can be found in Chapter V. Annual review will be advertised in order to include representation from the stakeholders who participated in the development of the Community Wildfire Protection Plan.

Mechanisms for initiating a CWPP Committee meeting are outlined in Appendix L page 9, under the form titled *Go/No Go CWPP Evaluation, Revision, or Committee Meeting*. This table is designed so that any question that receives a "yes" answer warrants the need for the CWPP Committee to meet and discuss changing conditions or progress. It provides the Evaluator key, unbiased questions or conditions that would typically create a need to re-assess the County CWPP.

Mechanisms to identify the need for public meetings will be left up to the CWPP Committee unless there is a high level of demand for fire agencies assistance by landowners or unexpected tensions between parties. Forums organized in Union County for notification should not be limited to one type of outreach. Multiple avenues should be used to encourage as many citizens as possible to attend the meeting. The best forms of public announcement and access utilized at the time of this revision were: radio, Facebook, internet web sites, newspapers, US Postal Service, and public meetings. As thoroughly as possible, record and maintain a detailed list of participants that have participated in some fashion in the CWPP development and implementation.

All records of accomplishment, data, funding acquired, equipment, and infrastructure improvements should be identified and recorded to the CWPP file. The file will follow the current planning process with a joint effort between Oregon Department of Forestry (ODF) and Union County. Whenever possible, geographic location points with longitude and latitudes and/or polygons should be made known to update the CWPP to display across boundary treatments, level of landowner participation, specific locations for mapping, and areas where maintenance work is not overlooked in the future.

There is a form available for reporting annual accomplishments in Appendix L, pages 10 - 23. The form provides a level of standardization for the CWPP committee when assessing progress. Each fire management agency is responsible for updating plan achievements annually, at a minimum. Progress or obstructions to work completion should be identified and posted to maintain discussions throughout the year in an effort to prevent redundant occurrences. Annual postings will inform the collaboration group of trends in implementation issues, successes, and other topics contributing to or preventing success in plan implementation. Ongoing upkeep of records and documentation throughout the year can be used during the next plan update. Written communications of progress are needed for tracking purposes.

In an attempt to provide consistent messages, common language definitions are provided in the *Glossary of Terms.* These definitions provide a level of standardized terms and concepts necessary for clear communication between agencies and with members of the public. Eliminating confusion in definitions is the first step to a common vision and expected outcome. Shared terms among agencies can be found in Appendix J: *Glossary of Terms.*

Customized terms or reporting may occur within specific fire agency guidelines and/or policies. An example is the reporting of new fire starts. Each agency has its own required reporting process and form for database upload. There is however, specific, standardized information that is *required* in order for a holistic County approach during the next revision. New fire starts regardless of responding agency *must* report at a minimum fire start date, latitude and longitude, cause, and fire size to provide meaningful statistical information. This ensures consistent and statistically valid data and is a priority of this plan.

Agencies also have customized terminology of definitions and conditions regarding forest management as outlined in their agency's direction. Management direction and terms must remain tailored to their agency's specifications. This plan does not serve as a means of bypassing the individual processes and regulations of the participating agencies. Each project must adhere to any pertinent local, state or federal rules or guidelines in determining the point of project implementation. The plan is a coordinating document for forest projects related to safety, education and outreach, information development, fire protection, and fuels treatment for altering fire behavior.

National Priorities

The National Strategy, supported by scientific analysis, processed over 100 different data sources to thoroughly examine wildland fire issues across the nation in order to understand the differences and similarities among locations.

National Strategy for prioritizing where activities should be emphasized was based on the premise that planned actions have a greater likelihood of being most effective and efficient in areas where conditions contributing to the issue are most severe (CWS 2014). Four spatially prioritized opportunities and challenges were assessed in the CWS at the national level.

1. In areas that historically were frequented by fire, successful suppression efforts have exacerbated fuel conditions that contribute to higher intensity wildfires. As a result, these fires become more damaging and costly while threatening both firefighter and public safety (CWS 2014).
2. Homes, communities, and other values are at risk simply because of their proximity, or juxtaposition with flammable natural vegetation in environments conducive to wildland fire (CWS 2014).

3. Human ignitions account for the majority of wildfires throughout the Nation, requiring response organizations to be maintained in most locations (CWS 2014).
4. There is a need for highly competent multi-jurisdictional response resources with capabilities to quickly suppress the majority of wildfires. The effects of large wildfires are not only costly from an economic and ecological impact standpoint, but also threaten the health and safety of firefighters and public (CWS 2014).

On a scale of High, Moderate, Low, or Very Low, the CWS's national assessment of the above four topics resulted in Union County as:

Category	National Rating
Vegetation and Fuels	High Priority
Homes, Communities, and Values at Risk	High Priority
Managing Human-caused Ignitions	Low
Effective and Efficient Wildfire Response	High Risk of Wildfires More Potential for Resource Benefits

The National Strategy emphasizes the safe and effective response to wildfire as the highest priority. Acknowledging that equipment and personnel are important for wildfire response, areas such as improved coordination, communication, and training are important components of intergovernmental preparedness and should be included regionally as well.

Union County Plan Priorities

Details of prioritization of elements within this plan are outlined in Chapter IX, describing various levels of risk, threat, and effects locations. Recognizing possible time and budget constraints, prioritization should be given to fire fighter and public safety first and foremost.

Elements key to fire fighter and public safety are given the highest importance with actions that provide the most efficient approach to wildfire risk reduction. Using analysis completed in the West Wide Risk Assessment for the State of Oregon, local data, community knowledge and expertise, components were identified that took precedence as priority. Potential for high priority conditions within the county included both temporal and spatial considerations:

a. Treatments across jurisdictional boundary creating a contiguous landscape of treatments.

b. Deficiencies in equipment and infrastructure where improvements would increase fire response success.
c. Locations of high fire threat (includes start density) and fire effects (values) that result in a high and extreme fire risk.
d. Potential threat to firefighter and public safety exceeding what would be considered an inherent risk or one that is preventable through a mitigation action. An example would be poor ingress/egress,
e. Identified high fire occurrence level locations with long response times or no local response capabilities.
f. Areas where concentrated ignition starts are coupled with vegetation that contributes to extreme fire potential.
g. Actions that improve suppression effectiveness and successful value protection.

Conditions where multiple high potential for a undesirable outcomes overlap one another convey locations and actions needed to address the most efficient use of funds while still meeting both the local and national intent.

Participation and Responsibilities:

As part of the priority process, information was gathered from multiple facets of the population. These sources provided key information and played a role in the development of this plan. Our CWPP development occurred through that collective effort from multiple agencies, cooperators, and public members. Understanding the roles and responsibilities of those involved will provide insight on development and implementation of the plan.

County Commissioners

Final approval of the CWPP will be conducted by the Union County Board of Commissioners. As part of CWPP planning and development, the county commissioners maintain oversight of the planning and implementation process. Plan maintenance will be coordinated through Union County Emergency Service. In addition, they will:

1. Remain informed on progress through all stages of the plan.

2. Provide final Plan approval and any revisions to the CWPP.

Union County Emergency Services (UCES)

Union County Emergency Services was a primary lead during the CWPP committee meetings, media venues, oversight of plan development, and coordination with county officials. Its roles in the CWPP include:

1. UCES is responsible for apprising the county commissioners and cohesive wildfire strategy group on the progress of the CWPP on topics regarding plan maintenance, plan implementation, and progress.

2. Provides oversight to the CWPP committee on all aspects of plan development.

3. Maintains involvement in plan implementation and public contact to ensure fire fighter and public safety is priority.

4. Coordinates with local fire management agencies to meet the three goals of the CWPP.

5. Holds and maintains the CWPP document, forms, and project files.

CWPP Committee Members

Multiple fire management agencies were represented on the CWPP committee. Those that participated on a regular basis included: Oregon Department of Forestry, Union County Fire Chief, Multiple Rural Fire Chiefs, Umatilla Fire Management, Wallowa-Whitman Fire Management, Bureau of Land Management Fire and Fuels, and Blue Mountain Cohesive Wildfire Strategy Pilot Project Lead. These individuals worked through numerous meetings assessing county conditions and identifying action items needed to reduce impacts from wildfires. Their ongoing responsibilities include:

1. Oregon Department of Forestry provides the lead in developing the risk assessment for the CWPP and its five year revision (ODF 2015).

2. Provide local knowledge and data to be incorporated into the county CWPP.

3. Continued public contact and implementation of the action items identified within the CWPP. Submit progress reports for their agency on meeting those action items.

4. Work together collaboratively between agencies and public to meet the three goals of the CWPP.

5. Part of a collective group to assist members of the public in acquiring funding to reduce wildfire risk.

6. Part of a collective group to provide assistance at public meetings on the CWPP concepts.

7. Recommend, review, and give input into the content of the CWPP Plan.

8. Participate in ongoing CWPP meetings.

Rural Fire Departments

Rural fire departments play a complex role in county protection services. These fire resources not only are important in fire response; they are also crucial for communications with local landowners in their areas. Many of the rural firefighters are members of the communities in which they serve and have an established rapport with citizens. As a result they are often the first contact for risk mitigation information. Their participation includes:

1. Participate on the CWPP committee through a representative and convey input to that representative about knowledge of local fire issues in their districts.

2. Provide representation at public meetings to share concepts behind the CWPP with community members.

3. Work with other fire management agencies to educate and encourage members of the public to implement and meet the CWPP goal of Fire Adapted Community.

4. Provide periodic reports to Committee members on known landowners' fire risk reduction measures.

5. Continue to update fire statistical information for the State of Oregon Fire Marshall's Office; including but not limited to the following information: fire location using latitude/longitude, fire size, and fire cause.

6. Collaboratively work with other local fire management agencies in meeting the goal of Wildfire Response.

Cooperators

Union County cooperators are significant players when it comes to wildfire prevention and participating in wildfire events. For the purpose of this document, cooperators are considered non-fire agencies that play a role before, during, and after a wildfire event. Cooperators are considered agencies that supply assistance to direct tactical or strategic approaches and wildfire support to a wildfire event. They partake in prevention functions not only in the WUI Zone but in some cases throughout the county (i.e. Transmission lines, railroads). Examples of cooperators are Oregon State Police, Pacific Power Co., Pacific Railroad, and American Red Cross.

Their responsibilities differ somewhat from their fire agency counterparts.

1. Work collaboratively with lead fire management jurisdictional agencies in preparing for wildfire response regarding infrastructure.

2. Understand their role in emergency fire situations where infrastructure may pose threat to or assist in community protection.

3. Coordinate with Union County Emergency Services in development or changes to infrastructure as part of annual progress report.

4. Participate in risk reduction whenever/wherever possible and fire prevention to reduce the number of human caused fires.

5. Support public and firefighter safety as the number one objective during a fire incident.

6. Has potential to be actively involved with fire agencies in all phases of a wildfire.

Union County and Adjacent Fire Management Agencies

Closest suppression resource concepts and cross boundary approaches, include fire agencies adjacent to Union County. Union county supports WUI Zones that are adjacent and fall into other Fire Management agencies protection responsibility. This is particularly true in areas near Anthony Lakes Ski Area, Tollgate, and Kamela. These locations are bordering or expand into Umatilla National Forest – Umatilla County and Baker County.

1. Collectively report all fire starts according to their agencies protocols.

2. Understand the three goals of the CWPP its ideas and recommendations.

3. Work collaboratively toward the three goals of the CWPP during all phases of planning, implementation, and reporting.

4. Knowledgeable of WUI Zone concept. Understands fire risk, threat, and effects on the landscape and the need to reduce fire risk based on all hands all lands concept.

5. Function as part of joint effort of fire suppression in protecting life and property and minimizing wildfire impacts to communities while meeting the goal of wildfire response.

6. Oregon Department of Forestry notifies owners of properties within the county's forestland-urban interface (WUI Zone) areas (ODF 2015).

7. Participate in site visits and demonstration projects.

Community

The communities of Union County are familiar with wildfire on the landscape; some small populaces have firsthand experience of fire near communities. Because fire suppression resources have been successful in protecting the local communities, only a fraction of landowners has participated in risk reduction. Community members are being encouraged to join with fire management agencies in protecting their values at risk. Oregon Senate Bill 360 is an option to enlist the aid of property owners toward the goal of turning fire-vulnerable urban and suburban properties into less-volatile zones where firefighters may more safely and effectively defend homes from wildfires (ODF 2015).

1. Property owners in identified forestland-urban interface areas, once notified that their land meets the criteria of forestland-urban interface, have two years to reduce excess vegetation, which may fuel a fire around structures and along driveways (ODF 2015).

2. Appropriately apply received risk reduction funds to property based on funding source guidelines.

3. When opportunities arise, they may convey their fire risk concerns and property needs through discussions with local fire management agencies.

Although some groups were participated more than others, input from all was vital toward a collaborative Community Wildfire Protection Plan. Union County supports approximately 16 communities, with populations ranging from less than 100 to more than 13,000 residents, each facing the potential for wildfire threat.

Western states support vast areas of forested and rangeland acres where potential fire spread may threaten rural communities. Union County, Oregon is no exception, with fire occurrence high from both human and lightning sources. Because of the vast amount of forested public and private land surrounding the communities and their proximity to one another, a single WUI Zone concept was created to meet several recommendations for the western states outlined in the National Cohesive Strategy. Establishing a WUIZ accomplishes the need to address middle ground areas that lie between untreated areas and urban interface areas and provides the ability to allocate funding to multiple areas meeting the criteria of the monies.

In order to ensure plan goals and action items are being met, periodic progress reporting and annual meetings are needed. These are designed as a means of checks and balances among fire management agencies, community members, and public officials. Collaboration through implementation promotes coordinated efforts across jurisdictions and property lines while achieving the three goals of the CWS.

Summary

The 2014 Cohesive Wildfire Strategy puts emphasis not only on the forest areas in close proximity of private lands but takes into consideration expanding wildfire mitigation actions well beyond the property lines into the general forested areas. By recommending large landscape-scale changes to vegetative structure and fuel loadings an effort can be made to safely and successfully engage wildfires prior to them reaching communities. Creating this type of defensible space not only provides added protection for communities but protects social, economic, and environmental interests as well.

Forests and communities are dynamic in nature, exhibiting changes over time. The CWPP is an active document that should be assessed annually. Plan strategies will be evaluated for new opportunities, changes in regulations, implementation progress, and validity of plan intent. Appropriate amendment measures should be taken as needed based on National, State, and Local priorities.

The plan is an all-inclusive document where community members and organizations play an active role in fire mitigation. Union County Emergency Services will provide a lead role in CWPP implementation with the support of ODF and local fire management agencies. Through this collaborative effort community members can be provided with assistance and guidance during the CWPP implementation. Engaging as many groups and individuals in wildfire mitigation creates a holistic approach toward meeting the goals and objectives of the plan.

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IV. Union County Profile

Introduction

Located along the Interstate 84 corridor in northeast Oregon, Union County is approximately 250 miles east of Portland, Oregon and 160 miles northwest of Boise, Idaho. Union County is situated along the Grande Ronde River and Powder River Valley, taking in the northeastern slopes of the Blue Mountains. Union County is bordered by Wallowa County to the north and east, Baker and Grant Counties to the south and Umatilla County to the west.

Figure IV – 1. - Union County Vicinity Map for State of Oregon

Characterized by the ridges and valleys typical of the Blue Mountains, Union County is part of the Grande Ronde River Basin. Encompassing 2,038 square miles (1,304,523 square acres), the county is bordered by two different mountain ranges. The Eagle Cap Wilderness of the Wallowa Mountains defines the county boundary to the east while the Blue Mountains outline the southern and western sides of the county.

The Grande Ronde River originates in the southern part of the county and enters the west side of the valley skirting the town of La Grande, traveling east just short of the town of Cove then begins a meander north along the east side of the valley to eventually exit the valley near Palmer Junction. The valley is approximately 35 miles long, running in a north to south direction from Pumpkin Ridge to Pyles Canyon, and stretches east to west 15 miles from the town of Cove to the canyon where the Grande Ronde River enters the valley. In 1988, the United States Congress designated 44 miles of the river's northern portion, downstream of Union County, as a Wild and Scenic River.

The highest elevation point lies in the southeastern corner of the county inside the Eagle Cap Wilderness on Glacier Peak, at approximately 9,595-foot elevation. The highest elevation outside of the wilderness is Mount Fanny, due east of La Grande overlooking the valley from approximately 7,125-foot elevation. The lowest elevation point is located in the La Grande Valley near the airport at approximately 2,700 feet. This elevation difference is telling to the abrupt changes from valley floor to ridgelines within the county. Northeast Oregon's steep, dissected country provides a high degree of elevation changes, influencing both fire behavior and suppression efforts.

The Grande Ronde Valley and River area provides a number of opportunities to residents and visitors alike, including recreational activities such as skiing, hunting, fishing, wildlife viewing, hiking, biking and rafting. Residents also rely on the local area for irrigation of farm lands and crops, livestock grazing, timber products, and gathering products such as morels, firewood, huckleberries, blackberries, various other items in the surrounding national forest. Fire impacts to the river's upstream landscape could have high detrimental effects to both the economy and ecology of the area.

The valley and surrounding foothills support multiple scattered communities. There are eight incorporated communities in the county, La Grande being the largest in 2013 with an approximate population of 13,082 and Summerville the smallest at 135 people (Suburbanstats 2015).

Additionally, 12 unincorporated communities are located in the outlying areas of Union County, many of which no longer participate in the population census. This does not imply that the areas do not have full-time residents. For instance, Camp Elkanah and Telocaset do not participate in the census but each supports a small population of full time residents with approximately four and seven homes, respectively. Camp Elkanah is also host to a summer camp that houses up to 300 school-age children, not counting adults, for a week at a time during the months of June and July. Figure IV-2 displays spatial distribution of communities around the county. Communities are primarily located along main travel corridors and connecting thoroughfares that lead to adjoining counties. Except for the communities located in the center of the valley, most are in close proximity or adjacent to public forested lands.

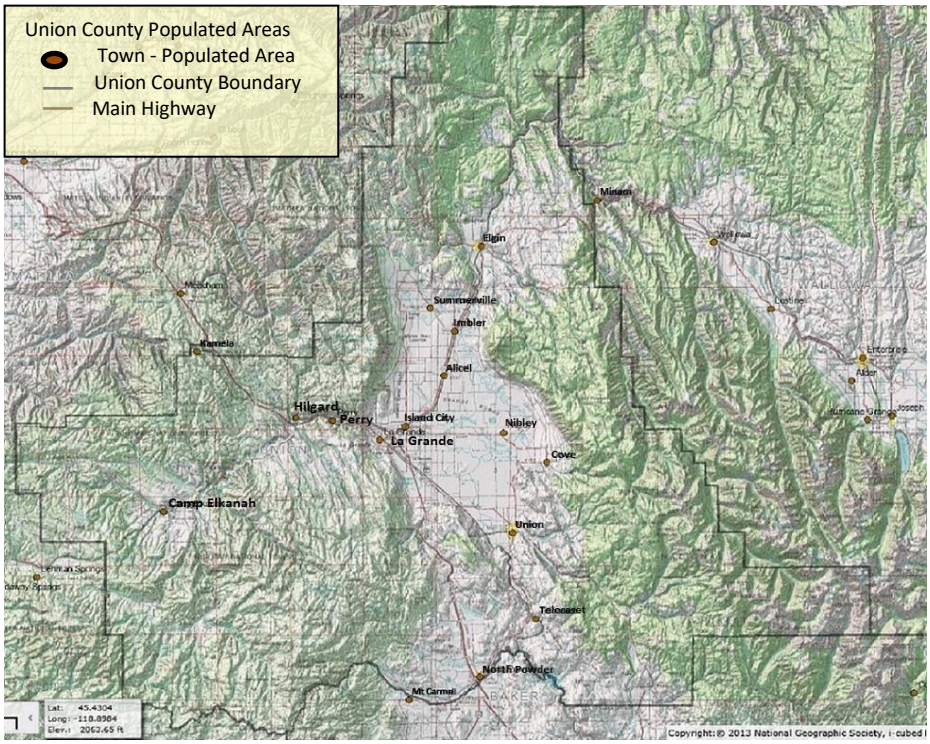


Figure IV - 2. Distribution of highest populated communities throughout Union County. Oregon Explore, 2014. Image provided by National Geographic Society. 2014.

Union County contains 10 fire districts/departments, providing structural fire protection with the bulk of these districts located primarily in the Grande Ronde Valley area. Figure IV-3 shows the distribution of Union County's seven rural fire departments. Agencies primarily responsible for wildland fire protection include the U.S. Forest Service, Oregon Department of Forestry, the City of La Grande and Rural Fire Departments. Fire Protection is discussed in further detail under Section XI – Emergency Management.

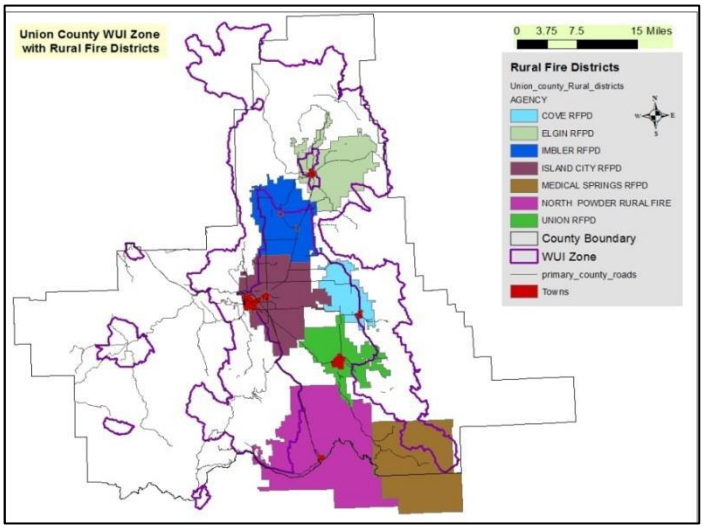


Figure IV – 3. Union County WUI Zone with Rural Fire District response coverage.

Union County protection agencies are responsible for part or all of the Wildland Urban Interface Zone(s). The entire WUI Zone accounts for approximately 503,573 acres of Union County. Twenty-one percent of WUI Zone acres (107,850 acres) are under rural protection, with La Grande Rural Fire District (RFD) accounting for the largest block of rural protection with 49,427 acres, followed closely by Elgin RFD with 46,229 acres. There are four outlining sections of the WUI Zone, all located in the west and southwest portions of the county. These small blocks include: Anthony Lakes, Blue Springs, Camp Elkanah, and Kamela varying is size from 2,565, 3091, 17,019, and 1,935 respectively. In addition, three areas overlap into adjoining counties of Umatilla and Baker forming a combined protection area. Twenty-six percent (678 acres) of the Anthony Lakes Zone is located in Union County with Baker County supporting the remaining 74 percent. The largest portion of the WUI Zone overlap occurs west of Elgin where approximately 45,909 acres cross over into Umatilla County. This area encompasses properties managed by Umatilla National Forest, residents of Tollgate and Spout Springs Ski area, all located on the Blue Mountain summit along Oregon highway 204.

Land Ownership and Stewardship

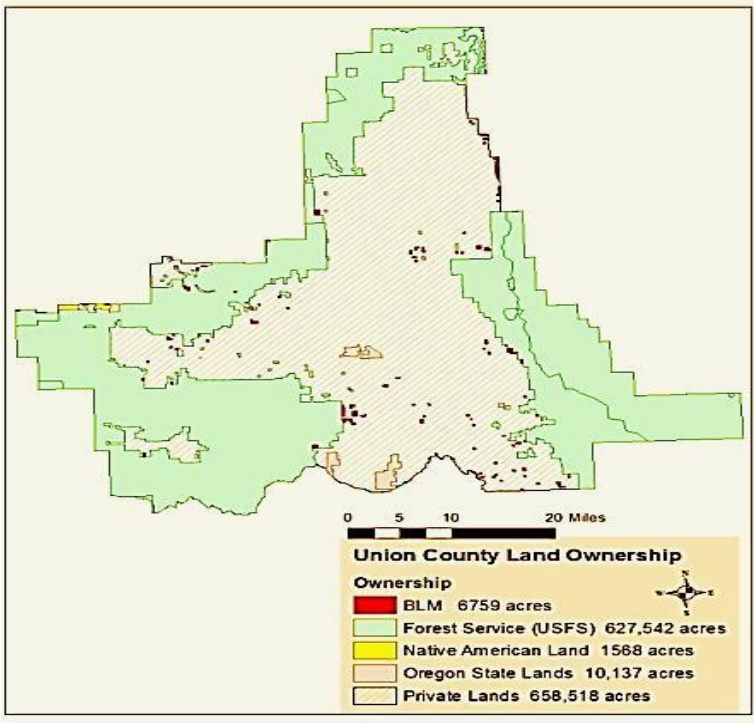


Figure IV - 4. Union County Landownership Distribution

As mentioned earlier, the land protection responsibility within the county is close to evenly split between the Forest Service and Oregon Department of Forestry (ODF), with Rural Fire Departments overlapping some areas. Public land protection by the Forest Service predominantly occurs at higher elevations of the mountainous areas surrounding the Grande Ronde and Indian Valleys, encompassing approximately 627,542 acres. The second highest ownership is privately owned land totaling 658,518 acres, incorporating most of the valley and surrounding foothills under ODF protection agreements. The remaining acres are comprised of Umatilla Tribal Lands, Bureau of Land Management, and Oregon State

Lands totaling 1,568, 6,759, and 10,138 acres respectively. The BLM lands pepper the landscape and are under a mutual aid agreement for fire protection with the Forest Service, Wallowa-Whitman National Forest.

Using land ownership data from the West Wide Risk Assessment, land ownership distribution is displayed for Oregon State and Union County in Table IV-1, showing administered land in Union County as compared with the state as a whole. Union County is divided among federal, state and private ownership or stewardship. Federal land managers include the United States Forest Service and the Bureau of Land Management. The Oregon Department of Forestry provides technical forest stewardship assistance and fire protection patrol for state and many private forest lands throughout Union County.

Administered Lands	Acres of Land (% of Land)				
	Private	BLM	Tribal	State Lands	USFS
Union County Lands 1,304,523 acres	658,517 (50%)	6,758 (.5%)	1,568 (.1%)	10,138 (.7%)	627,542 (48%)
State of Oregon Lands *	27,014,099 ** (44%)	16,039,954 (26%)	716,160 (1%)	1,504,254 (2%)	15,751,190 (25%)

Table IV – 1. Union County and State of Oregon comparison of land distribution. * State lands include: Parks and Rec., Fish and Wildlife, Dept. State Lands, and other State Managed Lands. ** Includes 94,052 acres of the Nature Conservancy. Remaining acres *not shown in state totals* are properties of: U.S. Fish and Wildlife, National Parks Service, Dept. of Defense, National Oceanic, and local county governments.

Population and Demographics

According to the Portland State University Population Research Center, Union County's population consisted of 24,550 people in the year 2000.

Union County Community Populations **Community**	**2000 PSU Revised ****	**Certified Population Estimates 2013 PSU***	**Population Change 2000-2013**	**Percent Change 2000 – 2013**
Cove	595	550	-45	-7.5%
Elgin	1,655	1,725	70	4.2%
Imbler	285	305	20	7%
Island City	925	1,015	90	10%
La Grande	12,340	13,125	785	6.3%
North Powder	490	445	-45	-9%
Summerville	115	135	20	17%
Union	1,930	2,150	220	11.4%
Union County	***24,550***	***26,325***	***1775***	***7%***
Incorporated	**18,335**	**19,450**	**1115**	**6%**
Unincorporated	**6,215**	**6,875**	**660**	**10.6%**

Table IV - 2. **Population Estimates for Oregon and Its Counties and Incorporated Cities: April 1, 1990 - July 1, 2007 Prepared by Population Research Center, PSU, March 2008: *2013 Certified Population Estimates, Prepared by Population Research Center, Portland State University For the State Board of Higher Education, 12/15/2013

All cities with the exception of Cove and North Powder have shown an increase in population since 2000, with Union having the largest growth rate of 11.4 percent (Table IV – 2). In March of 2013, the State of Oregon released population projections for the state's counties. Union County is expected to continue to increase in population through the year 2050 (State of

Oregon, 2013). The estimated population change from 2015 to 2030 is forecast to be 3,566, giving the county an expected increase of 13 percent, with an additional increase from 2030 to 2050 of 18 percent (Table IV – 3).

	UNION COUNTY, OREGON							
	FORECAST							
	2015	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Population Growth	26,964	28,216	29,419	30,530	31,548	32,572	34,211	35,973
	FIVE YEAR INCREMENT FORECAST							
	2010-2015	**2015-2020**	**2020-2025**	**2025-2030**	**2030-2035**	**2035-2040**	**2040-2045**	**2045-2050**
Anticipated Increase	1,154	1,252	1,203	1,111	1,018	1,024	1,638	1,763
	FIVE YEAR INCREMENT PERCENT CHANGE							
	2010-2015	**2015-2020**	**2020-2025**	**2025-2030**	**2030-2035**	**2035-2040**	**2040-2045**	**2045-2050**
Growth/Per 5 years	4.50%	4.60%	4.20%	3.70%	3.30%	3.20%	5.00%	5.10%

Table IV - 3. Information was taken from Excel Spread sheet through Forecasts of Oregon's County Populations and Components of Change, for dates from 2010 to 2050. Prepared by the Office of Economic Analysis, Department of Administrative Services, and State of Oregon. Release date: March 28, 2013.

Increased growth (both urban and rural) can be expected to impact agency abilities for managing emergencies because of increased population and development, especially within the WUIZ. County growth has potential impacts on several aspects of fire protection. First, fire response capabilities can be compromised if new access roads are not identified and managed with fire emergency in mind. This could potentially compound an already existing risk to fire fighter and public safety. Secondly, 47 percent of fire starts within the WUIZ are human-caused, indicating that almost half of all fire starts may be preventable. An increase in population is expected to bring an increase in recreation and land use. As a result, it can be anticipated that an increase of human-caused fires will occur with population growth. Third, an increase in population will likely result in additional development in the WUIZ, in effect increasing the number and types of values at risk and potential hazards. New residents bring new home constructions, outbuildings, and livestock, as well as increased infrastructure, causing new fire response assessments. In addition, heavy populations and large proportions of landscapes in the wildland-urban interface (WUI) intermix can lead to even small wildfires threatening structures, increasing the risk and complexity for firefighters (CWS 2014).

According to the US Census Bureau, as of 2010 Union County has a variety of household types, some of which are worth mentioning to bring attention to potential issues that may surface during potential evacuation situations. Out of the 10,501 households in Union County 8.5 percent have single male with children under 18 or single female with children under 18 (218 and 668 respectively). Households with single occupants over the age of 65 living alone account for 10.5 percent, of the total, with figures at 232 male and 777 female residents in this situation. Identification of residents within the WUI areas who may require additional assistance or longer than average time to evacuate may assist emergency services personnel in pre-fire assessments and planning.

Employment and Industry

Union County hosts many diverse businesses and employment opportunities. The area

is supported by a variety of businesses that contribute toward the local economy with principal industries including agriculture, timber, government, education, and manufacturing (Oregon State University, 2012).

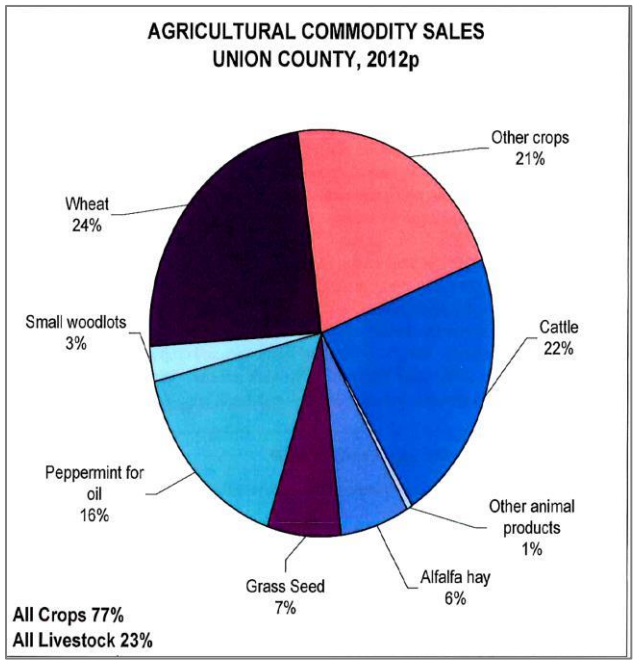


Figure IV - 5. Oregon State University 2012 Profile of Union County Agriculture. 2012 Crop sales: Alfalfa hay - $6,210; Grass Seed - $7,040; Peppermint for oil - $15,990; Small woodlots - $2,760; Wheat - $23,505; Other crops – $21,115.

Revenue from crop sales has increased from 2007 to 2012 with agriculture products showing a 17percent gain from $58.2 to $68.3 million in revenue. Seventy-five percent of agriculture products were crop sales and livestock accounted for the remaining 25 percent (USDA 2012).

The county is home to a multitude of state and federal agencies that have provided the local area's largest employment opportunities. Out of 10,070 non-farm employment positions, 2,140 are working in transportation, warehousing, and utilities. Another 1,510 are working in education and health services, with an additional 2,750 employed by the government (Union County Chamber Commerce, 2014).

Timber played a key role in Union County's early economic development with continuing declines since the early 1980s. Timber harvest records, in thousand board feet (MBF), show that in 1990, public lands were harvesting approximately 58,116 MBF and private lands 55,037 MBF. In 2012, public lands had a harvest of 3,119 MBF and private lands 36,849 MBF, with a decrease of 94.6% and 33% respectively (NEOEDD, 2013). More than one-third of the private lands in Union County are owned by Hancock Forest Management, which is the county's largest timber volume supplier.

Impacts from timber harvest reduction have been felt through permanent mill closures, yet timber-related employment continues to be an important source of family-wage jobs for the community. Union County currently supports one of the few mill infrastructures in the area, including a plywood mill, particleboard plant, stud mill and dimensional lumber mill. Using available data for Union County, the average annual wage in 2013 for timber and wood product manufacturing jobs was $51,601. In Union County, forestry and logging jobs average an annual salary of $42,294, positions for agriculture and forestry support $27,915, with natural resources in State and Federal positions averaging $38,779 and $61,813 respectively (Oregon Labor Market, 2013). These local infrastructures play a significant role in cost-effective projects, eliminating additional expenses such as haul costs that other remote counties are currently facing.

Self-employment and small businesses in Union County are showing signs of growth, with a change from 2000-2012 of 11 percent and an average income for self-employment in 2011 of

$15,806 (Oregon Employment Department, 2013). Personal income sources in Union County account for $454 million dollars in wages and salaries. The four top occupations in wages and salary income for Union County are as follows, starting with largest: government jobs with $132 million; healthcare positions with $79 million; manufacturing jobs at $58 million; retail at $44 million. Public source income contributes up to 44 percent of personal income earned in Union County (NEOEDD, 2013).

Between September 2013 and September 2014 there was a 1.7 percent increase in nonfarm payroll employment for Union County. Manufacturing showed the highest increase over that same timeframe at 9.7 percent with Professional and Business Services next at 4.3 percent. The two areas of decrease were financial activities and leisure/hospitality at -2.9% and -7.1% respectively (OLMIS, 2014).

Oregon Labor Market projections for Region 13, including Union, Baker, and Wallowa Counties from 2010 to 2022, show a gain of 11 percent for all occupations. Using the Oregon Employment Office standard occupational classification code listing, the regional employment projection for farming, fishing, and forestry is expected to show the largest positive change of employment categories, with a projected increase of 17.5 percent by the year 2022. Notable sub-groups of this category include Agricultural Workers, with the largest projected growth of 19 percent, while the Forest, Conservation, and Logging Workers sub-category have the lowest predicted increase at 14.3 percent with Fallers and Buckers down -33.3 percent. Health Care is the second largest primary category with a 13.8 percent rise and Construction and Extraction are predicted to have an increase of 13.7 percent over the same period. Professional and related occupations are expected to increase 8 percent just above Management, Business, and Financial type employment increasing by 6.2 percent (Oregon Emply. Depart. 2014)

Although supervisors and managers of firefighting and prevention workers are expected to remain constant, the number of individual firefighting jobs is expected to increase by 11 percent. Changes in firefighters are expected to increase by nine positions from 82 to 91 with replacement openings occurring in 22 of the existing positions (Oregon Emply. Depart. 2014).These positions will play a key role in fire protection, particularly if changes in snow/rain precipitation and amounts continue to shift.

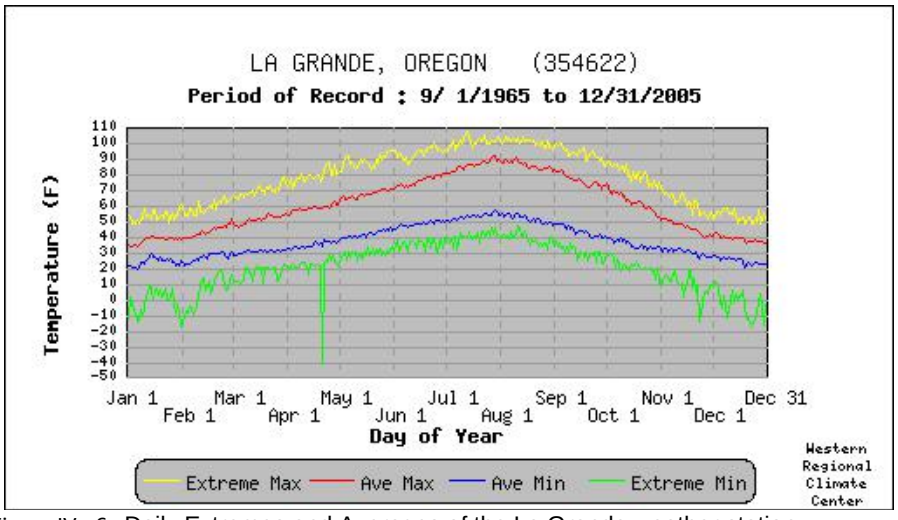


Figure IV - 6. Daily Extremes and Averages of the La Grande weather station. Information from the Western Regional Climate Center.

Local Climate

Union County enjoys four distinct seasons with wide temperature fluctuations between day and night. Summer temperatures can reach a maximum more than 100 degrees, with averages of 75 to 86 degrees from June through August. Fall provides a transition phase for adjusting to the upcoming winter through temperature

variations of up to 33 degrees difference from day to night. Daytime temperatures can reach into the high 70s, cooling off quickly at dusk with temperatures dropping into the upper 30s to low 40s at night. Winters can be cold and harsh at times, with lows dropping below zero, but average temperatures typically range from 20 to 30 degrees.

Precipitation is measured in both rainfall and high-elevation snowpack. Annual precipitation data taken from the U.S. Department of Agriculture Natural Resource Conservation Service website shows annual precipitation in the valleys is approximately 14 - 16 inches, while high mountain precipitations vary with location, see Figure IV - 7. The high elevation ridgelines in the northwest and southeast corners of the county can experience anywhere from 24 to more than 60 inches of precipitation.

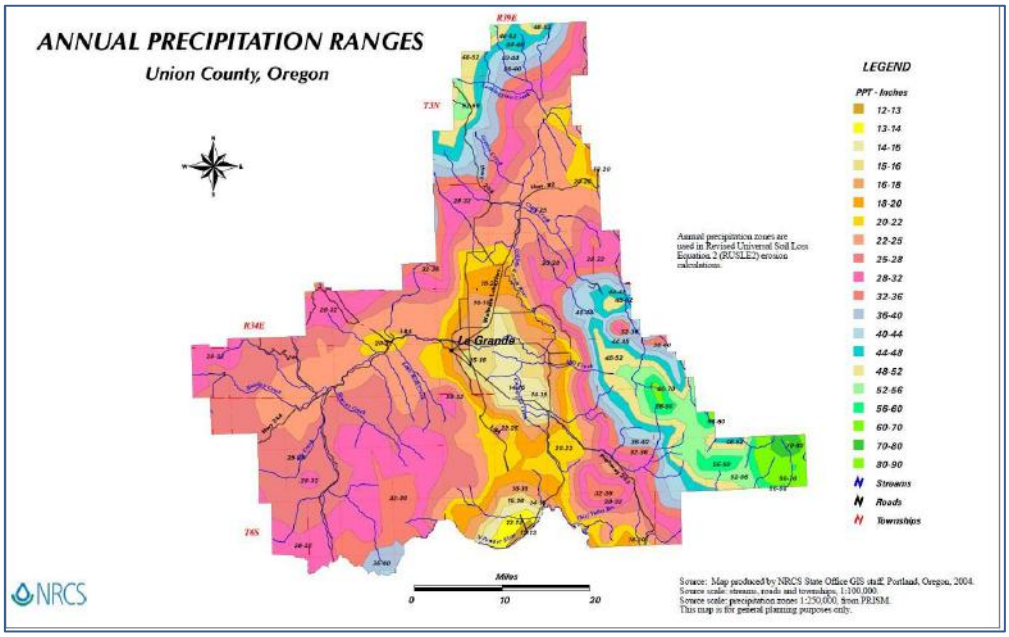


Figure IV – 7. Geographic distribution of precipitation for Union County. NRCS 2013. http://efotg.sc.egov.usda.gov/references/public/OR/union_ppt.pdf

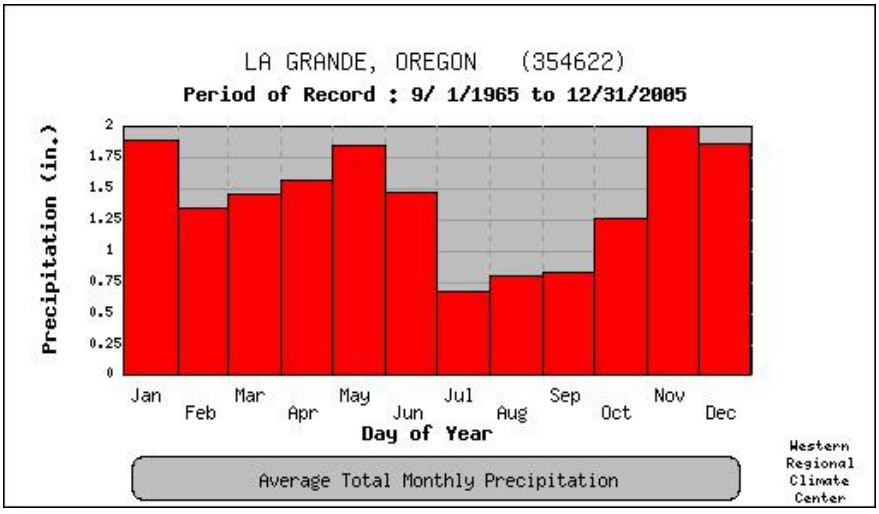


Figure IV – 8. Averages the forty year monthly total of precipitation for the La Grande weather station. Western Regional Climate Center, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?orlagr

At approximately 4500 feet in elevation, the pass from La Grande westward to Pendleton has precipitation variants of 20 to 35 inches, compared to the previously mentioned ridgelines.

Oregon's climate varies depending on location. The west side of the state is subject to weather systems usually traveling eastward from the Pacific Ocean. The Coastal Mountain Range receives a great deal of moisture that often continues to moisten areas into the Cascade Range. Eastward beyond the Cascade Range, precipitation lessens significantly. Seasonal distribution of moisture for the Grande Ronde Valley is quite different from western

Oregon valleys. Coastal influence west of the Cascade Mountain Range brings a mean rainfall of six inches per month for November, December, and January alone at the Salem airport weather station (Western Regional Climate Center WRCC, 2013). Data from 1971 – 2000 shows mean precipitations of 6.39, 6.46, and 5.84 inches respectively for Salem.

Union County data at the La Grande weather station, number 354622, shows averages for time span between 1965 to 2005 as relatively uniform from November through June with precipitation ranging between 1.25 and 2 inches per month, including November, December, and January, with significantly less accumulation in July, August, and September (Figure IV - 8). Moisture that does occur during the summer months is often associated with thunderstorms, making moisture sporadic and accumulations gradual. These frequent thunderstorms in the mountainous and timbered regions of the Blue Mountains make eastern Oregon highly susceptible to lightning-caused fires.

Annual moisture amounts and temperatures play an important role in wildfire behavior. Collaboration between the University of Arizona, the Western Regional Climate Center (WRCC)/Desert Research Institute, and the PRISM Climate Group at Oregon State University developed the WestMap data link via NOAA, with the objective of the WRCC to provide the best quality climate data and information possible (Westmap 2007). Union County data was analyzed for the years between 1955 through 2014. Mean temperature was assessed over the 60-year time period using the overall average from all years as the baseline for change. The average temperature for this time was divided into 15-year increments. Annual temperatures for Union County are displayed in Figure IV – 9, showing each 15-year period compared to the average from 1955 - 2014, with each plot representing a 12-month period. Prior to the 1980s, average annual temperatures for the first three decades (1955 – 1969, 1970 – 1984) fell below the 60-year average, with 73 percent of the years below average and 27 percent of the years above average temperatures. A shift in temperature averages began around 1986, showing a slight increase of temperature within the next 15-year increment. This shift continued to increase the annual average temperature over the next 15 years (2000 – 2014) in Union County with only one year falling below the 60-year average.

Using temperature and precipitation stations for the Pacific Northwest located in the Historical Climate Network (USHCN) (Peterson and Vose 1997) it was found that most stations in the Northwest showed temperature trends as positive over the 1920 to 1997 period (Mote 2001). Temperatures over the last 25 years have generally been above the long-term average, both from an annual and seasonal comparison. Using an average from 1901 – 1960, all years have been above average except for two, with seasonal temperatures reflecting similar results. Five of the nine warmest summers have occurred since 1998 (Kunkel et. al. 2013). Dalton et. al. also found that temperatures of the last 30 years in the Northwest have generally been above the 20th century average, and since 1998, all but two years are above the average for the century (Dalton et. al 2013). Temperature trends for 1895 – 2011 have risen annually and for all seasons except spring, with increases ranging from +0.10 to +0.20^{o}F/decade (Kunkel et. al. 2013).

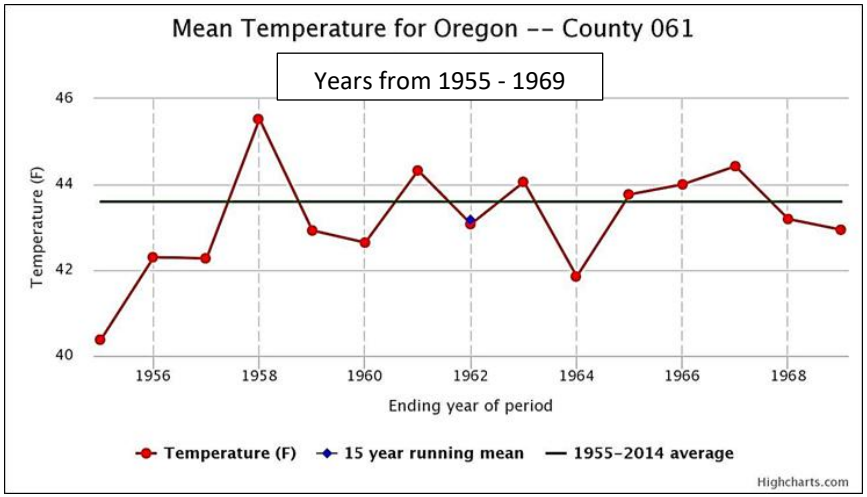
The implications of rising temperatures are shown to have a correlation to both the length of fire seasons and accentuated conditions that favor large wildfires. Westerling et. al., found that the incidence of large wildfires in western forests showed an increase in the mid-1980s.

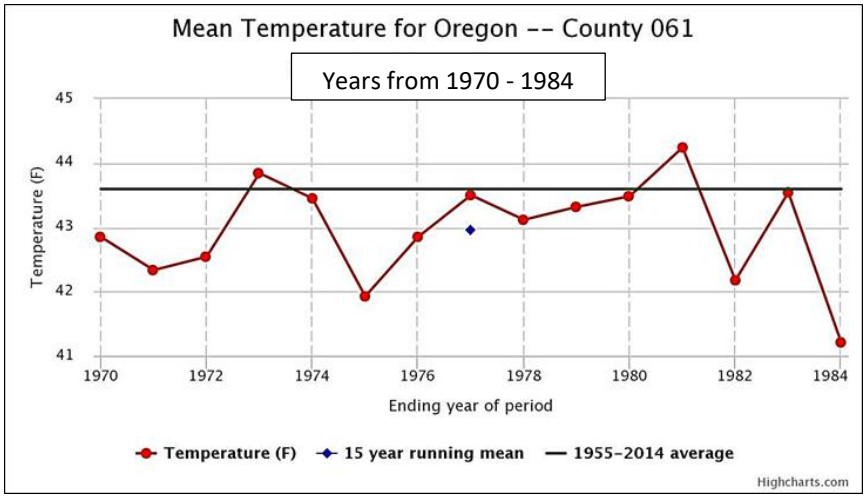
Comparisons of fire frequency and fire size from 1970 – mid-198's to fires after the mid-1980s show the latter time period had wildfire frequency that was nearly four times higher and the total burned area from the fires was over six and half times as large (Westerling et. al. 2006).

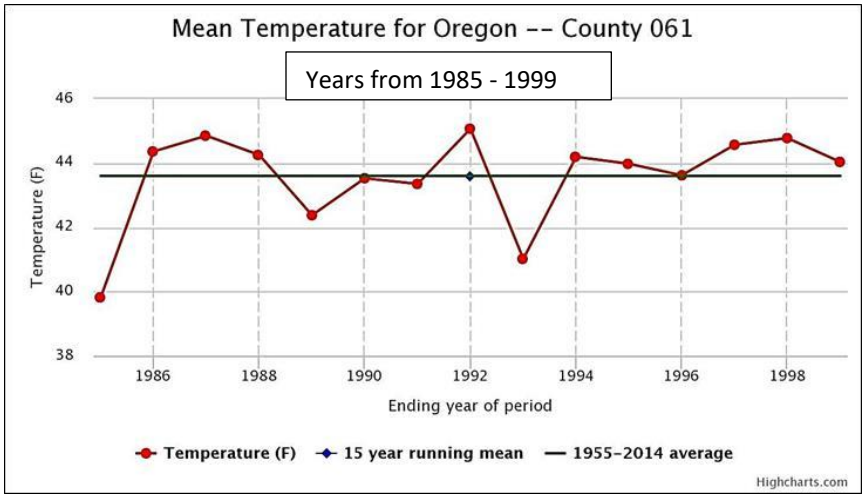
The length of the wildfire season also increased in the 1980s (Westerling et. al. 2006). This too, is consistent with the prolonged above average temperature found in WestMap's graphs of Union County. As a result, Westerling et. al. determined the average fire season length increased by 78 days (64 percent) when comparing timeframes of 1970 to 1986 with 1987 to 2003 overall, while the Northwest fire season increased five percent by 2003. Warm years having early snowmelt, particularly since the mid-1980s, have shown a concentration of increased wildfire frequency at between 5500 and 8500 feet in elevation (Westerling et.al 2006).

Recent years have been no exception; from May 2012 through May 2015, both precipitation and temperatures have deviated from recent 30-year, 1981 – 2010 averages. Warmer than normal winters, low snow pack, and lower than normal precipitation, at the time of this document development, have impacted many areas of the West. Figure IV – 10 shows the last 36 months departure from the 30-year average based on the Western Regional Climate Center 2015.

Future climate trends, particularly where temperature is concerned, are expected to continue to show above average temperatures. This anticipated prolonged warming has management implications for treating vegetation, fire response, and costs. Further information can be found in Chapter VI, Wildfire Risk and Hazard Assessment.







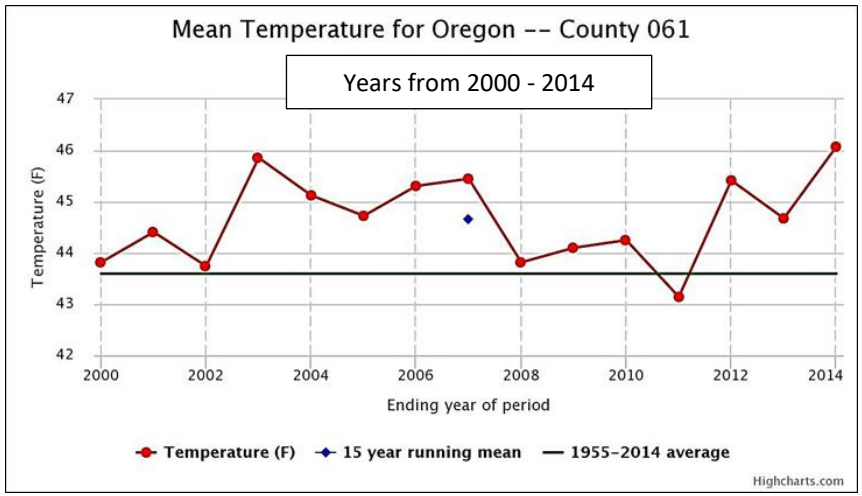
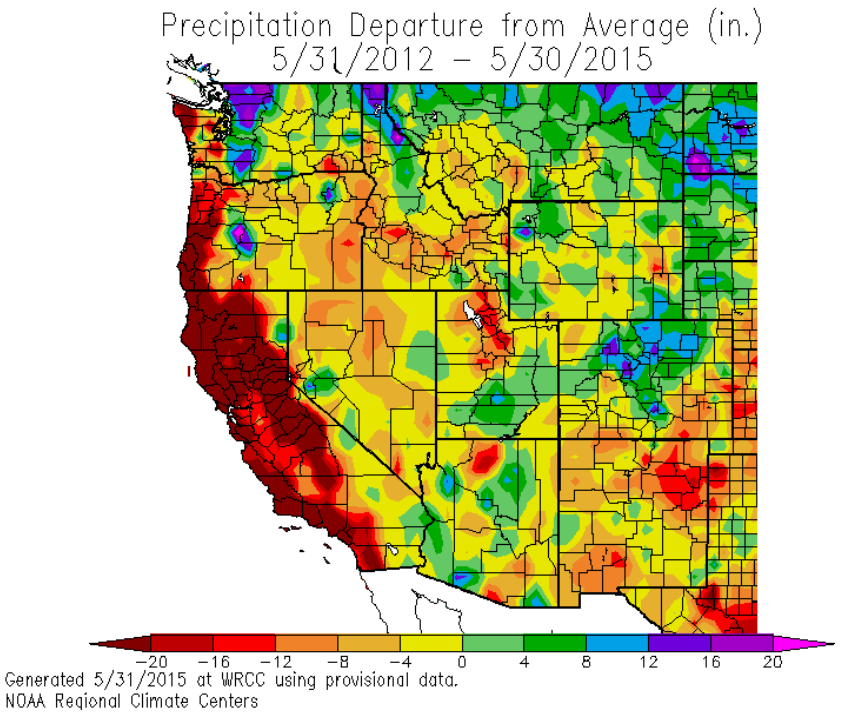


Figure IV – 9. Fifteen year Mean Temperatures for Oregon using 1955 – 2014 as Average baseline. Data Charts Generated from WestMap – Western Climate Mapping Initiative: http://www.cefa.dri.edu/Westmap/Westmap_home.php?page=timeseries.php. Information presented on the Western Regional Climate Center web site is derived from data received from the National Climatic Data Center, the National Weather Service, the Natural Resources Conservation Service, the Bureau of Land Management, the U.S. Forest Service, and other federal, state and local agencies.

36 Month Precipitation Departure



36 Month Temperature Departure

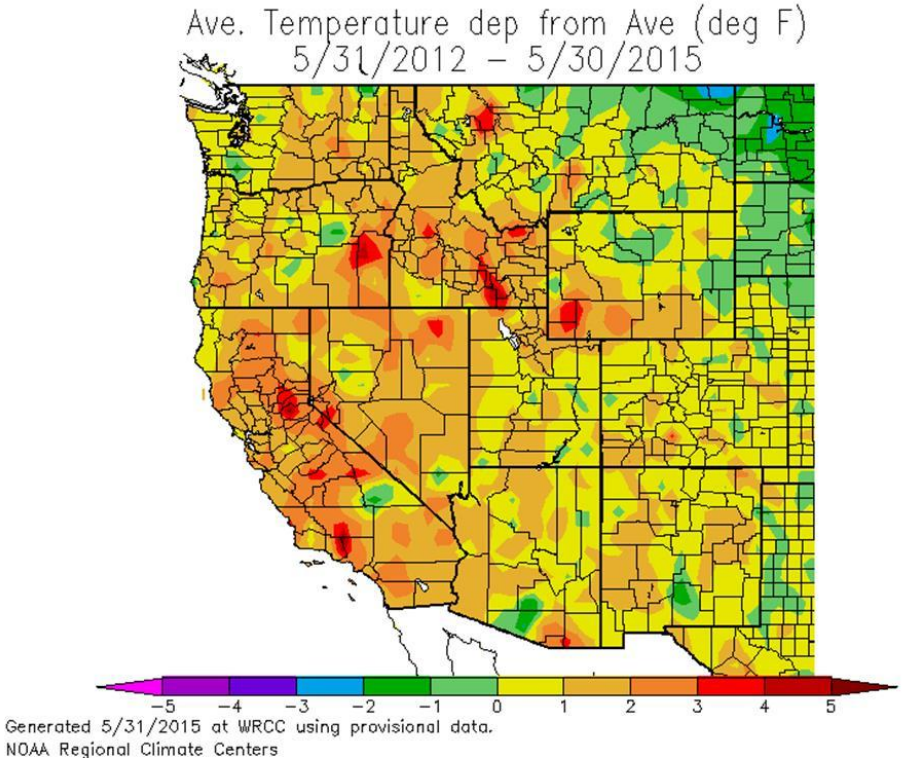


Figure IV – 10. Recent Climate in the West. Temperature departure from 1981-2010 Average and Percent of Average Precipitation for the most recent 36 months. Western Regional Climate Center, Reno Nevada.

Fire History Overview

Union County and the surrounding area have a significant history of both human and lightning caused fires. A combination of climate, fuels, and topography make Union County an ideal receptor to wildfire. Figure IV - 11 shows Union County and surrounding area of lightning vs. human caused fires and their geographic distribution for a 10-year period from 1999 to 2008 (Oregon Department of Forestry -WWRA, 2013). Approximately 558 fire starts (human and natural) were reported during the years 1999 – 2008 according to the West Wide Risk Assessment data. During that time frame, human causes were responsible for approximately 211 (38 percent) of starts in Union County, while lightning strikes totaled 347 (62 percent) of starts. In analyzing just the fires within the identified WUIZ, which accounts for 44 percent of all county fires, human caused fires increase significantly in proportion to lighting fires. Human-caused fires just within the WUIZ account for 47 percent of fire starts while lightning starts account for 53 percent in the WUIZ. This implies that approximately 47 percent of fires within the WUIZ may be preventable.

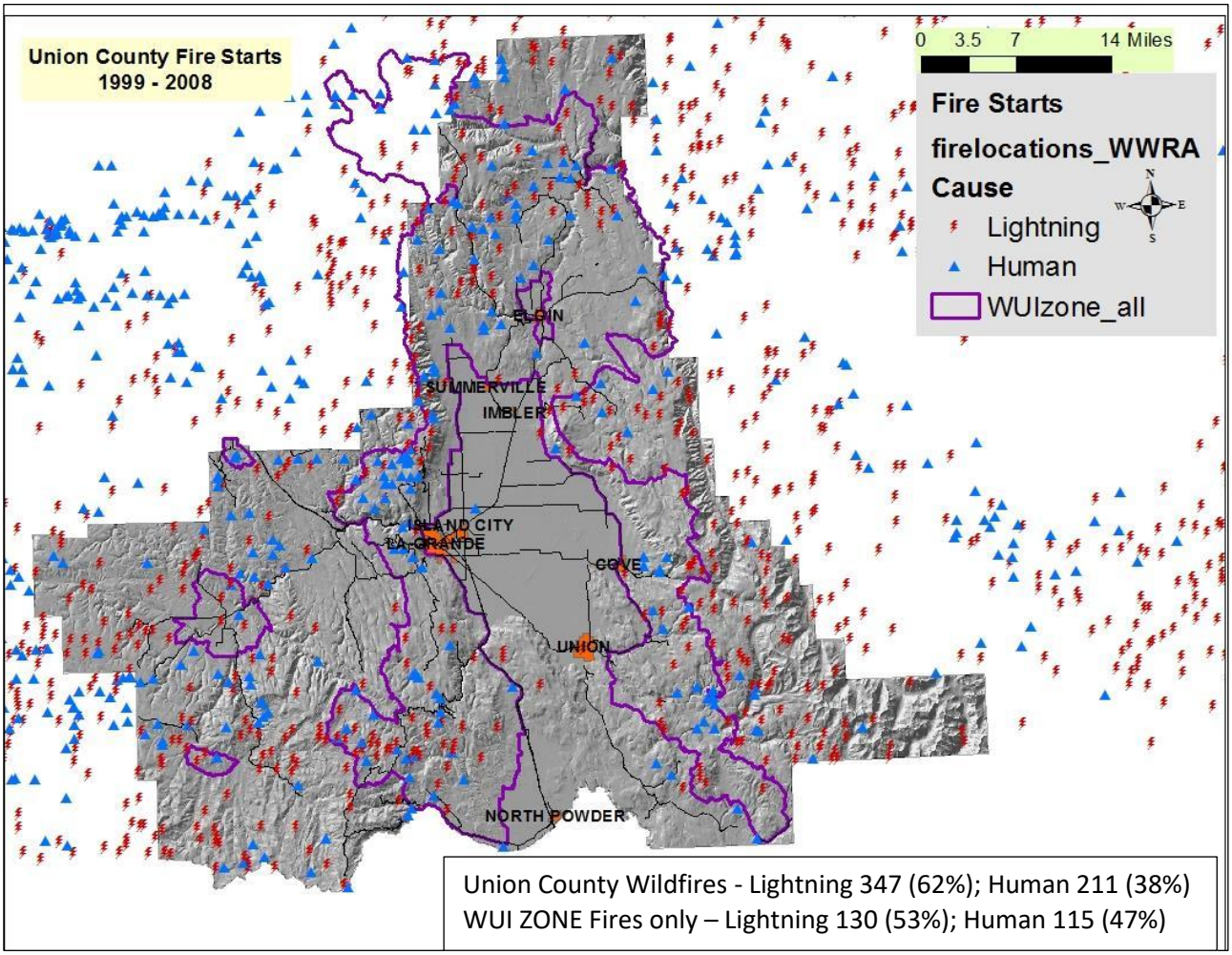


Figure IV – 11. Fire Starts for Union County and surrounding area. Data used to create map was provided by the West Wide Risk Assessment, Don Carlton and Jim Wolf 2014. Years used were based on availability of data from five federal agencies and 17 individual states' data.

The WWRA provided results at a scale compatible with state and community use, much finer than the current national efforts (ODF-WWRA 2012). Fire points used needed to be from a

data base period that was supported in all 17 western states during the West Wide Wildfire Risk Assessment development. WWRA summary of statistics for Oregon indicates that key data used in the assessment varies with respect to accuracy and date of compilation. Federal and most state fire ignition data was utilized for the period of1999-2008, however this range varied depending upon the availability of useable data. For most of the states, fire occurrence data ranging from 2004-2009 was used from the National Fire Incident Reporting System (NFIRS) to supplement the fire ignition data for private land (ODF -WWRA 2012). Key pieces of information needed to utilize fire start data were the latitude and longitude and fire size. One finding was this information, in the fire reporting systems at the field office level, was the key information needed was stated as optional or mandatory depending on protection agency, resulting in elimination of some fire data. Implications of inconsistent reporting and missing fire details could result in fewer than actual Fire Occurrence Areas for Oregon State and its counties.

The West Wide Risk Assessment reviewed the number of fires ignited per 1000 acres per year to display areas of fire start concentrations over the 10-year period. Figure IV – 12 takes into account the fire start locations and proximity of the fire occurrence area for Union County and adjacent counties that the WUIZ overlaps into. An increase in the legend number indicates a higher concentration of fires over that area for the 10-year time frame.

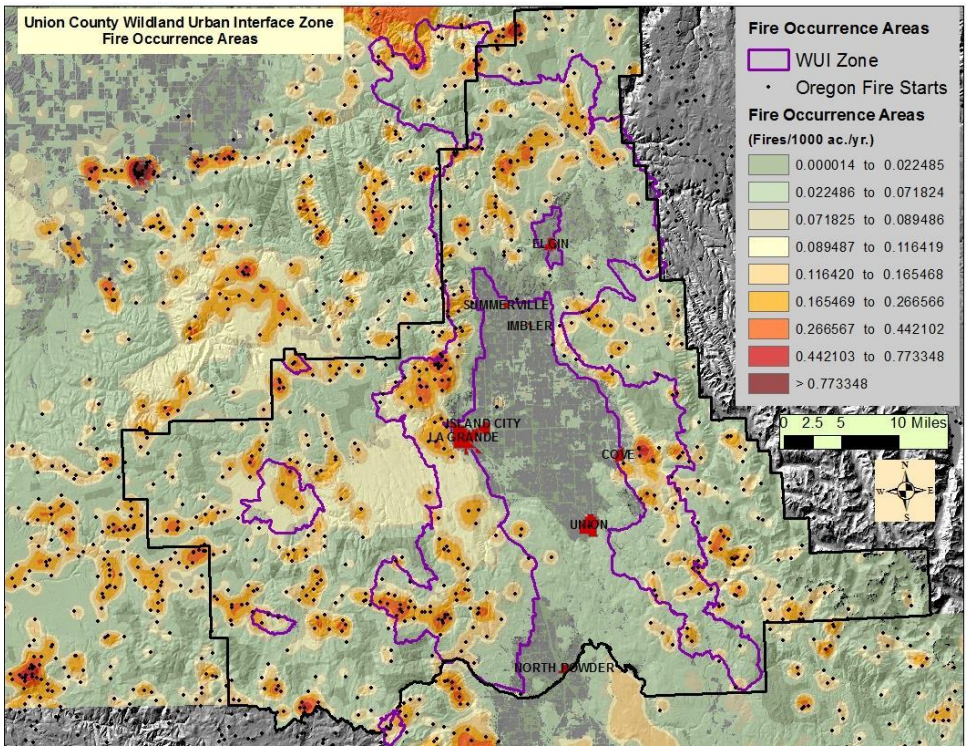


Figure IV – 12. Fire Occurrence Areas. Based on the number of fire starts and land mass ratio. Depicts the number of fire starts per 1000 acres per year. The higher the number the higher the fire occurrence.

Union County had a total of 558 recorded fire starts, based on the West Wide Assessment, over the 10-year period. That is an average of 55.8 fires per year. As shown, Union County annually endures many fire starts from both lightning and human sources.

The number of fires reaching a 10-acre threshold was 32. An average of 3.2 fires per year exceeded 10 acres. Thirteen of those fires within the same time frame were over 100 acres in size averaging out to 1.3 fires per year. Human-caused fires accounted for half of the large fires with an average fire size of 200 acres; the largest occurred in 2005, reaching 1,156 acres in size.

Time of year also provides insight on when the majority of the fire starts can be expected to occur. July and August account for approximately 65 percent of all fires over the 10-year period. Including September, close to 78 percent of the fires occurred in a three-month period (Figure IV-13). This plays an important role in fire management preparedness and response.

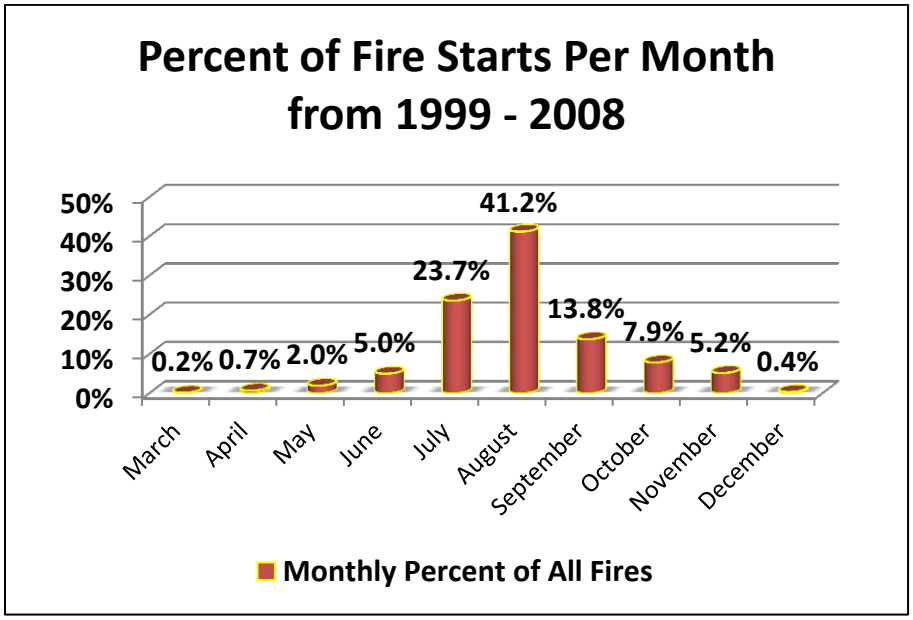


Figure IV – 13. Distribution of fire starts per month for a 10 year period from 1999 –2008.

Effective initial attack and coordinated local suppression efforts have kept large fire numbers lower; historically they may have been significantly larger. This level of fire activity coupled with landscape conditions and increased fire risk creates potential for large damaging wildfires both in and near communities and their adjacent forested areas.

Major Union County Fires


Shrouded in smoke, a big air tanker drops its load on the doorsteps of La Grande homes.

Figure IV – 14. Rooster Peak Fire photo courtesy of The Observer, August 16, 1973.

Over the past twenty-five years, Union County has had several fires of major significance. The fires are: Rooster Peak – August, 1973, Mt. Harris – 1981, Frizzel Loop – 2003. These fires held significance for the local communities for various reasons.

The lightning-caused Rooster Peak fire of 1973 was the largest and most destructive in recent history. It burned approximately 6,400 acres, including six structures close to La Grande's southwest city limits. One of the threatened structures, in the path of the fire was the County's only hospital. Situated near the foothills of town, the Grande Ronde Hospital remains the only medical center servicing the county today.

The Mt. Harris fire in 1981 was an 850-acre human-caused fire resulting in high loss of local timber commodity within the fire perimeter. In addition to timber loss, this fire was also visible from La Grande, Summerville, Imbler and Cove, reminding residents of their vulnerability to wildfires. The Mt. Harris fire area has been slow to recover with much of the burn area still lacking large tree components and the burn scar showing little change.

The Frizzel fire in 1986 (250 acres, lightning-caused) and the Craig Loop fire of 2003 (43 acres, human-caused) were not significant fires due to their size, but were significant due to their location and potential. Both fires took place in the Mt. Emily WUI. This interface is now recognized as one of Union County's most populated and most at-risk interface areas. Though these fires were relatively small and quickly contained the potential for property damage and loss of life was apparent.

The 2001 Boulevard fire (150 acres, lighting-caused) was another potential threat for Union County. The fire threatened the La Grande watershed, a rugged and roadless area of high environmental value. The potential was high for a destructive wildfire. First, the watershed contains substantial fuel providing for high intensity burning and long flaming time with potential for the area's soils to sustain sterilization from excessive heat and high mortality to the existing overstory vegetation. Secondly, there is very limited access to the area, making it more difficult for suppression efforts to be effective.

The Booth Fire, started by lighting, occurred in the southwest corner of Union County near the town of Ukiah, Oregon. This fire was declared a conflagration fire on August 20, 2003 for threatening communities of Bridge Creek State Wildlife Area and Ukiah. This fire threatened more than 1,063 structures and resulting in a loss of eight cabins, one auditorium, one shower house, and one outbuilding (Oregon.gov 2015). Multiple structural fire agencies from Oregon and several participating federal and state agencies were involved in the firefighting efforts.

The Mt. Harris fire occurred on October 04, 2014, with the cause still under investigation at the time of this document. Highly visible to local communities the fire burned in timber, brush, and grass fuels on the lower slopes of Mount Harris. Due to the time of year and a wide geographic area receiving moisture within the week prior to ignition, there were adequate resources available to stop the fire. Two weeks earlier, the state of Oregon had nine active large fires of which four were threatening structures. These nine fires were burning over 41,500 acres and had over 2,885 firefighting personnel committed to fire suppression (NIFC 2014). Had the Mt. Harris fire started two to three weeks prior than it did, the outcome may have been more costly to both communities and landscape. As

Figure IV - 15 – Mount Harris Fire on the west facing slopes of the La Grande Valley, October 2014. Photo courtesy of Blue Mountain Interagency Dispatch Center (BMIDC)

with the previous large fires, the potential was high for a severe negative outcome, had local resources not been available at the time of ignition.

The Phillips Creek Fire occurred on August 3, 2015 just west of the town of Elgin. Fire perimeter was 2,601 acres, covering 1,998 acres of US Forest Service land and 603 acres of ODF protected land. A Type II overhead team was set up at the Elgin Rodeo grounds to manage a total of 736 fire personnel fighting the fire.

Figure IV – 16. Photo posted on Union County Emergency Services , August 5, 2015. (Union County 2015)

Figure IV - 17. Photo posted by Pacific Northwest Coordination Group , Phillips Creek Fire - August 3, 2015. (nwcg.gov)

This fire resulted in significant impacts to both local residents and travelers. Several residences were threatened, forcing Union County officials to issue Level I Evacuation Notices for Ruckle Road and Sanderson Springs Road, Highway 204 between Phillips Creek and Valley View, Valley View between Hwy 204 and Gordon Creek and all of Gordon Creek Road (Blue Mountain 2015). A Level I evacuation notice means residents should be READY to leave their homes at a moment's notice (nwcg.gov 2015). Road closures were expanded for public and firefighter safety to include 14 Forest Service roads, two county roads, and a pilot car was used for traffic on State Highway 204.

Communities and Wildfire

One of the Actions outlined in the Northern Blue Mountain Cohesive Strategy Pilot Project Action Plan in the Goal *"Human populations and infrastructure can withstand a wildfire without loss of life and property",* is to *Develop an Integrated Information, Education, and Awareness Program* (Board of Forestry 2013).

Wildfire effects and values threatened are individual and subjective to residents. They occur in the form of buildings, homes, infrastructure, public and firefighter safety, health, and benefits the surrounding landscape provides to the communities and residents (CWS 2013).

Community education and preparedness is critical to lessening these impacts.

> *"The capacity of a community to prepare for, respond to, and recover from a wildfire event is also a critical*

> *concern. There is emerging literature on the concept of social vulnerability to catastrophic events."* (CWS 2013)

Wildfires have an ecological as well as social impact to their geographic area and residents both during and after the incident. Communities directly threatened by wildfires can experience financial, physical, and psychological impacts (Cohn et al. 2006, Downing et al. 2008). Wildfires can impact community members in a number of ways and for many reasons even when there are limited losses. Evacuated residents reported substantial anxiety due to not knowing the status of their home and properties (Kent et al. 2003, Rodriguez-Mendez et al. 2004) and having little control over the ongoing events (Hodgson 2007). Additionally, anxiety from evacuating can be affected by the type of evacuation order (voluntary or mandatory), the amount or lack of fire preparedness accomplished around their properties, presence of pets or livestock on the premises, current physical health of family members, and previous experience with wildfire evacuations (Cohn et al. 2006, Mozumber et al. 2008).

Post-fire is not without concern; it can result in psychological impacts to residents when they return home to a variety of issues stemming from loss of homes, physical possessions, family memorabilia, and documents (Downing et. al 2008) and/or apprehension over long term site conditions. There may also be emotional scars even if loss of homes does not occur and residual impacts from the wildfire are experienced such as: smoke damage, charred landscape and vegetation, and injury or death of pets/livestock (Taylor et al. 2007). The visual impacts, whether ecologically damaging or not, can leave residents with a variety of perceptions when viewing the results from their homes.

While the wildfire is actively burning, having current knowledge of the situation often allows residents to cope with the situation and understand the extent of combined efforts put into fighting the fire (Carroll et al. 2005). There are also times when community cohesiveness surfaces from impacted local residents through humanitarian efforts to assist one another in dealing with and rebuilding during and after a wildfire.

The La Grande valley is not exempt from these psychological effects. The high visibility of the flaming fire fronts from local communities have left many residents with the memory of Rooster Peak, Mt. Harris, and Phillips Creek fires, particularly with the burn area still visible from the valley. These fires made wildfire threat a much more tangible danger.

Public meetings, website posts of public safety concerns, and current fire information during the Phillips Creek Fire helped local residents with fire situational awareness and understanding of decisions being made by the fire managers. Public opportunities to see and talk to local fire managers increased their level of trust in the decisions.

Communication before, during, and post-fire has been found to be important to the success of future outreach efforts. Education people about wildfire risk reduction measures in advance of wildfires and building awareness that local forests are prone to fire is crucial to a successful program. Time and place of the application of treatments and utilizing tools available will help both residents and land managers prepare for future wildfires.

Economic Impact of Major Fires

Northeast Oregon supports a dynamic landscape of ecosystems with constantly changing environments. Shifts in stand dynamics have occurred over the last century partially as a result of successful fire suppression in fire-adapted ecosystems. Historically, fire would have naturally performed stand cleansing by periodically removing accumulation levels of surface fuels, pruning of residual trees, and limiting stand undergrowth. The Carsey Institute issued a briefing paper in the spring of 2012 resulting from a survey conducted in the fall of 2011. The focus was the tri-county area of Northeast Oregon including Baker, Union, and Wallowa Counties where landscapes and communities are changing in interconnected ways. One of the key findings in the survey is that large majorities of those surveyed perceive wildfires, insects, and the loss of forestry jobs and income as a serious threat to their communities (Hamilton et. al 2012).

In 2014 there were 63,612 wildfires reported at the national level, of which 666 were significant. Significant fires defined in the National Mobilization Guide are fires that are a minimum of 100 acres in timber, 300 acres in grass/brush fuel types, or are managed by a Type 1 or 2 Incident Management Team, a National Incident Management Organization or a Wildland Fire Management Team. Significant fires accounted for approximately 1.1 percent of the all wildfires reported (NIFC 2015).

By comparison, the Northwest (NW) states of Oregon and Washington received a total of 3,087 and 1,480 reported fires, respectively. Significant fires for the NW totaled 113, accounting for 2.4 percent of all the wildfires reported in these two states (NIFC 2015).

Although large wildfires occur nationally every fire season, fire starts that are considered significant are a relatively small percentage in comparison to the total wildfires reported. However, these fires account for most economic impact on state and federal funding in terms of suppression costs, natural resource loss, personal property loss, and local economies.

Federal appropriations to fight wildfire increased from an annual average of $1.2 billion during fiscal years 1996 through 2000 to more than $2.9 billion annually in fiscal years 2001 through 2007 (General Accounting Office [GOA] 2009).

Suppression Costs

Fire suppression costs have continued to increase since the 1980s. The average cost of fire suppression expenditures for a 10-year period from 1990-2000 was around $350 million dollars. Fiscal years 2000, 2002, 2003, and 2006 had suppression expenditures totaling approximately $1 billion annually for USDA Forest Service alone (Gebert et. al. 2007 and Prestemon et al. 2010). Between Fiscal Year (FY) 2002 and FY 2012, the Forest Service found it necessary to transfer funds from discretionary, mandatory, and permanent accounts to cover fire suppression costs. In a statement before the Committee of Energy and Natural Resource of the U.S. Senate in 2013, the Chief of the Forest Service Thomas Tidwell stated, "*These transfers occur when the agency has exhausted all available funding resources from Suppression and FLAME accounts"* (Tidwell 2013). In 2002 alone, the Forest Service

transferred $999 million to cover suppression costs. Since FY 2000, the 10-year average has risen almost every year up to $1 billion in 2010 and beyond (Tidwell 2013).

These fires not only impact suppression cost but also affect natural resources and infrastructure. In 2012, more than 4,000 structures were destroyed, including 2,216 residences, exceeding the annual average loss of 1,416 between 1999 and 2012 (Tidwell 2013). In 2014, 1,953 structures were destroyed nationally including 1,038 residences, 874 minor structures, 20 commercial structures, and 14 mixed commercial/residential structures (NIFC 2015).

Economically, losses to natural resources and infrastructure can have significant impacts to businesses, water delivery systems, municipal watersheds, power supplies, and transportation systems, in addition to impacting the health and wellbeing of local communities. Home construction in the western states may increase future fire suppression costs since only 14 percent of available wildland interface areas are currently developed (Gude et. al 2008). Environmental conditions in combination with effects of expanding WUI areas underlie four broad areas of risk: risk to firefighters and civilian safety, ecological risks, social risks, and economic risks (CWS 2014).

Suppression costs are often associated with immediate costs of wildfires and WUIs, while some costs are associated with various other impacts that wildfires may have on the communities and ecosystems. These can occur during a wildfire incident or can extend well into the future, leaving long-lasting economic impacts. Costs related to wildfire reach beyond acres burned and the length of time of the actual fire event (WFLC 2009). Costs related to wildfires are explained here in the categories of direct and indirect costs.

Direct costs for the purpose of this document are expenses incurred during or immediately after a wildfire. When large fires occur, they are rarely an exclusive agency event. As a result, suppression costs are often associated with multi-agency expenditures that occur in categories such as: aviation, engines, firefighting crews, and personnel in supporting roles. Other direct costs include private property losses (insured and uninsured), infrastructure shutdown or damage, damage to recreation facilities, loss of timber resources, and evacuation/emergency aid (WFLC 2009).

Indirect costs often emerge post-fire when suppression resources are either down to bare bones or completely withdrawn from fire duties. Rehabilitation efforts are frequently associated with stabilizing and improving damaged fire areas. These can accumulate years post fire depending on the degree and amount of severely burned areas. Examples such as delayed fire effects to overstory trees (mortality may occur up to five years post burn), heavy rains a year or two later when vegetation is slow to re-establish causing soil or land movement, or potential for irrevocable impacts when loss of life is involved.

The Western Forestry Leadership Coalition examined six case studies of wildfires, all located in the western U.S., illustrating the range of costs from fire impacts. Figure IV - 18 shows that actual wildfire costs exceed those often calculated, particularly when considering rehabilitation, direct and indirect costs; with differences vary from 2 to 30 times (WFLC 2009).

FIRE	COST CATEGORY							
	Suppression Costs	Other Direct Costs	Rehabilitation Costs	Indirect Costs	Additional Costs	Total Costs	Total / Suppression	Suppression / Total
Canyon Ferry Complex (MT 2000)	$9,544,627	$400,000	$8,075,921	$55,310	n/a	$18,075,858	1.9	53%
Cerro Grande (NM 2000)	$33,500,000	$864,500,000	$72,388,944	n/a	n/a	$970,388,944	29.0	3%
Hayman (CO 2002)	$42,279,000	$93,269,834	$39,930,000	$2,691,601	$29,529,614	$207,700,049	4.9	20%
Missionary Ridge (CO 2002)	$37,714,992	$52,561,331	$8,623,203	$50,499,849	$3,404,410	$152,803,785	4.1	25%
Rodeo-Chedeski (AZ 2002)	$46,500,000	$122,500,000	$139,000,000	$403,000	n/a	$308,403,000	6.6	15%
Old, Grand Prix, Padua (CA 2003)	$61,335,684	n/a	$534,593,425	$681,004,114	n/a	$1,276,933,224	20.8	5%

Figure IV -18. Summary figures (last two columns) presented in Table are: 1) a ratio of total costs to suppression costs, and 2) suppression as a percentage of total costs. USFS, 2007 Large Fire Cost Review. Table was obtained in section Case Studies, Summary of Cost Information in The True Cost of Wildfires in the Western U.S. by Western Forestry Leadership Coalition. State and Federal government partnership including: 23 state and Pacific Island Foresters of the West; 7 western Regional Foresters, 3 western Research Station Directors, and Forest Products Lab Director of the USDA Forest Service (WFLC 2009).

Additional Local Economy

Recreation Economy

Large fires in Union County and adjacent areas can have a high economic impact for several reasons. First, the Northeast Oregon tri-county areas of Baker, Union, and Wallowa Counties have a strong economy base in natural resources and timber, agriculture, and tourism. Leisure and Hospitality is responsible for nearly 12 percent of direct employment, including rich cultural heritage, national historic sites, scenic beauty, and numerous outdoor recreation opportunities. Recreation can be further divided into hiking, bicycling, swimming, and rafting, as well as fowl and big game hunting. For example, bicycle tourism alone contributes up to $15 million for the Eastern Region of Oregon. Travel expenditures to Union County from 2000 to 2012 have increased by $5.4 million dollars, with earnings in 2012 of $9 million (NEOEDD 2013).

Travel impacts and visitor volume for Union County have made an impact on the local economy. The annual percent change in travel trends from 1991 to 2014p in spending and earnings was 1.2 percent and 1.1 percent, respectively, with 2014 being preliminary (p) results. The change from 2013 to 2014p in spending and earnings was 5.5 percent and 5.1 percent increase (Runyan Associates 2015).

Visitor spending for travelers on different overnight accommodations for Union County has increased in all categories except for Vacation Home. All numbers reflect changes from 2013

– 2014p in ($Million): Hotel, Motel 10.4 – 11.6; Private Home 5.1 – 5.4; Campground 5.4 – 5.5; Vacation Home 0.4 – 0.4: Day Travel 5.8 – 6.2; Spending at Destination 27.2 – 29.1 (Runyan Associates 2015). Destination spending includes accommodations, food service, food stores, local transportation and gas, arts/entertainment/recreation, and retail sales.

Recreation spending does not only include typical family vacation visits, but also accounts for seasonal visits of non-locals for hunting fowl, bear, turkey and big game as well as steelhead fishing.

The local forests also provide for numerous opportunities economically in terms of gathering of forest products, livestock forage, and lumber. Forest products gathered in the Blue Mountains of eastern Oregon are numerous, with some providing major commercial enterprises on a seasonal basis.

Ranching

Local ranching and beef production is another common use of the local forests. Rangeland on public lands of the Wallowa-Whitman National Forest varies from low elevation meadow bottoms to high alpine lands. Approximately 1.2 million acres of the 2.3 million acres of national forest are currently grazed by livestock. The Wallowa-Whitman National Forest currently has 93 term grazing permits issued on 110 grazing allotments, providing forage for an estimated 23,800 head of cattle and 3,300 head of sheep.

Timber

Timber products are another commodity used by the local residents and businesses. Winter temperatures and harsh conditions have caused many local residents to maintain a secondary heating source in their homes, which often is in the form of a woodstove. Firewood is a key source of heating during the winter months.

Several of the fire mitigation vegetation treatments conducted since 2005 have relied on the local timber and biomass infrastructure. Local mills are necessary to maximize funding, create utilization opportunities resulting in reduced smoke emissions from burning, and provide revenue through local jobs. These infrastructures can only be maintained through a regular supply from private and public land sources. Cost of doing business will increase if these infrastructures are not supported, resulting in high transportation costs, which may reduce the type and amount of fire risk mitigation work to be accomplished.

The timber industry in the region has declined since the 1980s. Currently, more timber is being removed from private lands compared to public lands. In 2012, approximately 36,849 thousand board feet of timber was harvested from private land and 3,119 from public land (NEOEDD 2013). The Oregon Labor Market Information System shows timber-related employment in Union County supporting approximately 438 jobs with a total payroll of $39,844,592 of which only $3,635,591 listed as Forestry and logging. Other industries included in timber-related employment are agriculture and forestry support activities, truck transportation, and federal and state government natural resources and mining.

Because Union County relies heavily on both private and public forests to help sustain its local economy, large, damaging wildfires could have significant negative economic impacts. This is particularly true for Handcock Forest Management that owns over a third of the private lands and is the largest timber supplier in the county. Since the bulk of private lands are within the WUIZ, a wildfire burning into the WUIZ could have major implications toward local economy in terms of timber-related dollars. Impacts to recreation could also be significant, resulting in reduced local revenue for multiple years post fire.

Case Studies

In the case studies examined by the Western Forestry Leadership Coalition, they concluded that two to three years following the Canyon Ferry Complex Fire, recreational visits to the national forest declined by 10 percent; no dollar figure was provided (WFLC 2009). In 1988, Yellowstone experienced multiple fires in and around the National Park, resulting in expenditures dropping approximately $13 million in 1989, and $26 million in 1990. The Rodeo-Chediski Fire is estimated to have had indirect costs in the tribal community of $8.1 million dollars through loss of sales tax revenue and job loss. The Hayman Fire also showed impact costs post-fire extinguishment of $2. 7 million (approximate) through tax revenue and business losses, plus value reduction on surviving structures in the fire area (WFLC 2009).

Economic implications of a fire occurring within Union County, especially within the WUIZ, could have significant long-term impacts to the communities. Many businesses rely on their relationship with the forests through tourism, recreation, commodities, and beauty. The multitude of impacts has not taken into account the additional ecological impacts that would be sustained affecting aquatics, wildlife habitat, and aesthetic values. On November 5, 2013, Colorado Senator Michael Bennet highlighted the need for wildfire mitigation resources at a Senate Hearing. Mitigation savings were pointed out by the Congressional Budget Office, stating that every $1 spent in wildfire mitigation saves $5 in future disaster losses (Bennet.senate.gov 2013).

The cost of suppression for land management agencies such as the Oregon Department of Forestry and United States Forest Service can mount quickly depending on fire season severity. When wildfire consumes physical property like structures, timber stands, or in areas with potential landslides, the associated costs rise dramatically, displacing people and businesses and contributing to higher overall economic losses. Union County assets, both natural and created, should be protected to the extent possible against loss from wildfire.

Summary

Union County supports a variety of geographic features that includes the northern Blue Mountains, Wallowa Mountains, and the La Grande and Indian Valleys with elevation variations of more than 7,000 feet. The land ownership of the county is close to evenly split between Forest Service managed lands and privately owned properties.

The diverseness of the county provides numerous economic opportunities from mercantile, agriculture, recreation, and natural resources. Government jobs provide the largest number of income to the county with retail coming in fourth. La Grande is the third largest city in eastern Oregon, with an estimated population of 12,340, accounting for half of Union County's

population. The remaining population is scattered in multiple communities throughout the remaining 2,038 square miles.

The climate of Union County is relatively dry with an average annual rainfall of 14 to 16 inches. Shifts in temperature based on local data are correlated with increasing length of wildfire season and an increase of fire frequency, occurring predominately between 5500 and 8500 feet in elevation. The bulk of wildfires typically occur between July and mid-August accounting for 65 percent of all annual fires. Wildfire ignition causes are 62 percent lighting and 38 percent human, indicating there is opportunity to reduce the number of human fires, lowering firefighter expose and suppression costs. Fire size is not limited to small acreage, with four of the seven recorded large fires occurring since 2001 with the largest being the 2015 Phillips Creek Fire at 2,601 acres and including road closures and evacuation notices.

Fire suppression costs continue to rise with increases of homes lost and acres burned. Since fiscal year 2000, the 10-year average has risen, with costs reaching $1 billion dollars in 2010. Taking the initiative toward mitigation measures can help prevent some of the direct suppression costs. Every $1 spent on wildfire mitigation has the potential to save $5 in suppression costs. Promoting wildfire mitigation in Union County will not only have potential cost savings in suppression, but will also reduce risks to firefighters and provide homeowners in treated areas opportunities to be involved in preparing their properties in advance.

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V. Community Participation and Education

Introduction

Union County is characterized by large blocks of public lands and a patchwork of jurisdictions and ownership in which multi-agency protection may be involved in managing wildland fire incidents; approximately 50 percent of the county is privately owned. As a result, collaboration efforts are vital to integrating local land agencies, fire protection agencies, cooperators, and members of the public in an attempt to create a local stakeholders partnership. The first step in accomplishing a partnership was to share information regarding existing concerns, conditions, and efforts in creating a comprehensive community wildfire protection plan. To ensure full success in implementing a collaborative approach it was important to identify issues and individual roles in mitigating those issues. Sharing responsibility established a sense of ownership in both the mitigation of wildfire impacts and increasing the effectiveness of fire protection agencies.

Meetings were designed to collectively work with rural fire departments, cooperators, and community members to develop the wildfire protection plan. Goals of this process were to:

1. Build upon existing partnerships and create new opportunities within the communities.
2. Provide Union County community members with tools, methods, and the opportunity to partake in wildfire risk reduction.
3. Demonstrate the importance of shared responsibility in wildfire prevention, risk reduction, and forest management.
4. Identify additional opportunities for understanding what can be expected during the three phases of evacuation and wildfire events. (Pre, During, Post)

Efforts were made to gather local knowledge to include in the Community Wildfire Protection Plan (CWPP) along with input identified in the fire risk assessment of the WWRA, in order to provide as thorough a plan as possible. Plan development was based on as much diverse input as possible, in order to meet the needs of all landowners, cooperators and local fire management. This type of approach accomplishes several things.

1. It provides an opportunity to validate map display modeling data for accuracy with input by local resources with on the ground knowledge and expertise.
2. It establishes a collaboration forum essential for obtaining funding, especially for federal agencies through the Healthy Forest Restoration Act, thereby improving treatment opportunities on public lands and reducing potential for fire spread onto private lands. Collaboration-based decisions offer more opportunities toward efficient and effective approaches.
3. Improved chances for competitiveness in grant programs designed to provide support to state, counties, local fire departments and communities to prepare for and recover from wildfires.
4. Provides a message that is consistent with the Cohesive Wildfire Strategy to improve wildfire response, build a fire-adapted community, and move toward a

resilient landscape to increase opportunities for effective suppression efforts while maintaining a healthy ecosystem.
5. Provides mutual understanding of local environmental conditions to better prepare Union County communities and fire managers for wildland fire events.
6. Provides the county with a plan based specifically on local needs and expectations.

All the meetings generated a similar message on why local knowledge was important to the CWPP process:

a. Local involvement allows the plan to be a needs-based process on what is and is not working and identifying ways to improve wildfire protection.
b. Recognizes a cohesive community approach through collaboration is imperative for success.
c. Provides a means of validation of base information and verification that a need exists.
d. Creates opportunities to incorporate new ideas and new approaches offered by local community members.

Outreach

Several avenues were used to incorporate local communities into the CWPP process. Media outlets, such as Facebook and local web sites, were used to reach out to the public. These were found to be the best source in linking local citizens to the CWPP process. Use of the Emergency Services Facebook page provided the ability to see the number of times the information was shared and an avenue for directly responding to questions.

Additional methods in reaching out to citizens and cooperators included radio announcements, newspaper articles, postal service mailed letters sent out to cooperators, and email messages. Included in outreach materials and announcements were: intent of meetings and dates, opportunities to be locally involved, and local contacts for more information.

The CWPP committee designed workshops and community meetings using the outreach mechanisms in an attempt to reach as many Union County citizens as possible. All workshops provided:

- An overview of West Wide Risk Assessment (WWRA) framework, highlighting various input data with the three key outcomes of Fire Threat Index, Fire Effects Index, and overall Final Risk Index.
- Information about Firewise and Ready, Set, Go concepts
- Accomplishments achieved under the original 2005 CWPP
- The rationale and need to expand on current efforts
- How local conditions benefit or hinder achieving the three primary goals in the CWPP.
- Opportunities to work with local fire management in education and project design for reducing wildfire risks

Rural Fire Departments (RFD)

Union County is supported by seven different rural fire departments that respond to both structural and wildland fires. These rural fire departments have jurisdiction responsibilities on approximately 250,630 acres combined. A Rural Fire Department representative was a member of the steering committee throughout the CWPP development. Opportunities for RFDs to provide input during the process were important for the development of mitigation action items. One of the local Fire Defense Board meetings allotted the CWPP committee ample time on their agenda to conduct an information sharing meeting.

Outreach

Fire Chiefs were sent a hard copy, three-page letter via postal service with follow up email regarding the meeting date, location, and agenda. The letter provided a preliminary overview of the Cohesive Wildfire Strategies' three key goals as the foundation for the updated CWPP.

The letter stated,

> *"It is our hope that through these three goals that you as Fire Chiefs can begin to consider what and where improvements are needed, shortfalls exist, and opportunities for new innovative ideas can occur. We encourage you to approach your needs and recommendation on the premise that,*
>
> *In a perfect world with available finances, what needs to be done to better protect life (firefighter and public) and property in the WUIs within your jurisdiction?"*

A list of topic categories was provided with the letter to provoke thoughts and ideas in advance of the meeting. The list of specific issues was focused on areas that could potentially impact or enhance the county's capabilities of meeting the three CWS goals. These topic categories included: risk assessment in terms of life and property, potential structure loss or survivability, fuels treatment options/reduction, emergency management, collaboration/partnerships, education/outreach, technology and reporting systems, etc.

Union County Fire Defense Board Meeting

The Fire Defense Board meeting on January 22, 2015 provided an ideal forum for CWPP committee members to work with representatives from the following rural fire departments: Elgin, Cove, Union, La Grande Rural, North Powder, Medical Springs, and Imbler, as well as representatives from the Oregon State Fire Marshal's office, La Grande City Fire, and Oregon Department of Forestry.

Rural fire departments arrived prepared to discuss all aspects of fire protection with the CWPP committee and provide input into CWPP process. There was representation of all fire departments, with some having multiple attendees. This meeting was productive and informative, and included discussion of current positive efforts, rural needs, and county and rural response concerns.

Highlights of the meeting included updates on the CWPP process and the Cohesive Wildfire Strategy key goals. Discussions centered around issues regarding road access to both homes and geographic areas, water sources, future mitigation action items, public education, wildfire response capabilities, equipment and technological shortfalls, qualifications/training, home protection treatment options, communications, information sharing, and new opportunities. Specific action items developed out of the meeting are detailed in Chapter VII Mitigation Measures and Fuels Treatment.

Cooperators

The meeting was structured to accomplish the following Items:

- Review maps of known locations of infrastructure for accuracy.
- Discuss issues that could potentially impact or enhance the county's capabilities of response in terms of planning for, providing protection during a wildfire, and/or influencing efforts after a wildfire has occurred.
- Actively involve cooperators in developing options specific to their interests that improve their ability to effectively interact and coordinate with other cooperators and fire agencies in wildfire emergency situations.

In order to narrow down cooperators, the committee recognized that involvement would be limited for some and extended for others. A list of 22 cooperators was identified based on their potential involvement with wildland fire in order to focus efforts toward the CWPP.

Outreach

Cooperators contacted for the meeting fell into one or more of the three categories below:

- Those who have existing infrastructure in the area that has potential to either be compromised during a fire or could potentially impede suppression efforts. (i.e. transmission lines / Highway department)
- Those who are regularly involved in fire response when communities at risk are involved (Sheriff Department)
- Those who would need to be notified in the event of potential evacuations (i.e.: Red Cross)

Some cooperators met all categories, while others may only be involved at certain times of the fire or on a specific fire based on location. A full list of cooperators contacted for the CWPP can be found in Appendix H, pages 1 and 2.

Cooperators Workshop

A meeting was held on March 26, 2015 at the La Grande Fire Department conference room on Cove Avenue.

Meeting turnout resulted in only cooperator in attendance, a representative from Idaho-Northern Railroad. Although the turnout was very low, the accomplishments were numerous.

The meeting proceeded as planned with discussions regarding:

a. Railroad ignitions along right-of-way with a focus on areas that are more susceptible to starts such as Reinheart Gap between Imbler and Elgin and the hard pull between Balm and McAlister Road.
b. The railroad's fire prevention plan and possibilities of fire agencies working with the railroad to further improve the plan. Include within the plan direction for local fire agencies regarding suppression strategies and tactics such as: retardant use, fire patrol once the fire is controlled, etc.
c. Possibilities of an option for prevention and suppression training to be made available to railroad personnel.
d. Identifying and developing agreements and coordination opportunities that may help combine efforts in prevention and suppression.

Additional cooperator and rural fire department input was obtained during the Union County wildfire simulation conducted on May 21, 2015. As a mock wildfire situation, it provided insight on strengths and weaknesses prior to an actual incident. This simulation resulted in approximately 23 participants by local cooperators. Simulation attendees are listed in Appendix H, pages 6 and 7.

Local Residents and Communities

Involving community members occurred in the form of meetings, radio announcements, Firewise, and Ready-Set-Go pamphlets, boots on the ground, information surveys, and multimedia forums in an attempt to reach as many citizens as possible.

Outreach

Notifications of meeting dates were conducted in the form of radio, newspaper articles, and web based announcements. Announcements of meeting dates were also posted on Union County Emergency Service Facebook page and Web site.

A news article listing the meetings was submitted to the La Grande Observer, emphasizing local fire organization efforts to involve the public to create a cohesive fire prevention and fire response program. The article highlighted some CWPP efforts to identify ways to promote fire-adapted communities to enable people to live in a fire-

prone environment and mitigate loss in the event of a wildland fire, looked at ways to increase the forest's resiliency and health, especially around homes, and looked into ways to improve safety for both fire fighters and the public.

The news release asked the community for help identifying and addressing values at risk, evacuation routes, bridges, roads, access/egress concerns, and water sources, and offered opportunities for community members to take a role in fire prevention and protection efforts.

Three public meetings were held in the county: in La Grande, then Elgin, and finally in the town of Union. The meetings were scheduled as follows:

6 pm on April 21 at La Grande Fire Department, 1806 Cove Avenue,
6 pm on April 30 in Elgin at the Fire Hall,
6 pm on May 6th at Union Fire Hall

Public Meetings

Turnout for the public meetings and survey responses were both very limited. The meetings resulted in a show of one individual in La Grande, two in Elgin, and two in Union. It is worth noting that during the Phillips Creek Fire (Chapter IV) in August of 2015, frequent public meetings were conducted resulting in an average between 50 and 100 attendees, however, a post-fire wrap up and general operations meeting put on by the Umatilla National Forest staff resulted in similar attendance as the CWPP meetings.

Although low in turnout, the meetings were conducted to provide those present with updates and new information and to obtain feedback from attendees. A holistic approach toward community fire protection through partnership was the desired outcome. Using the new National Cohesive Wildfire Strategy, the committee incorporated its three key goals as the foundation in achieving a synergistic, planned approach in the new CWPP.

The focus of the meetings was to share information about current CWPP committee activities regarding plan development, current county fire risks, ongoing collaborative efforts, fire organization and landowner responsibilities, and ways to get involved in the process. Meetings were also designed to build new and improve existing partnerships with the community. Through the meetings, we provided tools, methods, and opportunities for playing an active role in risk reduction measures. Emphasis was put on using community input to help develop portions of the CWPP and design a plan that encouraged landowner involvement in wildfire risk reduction

Several key messages were presented at the meetings to create an informative forum with up-to-date information. Discussion topics included:

- Planning efforts with an overview of the history of Union County's CWPP, describing the plans accomplishments and benefits since inception.

- An overview of the new Cohesive Wildfire Strategy and its three goals of Wildfire Response, Restoring and Maintaining Landscapes with high focus on Fire Adapted Communities
- Overview of the role of West Wide Risk Assessment role and the importance of local knowledge input.
- Opportunities for the steering committee to discuss the level of fire occurrence in their area, overview of the risk assessment, values threatened by wildfire risk, plan completion timeline, and work completed under the 2005 CWPP.
- The majority of the meeting time was given to discussions with community members about their concerns, roles, and involvement in wildfire risk reduction and protection.
- An opportunity for the CWPP committee to hear the public's input related to emergency services, fire agency response, and perception of fire risk on their properties.
- Additional emphasis was put on the importance of shared responsibility in wildfire prevention, risk reduction and forest management. With 47 percent of the WUIZ's ignitions being human-caused, it was imperative that the potential to prevent wildfires was understood. It was important to send a message of "we are in this together" in wildfire risk reduction and prevention. Collective responsibility was also emphasized through program pamphlets offered during the meetings.
- Information was shared regarding assistance opportunities to landowners for creating defensible space while living in fire adapted communities and how best to prepare themselves through collaborative efforts and available programs. Pamphlets and information were distributed explaining programs such as Firewise and Ready-Set-Go.

Programs

Firewise

Firewise is a community-based program that emphasizes involving homeowners in local solutions for wildland fire protection. It has a five-step process, in which communities develop an action plan that guides their residential fire risk reduction activities while engaging and encouraging their neighbors to become active participants in building a safer place to live (Firewise 2015). Firewise empowers neighbors to work with protection agencies to reduce wildfire risk across boundaries through a collaborative approach, of creating fire-adapted communities. Firewise encompasses actions that involve wildfire education, planning, on-site implementation of mitigation measures, and communication with those involved in protection from the risk of wildfire.

Nationally recognized for their program, Firewise focuses on communities and homeowners taking responsibility and showing interest in creating and maintaining defensible space; ensuring adequate access; addressing signage; and building or retrofitting structures designed with non-combustible building material in terms of siding, decks, and roofing. It is co-sponsored by the USDA Forest Service, the US Department of the Interior, and the National Association of State Foresters.

Ready-Set-Go

This program started in March of 2011 and strives to develop and improve the discussion and information flow between local community members and local fire organizations. It is designed to better equip fire personnel with tools to teach local residents in fire-prone wildland areas how best prepare for personal safety and protect their properties against wildfire. Ready-Set-Go emphasizes preparedness in all hazard situations.

This information was outlined and made available at the public meetings with discussions on not only landscape preparation, but also on key issues that many structures have that make them more receptive to burning embers cast off from the fire. Discussion occurred covering how wildland and structure preparedness prior to a wildfire can increase personal and fire fighter safety, improving the likelihood of a positive outcome after a wildfire.

Ready-Set-Go represents the steps to be taken long before a wildfire as well as during a wildfire. The CWPP committee came prepared to discuss ways to be ready well in advance of a fire occurring in their area, finding funding sources to help, and how to find workforce help if needed. Emphasis was put on local fire personnel's willingness to work in conjunction with landowners to protect life and property. Additionally, the meeting was aimed at increased public understanding and situational awareness once a fire was burning in the area through preparing emergency items to take and staying informed on current situations. Finally, a proactive public can increase the opportunity for firefighting resources to be successful through property preparation and in the event of a fire situation be prepared to leave the area for personal safety. Acting early was a key point in part of Ready-Set-Go.

Public Surveys

The steering committee updated the 2005 CWPP questionnaire to identify potential educational opportunities, gauge what citizens value most, and assess how those values may be threatened by wildfire. Two public surveys were made available to the public. One contained 24 questions designed to gain information regarding public knowledge of wildland urban interface, risk reduction activities and cost, and defensible space. The second one, a shorter survey of 12 questions, focused on the landowner's assessment of their own property in terms of wildfire accessibility, structure vulnerability, and potential safety issues.

Outreach

The CWPP committee felt it important to integrate as many community members as possible in the planning process. Several communication mechanisms were used in an attempt to reach the largest possible number of people in the county. Local media outlets were found to be best source of information for encouraging community involvement.

The surveys were also uploaded into a web-based program called SurveyMonkey, an online survey development cloud-based company that provides free, customizable surveys. Venues utilized for public outreach included:

a. Distributing the surveys at the public meeting and collecting them prior to meeting closure
b. Newspaper articles were released with the link to the website where individuals could access the survey directly.
c. The link was posted on the Union County Emergency Services website with a one click access.
d. The link was also posted on Union County Emergency Services Facebook site where one click would take the individual to the survey.
e. Fire agencies providing survey handouts at their reception desks.
f. Email was also used in an attempt to reach as many people as possible.

In addition to community workshops, radio interviews, newspaper articles, the steering committee decided a website would also be an effective method for communicating with citizens throughout the evolution of the plan. Both the Union County and the La Grande ODF Office websites were used to communicate the opportunity to participate in the survey. (Survey form is located in Appendix L, page 24 - 27)

Unfortunately, once again participation was limited, with only 13 individuals participating in the survey. Due to low public representation, the results were noted and retained but cannot be used to reflect the community as a whole.

Summary and Recommendations

Several attempts were made to reach out and obtain local public involvement. The highest response came from the local fire response organizations within the rural departments. They provided valuable information both general and specific to meeting the needs of the CWS goals.

Local cooperators were less responsive to participation requests at the time of the meeting. However, in May a fire scenario simulation was conducted with local cooperators participating in some fashion. Feedback on the scenario indicated a new understanding of their role in wildfire events. This new knowledge may provide opportunity for reaching out to cooperators for additional input.

It is unclear why the majority of local community members were unresponsive to opportunities to interact with fire managers and CWPP committee members. Recommendations of potential new outreach mechanisms, such as hard copy mailing of letters or information booths at public events, could potentially draw further interest. Additionally, the 2015 fire season also resulted in fires close to local communities that likely resulted in a peak of public interest in how to they can be involved in the process. Perhaps a second round of surveys would result in a higher response.

Consideration of how to use other educational opportunities within communities may prove valuable. This could provide interaction from both fire response managers and local community members in a joint effort to meet the CWS goals. All stakeholders must be responsible for supporting communication, informing, and joining in the formal and informal communication networks across organizations (CWS 2014).

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VI. Wildfire Risk Assessment

Introduction

In order to understand Union County's fire hazards and risk it is important to gain some appreciation of the causative factors leading to the risks. As identified in the Cohesive Wildfire Strategy (CWS), there are four broad areas of risk when addressing wildfire: risk to firefighters and civilians, ecological risks, social risks, and economic risks – addressed in Chapter IV. These risks are broad scale potential outcomes placed on all wildland fires.

Chapter IV also provided a profile of Union County's fire history based on fire point source. This chapter further examines research studies and area data of large perimeter fire history greater than 50 acres, temporal and spatial distribution, potential values impacted today and the ecological implications of fire exclusion that contribute to increased wildfire behavior.

This chapter uses data information from local sources and West Wide Wildfire Risk Assessment (WWRA) analysis results to explain county conditions and individual components that contribute to the counties geographic rankings of low, moderate, high, and extreme with these primary concepts: fire threats, fire effects, and fire risk. Historic fire frequency and spatial locations, stand conditions, and effectiveness of suppression efforts are part of fire threat levels. Local knowledge of values that hold significant importance and the ability to protect those values contribute to the degree of negative fire effects when wildfires occur. A progressive assessment of existing conditions by the WWRA includes many of these attributes in Union County offers a comprehensive measure of wildfire risk.

This chapter describes the data information used to determine the overall Fire Risk for Union County. A more detailed explanation of the data and its importance in the process is referenced in corresponding appendixes throughout this chapter.

Union County Fire Statistics

Union County Fire Frequency

Fire's interaction with the environment has played a significant role throughout Union County's history. Historical fire records indicate that prior to effective fire suppression, large fires were common in the Blue Mountains of eastern Oregon. The Blue Mountains extend over a large portion of eastern Oregon with 4,060 square miles of land mass. The Blue Mountain Range includes the Strawberry Mountains, Elkhorn Mountains, Eagle Cap Mountains and many consider the Wallowa Mountains also part of the Blues (Wikipedia, 2015).

Fire studies conducted in the Blue Mountains (Blues) of Eastern Oregon have demonstrated the frequent fire return intervals for the geographic area. Although the Blues have an extensive geographic range, the primary focus for this plan will be study results near Union County. These study results are provided in further detail in Appendix B, pages 1 and 2.

A study completed by Kathleen Ryoko Maruoka in 1994 analyzed the mean return interval between fire events. Maruoka focused on mixed conifer where ponderosa pine is co-dominant with Douglas-fir and grand fir (Maruoka 1994). During the study she established 15 plots in the Blue Mountains. Out of the 15 study plots, five sites were in relatively close proximity to Union County with the closest at less than two miles from the county line and just seven miles west of Mount Emily. Mean fire return interval ranges from 9.9 years to the longest of 30.8 years.

Two years later in 1996 Emily Heyerdahl using tree ring analysis studied fire history in northeast Oregon providing results for both fire intervals and estimated large fire sizes. Three of the four areas were in relatively close proximity to Union County, as shown in mapped in Appendix B, Figure B - 1. During the time span of 1687 through 1994, these sites revealed that the median fire intervals were 23, 25, and 11 years for Tucannon, Imnaha, and Baker respectively. Between 1687 and1994 every site experienced 13 or more fires ranging from 1000-4999 acres in size and the Baker site experienced at least 12 fires greater than 5000 acres. Fire size estimates were considered conservative largely due to the low density sampling areas, periods of low severity burning where fire scars did not occur on trees, and low sample average of three trees per sample plot were taken creating potential for missed data. This resulted in a likelihood of an under-estimate of fire recurrence (Heyerdahl, 1996).

Large Fire History

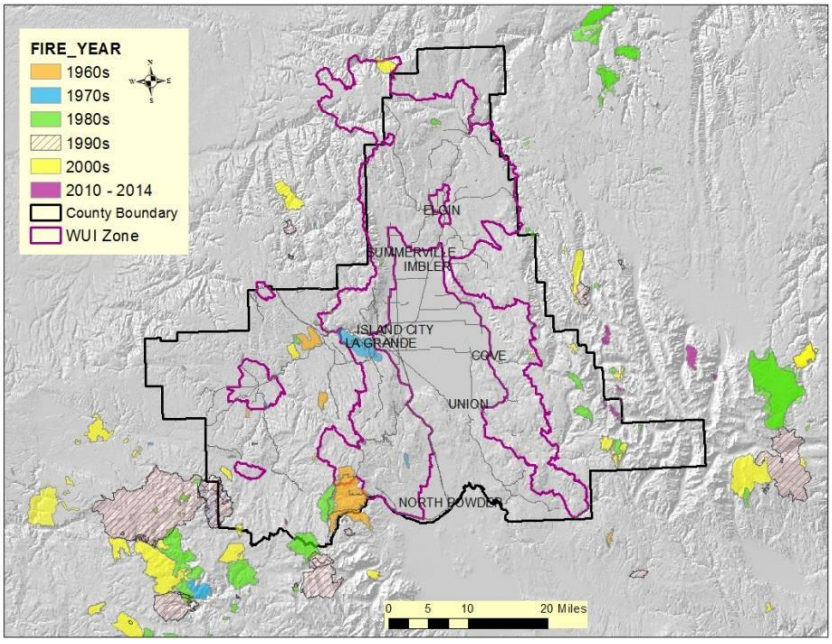


Figure VI – 1. Historical Fire Perimeters within 20 miles of Union County. Years include 1960 through 2014. U.S. Forest Service GIS Data Library, 2015 and Oregon Department of Forestry data base.

Historic large fire perimeters maps were obtained from the US Forest Service online GIS Data Library (U.S. Forest Service 2015) and from Oregon Department of Forestry GIS staff. The data base provided large fire perimeters dating back to the late 1800's through 2014. However, the data prior to the 1960's revealed limited fire records. For example, between 1920 and 1949 there were no fires recorded and only one in the 1950s. For this reason

large fire history was not used prior to 1960. The large fires were further reduced to fire perimeters of 50 acres or larger and within a 20 mile radius of Union County. Figure VI-1 shows a spatial distribution of where fires have burned on the landscape since 1960.

In examining the fire perimeter records from 1960 to present information revealed the following number of large fires greater than 50 acres per decade, Figure VI – 2. Beginning in the late 1970s, large wildfires became more commonplace in and around Union County. Mean acre size for the fire areas in the 1980s, 1990s, and 2000s were 1568, 3326, and 4311acres respectively.

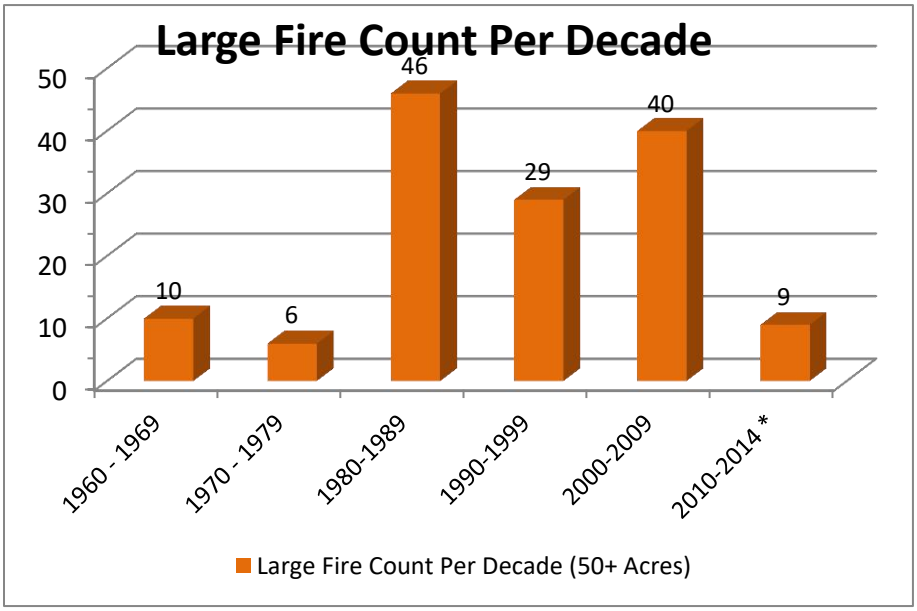


Figure VI – 2. Fire perimeter of public land fires 50 acres in size and greater. This includes all fire perimeter records within a 20 mile distance of Union County. Note: * accounts for only four years of current decade. http:/www.fs.fed.us/r6/data-library/gis/umatilla

Mean Fire Costs

Fire costs for Forest Service records became more consistently available starting in the 1980s and showed mean fire costs in the hundreds of thousands in the 1980s. This rose to a mean large fire cost of more than a million dollars per fire over the next two decades, this mean fire cost has already carried into the current decade where only four years, 2010 to 2014, have passed.

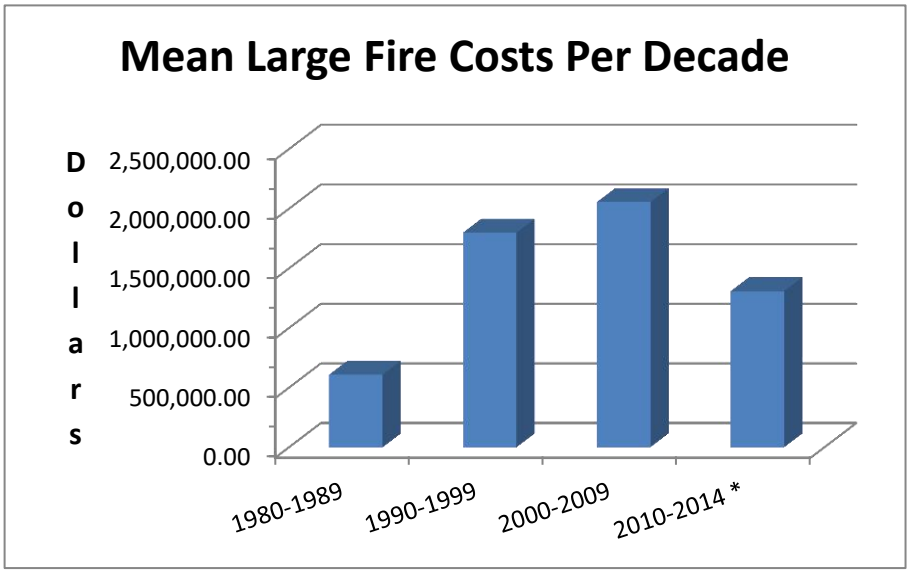


Figure VI – 3. Fire costs of public land fires since 1980. Graph displays a mean cost per fire for that decade of fires 50 acres and larger. Average costs estimates are under-represented due to missing fire cost data. Data includes fires within a 20 mile distance of Union County. Note: * accounts for only four years of current decade. http:/www.fs.fed.us/r6/data-library/gis/umatilla

Using the same fire information from Figure VI – 2, data shows the mean fire cost for 46 large fires in the 1980s was $609,065. Although the 1990s had 17

less large fires, the mean fire cost during that time was more than double, resulting in mean fire cost of $1,799,689. Fire cost for the 40 large fires in the 2000s increased further to an estimated expense of $2,055,689 per fire. While years 2010 to 2014 account for only four years into the next decade, there have been nine large fires to date with a mean cost of $1,309,267.

The western United States supports large blocks of publicly owned land, encompassing more than half of the total land area. Fires that occur on public lands and spread onto private lands are a significant problem in the west compounded by steep slopes, insect and deceased trees, and limited resources as well as access (CWS 2014). Total individual fires reported, regardless of size or agency, in the western U.S. from 2008 through 2012 were on average, approximately 23,091fires per year, resulting in an average annual burned acres of 4,666,030 (National Interagency Coordination Center 2013). Fires reported by all agencies in Oregon and Washington (northwest), for the 2014 fire season totaled 3092, involving 996,542 acres in Oregon and 1480 fires for 386,972 acres in Washington (NIFC 2014). Fire cause for the 2014 fires were 2,155, human causes accounted for only 11percent of the acres while 2,417 lightning fires accounted for 89 percent of the fire acres (NWCC 2014).

Fire Records

As mentioned in Chapter IV, fire starts are not new to Union County. Reported fire starts were mapped utilizing information gathered from various fire management agencies. Fire dates used for mapping were provided by the WWRA completed in 2013 that references a period from 1999 to 2008. Data years for the WWRA were limited due to the need for consistency across 17 states to allow comparisons to be made between states then further comparison from county to county within each state. These points were used in the WWRA to identify areas of fire start densities for the county and build the fire threat, fire effect, and fire risk assessment for geographic areas.

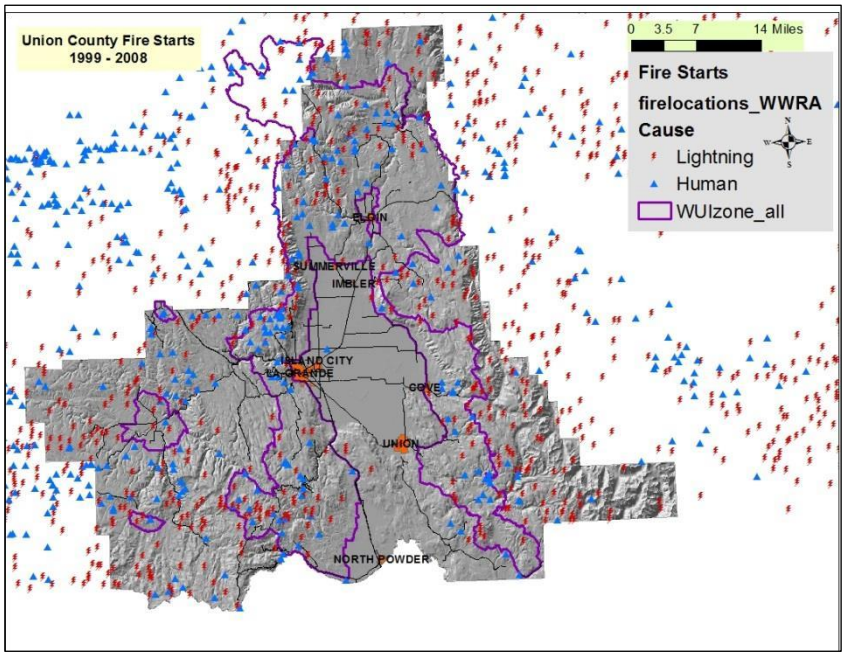


Figure VI – 4. Historical fire points in Union County and surrounding area (Baker County not shown to the south) from 1999 to 2008. (ODF-WWRA 2013).

Fires on state lands were reported for only areas that the state has the statutory responsibility (ODF-WWRA 2013) for fire protection, making it necessary for WWRA to obtain fire occurrence data for other privately owned

lands, most of which receive fire protection from city or rural fire protection districts. These protection districts report their fires to the U.S. Department of Homeland Security National Fire Incident Reporting System (NFIRS) (ODF-WWRA 2013). Unfortunately, almost all the fires did not contain a latitude/longitude or legal description with a Township, range, and section, or other pertinent information needed for consistency with other protection agencies. As a result, the ability to use this data in some states was either very limited or could not be used at all. Another issue for fire reports was some states have a voluntary reporting process making it necessary to use at a minimum what was available (ODF-WWRA 2013).

Fire points, for more recent years 2009 to 2014, were accessed from Geographical Information Systems (GIS) of the Forest Service and Oregon Department of Forestry. It was determined that between the years 2009 and 2014, Union County's local data had an additional 217 fires reported on public lands and another 97 fires on private lands; duplicate fires were removed based on response agencies showing identical data for a specific fire.

Locally only partial data was available for City and Rural Fire Departments in Union County. It is noteworthy of mentioning that these local fire management agencies are not exempt from responding to vegetation fires on an annual basis. Between 1996 and 2003 fire records were discovered for Union County city and rural fire departments to show approximately 139 fires over the eight-year period, all situated along the foothills of the La Grande Valley or in the valley itself. Rural Fire Department knowledge affirms that this number is significantly low to actual wildland fire responses that occur annually. Unfortunately the fire data criteria for statistical fires in the WWRA were not compatible with the Oregon State Fire Marshall data base. Using the criteria used by the WWRA for fire starts and the need for consistencies among the data, a large percentage of rural wildland fires were not capture in the WWRA for Union County.

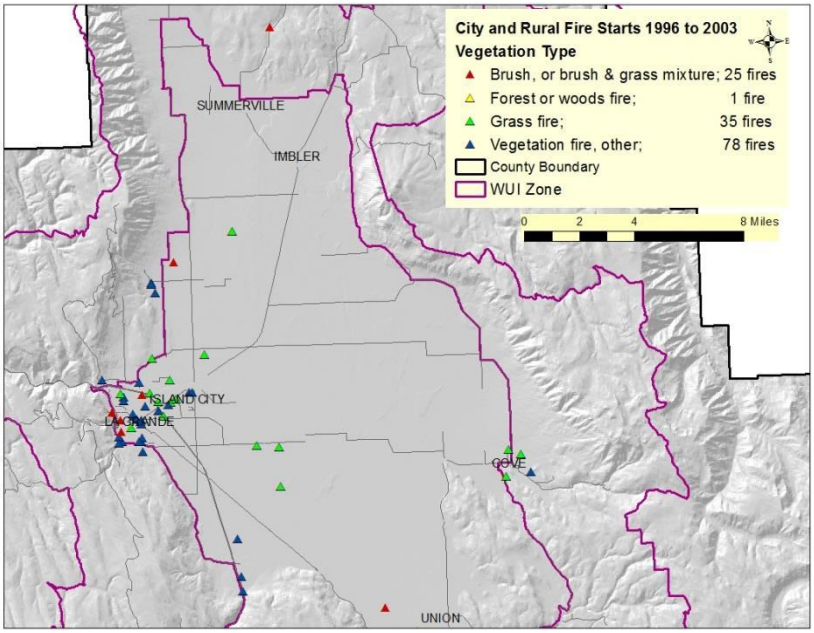


Figure VI – 5. Fire records of City and Rural Fire Departments for the time period of 1996 – 2003. **Oregon Explorer, 2014.**

Although data does not reflect it, the CWPP committee agrees that fire starts in the La Grande Valley proper are significant in numbers and the rural and city fire departments play a crucial role in providing wildland fire response

to vegetation fires within the valley proper and local communities. Figure XI - 3, Chapter XI provides a map of rural fire protection areas.

Jurisdictionally, over the eight year period, North Powder recorded three of the fires during this time frame, Union County Emergency Service seven fires, Cove Rural Fire Department 13 fires, La Grande Fire Department and La Grande Rural Fire Department each recorded 58 vegetation fires during the eight year period.

Fire Regime Condition Class

Fire regime condition class (FRCC) is a method to determine the change in successional classes of vegetation, fire frequency, and the degree of overstory plant mortality after a wildfire (fire severity). It is a way of comparing current landscape conditions to a historical range of variation that existed before significant Euro-American settlement. One assumption in identifying FRCC is that historical fire regimes represent conditions under which fire-adapted ecosystems have evolved and been maintained over time (Hardy and others 1998). Today's vegetation departures from the historical baseline can serve as a useful proxy for potential uncharacteristic fire effects and can be used to address risks to the sustainability of fire-adapted ecosystems (Jones et.al. 2012).

Landscape fire regimes identified in the CWS is supported by fire history studies, historical large fire perimeters and fire occurrence levels within Union County. Fire regimes describe the frequency of which fires occur on the landscape and their relationship to vegetation conditions shaped by those fires. These fire regimes explain the connection between the degree of mortality in the overstory vegetation of an area due to a wildfire, better known as fire severity, and the average number of years between fire events (fire frequency or mean fire interval) and their ecological consequences (Barrett and others 2013). The CWS identifies Union County as predominately represented by Fire Regime Groups I, II, and III (Figure VI – 6) with a high proportion of the county falling into regimes I and III. See Appendix B for further explanation and details fire regime and condition class.

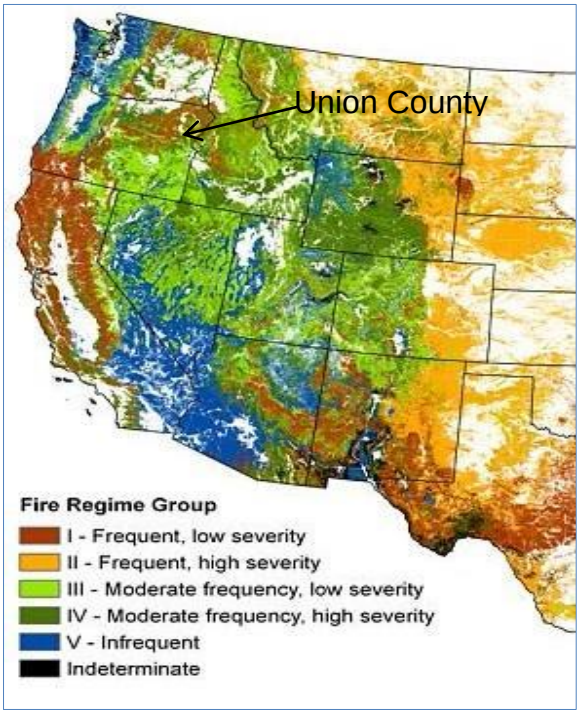


Figure VI – 6. Gross scale of historical fire regime groups values. Clipped from U.S. map Figure 3.2 of Cohesive Wildfire Strategy. CWS 2014.

How fires interact with the environment when they do occur is dependent on many variables. This is important in that the interaction of fire in the environment influences many variables one of which is the quantity and quality of vegetation (flammable material) on site. This in turn has

a direct bearing on suppression resources ability to be successful during initial attack fire response.

The vegetative stand structure can influence the amount of live and dead material and stand health directly influencing the intensity and severity at which fires burn. Fire intensity is related to amount of heat emitted, rates of spread, flame length, flame height, and other fire behavior characteristics. Fire severity is directly linked to the effect the fire has on vegetation mortality, soil sterilization, water permeation, and area recovery rates post fire. There is a close correlation of fire regimes to forest conditions including characteristics such as: dead fuel accumulation, vegetation structure, type, quantity, and composition, which play an intricate role in contributing to wildfire behavior (CWS 2014).

Due to environmental condition changes increasing the degree of difficulty in fire suppression and extend drought periods fires size and costs have increased. Expansion of housing areas coupled with society's negative views of fire, particularly in the wildland urban areas, have also contributed to biological and physical changes on much of the landscape. Over several decades, fire no longer kept vegetation and down woody in check, and new fuel types in the form of structures were being placed in and adjacent to forested areas further complicating suppression efforts.

The wildland fire environment, particularly over the last 40 years, is inconsistent with historic stand conditions for multiple reasons. First, with the amount of successful fire suppression, it has altered fire size and intensities since the 1900's. If left unimpeded, these suppressed fires would have likely been more frequent, low severity, landscape size fires providing a cleansing of forest stands. Successful suppression has resulted in fire regime changes from relatively frequent intervals to much longer intervals with higher severity (significant mortality) impacts to overstory vegetation that historically would have experienced low levels of mortality. Secondly, the large fires of today burn with more lethal results to the ecosystem than historically, in part due to accumulation of available fuels in terms of down woody and understory live vegetation creating a "ladder fuel" effect providing a means of surface fires to reach overstory canopies. Thirdly, there has been an increase in wildland-urban interface land area and housing unit growth since the 1990s. Along with housing growth in an increase in infrastructure that provide support to the residence.

West Wide Fire Risk Assessment

To identify and prioritize wildland-urban interface areas-at-risk in Union County, an assessment of factors contributing to large wildfire events was conducted. This section will outline the process used and highlight any unfamiliar definitions.

Union County Fire Threat

WWRA provided a thorough analytical method to calculate the probability of an acre burning when developing the Fire Threat Index. A brief overview of the WWRA process

can be found in Appendix D, with a detailed analysis of the process located in the final report of the WWRA. The WWRA developed the FTI by integrating the probability of an acre igniting and the expected final fire size based on the rate of spread of the fire in four weather percentile categories (ODF-WWRA 2013). Another words historical fire start locations and historical large fire size were considered with how a fire will burn under various weather conditions for an average fire season.

Fire Occurrence

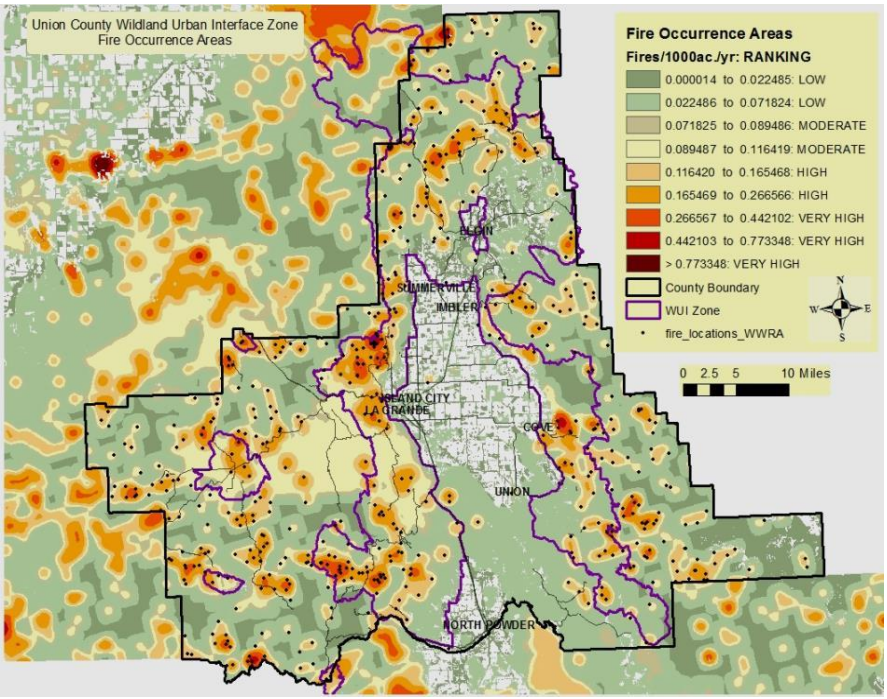


Figure VI – 7. Distribution and probability of fire ignitions in Union County. The closer the numerical value to the whole number 1, the higher the historic fire density and the higher the fire occurrence. Mapping inputs provided by WWRA.

Historical fire records from 1999 – 2008 were used in developing the probability of fire occurrence. These dates provided consistent data across 17 western states allowing an accurate comparison between states. This information was carried one step further to meet individual state needs of prioritization and data distribution. Data from the WWRA found that Union County wildfires for the 10 year period totaled 558 fires with ignitions sources of 62 percent lightning and 38 percent human.

Weather

Since weather has a direct impact on curing of grasses and vegetation, these ranges include how moist or dry the forest fuels (live and dead vegetation) are and the number of days over the timeframe June – October that conditions meet a specific criteria range that result in herbaceous curing levels for each range. Weather influences curing, in turn resulting in how on site conditions contribute to wildfire behavior.

Weather data was broken out into four categories to provide the number of days during a typical fire season, based on weather and fuels conditions, that a fire could potentially exhibit very low, moderate, high or extreme fire behavior. The weather and fuels conditions were represented by the following percent and number of days for each category between June 15th and October 15th for the weather stations that represented

northeast Oregon (OR08) which includes Union County (Weather zone OR08 geographic map is located in Appendix D, page 4). There is approximately 13 days through the fire season where fires fall into the high or extreme weather conditions.

For northeast Oregon, including Union County the weather and curing conditions are as follows:

- low 15% – 18 days - 20% proportion of the herbaceous cured.
- moderate 75% - 92 days - 60% of herbaceous fuels contributing to fire spread.
- high 7% - 9 days - approximately 90% of herbaceous fuels cured
- extreme 3% - 4 days - 100% cured herbaceous

Wildfire starts were also examined and separated based on weather conditions at the time of ignition and put into one of the four weather categories it fell into. The percent of fires that occurred for OR08 for each condition range were as follows (ODF WWRA Addendum I - 2013):

Weather Category	Percent of fire starts in Category
low	10.74%
moderate	81.32%,
high	6.17%,
extreme	1.77%

Slope

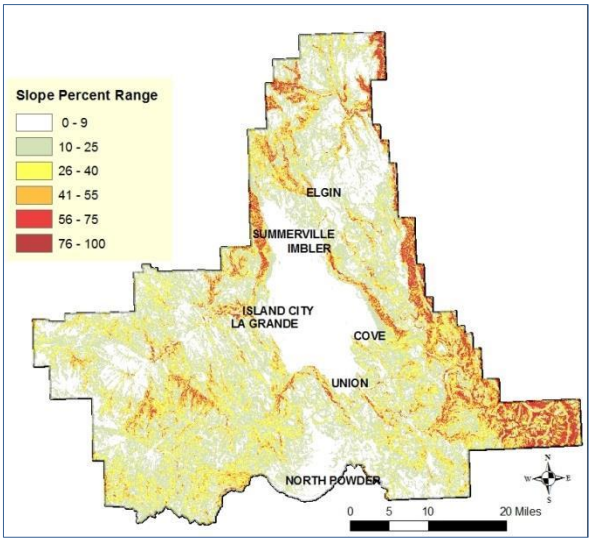


Figure VI - 8. Slope steepness of Union County. Slopes of 26 to 40 percent was the most common with 41 to 55 as the second most common in the county.

The nearly 7000 foot elevation change in the county results in steep slopes surrounding the Grande Ronde Valley that influence both fire behavior and suppression efforts. Wildfire behavior calculations display slope influences on wildfires similar to how wind influences fire behavior. The higher the wind speeds on a fire the faster the rates of spread and the steeper the slope the faster the rates of spread.

Topography, including slope, also plays a role in how difficult it will be to suppress a fire.

Fuel Models

Fuels models represent vegetative material that provides burnable “fuel” or material to the fire that contributes to the flaming front.

Down woody fuels play an instrumental role in fire behavior such as:

- Fuels can impact wildfire rates of spread particularly in fine dead fuels (0 – ¼" in diameter) and as well as material 3" diameter and smaller because they ignite more readily, burn faster.
- Larger stems 3" and above may take slightly longer to ignite but once burning can generate higher levels of heat (intensities) and have a longer burn time in one location (residence time).
- Fuels models are used to predict surface fire behavior, meaning fires that spread across the forest or rangeland floors. Leafy material, such as brush can be lofted into the air in the form of hot embers igniting new fires ahead of the main fire.

Figure VI – 9 shows the distribution of fuel types in Union County with each type, used by WWRA based on Scott and Burgan with a list of characteristics such as:

- tons per acre of different size material
- a dynamic fuel or not (herbaceous and progressive seasonal curing)
- depth of fuel bed in feet
- and numerous other attributes

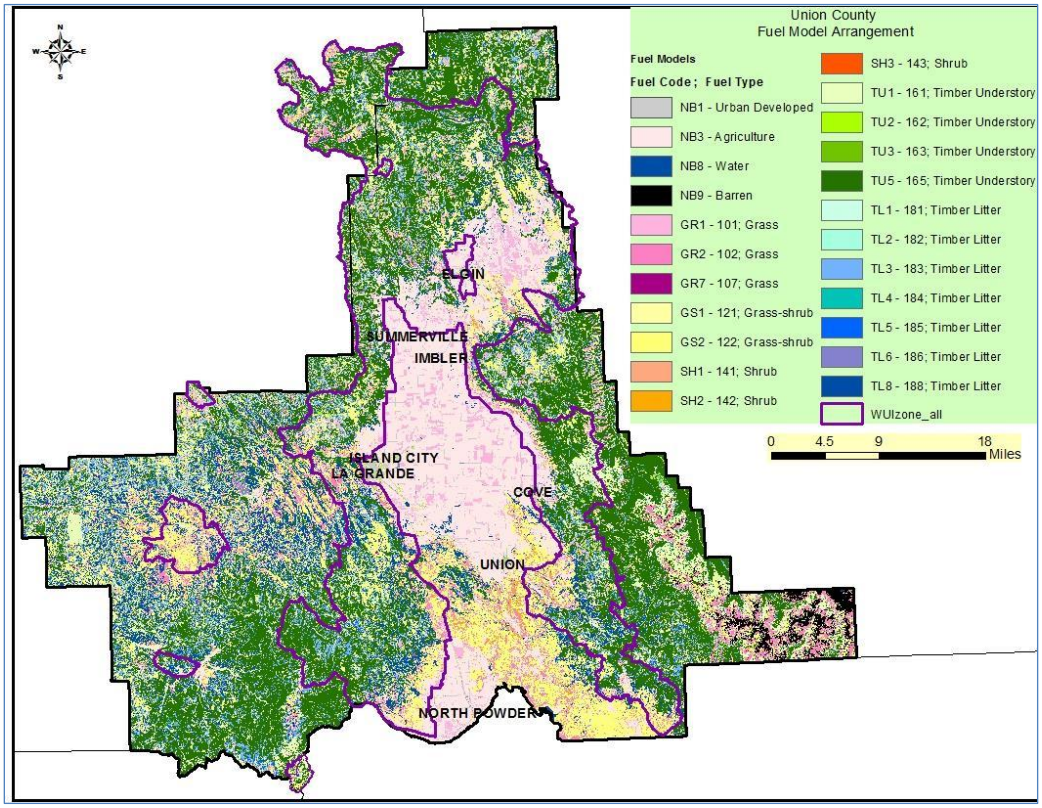


Figure VI – 9. Union County distribution of fuels models used as an element to predict wildfire behavior in developing FTI. Data Source: ODF-WWRA 2013 with utilization of LANDFIRE data. NB = No Burn.

The WWRA utilized the fuel type characteristics in combination with the stand canopy conditions and the four weather categories to determine overall fire behavior.

Although the valley center is peppered with a grass fuel model, many areas identified as NB (no burn) are either irrigated agricultural fields during the fire season or are a grass fuel model with a short time frame as an available fuel for burning during the summer months, this is particularly true for wheat fields just prior to harvest. Appendix D provides a more details account of how and why fuels impact fire behavior.

Canopy Fuels

Fire behavior is often influenced not only by surface fuels but by trees that contribute to the stand structure. Individual tree attributes as well as entire stand characteristics play a role in fire behavior involving tree canopies. For the purpose of this document the word *canopy refers to stands of trees* and *crown represents an individual tree*. Stands that have a tight closed canopy where limbs are touching, heavy undergrowth and down woody material pose a higher threat for crown fires. Stands that have spaces between individual tree crowns, are more open with less dense undergrowth, and lower amounts of down woody material often result in surface fires with little to no tree torching during a wildfire. Detailed description of canopy characteristics can be found in Appendix D, pages 10 and 11 - Risk Assessment Framework.

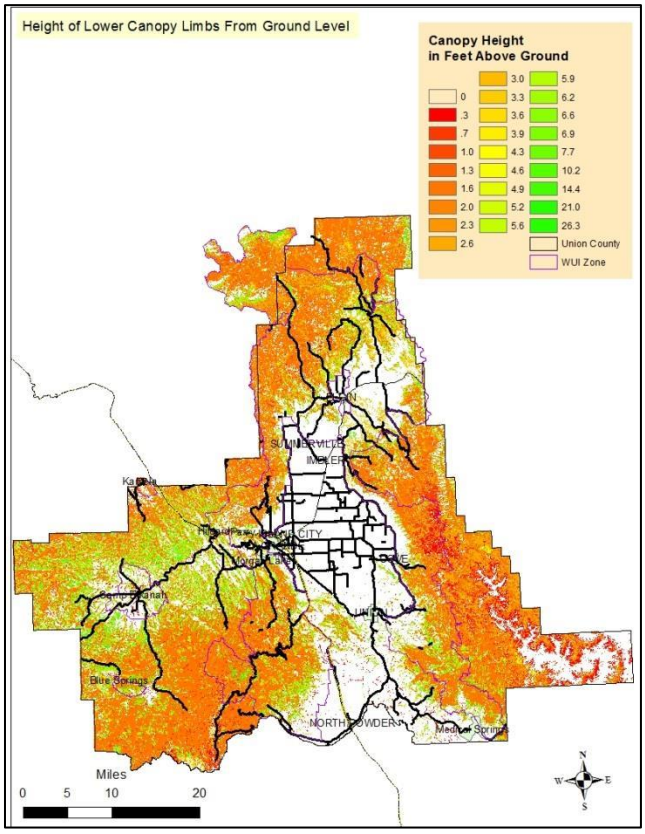


Figure VI - 10. Union County forested areas showing distance of canopy from ground level measured in feet above ground (canopy base height). The lowest reading was .3 feet with the highest of 26.3 feet. This influences wildfire's ability to transition from surface fire to crown fire. The shorter the distance from the ground the greater chance of

Fire Behavior Results - Surface and Canopy Fire

Fire Behavior

When wildland fire burns on the landscape a number of environmental characteristics influence it, that when working in unison, will dictate wildfire behavior.

Figure VI - 11. Fire Behavior Triangle. Fire behavior characteristics are influenced by fuel , weather, and topography.

Three specific environmental attributes that contribute to wildfire are weather, fuels, and topography. In order to determine which geographic areas of Union County will exhibit fire behavior that results in hampering suppression resources firefighting capabilities and poses the highest fire threat, it was necessary to assess the three attributes relationship to wildfire.

These data sets included: Local Weather Data, Elevation, Slope, Aspect, Fuel Model (live and dead vegetation), canopy cover, canopy height, Crown base height, and Crown Bulk density, all of which apply to the fire behavior triangle. These attributes were used to develop fire behavior predictions that made up the subsets of the FTI. This information is an essential input for determining how effective fire suppression resources would be during a wildfire and eventually used for overall county Fire Risk Index (See Appendix D).

Flame lengths play a significant role in tactical decision of suppression resources. Flame length and fireline intensity are directly related to the effectiveness of control forces (Andrews and Rothermel 1982). Fireline intensities are measured by the amount of heat released by a square foot of fuel that is actively burning within the flaming zone.

Fuels models have a direct correlation to the amount of heat (fire intensity) released by a fire, the flame lengths exhibited, and the rate at which the fire spreads.

Fire Flame Lengths and Rates of Spread

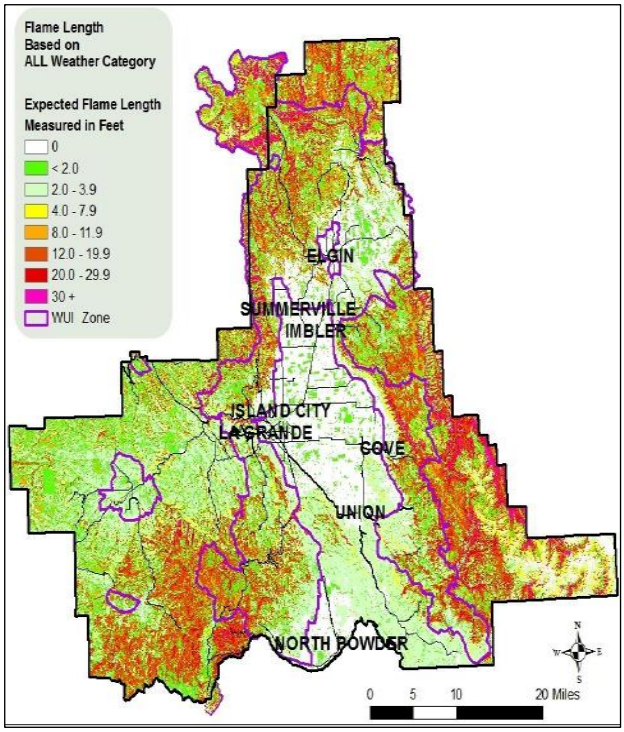


Figure VI - 12. Expected flame lengths exhibited from a fire. Impacts suppression resource effectiveness. (Information for mapping ODF-WWRA 2013)

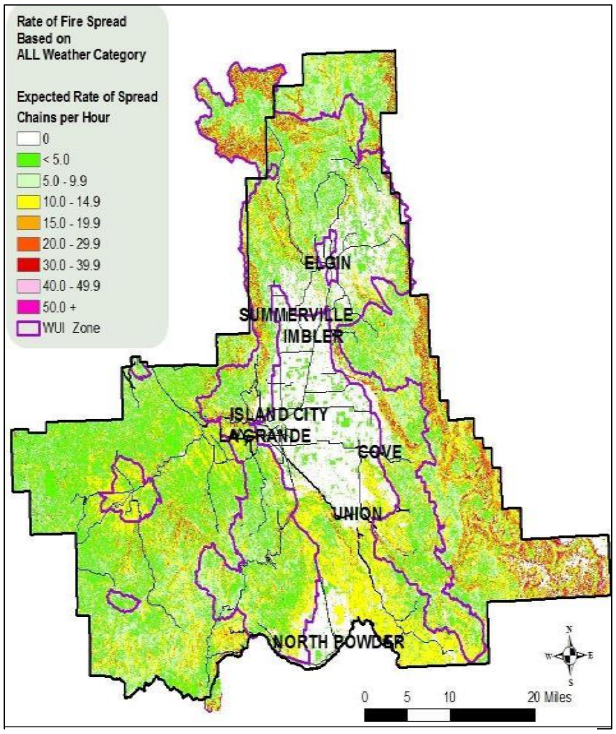


Figure VI - 13. Expected rate of Spread using all four weather categories.

WWRA delineates out the potential areas where a fire is unlikely to burn, a surface fire may occur, or conditions are such that a canopy fire is likely. All three fire types could potentially occur depending on environmental conditions. For practical terms both passive and active fires are collectively referred to as canopy fire (ODF-WWRA 2013).

Fire behavior scenarios were developed for all four weather categories taking into account dead and live fuel conditions, weather, and topographical features to demonstrate potential rates of fire spread (chains per hour) and flame lengths (feet) within the county. The probable mapped fire behavior, using the “average” weather, is presented in the body of this chapter as “expected” fire behavior, unless otherwise stated.

Potential for Crown Fires

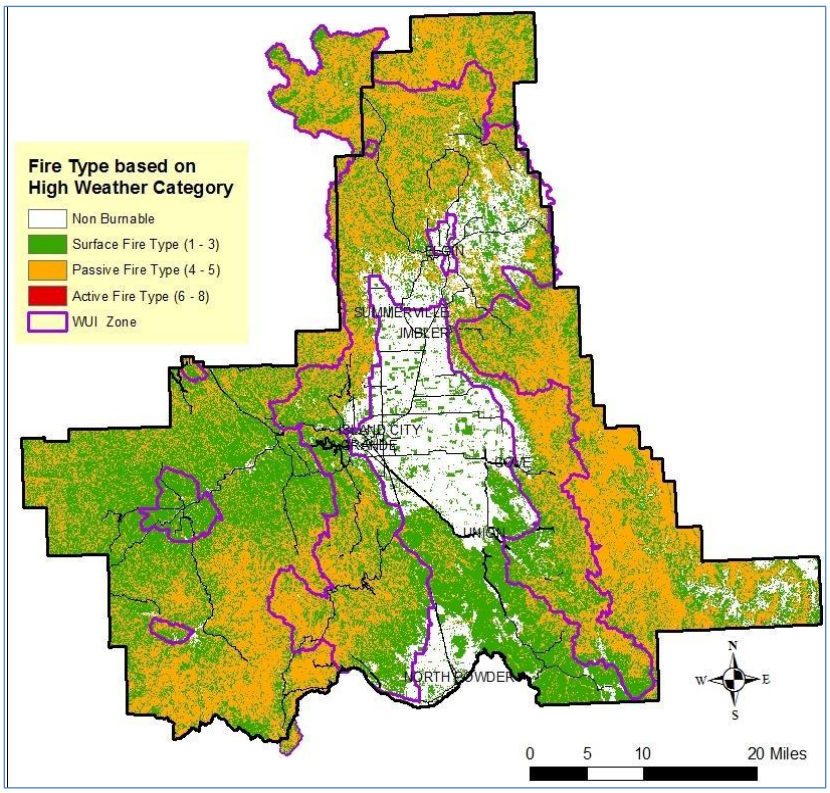


Figure VI - 14. Distribution of surface fire, passive canopy fire, and active canopy fire in Union County. Areas of canopy fire can be expected, in most cases, to also exhibit surface fires in conjunction with the canopy fire.

Union County WIUZ supports a significant amount of passive canopy fires where potential for increased fire spread through spotting and crown fire can occur. Areas identified as canopy fire are likely to exhibit both surface and canopy fires types.

In reviewing the three fire types the most likely fire types to occur are surface fire and passive canopy fires. This does not imply that active canopy fire types are not possible, what is important is that the canopy is likely to be involved during wildfires in most timbered areas once the high weather category is reached during fire season (Figure VI – 14).

The low weather category conditions generate a surface fire over a high percentage of the entire area. The canopy becomes involved in some areas when conditions move into the high weather category with a continual increase as weather and fuel moisture conditions worsen. In weather zone OR08, approximately 10.74percent of the fire starts occur in the low weather category, while the remaining 89.26 percent of the fire starts occurring in the remaining weather categories.

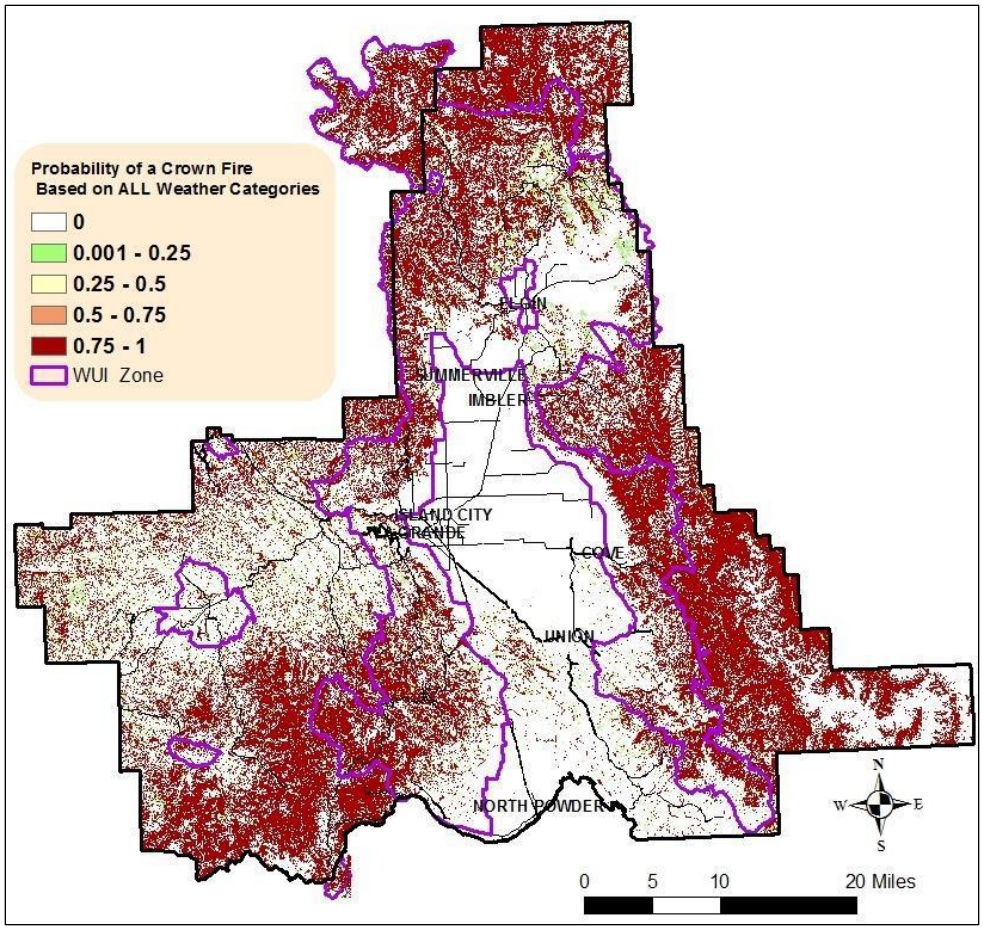


Figure VI – 15. Considering all weather categories the "expected" probability of a canopy fire is at least a 75 percent or more likelihood in most timbered areas. This includes both passive and active canopy burning.

Fire Threat Index (FTI)

Knowledge of fire behavior and the potential expected fire size was applied to calculate fire theat. Fire Threat Index is associated with the likelihood of an acre burning. It takes into account an acre igniting and the expected final fire size based on fire spread in the weather categories. This relationship between the rate of spread and final fire size was developed using the data from federal and state fire reports. The predicted annual acres burned are similar to the historic expected acres burned developed from the fire occurrence reports. Calculations were completed using the four weather categories, total expected acres burned, and probability of an acre burning based on the fire occurrence history. Details of calculations can be found in WWRA document 3.3.4 Fire Threat Index (FTI) pages 42 – 44.

Nine fire threat levels were developed ranging from the lowest threat to the highest threat. The higher the treat the more burnable the area analyzed.

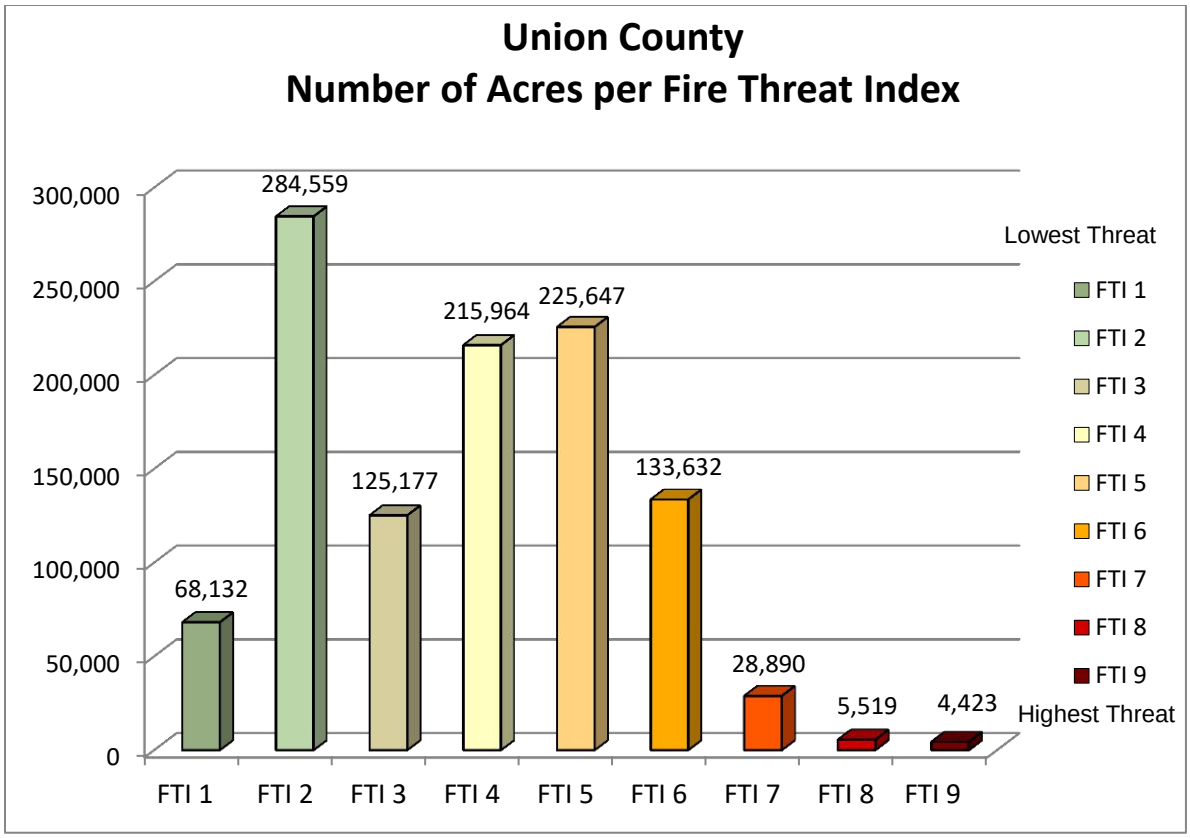


Figure VI – 16. Union County acres by Fire Threat Index class. Data from table in Addendum VI – Oregon County Risk Summaries (ODF-WWRA December 5, 2012).

Fire Threat takes into account the historic fire occurrence and fire size, fuels live and dead, historical weather trends broke out into four weather categories, and topographic features and successful suppression efforts. The landscape distributions of Fire Threat when displayed spatially for Union County are shown in Figure 17. The Fire Threat Index for Union County is the potential of a fire starting and threatening local communities strictly based on existing conditions and historical weather and fires, without consideration of the fire effect or potential loss if a fire should burn through the area.

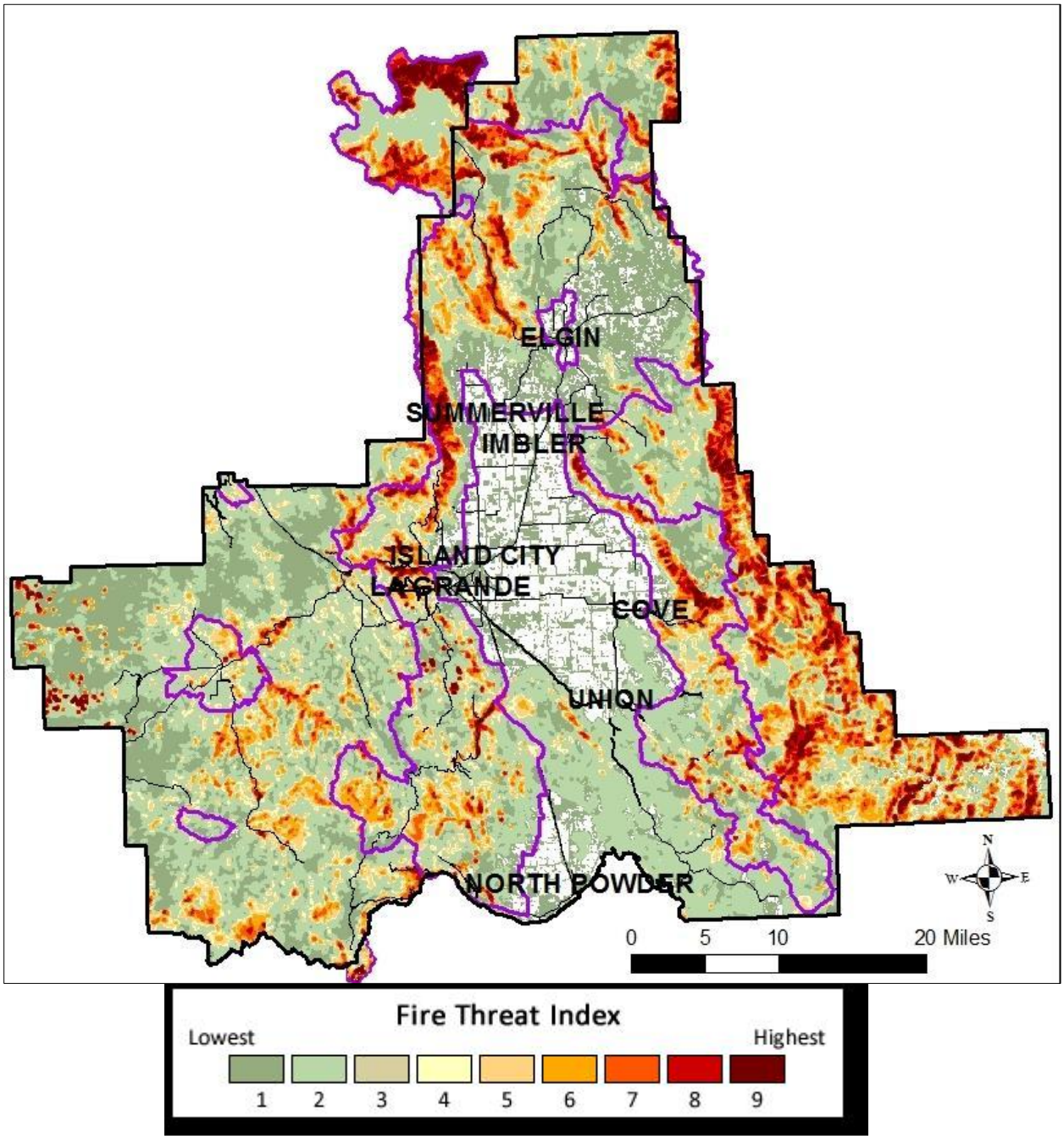


Figure VI – 17. Output of "Fire Threat" to Union County based on fire occurrence, fuels, weather, and topographic conditions.

Fire Effects

Wildland fires interaction with its surroundings can have a variety of effects both short and long term with some degree of impacts ranging from minor to extremely detrimental depending on each individual fire.

Merriam-Webster defines effect as: *"a change that results when something is done or happens: an event, condition, or state of affairs that is produced by a cause".*

It is important to identify areas that have important values that can be impacted by wildfire. Defining a *"value"* can be subjective depending on the audience providing the answer. In an effort to narrow down these important values, the WWRA through the iterative process with the technical team researching and developing identified likely candidates for the values dataset, often assisted by state feedback, and then presented the findings and recommendations to the Project Steering Committee for final approval (ODF-WWRA Final Report 2013).

There were five key values deemed most important should a wildfire change the valued resources current condition based on the West Wide Wildfire Risk Assessment (WWRA) calculation using the input from the individual states. These key values were assessed and evaluated based on some measure of fire intensity such as flame length to determine:

- how they would be affected by wildland fire (susceptibility and response) referred to as rfs (response function score)
- and/or locations that are costly to suppress to develop Suppression Difficult Rating (SDR) (ODF-WWRA Final Report 2013).

Suppression Difficulty

The final SDR was based on suppression resources capabilities to produce fireline based on rates in chains per hour, slope, and composite of scores and weights with input provided by the states and demonstrates the difficulty for fire suppression (ODF-WWRA Final Report 2013). Fuel type (live and dead material) and steepness of slope influence firefighters ability to effectively flank and control a fire.

Successful fire control can be hindered when the onsite conditions impede suppression resources effectiveness resulting in negative impact to important values. These values play a role in the social, economic, and sustainability of local communities.

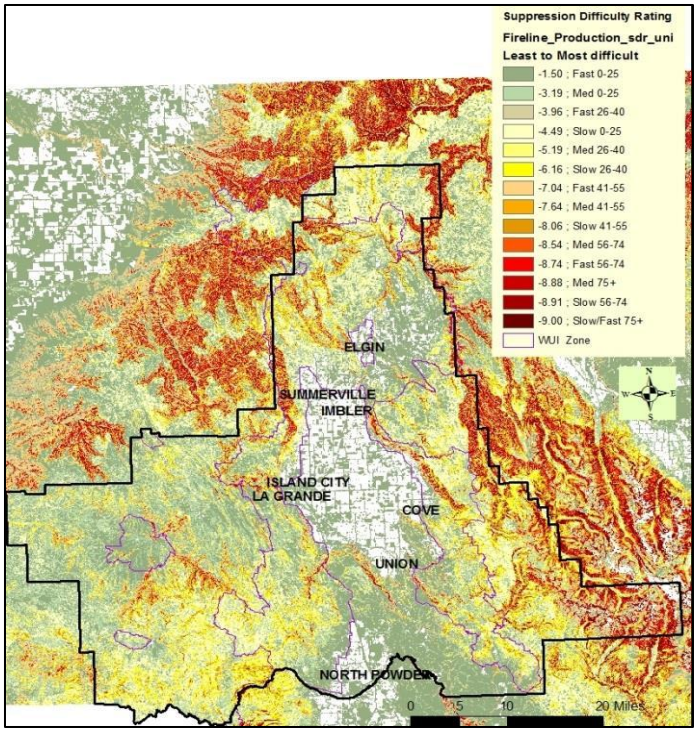


Figure VI - 18. Reflects increased difficulty to suppress a wildland fire. Map demonstrates the level of suppression difficulty in adjacent counties bordering Union County. The more negative the number, the more difficult the suppression of wildfire.

Values Impacted

Values assessed for potential negative fire effects included Infrastructure, wildland development areas, drinking water importance areas, forest assets, and riparian assets. Loss or damage to these values would have significant undesirable impacts to community if wildfire damaged were to occur.

The five key values identified as part of the Values Impacted dataset were analyzed, weighted, and mapped in the WWRA for final fire effects. These values were then given a rating of relative importance based on State Official input. This information was incorporated into the Fire Effects Index (FEI) component prior to calculating the final fire risk determination:

1) Infrastructure Assets – This data identifies key infrastructure such as schools, airports, hospitals, roads, and railroads that are susceptible to adverse effects from wildfire.

- Roads included levels 1;mainly interstate highways, 2;mainly state highways;, also key arterial and collector roads. Roads and railroads were buffered by 300 meters.

- Airports, Schools, and Hospitals
  has a 500 meter buffer.

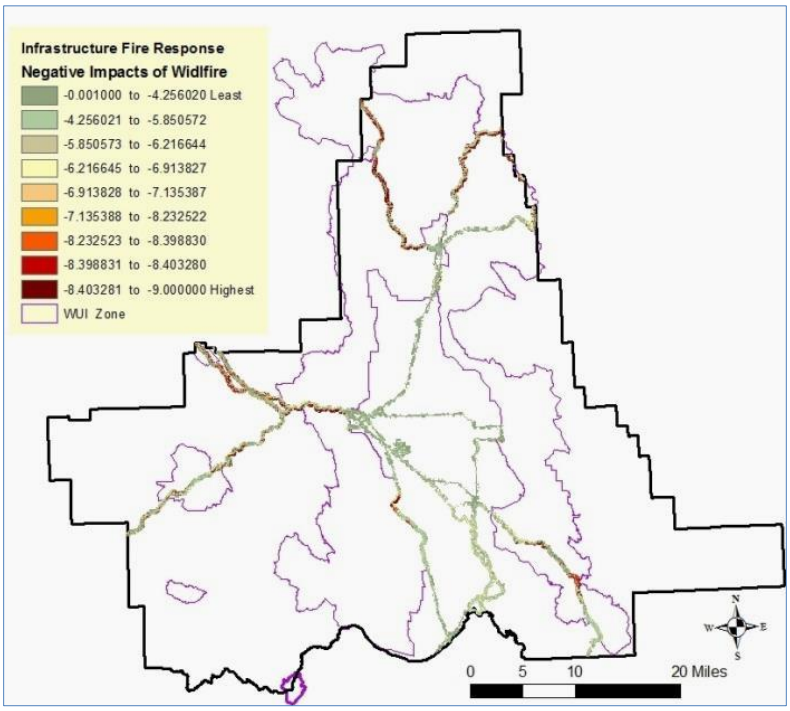


Figure VI – 19. Locations of infrastructure assets and their anticipated negative response to wildfire.

2). Wildland Developed Areas – this value describes locations of people living in wildland areas, is represented by the number of housing units on given acreage of land parcel. To maintain consistency over all states population count data from the Department of Homeland Security, HSIP Freedom Dataset was used (ODF-WWRA Final Report 2013). The WWRA through DHS utilized structural light detection was used for structural point locations based on visual light discovery. Categories were set ranging from more than 3 housing units per acre to as low as 1 housing unit per 40 acre parcel. See Figure 21. A corresponding table can be found in Appendix D, page 20 Figure D - 26.

This process did not however take into account additional homes and structures within Union County that went undetected by homeland security. Local data sources revealed a distribution of both residence and non-residential structures in Union County that would potentially increase the Wildland Development Areas. The Union County structure map however does not delineate between out buildings and residential.

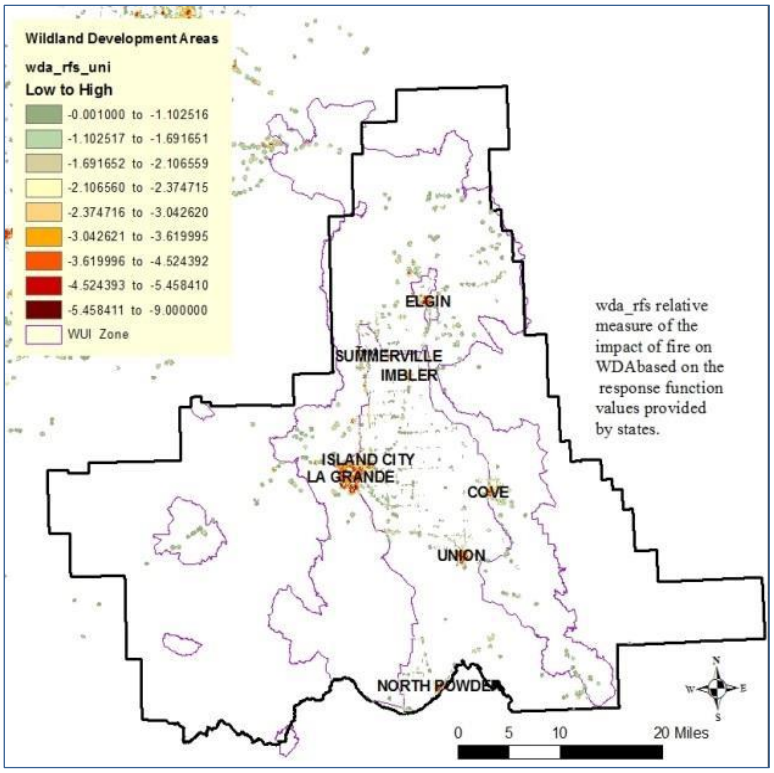


Figure VI – 20. Response function rating outcome used in calculating final Fire Effect Index. Indicates low to high density of where people live.

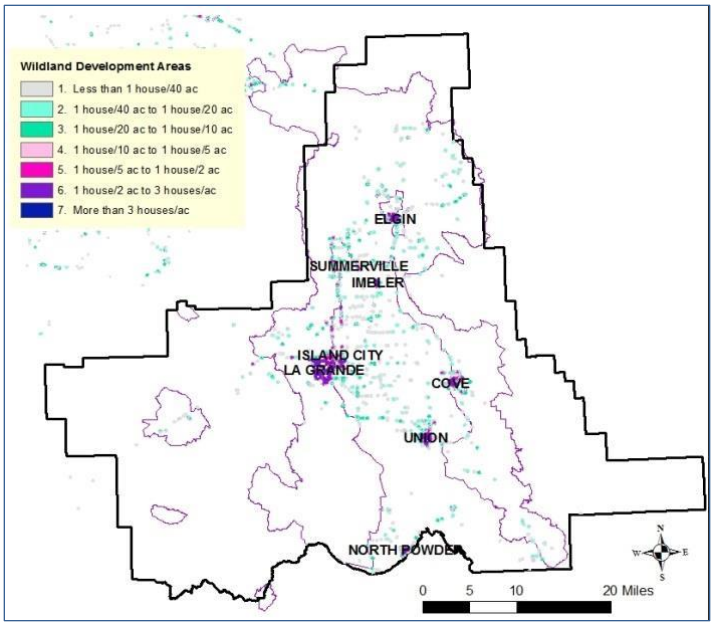


Figure VI - 21. Housing density of residential areas based on Department of Homeland Security , HSIP Freedom Datase (ODF-WWRA Final Report 2013).

Figure 22 has contains the WWRA housing density AND the most recent structure location for Union County that was obtained locally. A zoomed in area of the town of

Elgin (Figure 23) and vicinity shows a high number of structures represented by red dots, not accounted for in the WWRA. Further review shows several of these structures are residential in nature.

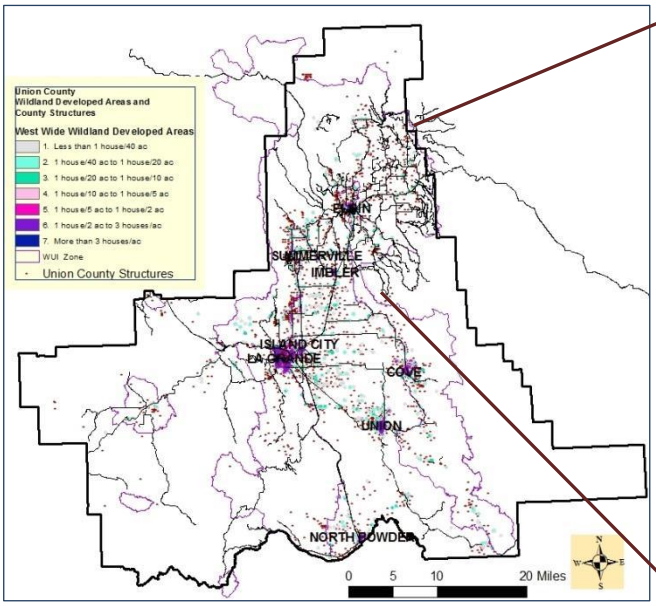


Figure VI - 22. Map displays comparison of WWRA data for housing density and local data of most recent structure locations near the Community of Elgin in Union County. Close up red dots are structures from Union County local data.

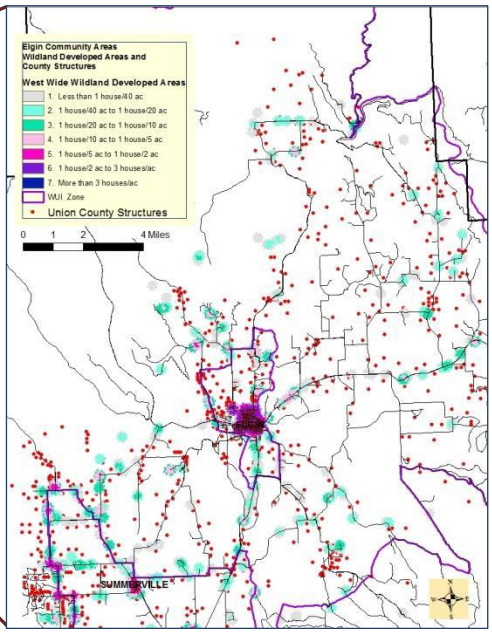


Figure VI - 23. Close up of structures surrounding the Elgin Community. Compares Union County data-structure points and WWRA. residential

A map density of all known structures was then developed based on Union County local data only to show the distribution of buildings ranging from low to high concentrations.

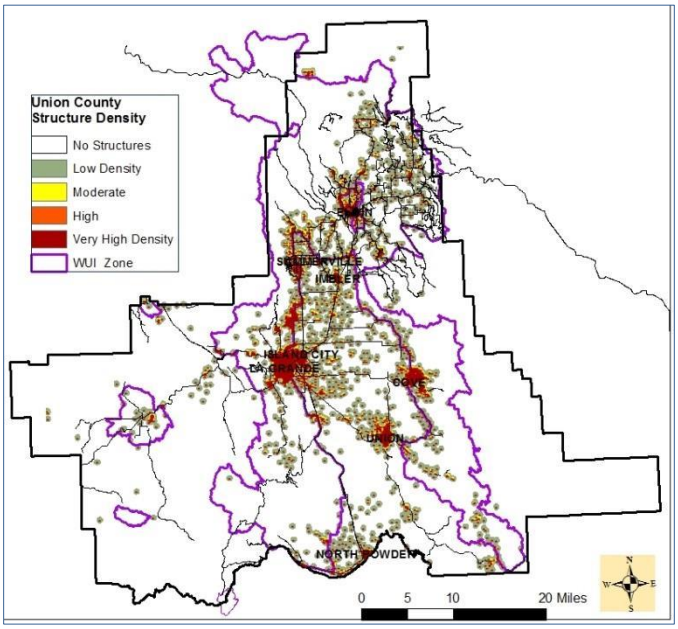


Figure VI – 24. Display of structure density using *only* local data, layer does not differentiate between resident and outbuilding. Does not include WWRA data. Using this data provides additional emphasis to areas of multiple structures that may otherwise be overlooked. Examples include locations such as: Palmer Junction Road and Robinson Road-Palmer Junction

Figure VI – 24 shows the density distribution of structures in Union County using best available data. This approach supports OAR 629-044-1060 (1) approach to classification of structures as Moderate, High, Extreme densities. Union County supports 11,590 housing units as of July 2015, according to U.S. Census Bureau for the State of Oregon. Forty-two percent of the county's populations live in rural areas. Although this data does not delineate between the residential and outbuilding structures, there is currently an effort to conduct a more accurate tri-county structure assessment that may be beneficial as a future addendum to this document.

The following Values impacted have been included in Appendix D, pages 15 - 19:

- Forest Assets – Discusses vegetation susceptibility to wildfire in terms of how they respond ecologically: sensitive, resilient, adaptive. Eighty-four percent of Union County is resilient supporting fire tolerant species.
- Riparian Assets – two primary functions of riparian; water quality and quantity. Categorized 1 through 3 with 3 having the highest importance.
- Drinking Water Importance Areas – Crucial areas to sustaining quality of drinking water, Oregon Department of Environmental Quality (DEQ) sub-basins with drinking water intakes, and Union County dependence on water such as protection, water rights for commercial and business.

Value Impacted Rating

A spatial distribution of least to most negative impact by wildfire for identified key values assessed in Union County is displayed in Figure VI - 25. The listed outcomes should not be interpreted that those areas of identified as least will not be impacted, but it provides a comparative view at one parcel of ground to the other should a wildfire occur.

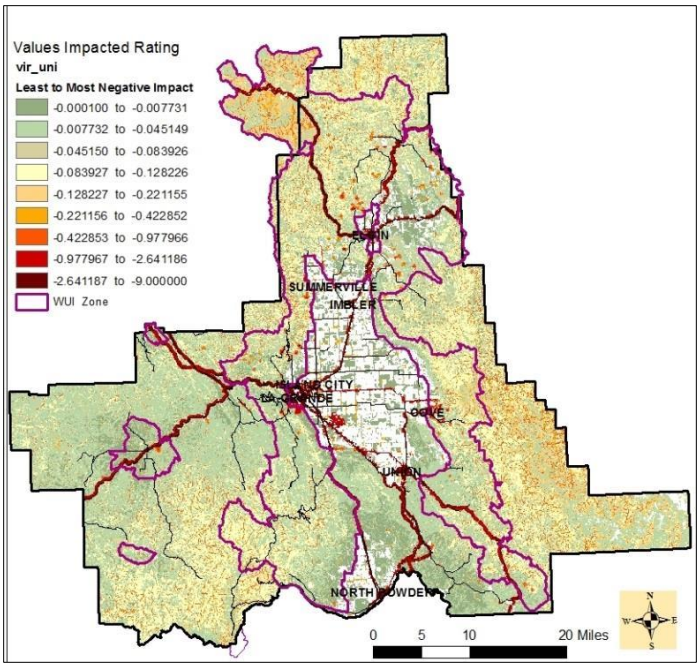


Figure VI - 25. Wildland Developed Areas and Infrastructure were important values that received a higher ranking (weighted percent) followed by Riparian, Forest Assets, then Drinking Water

Overall Fire Effects Index

The Values Impacted Rating is *combined* with the Suppression Difficulty Rating to determine the overall Fire Effects Index for the West Wide Wildfire Risk Assessment, The purpose of the FEI is to identify those areas that have important values at risk to wildland fire and/or are costly to suppress. The overall Fire Effects for Union County indicates locations, on the ground, that have a potential for wildfire to have high negative impacts to values overlapped with vegetative and topographic conditions that would make it difficult for suppression resources to be effective. The FEI will be eventually combined with the FTI to calculate the Fire Risk Index (ODF-WWRA Addendum VII 2013.

Fire Effects does not take into account the threat (potential for) of a wildfire actually occurring. It strictly evaluates if a fire covered every section of ground where would the most impact occur to values. It was also broken down into 9 levels from lowest to highest negative effects.

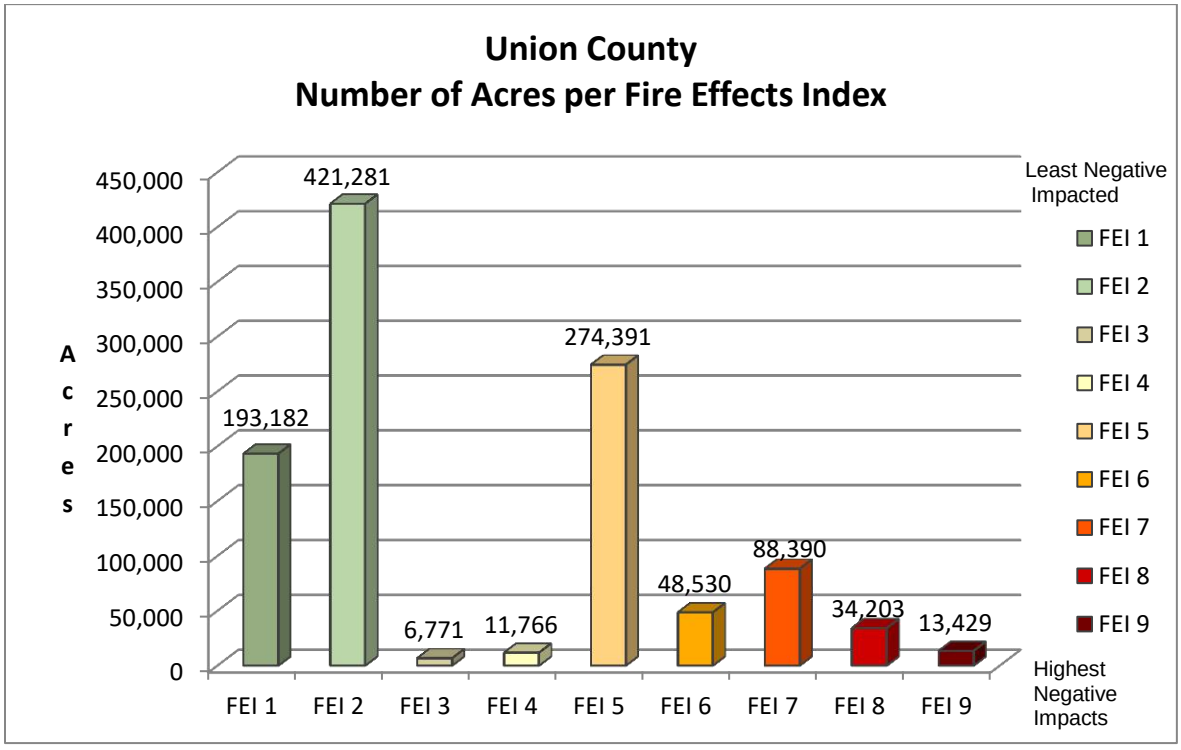


Figure VI - 26. The number of acres from least to most impacted by wildfire. Data from table in Addendum VI – Oregon County Risk Summaries. (ODF-WWRA December 5, 2012).

Knowledge of the number of acres provides an understanding of the overall impacts a fire could have in and around the county. The least negative impact does not imply that there are not negative outcomes to local values. It does however provide fire managers with an indication on how these areas compare to other geographic location in the county and where to set priorities.

Where these areas are located spatially in the county are provided in figure VI – 27. The Fire Effects acres listed in Figure VI – 26 do not include the northwest corner of the WUIZ that overlaps into Umatilla County.

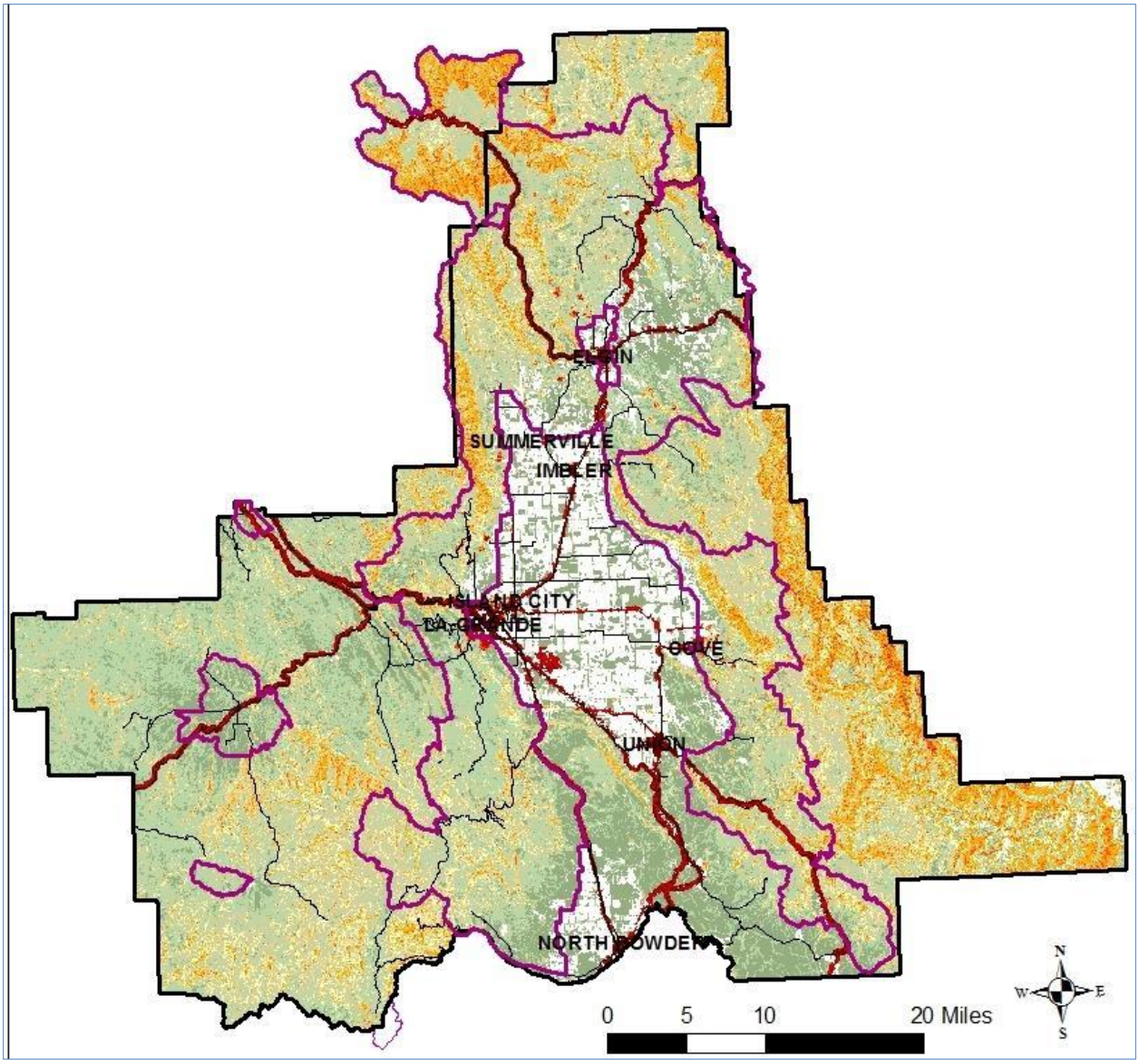


Figure VI - 27

The effects from wildfire are resultant of values present in terms of infrastructure, where people live, riparian and forest assets, and drinking water importance along with locations where the ability to suppress wildfires is highest. Buffering of some values were done prior to final outputs.

- Infrastructures were buffered to reflect areas of concern surrounding the asset and watercourses were buffered to create a footprint of the riparian area.
- Wildland developed areas provide information of where people live was based on the number of housing units per acre.
- The forest assets are detailed conditions of stands that should be resilient, adaptive, or sensitive to wildfires.
- Resilient stands often retained various degrees of vegetation after a wildfire especially where the overstory is concerned.
- Drinking water importance was less significant to Union County since the local towns are not dependent on sub-basins for drinking water. They are however dependent on the sub-basins for a number of other uses such as irrigation, livestock support, domestic uses, commercial and business uses such as: fire protection, power development.

Geographic locations where fire suppression is difficult play an important variable that can impact the potential for values lost during a wildfire. Areas where ability to fight the fire is impeded, such as steep ground or thick overgrown vegetation and/or heavy down fuels, typically are areas where fire burns hottest and moves fastest. Knowledge of these areas and their contributions to fire spread will help fire managers in preplanning strategies. The Fire Effects Index is used along with the Fire Threat Index to determine the overall Fire Risk.

Overall Fire Risk Index

The conditions of Union County have been identified through combining the subsets of Fire Threat and Fire Effects (See Appendix D) then spatially displaying risk through mapping. Knowledge of the threat of a fire occurring and the location combined with the negative outcomes based on values threatened and effectiveness of suppression provide the two key components to determine the acres and locations of the highest fire risks to Union County.

To better display the final risk of a single area in the county the vicinity of the town of La Grande was used to zoom in and display the following conditions:

- Fire occurrence (fire start history and weather influence zones) (Figure VI – 28)
- Fire Threat Index (Fire Occurrence, Fire Behavior, Fire Suppression Effectiveness) (Figure VI – 29)
- Fire Effects Index (Values Impacted and Suppression Difficulty) (Figure VI – 30)
- Final Fire Risk Index (Figure VI – 31)

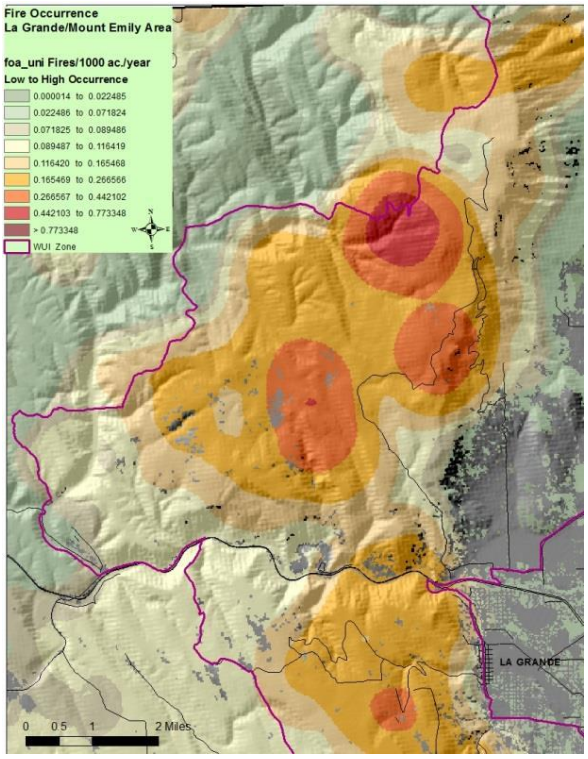


Figure VI - 28. Fire Occurrence for La Grande/Mt. Emily Area WUIZ.

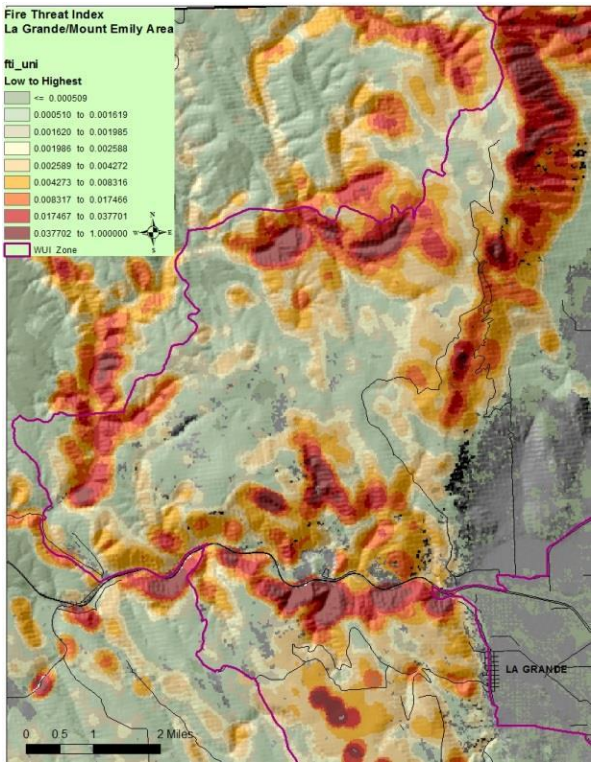


Figure VI - 29. Fire Threat Index for La Grande/Mt. Emily Area WUIZ

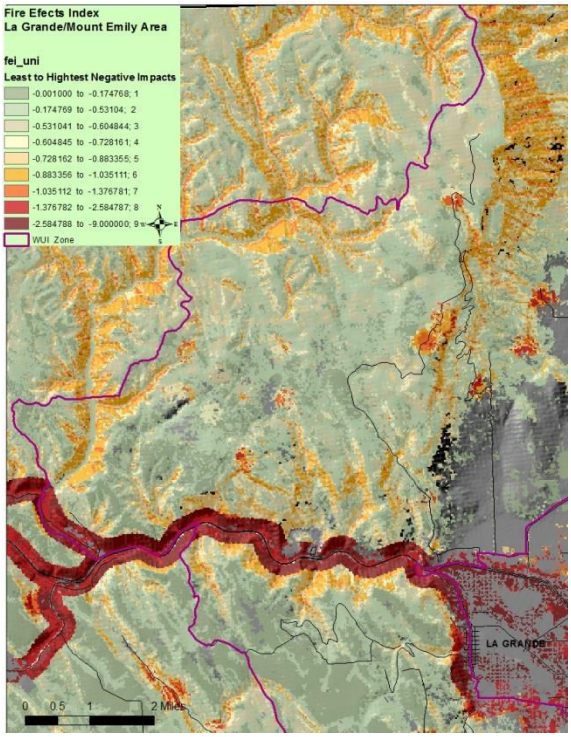


Figure VI - 30. Fire Effects (values impacted) for La Grande/Mt. Emily Area.

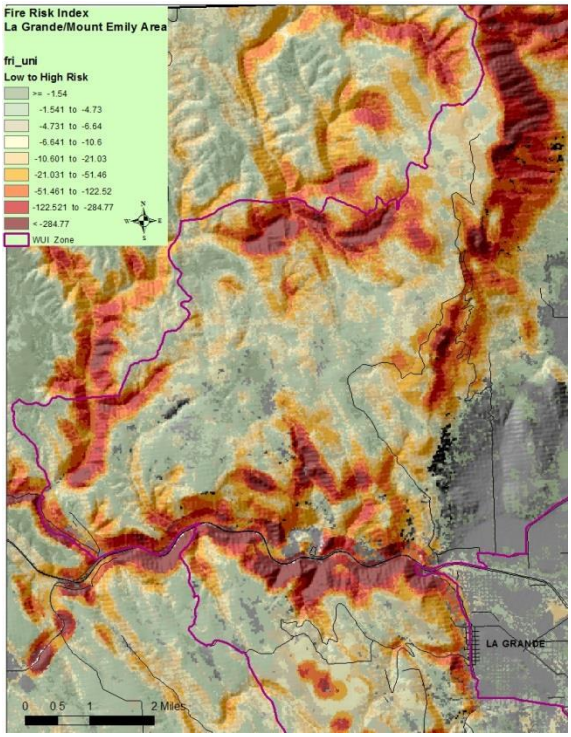


Figure VI - 31. OVERALL FIRE RISK for La Grande/Mt. Emily Area WUIZ.

The total distribution of acres for fire risk of Union County is provided in the graph in Figure VI - 32. This does not imply that low fire risk is not a concern but provides a relative comparison of risk throughout the county.

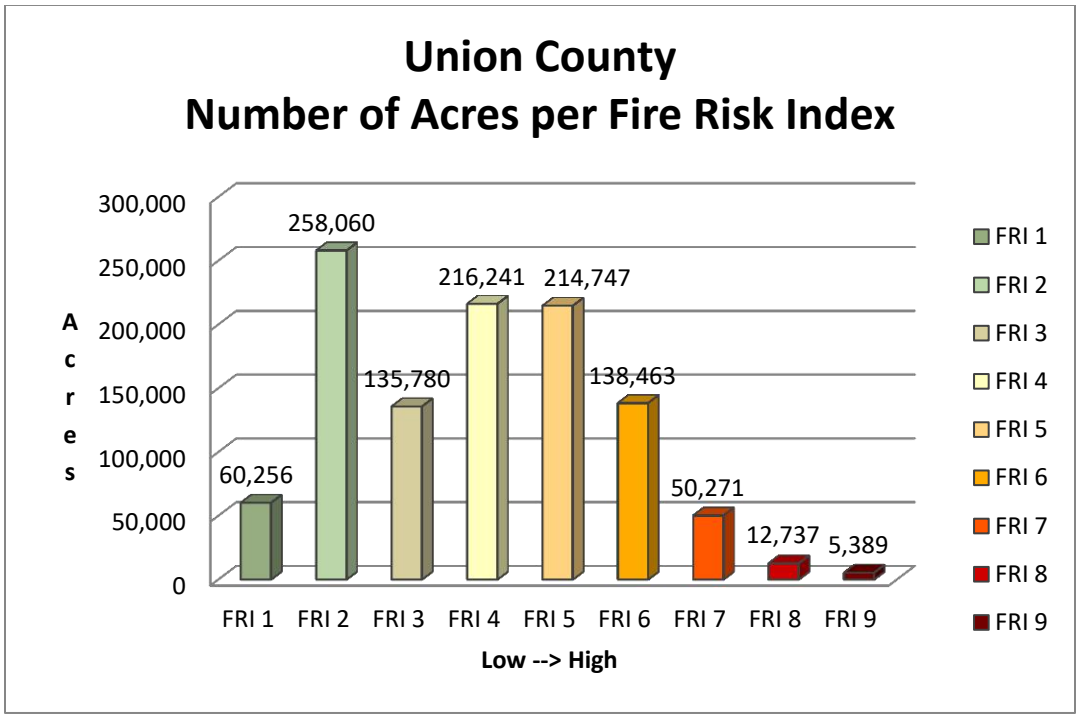


Figure VI - 32. Distribution of Acres for 9 levels of Fire Risk Index.

Spatial distribution of risk in Union County shows distribution of areas that will have the highest potential for fire occurrence, fire behavior, likely loss of values, and where fire suppression is difficult to achieve. Because fire does not recognize county lines it is important to understand not only the fire risk within the county but the fire risk that lies just outside the county lines.

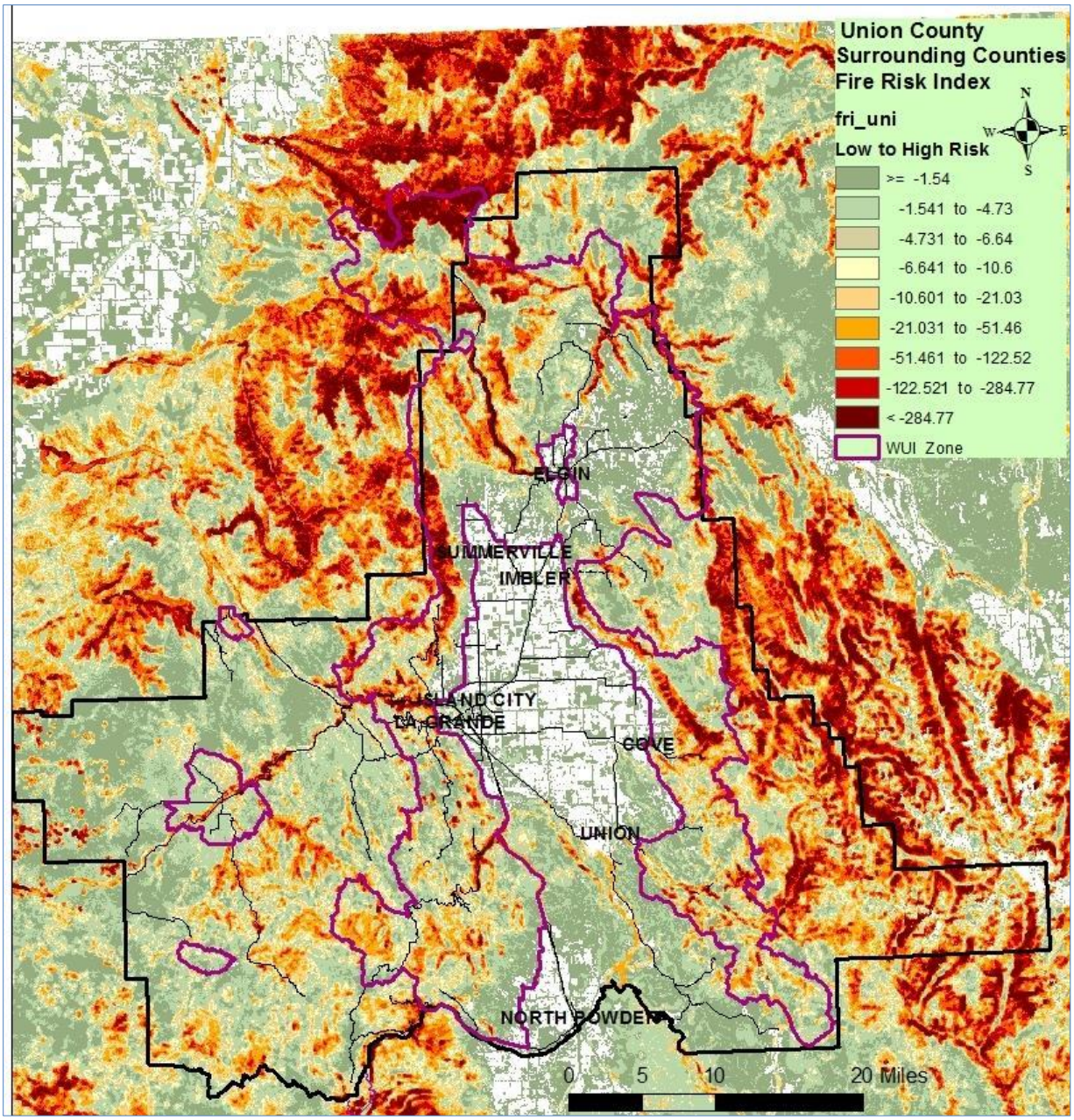
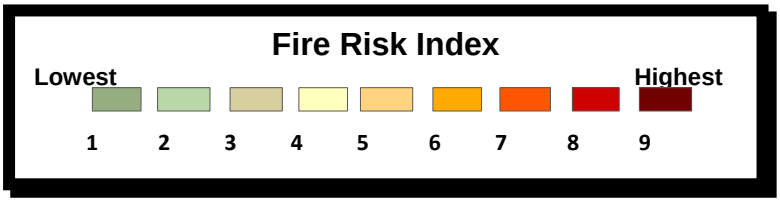

Union County
Surrounding Counties
Fire Risk Index
fri_uni
Low to High Risk
>= -1.54
-1.541 to -4.73
-4.731 to -6.64
-6.641 to -10.6
-10.601 to -21.03
-21.031 to -51.46
-51.461 to -122.52
-122.521 to -284.77
< -284.77
WUI Zone
N
W
E
S
ELGIN
SUMMERVILLE
IMBLER
ISLAND CITY
LA GRANDE
COVE
UNION
NORTH POWDER
0 5 10 20 Miles

Figure VI – 33.

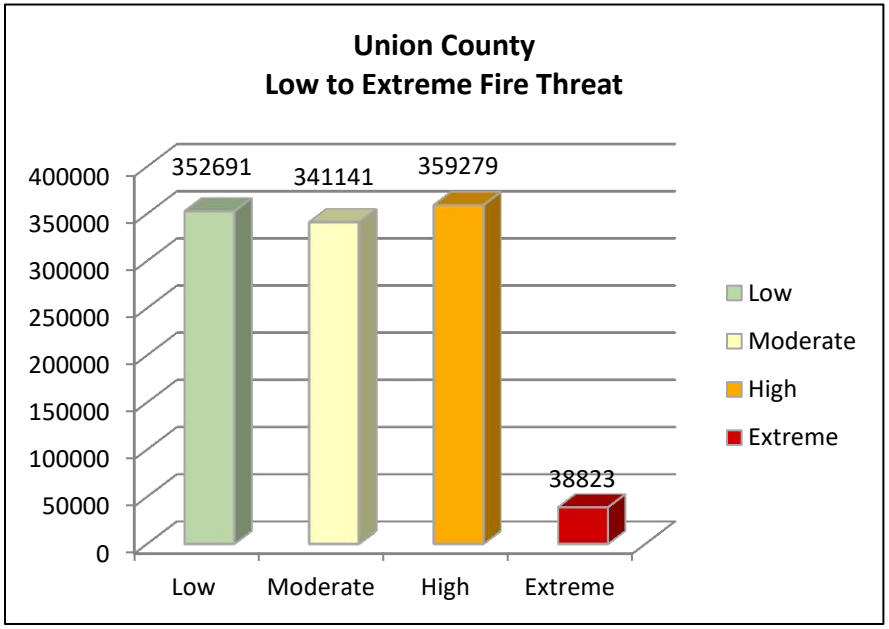

Fire Risk Index
Lowest
Highest
1 2 3 4 5 6 7 8 9

Display of Final Four Ratings Breakdown – Low, Moderate, High, Extreme

In working with developers of the Fire Risk calculations for the WWRA logical classifications for four groups were established. Fire-risk classifications were further consolidated from the breakpoints of the nine levels. These were classified into four ratings of low, moderate, high, extreme in both the spatial mapping and total acres. Combining the multiple levels into four key categories meets the OAR direction 477.027 that states, "*The criteria shall recognize differences across the state in fire hazard, fire risk, and structural characteristics within the forestland-urban interface. The criteria shall include not less than three nor more than five classes of forestland-urban interface."*

The following three pages provides maps showing areas that fall into the four ratings of low, moderate, high and extreme with corresponding tables with estimated acres in Union County and locations within the designated WUI Zone.

Fire Threat



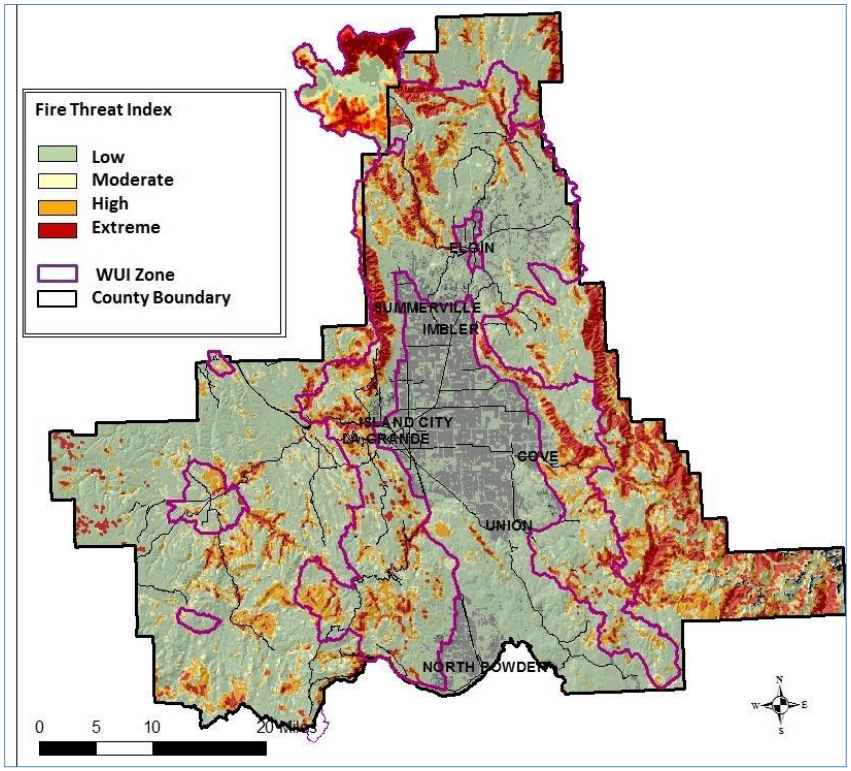
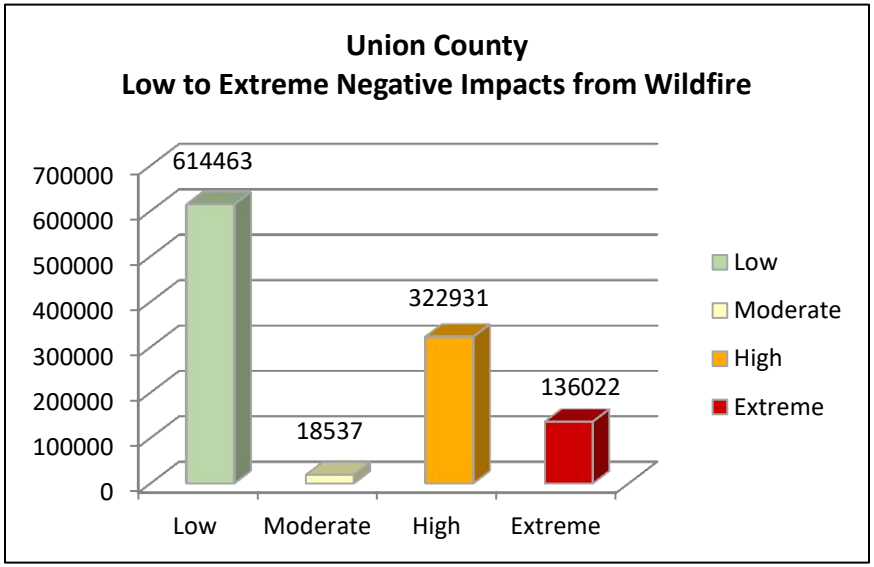


Figure VI – 34. Side by side graph and map of Fire Threat Index.

Fire Effects



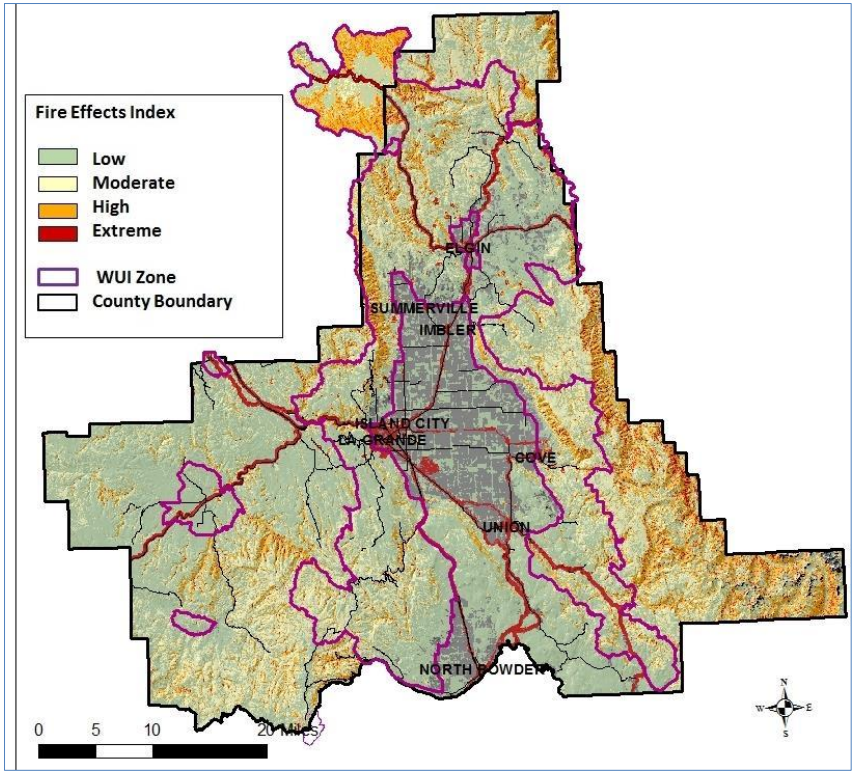
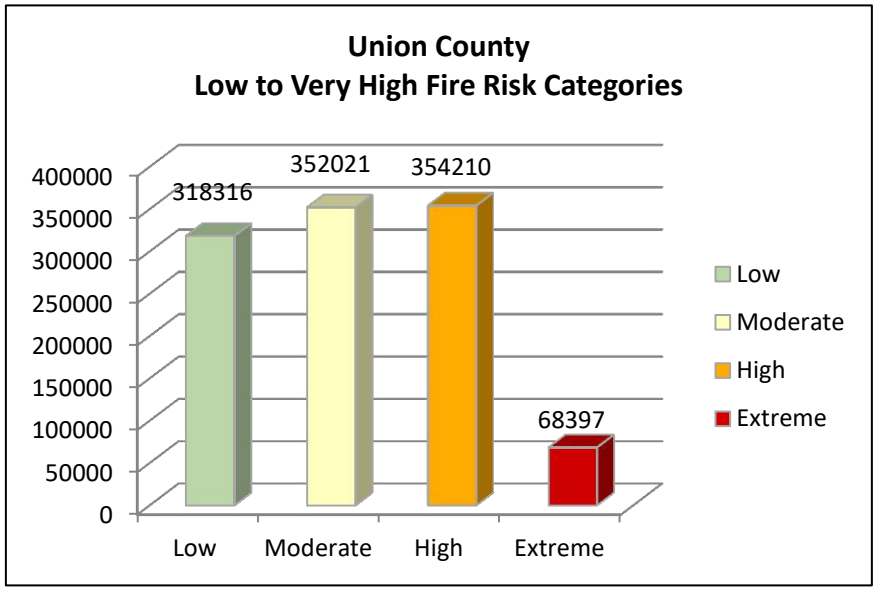


Figure VI – 35. Side by side graph and map of Fire Effects Index.

Fire Risk



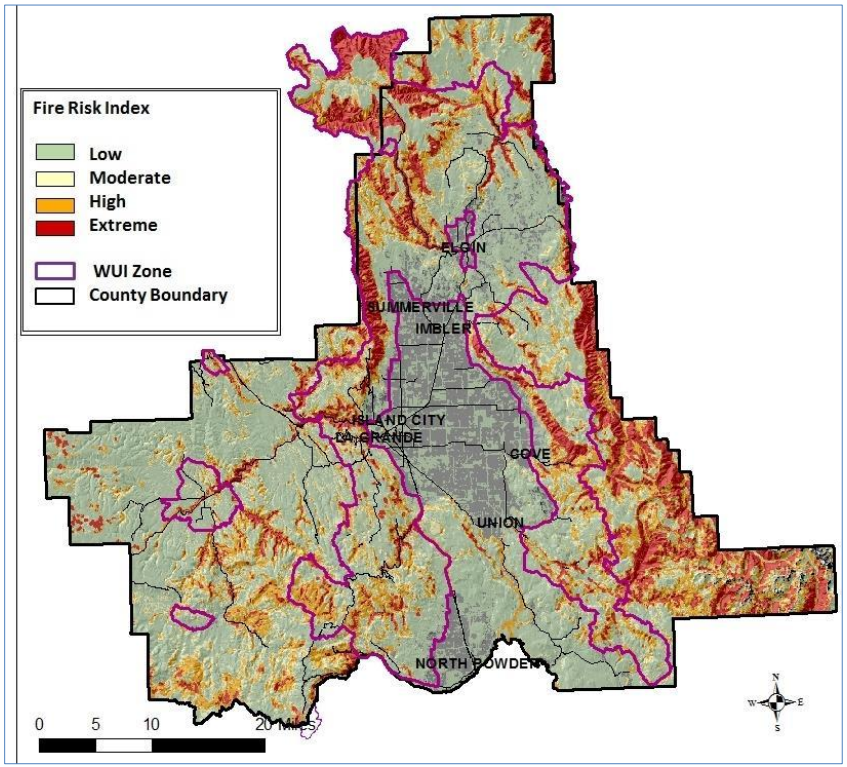


Figure VI – 36. Side by side graph and map of Wildfire Risk Index.

Summary

Union county landscape is a complex intersection of human and ecosystem interaction. Depending on a host of local site conditions fire behavior and post fire impacts can vary from mild to significant. Through decades of successful fire suppression, residential development in wildland areas, and continued extensive drought conditions result in wildfires that continue to pose difficulties for Union County's wildfire response resources. Knowledge of landscape issues provide management with the capacity to work with community members to prepare for, respond to, and recover from a wildfire event.

The Risk Model Framework takes into account a multitude of subsets that characterize Union County. Fire start locations and ignition causation allow managers to focus mitigations where ignitions are most prominent and/or can be prevented. Vegetation types and landscape conditions play a key role in wildfire behavior and is the only branch of wildfire behavior that can be manipulated to alter fire behavior and provide opportunities where suppression resources can be effective.

The effects from wildfire are resultant of existing values such as: infrastructure; where people live; riparian and forest assets; and drinking water importance along with locations where the ability to suppress wildfires is most difficult. Wildland developed areas provide locations where people live based on the number of housing units per acre. All structures including outbuildings were assessed separately to identify structure densities.

The forest assets represent vegetation's interaction with wildfire in terms of resiliency, ability to adapt, or sensitivity. Resilient stands often retained various degrees of vegetation after a wildfire especially where the overstory is concerned. Drinking water importance was less significant to Union County since the local towns are not dependent on specific sub-basins for drinking water. They are however dependent on the sub-basins for a number of other uses such as fish habitat, irrigation, livestock support, domestic uses, commercial and business uses such as: fire protection, power development.

Geographic areas where fire suppression is difficult play an important variable that can impact the potential for values lost during a wildfire. Areas where ability to fight the fire is impeded, such as steep ground or thick overgrown vegetation and/or heavy down fuels, typically are areas where fire burns hottest and moves fastest and where firefighting resources are least effective. Knowledge of these areas and their contributions to wildfire behavior will help fire managers in preplanning strategies to focus on attributes that can be humanly modified.

Sustainability of communities in Union County is reliant on proactive mitigation measures to protect economics, infrastructure, and resource values. Loss of one of more of these attributes can result in years of rebuilding at a significant cost. Combining efforts to maintain investments with new fire risk mitigations will assist in retaining our

important values over the long term. These results provide managers with insight on county conditions when developing mitigation plans to reduce the overall fire threat, effects and fire risks in the county. Management considerations regarding current conditions are included in the priority assessment in Chapter VII.

The Fire Effects Index is used along with the Fire Threat Index to determine the overall Fire Risk. This assessment provides key attributes that drive the fire risks in the county and narrow treatment focuses to those characteristics that offer the highest returns for fire protection. It is estimated that 42 percent of Union County is in either high or extreme for negative effects from wildfires with 12 percent of that in the extreme rating.

One aspect of fire effects that cannot be measured is the emotional and societal impacts especially where personal loss occurs. Each situation is relative to the individual and community being impacted. One thing that is clear making efforts in advance of wildfires provides opportunities to avoid what would otherwise be a devastating situation to both life and properties.

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VII. Communities at Risk and WUI Zone Priority Setting

Introduction

Efforts of the National Cohesive Wildland Fire Management Strategy (CWS) are defined by three phases, with phase I involved in establishing the vision statement, national goals, and guiding principles (CWS 2014). In short, Phase II shifted focus to understanding regional and local wildland fire management challenges and opportunities, while Phase III involved a descripted analysis of regional issues contributing to risk. Union County has taken this analysis to the local level to identify key attributes that contribute to wildland fire risk as it pertains to firefighting capabilities, landscape conditions with resultant fire behavior, and community preparedness.

This chapter applies the WWRA Framework components, described in Appendix D, with other pertinent local issues to determine areas of priority, particularly in regard to at-risk communities and WUIZ. This chapter identifies locations with conditions that contribute toward negative outcomes. Additional details describing prioritization and attributes of data layers can be found in Appendix F.

Supporting data is used to describe the following conditions:

- Attributes contributing to Wildland Fire Potential
  - Likelihood of a fire occurring
  - Wildfire behavior – flame length, rates of spread
  - Probability of a canopy fire
  - Overall Fire Threat
  - Overall Wildfire effects to values
  - Overall Fire Risk
- Attributes for Fire Protection Capability/Structure Vulnerability
  - Protection area structure density
  - Protected vs. unprotected
  - Where people live
  - Values to be protected
  - Community preparedness
  - Suppression difficulty

The definition of the WUIZ, the goals of this CWPP, and identified communities at risk according to federal, state, and local governments, made it important to assess and compare fire risk for each community both in and outside the WUIZ boundary and the WUIZ itself. The WUIZ design allows for prioritizing opportunities for cross-boundary treatment approaches to meet the concept of “all hands, all lands”. The majority of communities addressed are under rural fire protection, so excluding a community even though it fell outside of the WUIZ would not meet the goals and objectives of this document regarding fire response. All communities were assessed for a relative rating against other communities.

U.S. Department of Agriculture in the Healthy Forest Restoration Act (HFRA) defines wildland urban interface as an area within or adjacent to an at-risk community that has been identified

by a community in its wildfire protection plan and the HFRA define a "community at risk" from wildland fire as:

- A group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) in or adjacent to federal land;
- Has conditions conducive to large-scale wildland fire; and
- Faces a significant threat to human life or property because of a wildland fire.

Oftentimes, federally-managed public lands are situated in the middle ground area extending well beyond the boundaries of communities at risk, yet these locations are often the source of natural fires that develop into large wildfires that threaten communities.

This section focuses primarily on the Communities at Risk CAR and WUIZ with understanding that all of Union County was presented for overall Fire Threat, Fire Effects, and Fire Risk. The Fire Effects portion was necessary to display as a countywide map, since some infrastructure and forest assets extend well beyond the WUIZ.

Mitigation actions (Chapter VIII) and assessment results were primarily applied to locations within the identified WUIZ for Union County and its communities at risk. Mitigation actions outside the WUIZs on a case by case basis depending on need for infrastructure protection or other interests; these were not part of this assessment but can be assessed individually.

Since the conception of the 2005 Union County CWPP, new developments have occurred regarding fire policies and programs. These policies and programs are designed to provide direction on relatively consistent approaches in determining fire risk assessments when revising Community Wildfire Protection Plans. Some key documents referenced for this process, as instructed by the Oregon Department of Forestry:

1) *West Wide Wildfire Risk Assessment.* Was completed on behalf of the Council of Western State Foresters with funding from the USDA Forest Service. March 31, 2013.

2) *The Final Phase in the Development of the National Cohesive Wildland Fire Management Strategy.* The National Strategy. April 2014.

3) Oregon Administrative Rules 629-044, Oregon Department of Forestry, Criteria for Determination of Wildfire Hazard Zones, June 15, 2016.

4) Fiscal Year 2016 Budget Overview, US Department of Agriculture. Key areas of focus include: restoring resilient landscapes; building thriving communities; managing wildland fires; promoting safety for employees and public. February 2015

5) Senate Bill 357, Report to the Legislature Oregon Department of Forestry. Using stewardship authority to increase the pace of restoration, create jobs, and support local economies. May 2014.

These documents support expanding the assessment of communities-at-risk to also include the assessment of wildland-urban interface zone beyond communities to include surrounding areas.

In Union County, a ***community-at-risk*** is defined as a group of homes or other structures with basic infrastructure (such as shared transportation routes) and services within or near forest land.

In order to understand the fire risks on communities and urban interface areas, it is necessary to recognize the interactions of several elements at the landscape scale. Union County is approximately 1,304,523 square acres in size, supporting a Wildland Urban Interface Zone (WUIZ) area of 504,250 acres with some shared areas across boundaries in Umatilla and Baker Counties. To the northwest, Umatilla County supports the Tollgate area with Spout Springs Ski Area and Resort and multiple vacation homes lying across the boundary in Union County. The Anthony Ski area and Resort is located just inside Union County at its southernmost point, while many vacation homes are just across the boundary in Baker County. The WUIZ area strictly within the Union County boundary line accounts for 458,341 acres or 35% of the land base leaving 45,909 acres of WUIZ shared with the two counties.

The wildland-urban interface zone, defined in Chapter II, is not exclusive to communities, but is described as:

> *"An area strategically identified that provides effective wildfire defense for communities, infrastructure, and other values at risk that meet or intermingle with wildland fuels and offer opportunities for broadened mitigation measures designed to interrupt wildfire spread and modify wildfire behavior in order to protect social, economic, and environmental interests".*

Risk, in terms of wildfire, incorporates a multitude of elements that could potentially influence how fire interacts with the environment, the likelihood of a fire occurring and spreading, and values that could be impacted by a fire. Risk includes an array of historical and current information that provides realistic potential outcomes based on expected and past results, particularly fire starts, spread, and size.

The Merriam-Webster defines risk as: "*The possibility that something bad or unpleasant (such as an injury or a loss) will happen; someone or something that may cause something bad or unpleasant to happen".*

Wildfire "risk" for the purpose of this document, is a product of a multitude of interlinked conditions. It goes beyond just the possibility of a wildfire starting by combining the possibility of a bad outcome from a wildfire with contributing factors that play a role once ignition occurs. Factors such as weather, vegetation, ability to fight the fire, and historical fire size allow management to understand the level of fire threat in all acres across the county. Factors such as infrastructure, where people live, drinking water, and natural resource values combined with the level of difficulty in suppressing a fire start at any given location, provide insight on the values that potentially could be impacted by fire.

Prioritizing Communities at Risk

The Grande Ronde Valley Basin, plus anything within one mile of the actual valley, including along the foothills, supports eight communities at risk listed in the Federal Register, with the remaining communities scattered throughout the county.

Each community was examined using an agreed to set of concerns that could influence the outcome in the event a wildland fire occurs, and the probability of one actually happening. A matrix was developed to evaluate the individual communities and their surrounding areas based on these concerns. Nomenclature ratings of Low through Extreme breakouts were assigned corresponding to 1 through 4 numerical values respectively in order to compare communities at risk against one another.

1. Union county's communities at risk, for this assessment, fell into one of three criteria.
   a. An area designated by state or federal register with city limits established,
   b. An area designated by state or federal register that did not have city limits established, or
   c. An area that supported a population in a remote place recognized by Union County as a community at risk and has no established city limits.

2. In order to assess the communities at risk and their surrounding areas for the assessment, a common boundary design needed to be established for these areas. All communities were assigned a periphery perimeter encompassing the highest populated areas that included city limits and high residential areas extending out to homes in and near forested areas. Assessing these areas required the use of the most current data that incorporated the highest number of structure locations (including residence) in Union County.

Because perimeters were based on populated areas, there was no established acreage size for assessed communities. The WUIZ area, as a whole, was not considered at this time due to the fact that some communities at risk fell both inside and outside of the identified zone. Because of the close proximity and overlapping community buffers, some communities were combined with adjoining communities. The Union County structure layer obtained from the Forest Service contained the highest level of structural accuracy.

3. Once the community perimeters were finalized, a consistent 1.5-mile buffer was established to better meet the policy and guidelines assessment needs for all agencies. The community areas and the 1.5-mile buffer combined were the final analysis size for the *community* ratings. Those communities that were not within the WUIZ but were assessed are, listed from north to south: Imbler, Island City, Union, and North Powder. Those communities buffered 1.5 miles which still do not intersect the WUIZ are Imbler and Island City. Since Imbler when buffered intersects with Summerville, and Island City intersects La Grande, they are included in the rankings of priority and grouped with their adjoining communities.

This CWPP addresses prioritization as an additional method to identify and support mitigation needs. Two individual subsets of wildfire risk were used for prioritization of communities. Features such as high fire occurrence, wildfire rates of spread, flame length, and potential for crown fire are some of the attributes taken into consideration that could potentially pose a threat to community. The "expected" fire behavior results were used to represent what was likely to occur. It was recognized that down woody fuel and vegetation characteristics are some key influences in wildfire fire behavior and can be viewed individually based on anticipated wildfire behavior. A full description of attributes, their breakpoints for low through extreme, and the rationale for their use can be found in Figure Appendix F - 1. The table provides the 13 attributes assessed for determining community rankings and how the ratings of 1 through 4 were determined.

Prioritization Attribute Overview

The attributes were divided into two assessment categories concerning wildfire.

1. Wildland Fire Potential – This includes attributes that show the probability of an acre igniting and measure of fire behavior characteristics for flame length and rates of spread. It also provides the three key West Wide Risk Assessment (WWRA) outputs that measure;
    a. Fire Risk Index - the overall wildfire risk based on all current data.
    b. Fire Threat Index - an index related to the likelihood of an acre burning.
    c. Fire Effects Index- addresses important values affected by wildland fire and/or that are costly to suppress.
2. Fire Protection and Fire Structure Vulnerability – these attributes demonstrate the potential for suppression resource effectiveness in protecting structure and lands in close proximity to homes. In addition, those areas that have important values that could be impacted and current level of completed preparedness by landowners on pre-wildfire treatments.

Each table attribute was rated from 1 through 4, numbers that correspond respectively to a nomenclature ranking of low, moderate, high, and extreme. Assigned numerical ratings were designated based on the source of the data used. Data sources included the WWRA and agency data from ODF, Forest Service, and Union County Emergency Service. Numerical ratings and the two categories of Wildfire Potential and Fire Protection and Fire Structure Vulnerability allow managers to identify key mitigation actions that will be most effective.

Overall Fire Protection Capability/Structural Vulnerability

In order to determine the overall fire protection capabilities and structural vulnerability it was necessary to develop a new category with its own individual sub-tally. Several characteristics were considered when identifying the overall community susceptibility to wildfire. The approach for this category took into consideration six characteristics that contributed to 46 percent of the final score.

1. How predisposed the community structures are to wildfire.
2. Whether the area is currently under protection responsibility.

3. The level of protection capabilities based on suppression resource coverage area and the structure ratio to the size of the protection area.
4. Additional infrastructure values that may be impacted in addition to community structures.
5. Overall fire defense difficulty that would identify areas of impeded fire suppression efforts that may result in wildfire spread into the communities.
6. Current community level of preparedness in the event a wildfire should occur.

All ratings were given a 1, 2, 3, or 4 for corresponding low (L), moderate (M), high (H), and extreme (E) impacts respectively. The table in Appendix F provides a description and rating break points for each rated attribute and outlines what those numerical ratings represent for each characteristic examined. Final selection of rating was centered on highest percent of land area that fell into the rating category, unless it was deemed that proximity to communities warranted a different rating due to imminent impacts to communities. It was determined that local knowledge was important in finalizing the ratings.

Communities at Risk Ranking Results

Union County hosts the several small communities and the third largest town, La Grande, of Oregon's eight most eastern counties. Twenty residential and/or vacation areas have been identified as either a community at risk or area of concern for wildfire. The State of Oregon has identified 16 of these as communities at risk, with 12 of those also listed in the Federal Register (See Chapter III for listing). Additionally, there are four small, dispersed communities identified as at-risk by Union County: Blue Springs, Kamela, Perry, and Spout Springs Ski Area and its resort cabins.

Once the attributes rating system was finalized, mapping of current conditions was evaluated for communities at risk using local and WWRA data from the Geographic Information System (GIS). Figure VII – 1 displays the comparative results of the CAR. Details of the ranking process and attributes can be found in Appendix F.

It was important to evaluate communities and surrounding areas by prioritizing areas to assist land managers and community members with a high degree of information for the most effective use of funds. To meet Oregon Department of Forestry guidelines, the primary final risk maps were given the rankings of Low, Moderate, High, and Extreme. These ratings were assigned numerical values to help managers identify areas that ranked out as having:

a. the highest likelihood of a fire occurring,
b. potential for wildfire behavior,
c. overall fire risk,
d. protection status and coverage areas,
e. activity vegetation treatments in place and
f. the expected difficulty in suppressing a wildfire. It provides each category a relative comparison of one CAR to the others.

Communities At Risk	Wildland Fire Potential								Fire Protection and Fire structure vulnerability							
	Fire Occurrence	Flame Lengths	Rate of Fire Spread	Probability of Canopy Fire	Fire Threat	Fire Effects	Fire Risk	Sub Total Score	Protection - Structures to Sq. mile ratio	Protected verse non-protected	Wildland Development Area	Values Impacted	Level of Community Preparedness	Suppression Difficulty	Sub Total Score	Grand Total
Anthony Lakes	3/H	4/E	2/M	4/E	4/E	2/M	4/E	23	3/H	4/E	2/M	3/H	4/E	2/M	18	41
Blue Springs	3/H	2/M	2/M	4/E	2/M	1/L	2/M	16	4/E	4/E	1/L	2/M	2/M	2/M	15	30
Camp Elkanah	3/H	2/M	2/M	1/L	2/M	2/M	3/H	15	3/H	4/E	1/L	3/H	4/E	1/L	16	31
Cove	3/H	2/M	2/M	4/E	4/E	2/M	4/E	21	4/E	2/M	3/H	2/M	4/E	3/H	17	38
Elgin, Palmer Junction	2/M	4/E	2/M	4/E	2/M	3/H	3/H	20	4/E	2/M	3/H	4/E	4/E	2/M	19	39
Hilgard, Perry	3H	2/M	2/M	3/H	4/E	4/E	4/E	22	2/M	4/E	2/M	4/E	4/E	3/H	19	41
Imbler, Summerville	3/H	4/E	2/M	4/E	4/E	3/H	4/E	24	3/H	2/M	3/H	2/M	4/E	3/H	17	41
Island City, La Grande	3/H	2/M	2/M	1/L	3/H	4/E	3/H	18	4/E	2/M	4/E	4/E	4/E	1/L	19	37

Communities At Risk Issues	Wildland Fire Potential								Fire Protection and Fire structure vulnerability							
	Fire Occurrence	Flame Length	Rate of Fire Spread	Probability of Canopy Fire	Fire Threat	Fire Effects	Fire Risk	Sub Total Score	Protection – Structures to Sq, Mile Ratio **	Available Structure Protection **	Wildland Development Areas	Values Impacted	Level of community Preparedness	Suppression Difficulty	Sub Total Score	Grand Total
Kamela	3/H	3/H	2/M	4/E	1/L	4/E	3/H	20	2/M	4/E	1/L	3/H	4/E	2/M	16	36
Medical Springs	1/L	2/M	2/M	4/E	2/M	2/M	3/H	16	2/M	2/M	2/M	2/M	4/E	2/M	14	30
Mount Emily (mention MERA and recreation use)	3/H	4/E	2/M	4/E	3/H	2/M	4/E	22	3/H	3/H	3/H	2/M	4/E	3/H	18	40
North Powder	3/H	2/M	2/M	2/M	2/M	2/M	2/M	15	2/M	2/M	2/M	4/E	4/E	1/L	15	30
Spout Springs	1/L	4/E	3/H	4/E	4/E	4/E	4/E	24	3/H	4/E	2/M	3/H	4/E	4/E	20	44
Union	1/L	2/M	2/M	1/L	2/M	2/M	2/M	12	3/H	2/M	3/H	3/H	4/E	2/M	17	28

Figure VII – 1. CAR Rating Chart. Identified communities at risk and their corresponding attribute rankings. ** Does not have a corresponding map for this attribute.

Interpretation of Results

The rating output in Figure VII-1 provides insight on both overall conditions and specific issues facing each community analyzed. Rating scores provide a means of relative comparison for the CAR, however **using only the final rating as a rationale in approaching fire risk would result in missed opportunities to address underlying causes**.

All attributes rated under the Wildland Fire Potential were accessed from the WWRA. Additional local information was used to display any data gaps. The attributes of Fire Threat and Fire Effects are the primary sub-sets of Fire Risk. The overall Fire Risk accounts for all attributes combined and assessed in the WWRA framework as shown in Appendix F.

Fire behavior is influenced by fuels (live and dead), weather, and topography; human influence is only applicable to fuels in modifying fire behavior. Knowledge of expected fire behavior provides opportunities for fire behavior modification in advance of an ignition. In areas where flame lengths are High or Extreme, utilization of suppression hand crews alone would be ineffective in fighting fires based on flame lengths over four feet, and would require other resource support such as engines, dozers, and aerial delivery resources. Additionally, knowing flame lengths and the probability of canopy fire provides knowledge of areas where stand conditions are not consistent with “historic conditions” and are likely to promote the transition of surface fires into canopy fires.

Areas with a low fire occurrence (likelihood of a fire start), but displaying extreme fire threat and/or fire risk, such as Spout Springs, indicate that while the chances of a fire actually starting in the general area is low, if a fire were to ignite, the outcome could have dire consequences. Emphasis may not be needed in fire prevention for this location, but funds and efforts might focus on the modification of vegetation conditions that would support extreme flame lengths and canopy involvement during wildfires.

Fire Protection and Fire Structure Vulnerability utilized a combination of county, state, and WWRA attributes. These attributes provide insight to the level of protection capabilities, values, and difficulties facing each CAR.

Fire protection attributes can also be used as stand-alone indicators of conditions and issues facing the CARs. The community of Cove is currently under fire protection; however the structure ratio to protection area is at the highest level, indicating that protection resources would be depleted rather quickly in the event that the community was threatened.

Management Considerations

Knowledge of elements that are contributing to the increase in both wildfire potential and vulnerability of the communities provides focal points for reducing the potential for loss during wildfires. Results of the Community at Risk assessment can be beneficial for land managers in a number of ways. Resultant information can be used to:

1. Identify where the most critical wildfire potential is among the CAR.

2. Distinguish between CAR(s) that have fire and structure vulnerability issues in terms of resource response verses those that are more susceptible to extreme wildfire behavior.
3. Decision makers can focus on specific attributes that are contributing to wildfire behavior, thereby influencing reduction of the overall risk to that community.
4. Enables decision makers to take advantage of attributes that present opportunities to expand upon an already existing lower rating.
5. Identifies locations where mitigation actions create a ripple effect, influencing other attributes and possibly expanding the spatial area of treatment.
6. Identifies coverage areas versus number of structures for rural fire departments and areas where there are potential opportunities for remote sub-stations.
7. Provide opportunities for communicating information with community members about wildfire potential and emphasizing the need for shared responsibility among all landowners in reducing wildfire risk.

Individual CAR mapping of each attributes is available through Union County Emergency Services.

WUI Zone and Middle Ground Assessment

The middle ground area that is incorporated in the WUIZ accounts for a large percentage of the WUIZ land base. The WUIZ ownership is divided among primarily Forest Service and private lands accounting for 34 percent and 65 percent respectively, with Bureau of Land Management and Oregon State making up the last 1 percent of ownership.

As communities recognize themselves as at risk and approach Federal agencies to work collaboratively, joint development of plans and projects will ensure that investments in hazardous fuel reduction are the most economical and effective ways to reduce risk (HFRA, 2004). HFRA plans and projects are supported by the Memorandum of Understanding (MOU) for The Development of a Collaborative Fuels Treatment Program signed by the U.S. Department of Agriculture, U.S. Department of Interior, the National Association of State Foresters, and the National Association of Counties. Its purpose is to:

a. Provide the framework of a process for these agencies to collaborate on the annual selection of a fuels treatment program of work within their respective jurisdictions to provide for community protection and enhance the health of forests and rangelands.
b. Allow the parties to recognize that fuel treatments should be prioritized and selected through a timely collaborative process, and should be coordinated across ownerships and jurisdictions to effectively protect communities and improve forest and rangeland health.
c. Treatments will be accomplished by concentrating on high priority areas: 1) in the wildland-urban interface and, 2) outside the wildland-urban interface that are in condition classes two and three (MOU 2003).

Identifying areas with conditions that promote potential for high rates of spread, flame lengths, and likelihood of crown fires provides locations for concentrated efforts. Knowing the stand conditions such as surface fuels, canopy closure, canopy base height, and crown bulk density offers insight on the types of vegetation management that may be needed to alter fire behavior.

Although Fire Risk takes into account both Fire Threat and Fire Effects, it is important when implementing treatments to middle ground areas to also know where and what stand conditions are promoting wildfire behavior and where the likelihood of ignition starts will occur. This provides insight on locations to better prepare the landscape toward resiliency and strategically place treatments to support successful suppression efforts.

The intent of this approach is to concentrate management efforts in areas where funding can achieve multiple objectives, while maintaining consistency with the CWS goals and agency(s) direction. The WUIZ provides opportunities to identify locations that strategically make the most sense for resilient landscapes and fire response success,

and where environments can realistically be manipulated to meet management objectives across landownerships.

Landscape Conditions

It was important to visually display a breakout of the four rankings – low, moderate, high, and extreme – and to spatially to assess where landscape conditions could be compared and where treatments would provide the highest investment wildfire mitigation and protection. Treating the worst-case conditions would intuitively make sense; however, it may not be the most appropriate approach in all cases due to biophysical conditions (slope/access), funding limitations, or strategic design for increasing the successfulness of suppression efforts. Examples in which a lower-ranked area may benefit from treatment are:

a. An area in which investments in vegetation modifications have previously occurred or resource response capabilities have been improved; may warrant the need to retain those initial investments and build upon already established work.
b. An area that is of lessor ranking conditions and is spatially located where treatments can be strategically placed to increase protection of life and property, protection of a larger degree of natural resources, provides a connection between two highly rated areas or will more likely to provide successful modifications to wildfire behavior.
c. Areas where CWS goals overlap and landscape treatments benefit both community and natural resources.

This is not to imply that extreme areas would not be a priority. In fact, they are particularly important – especially those anticipated to display high rates of spread, flame lengths, and potential crown fires, with the possibility of spreading in or near a community at risk or the resultant fire would have high severity impacts to the ecosystem.

Attributes for Landscape Conditions

The WUIZ assessment is similar to communities at risk, consisting of areas of low, moderate, high, and extreme conditions. A key outcome for middle ground assessment is to provide opportunities for modification of fire behavior and fire effects, thereby reducing the magnitude, severity, and intensity of wildfires when they encounter treated areas. In addition, by reducing the intensity at which a wildfire burns, it provides fire management suppression resources a higher opportunity for successful suppression efforts in treated areas.

Several attributes were used in assessing WUIZ landscape conditions that lead to the overall Fire Risk. Many of the attributes were obtained from the WWRA, while others were part of agency (or agencies) protocol to be included in the decision making process. A brief description of the attributes used for the WUIZ assessment is below, with a more detailed explanation of the data and process further described in Appendix F, page 16 - 23.

1. Fire Regime Condition Class – Departure of ecosystems from what is considered historical ranges. Assists Forest Service (FS) and BLM in meeting the Healthy Forest Initiative and Healthy Forest Restoration Act direction. ODF recognizes FRCC as an interagency standardized tool.
2. Fire Threat Sub-Layers
    a. Probability of Occurrence – 10-year historical fire locations form 1999 – 2008
    b. Fire Behavior Layers – topographic and stand conditions
        - Canopy Base Height – Impacts likelihood of vertical fire movement from a surface fire to crown fire
        - Surface Fuel Model – Fuel type, arrangement, and distribution impact both fire behavior and fire suppression. Includes: grasses, brush, timber, and slash.
    c. Fire Type – Indicates whether wildfire will likely be a ground fire or has potential to transition into a wildfire with canopy involvement. Impacts spread rates, spotting potential, and safety.
    d. Fire Suppression Effectiveness – assumes full suppression of fires, considers fire behavior based on weather, historic fire size growth at those times, and past suppression organizations.

Each of the subsequent condition maps is followed by Management Considerations that correspond to the circumstances being displayed in the WUIZ. Management considerations are not limited to those presented here, but should be consistent with meeting the three goals of the CWS, the proposed mitigation measures in Chapter VIII, and changing policies. This CWPP is a fluid plan that provides flexibility to the CWPP committee to make adjustments as needed.

WUIZ Assessment Results

Fire Regime Condition Class (FRCC)

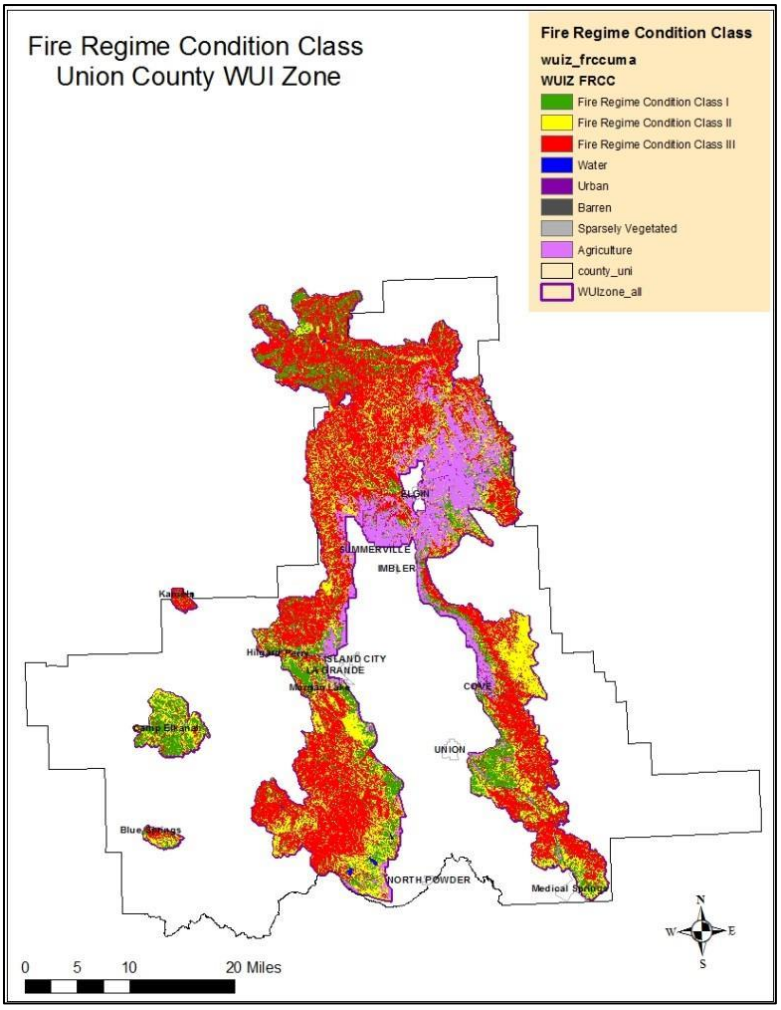

Figure VII – 2. WUI Zone Fire Regime Condition Class (FRCC). Identifies fire frequency of landscape and departure level of landscape conditions from historic conditions. See Appendix B for details on FRCC.

Management Considerations

1. There is interagency acceptance of the use of FRCC to identify the departure of forest conditions from historic ranges. FRCC is part of the decision-making process for the U.S. Forest Service and BLM under the Healthy Forest Initiative (HFI) and the HFRA direction. The Oregon Department of Forestry data information and reporting for indicators recognizes FRCC as an interagency, standardized tool for determining the degree of departure from natural (reference) conditions vegetation, fuels, and disturbance regimes.
2. This information will aid decision makers in determining whether the HFI and HFRA authorities are supported through FRCC conditions and the application of

planned hazardous-fuel reduction projects or whether other authorities should be used.

Fire Threat Attributes

Probability of Fire Occurrence

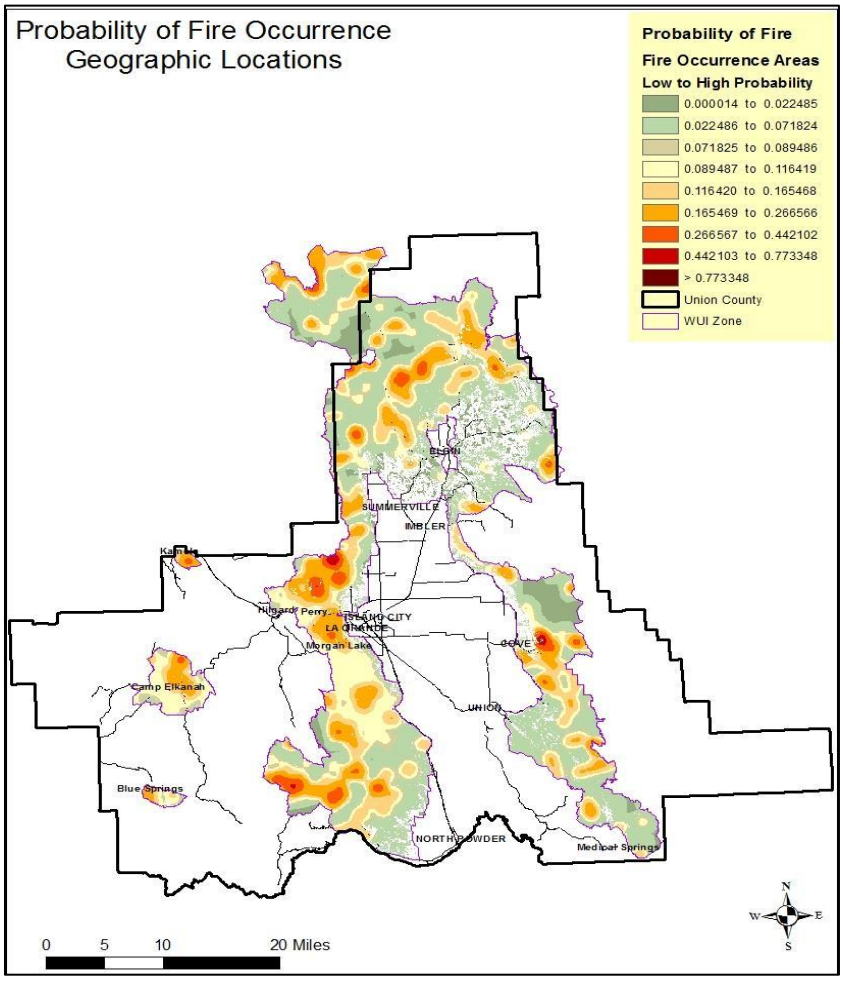

Figure VII – 3. Distribution and probability of fire ignitions in the WUIZ. The closer the numerical value is to the whole number 1, the higher the historic fire density and fire occurrence. WWRA layer clipped to Union County WUIZ.

Management Considerations

1. Knowledge of concentrated fire occurrence and ignition cause (human starts) allows fire managers to focus attention on public education programs such as: fire prevention, prevention signing, and specific mitigations based on fire cause such as hunter fires, campfires, etc.
2. This is a critical attribute in the Fire Threat Index rating. The ability to identify areas on the landscape likely to have ignitions that overlap areas in need of fuel and vegetation management are opportunities for mitigations to change fire behavior.

3. Provides possible opportunities for resource prepositioning at specific times of the year.
4. Can be useful with other attribute maps such as Values Impacted.

Canopy Base Height

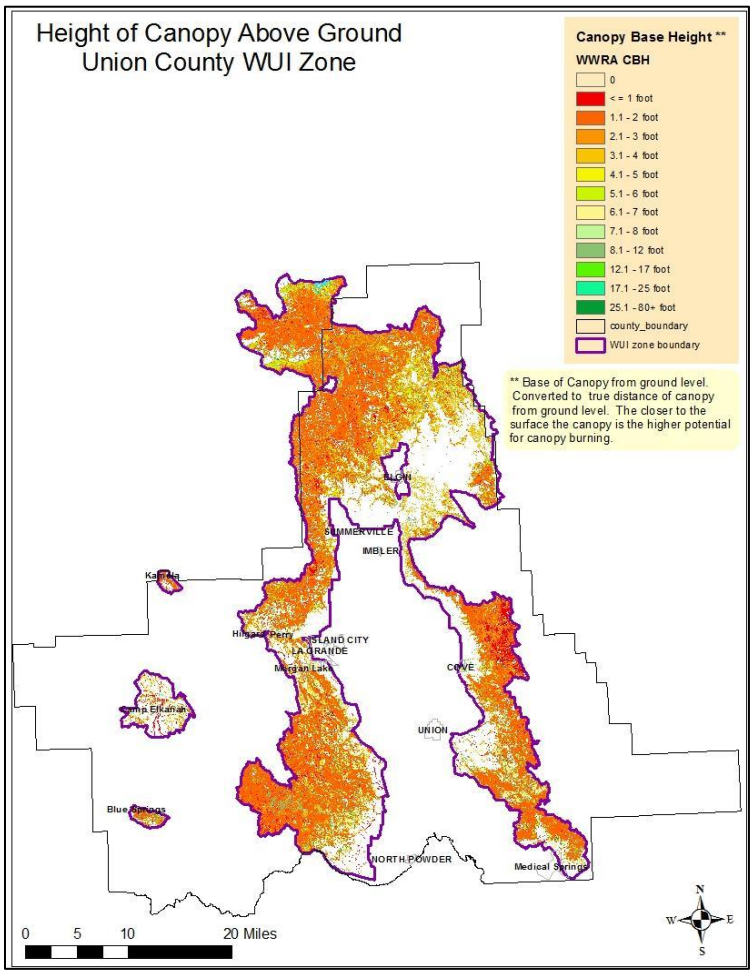

Figure VII - 4. Legend shows approximate height of tree canopy lower limbs from ground level in feet. The closer the limbs are to the ground, the higher likelihood of crown involvement during wildfires.

Management Considerations

Height from the ground to the lower limbs of the live canopy, referred to as canopy base height, can influence what type of fire(s) the area will experience. Stands that have a low canopy base height are more susceptible to torching or canopy involvement during wildfires. This information was one input used to determine fire spread potential for canopy fires. Seventy-three percent of the forest areas in Union County support canopies that are 10 feet or closer to the ground. This close limb proximity to ground level provides conditions to: facilitate ignition of the tree crowns from a surface fire; further compound fire spread through spotting; lead to potential crown fires; and increase public and fire fighter safety concerns.

1. This information is beneficial for assessing stand contribution toward canopy fire occurrence and is part of the input for fire behavior predictions in the WWRA. Canopy base heights assist managers with landscape locations where tree canopy conditions (of stands or groups of trees) may support or initiate fire movement vertically into the crowns of trees.
2. Provides locations with potential treatments areas, where raising the canopy base height can aid in reducing the likelihood of vertical fire spread.
3. Raising the canopy base height will also assist in meeting the CWS goal of restoring and maintaining the landscape. Stands that have a higher canopy base height can often withstand higher flame lengths and intensities, increasing survivability of the overstory. Strategically locating treatments may in effect increase suppression options.
4. Combination treatments of surface fuels and canopy base height can result in the reduction in potential surface fire behavior and minimize torching potential, in effect lowering the spotting potential and fire spread distance.
5. Addressing landscape scale treatments where middle ground and community boundaries can be treated simultaneously.

Surface Fuels

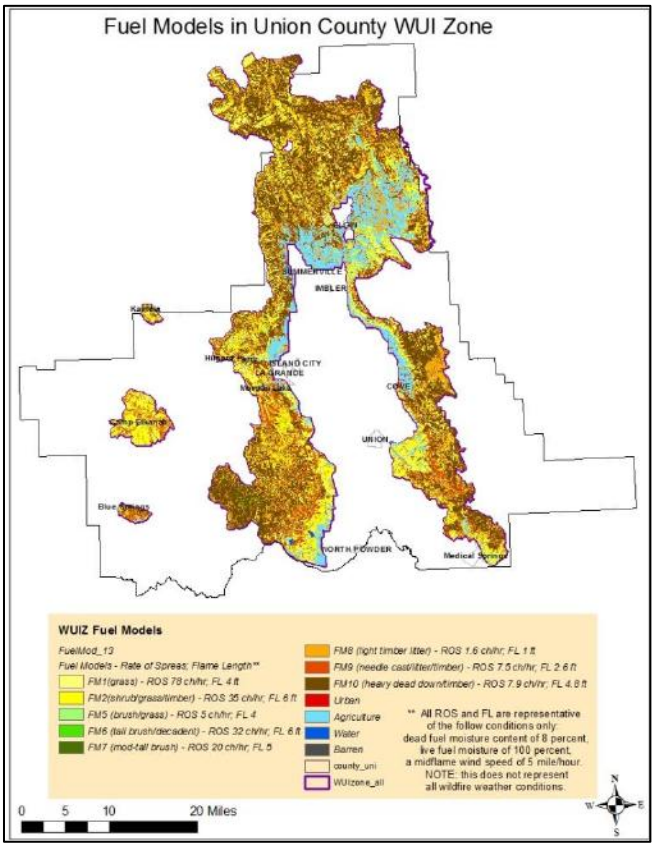

Figure VII – 5. Landscape fuel model distribution in Union County WUIZ. Fire Behavior estimates are based on Hal E. Anderson's 13 Fuel Models for Estimating Fire Behavior, 1982.

Management Considerations - Surface Fuels

Knowledge of current fuel condition provides management with several options in addressing these issues.

1. Managers can conduct mitigation actions in areas where fuel loadings and forest surface vegetation are not consistent with historic conditions and contribute to fire behavior that can pose control issues and threaten communities.
2. Focus on areas with high fuel loads that can be a conduit for tree and canopy involvement.
3. Combine treatment efforts for woody material utilization during stand thinning by removing dead and down material.
4. Utilize options for maintaining a grass and forbs fuel in strategic areas where suppression tactics are crucial for protection, allowing suppression resources to increase effectiveness.
5. Provide opportunities for landscape planning to increase stand resiliency against wildfire.
6. Combine cross-ownership treatment of areas.
7. Establish pilot projects that provide first-hand results for future management reference and opportunities for community education.
8. Connect large open landscapes with neighboring grass slopes, natural barriers, or management created barriers (roads), for increased personnel safety and community protection.
9. Opportunity for re-introduction of fire through prescribed burning on the landscape, particularly when weather conditions can be more favorable to low-intensity burning, and where middle ground areas can support it.

Probability of Canopy Fire

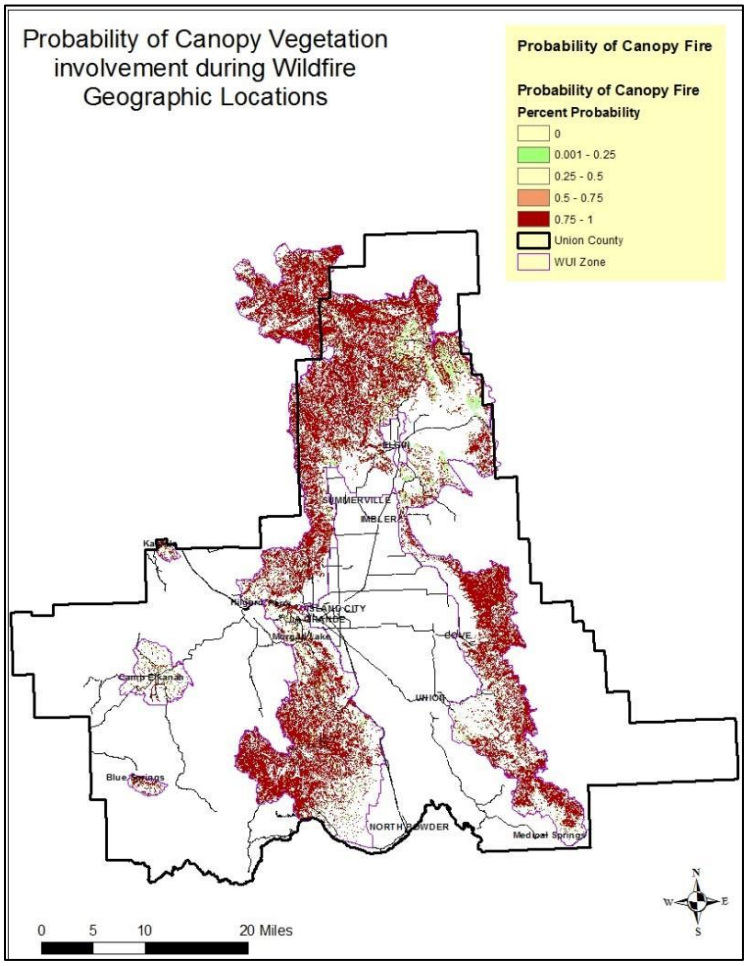

Figure VII – 6. Probability of canopy fire under all four weather percentile conditions.

Management Considerations – Canopy Fuels

Probability of canopy fire is directly correlated to canopy base height and surface fuel amounts. Fuels management in forest ecosystems with low and mixed-severity fire regimes can be designed to improve survivability of trees following wildland fires, restore forest structure, and improve the success of fire suppression efforts.

1. Identifies areas in which lower limbs of overstory trees contribute to and provide a conduit for fire spread into the crowns.
2. Opportunities to treat suppressed understory (ladder fuels) to modify fire behavior, reduce spotting potential, and improve fire containment. Utilize material whenever possible.
3. Plan projects/treatments strategically where landscape changes will alter fire spread toward communities, providing increased opportunities for successful suppression.

4. Thin stands to break up horizontal continuity of tree crowns, particularly where canopy fires can occur over large areas.
5. Combine canopy treatments with surface fuels treatments as needed.
6. As needed, design landscape treatments to facilitate active fire suppression at predetermined locations for all tactics.
7. Collaborative efforts between landowners for cross-boundary mitigation efforts.

Combined Surface Fuels and Canopy Considerations

Managers can develop preplanning based on expected weather and known topographic conditions, but altering these attributes prior to ignition in an effort to influence fire behavior is unrealistic. Dead woody material and live vegetation, however, can be manipulated and treated in advance of an ignition to alter fire flame lengths and rates of spread, increasing opportunities for suppression resource effectiveness and a more desirable post-fire outcome. Additional information of fuels models and canopy fuels can be found in Chapter VI.

Although behavior and effects of wildland fires can be changed within a particular treatment unit or stand, the behavior and progress of a much larger fire may not be affected by small treatment units (Finney 2004). Approaching fire behavior modifications on a landscape scale is likely to provide the most effective approach. Strategically placed treatments can provide a wider range of landscape impacts, suppression opportunities, and modifications of wildfire behavior. Mark Finney, research forester at the Rocky Mountain Research Station Fire Science Laboratory in Missoula Montana, utilized simulation models as a tool to evaluate the effects of management of vegetation and forest has on large fire growth and behavior (Finney 2004). Finney identifies the general relationship of fuels treatment and their intended changes to fire behavior in the table below. A more detailed table can be found in Appendix K.

Fuel target	Prescription	Change in fire behavior
Surface fuels (live grass and brush, and dead and downed woody material)	Prescribed burning, mechanical treatments remove, compact, or reduce continuity of surface fuels	Reduced spread rate and intensity, and limit ignition of tree crowns and other aerial fuels
Ladder fuels (small trees, brush, low limbs)	Thinning (small-diameter trees) and prescribed burning (scorching and killing small trees and brush) to decrease vertical continuity between surface and crown fuels	Limit ability for fire to transition from surface to crown fire by separating surface fuels from crown fuels
Canopy fuels (fine fuels like needles, and small twigs in tree crowns)	Thinning to reduce horizontal continuity of crowns (e.g., overstory thin)	Limit spread of crown fire

Figure VII - 7. Fuel Treatment and Fire Behavior. This is Table 7 taken from Mark A. Finney's, Chapter 9: Landscape Fire Simulation and Fuel Treatment Optimization of the General Technical Report 610. Table displays the general relationships among fuels, prescriptions, and intended changes to fire behavior from fuel treatments.

Expected Fire Flame Length and Rates of Spread

Since fire behavior is influenced by fuels (live and dead), weather, and topography, management's influence is primarily applicable to fuels in modifying fire behavior. Knowing what the expected fire behavior is provides opportunities for most effective fire behavior modification.

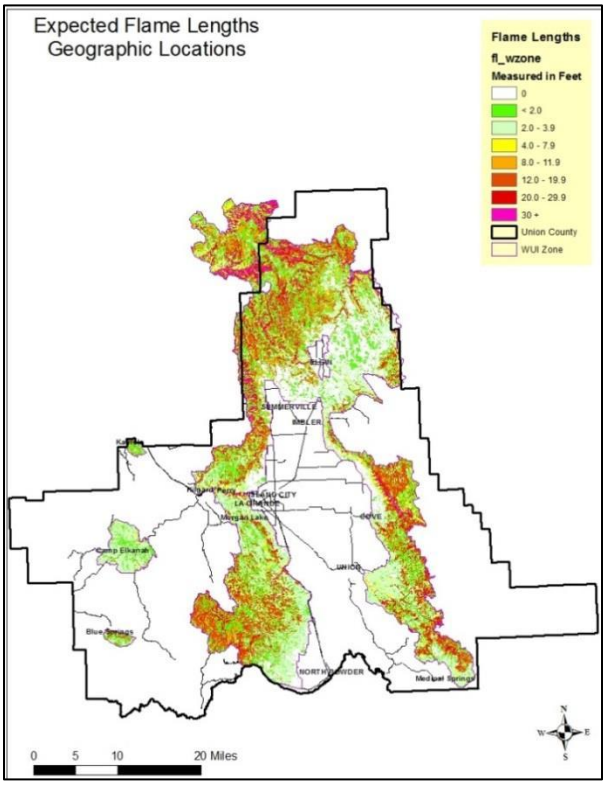

Figure VII – 8. Expected flame lengths under typical weather and fuels conditions. Weighted average of all four weather categories.

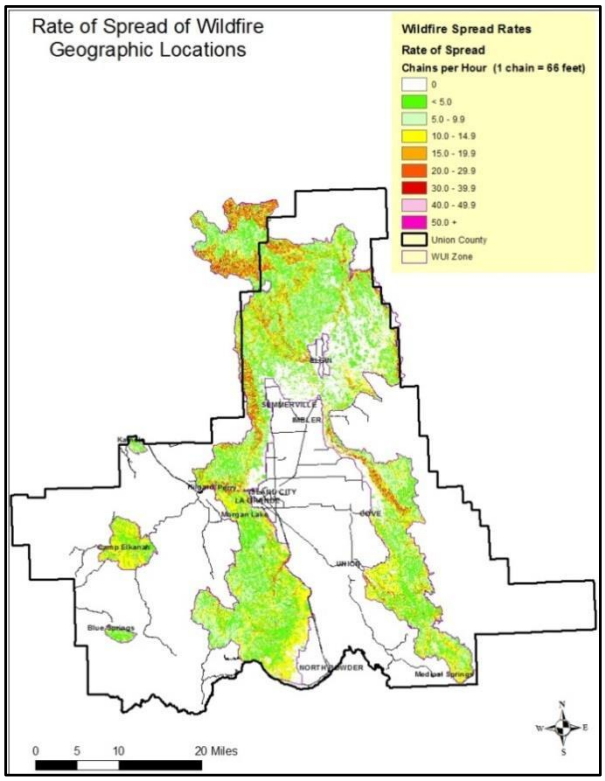

Figure VII -9. Expected fire spread rates under typical weather and fuel conditions. Weighted average of all four weather categories.

Worst Case (Most Extreme) Flame Lengths and Rates of Spread.

Approximately 98 percent of all ignitions in the forests of the northern Rockies and the east Cascade Range for which suppression is attempted are contained by initial attack (M. Finney, pers. comm., 4 February 2011 – Houtman May 2013). As a result, only approximately 2 percent of suppressed fires that escape initial attack spread on the landscape. Because most ignitions escape initial attack during weather events in which fire spread rates are high and fuel moisture is low (Houtman, et.al 2013), it is important to display the worst-case fire behavior during these weather events, based on the WWRA calculations. The WWRA considers extreme weather parameters to account for

1.77 percent of the fire starts with 6.17 percent of fire starts occurring under high conditions for the Union County area. Conditions for all four weather parameters, and how the weather influences fuel moisture levels which in turn impact fire behavior, can be found in WWRA Addendum I, Weather Influence Zone OR-3508, page I-8.

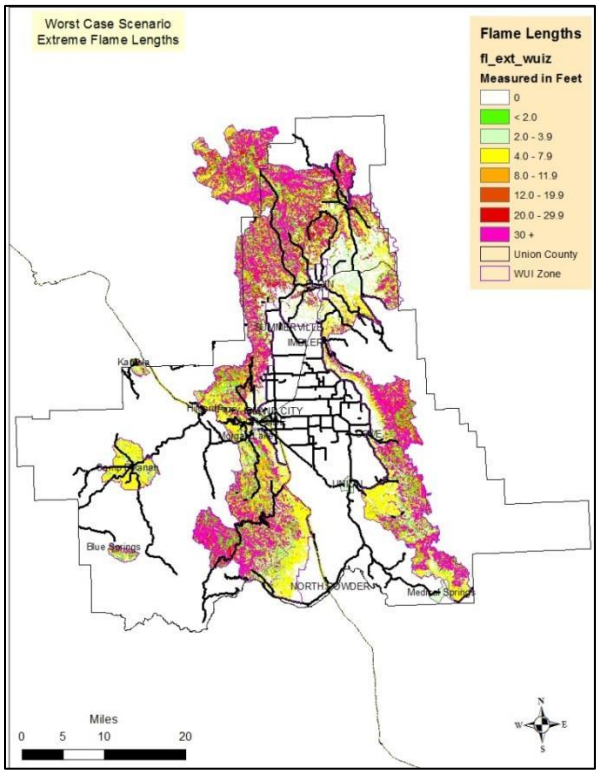

Figure VII – 10. Extreme Flame Lengths. Worst 3 percent of the summer weather conditions days.

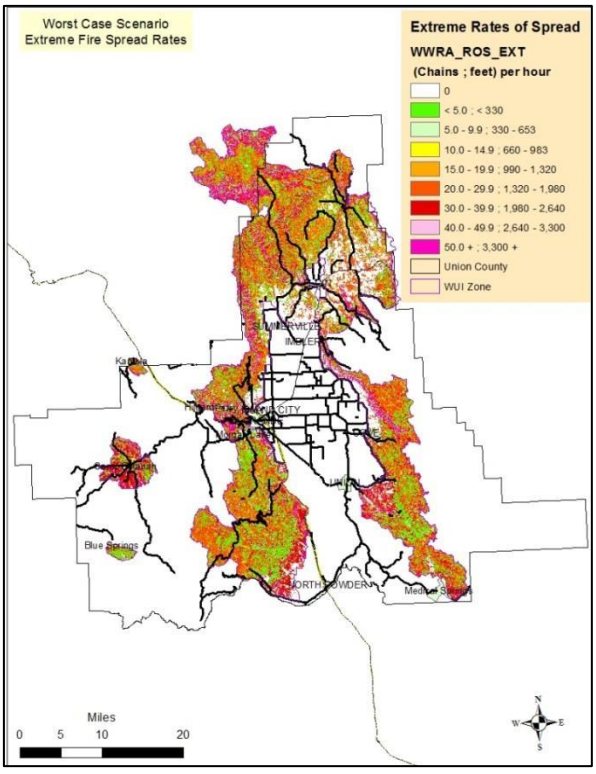

Figure VII – 11. Extreme Wildfire Spread. Worst 3 percent of the summer weather condition days.

The majority of the WUIZ under extreme weather conditions would sustain flame lengths that would prohibit hand crews and engines from successfully containing a wildfire. Live and dead fuel moisture parameters for worst-case conditions can be found in Addendum I of WWRA, weather influence zone (WIZ) OR-3508, page I-8.

Management Considerations

Human influences on fire behavior must focus on change to live and dead fuels on the landscape. Fuels, along with topography and weather, are the primary contributors to wildfire behavior, which leaves fuels as the primary emphasis in altering wildfire behavior. Using expected fire behavior outcomes with the canopy cover and fuels mapping can assist managers in identifying key areas that need attention.

1. Many areas of the WUIZ are expected to exhibit flame lengths that will render hand crews ineffective and necessitate water engine-type resources. Flame lengths play a significant role in tactical decisions for suppression resources.

Flame length and fireline intensity are directly related to the effectiveness of control forces.

2. Surface fires that exhibit flame lengths less than four feet can often be directly attacked by hand crews, meaning close proximity to flames by firefighters can occur and crew-constructed fire lines should hold. When flames are between four and eight feet in length, suppression resources typically include pumpers, dozers, and aerial support to provide for both firefighter safety and to ensure effective suppression efforts. Flame lengths play a significant role in fire suppression strategies. See Figure VII – 12.
3. Flame lengths and are related to safety of firefighters and their susceptibility to heat exposure, playing an important role in overall suppression.

The following chart displays the impacts of flame length on what type of suppression resource is needed and the effectiveness of the resource. By addressing the various flame length heights, this CWPP adheres to Oregon Administrative Rule (OAR) 629-044-1045 (4) (a-c).

Flame Length Feet	Fireline Intensity BTU/ft/sec	Interpretation
< 4	< 100	 -Fires can generally be attacked at the head or flanks by persons using hand tools. - Hand line should hold the fire.
4 – 8	100– 500	 -Fires are too intense for direct attack on the head by persons using hand tools -Hand line cannot be relied on to hold the fire. -Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8 – 11	500 – 1000	 -Fires may present serious control problems from torching out, crowning, and spotting. -Control efforts at the fire head will probably be ineffective.
>11	>1000	 -Crowning, spotting, and major fire runs are probable. -Control efforts at head of fire are ineffective.*

Figure VII - 12. Fire Haul Chart information from Andrews and Rothermel 1982. Suppression resources are most effective with flame lengths less than 4 feet. Engines, dozers, and air support are needed between 4 and 8-foot flame lengths. * The head of the fire is the side of the fire perimeter exhibiting the highest rates of spread (leading edge), and often associated with the location where continuous flaming combustion is taking place.

Suppression Difficulty

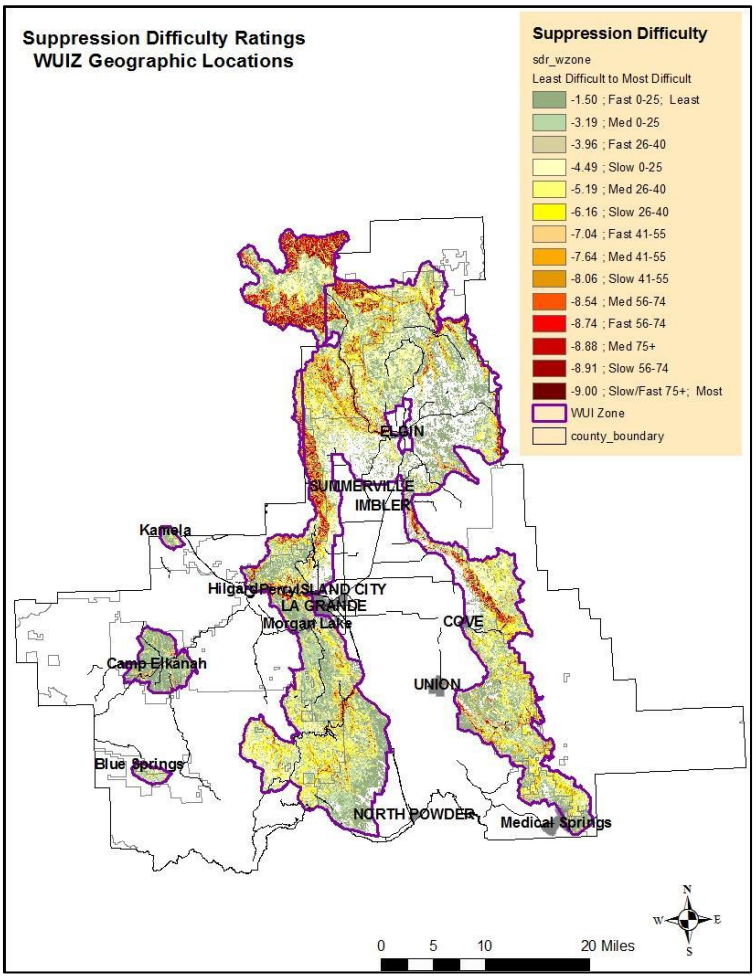

Figure VII-13. Suppression Difficulty Rating. Based on the fireline production rate categories of fast, medium, slow, with five breakouts of slope category combinations.

Management Considerations

Wildfire suppression capability of fire resources is primarily influenced by terrain steepness and the fuel type in which the fire is burning.

1. As slopes approach over 55 percent, suppression becomes increasingly difficult regardless of the fuels being consumed. This does not imply that fuels treatments would not be effective in modifying fire behavior but that fire resources have slower fireline production rates and are less effective due to slope steepness.
2. Modifying wildfire behavior provides a higher success of defensibility at ridge tops and roads on steep slopes.
3. Understanding where the suppression difficulty occurs provides opportunities of preplanning of initial attack resources, particularly where high fire ignitions occur. A variety of vegetation management tools can be utilized in areas in which forest

conditions influence fire behavior and impact the ability of firefighting resources. Treatment of these areas can be beneficial for:

- Connecting geographic areas in which suppression difficulty is low and creating opportunities for successful fire containment.
- Application of diverse treatment types based on slope and fuels.

4. In addition, there is a higher level of successful suppression action when fighting a surface fire versus a canopy-involved fire. Canopy fires often lead to crews and engine suppression resources having to withdraw due to increased safety issues.
5. Identifying geographic locations that are critical for community protection in which treatments are not realistic and suppression efforts may be hampered. Treat areas to break up fuel continuity to slow fire progress.

Values Impacted

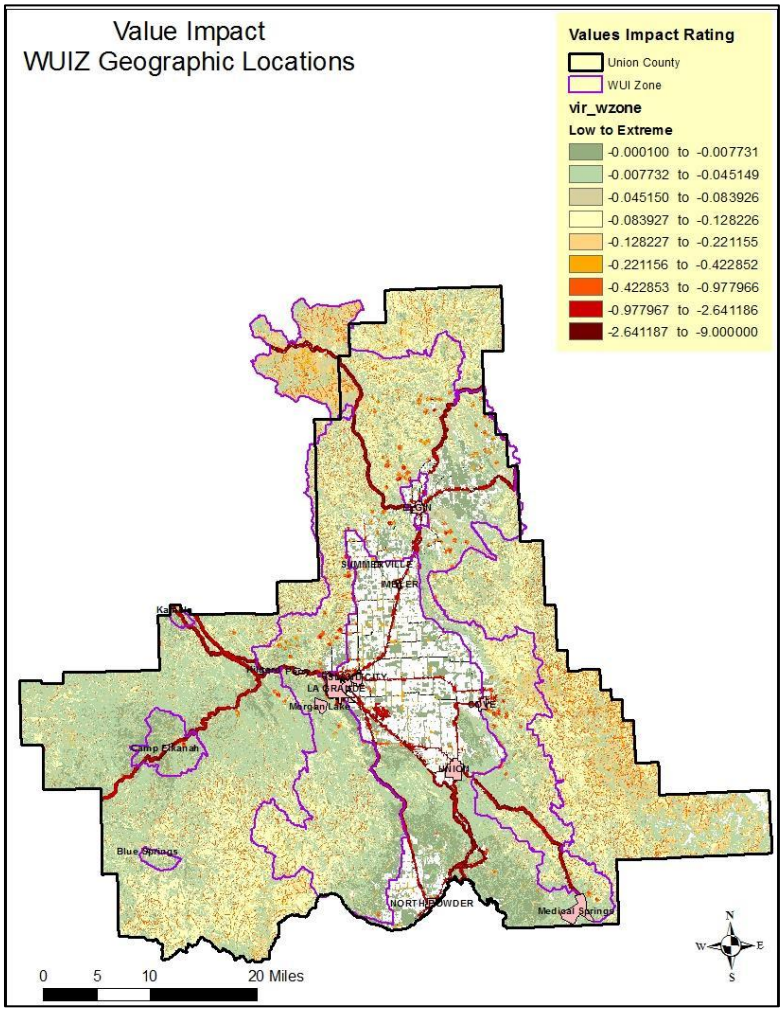

Figure VII – 14. Values Impacted Rating. Consolidation of multiple values such as wildland developed areas, drinking water, infrastructure, and forest and riparian assets.

WUIZ and Union County Structure Densities

Figure 15 displays the WWRA housing density and the most recent "structure" locations for Union County overlaid together. A zoomed in area of the vicinity of Elgin (Figure 16) shows a high number of structures (represented by red dots) not accounted for in the WWRA. Further review shows several of these structures are residential in nature.

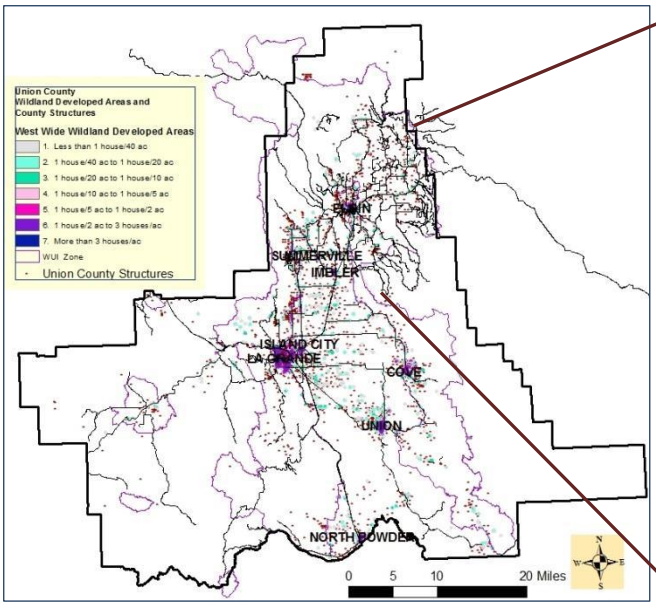

Figure VI -15 Map displays comparison of WWRA data for housing density and local data of most recent structure locations near the Community of Elgin in Union County. Close up red dots are structures from Union County local data.

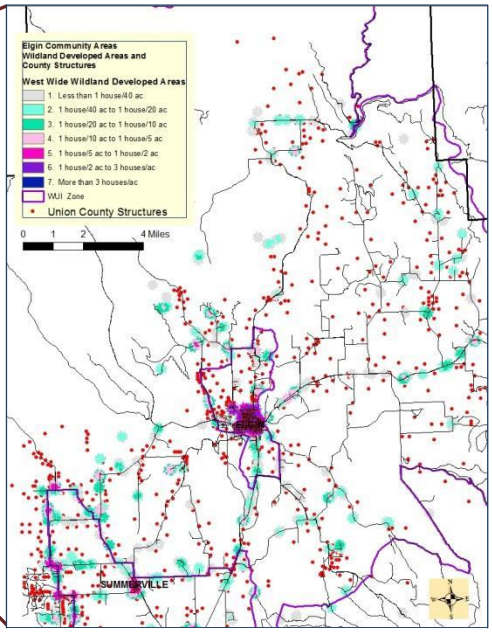

Figure VI - 16. Close up of structures surrounding the community of Elgin. Compares Union County data-structure points and WWRA. residential data.

A map density of all known structures was then developed based on Union County local data only. The density map indicates concentrations of residential areas based on houses per acres according to the WWRA Table 3-4 Housing Density in Appendix D. With the assistance of ODF Salem Office, the data was configured to show the distribution of buildings ranging from low to high concentrations. These concentrations provide a county-wide view of all known structures. Figure VI – 17 shows the density distribution of structures in Union County using best available data. This approach supports the OAR 629-044-1060 (1) approach to classification of structures as Low, Moderate, High, and Extreme densities.

Union County has roughly 11,590 housing units as of July 2015, according to U.S. Census Bureau for the State of Oregon. Forty-two percent of the county's population lives in rural areas. Although county data does not delineate between the residential and outbuilding structures, structures are peppered throughout the county.

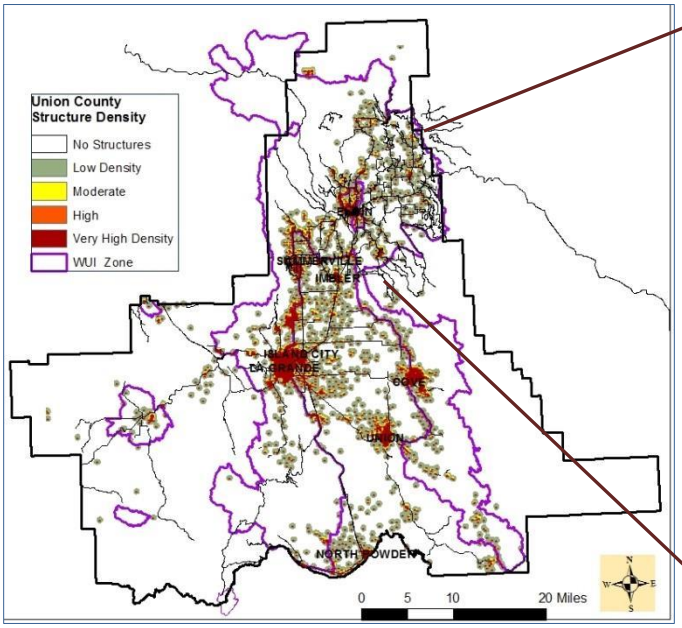

Figure VI – 17. Display of structure density using *only* local data, layer does not differentiate between residence and outbuilding. Does not include WWRA data. This data provides a higher display of structure density to areas of that may otherwise be overlooked. Structure does not imply that it is a residence.

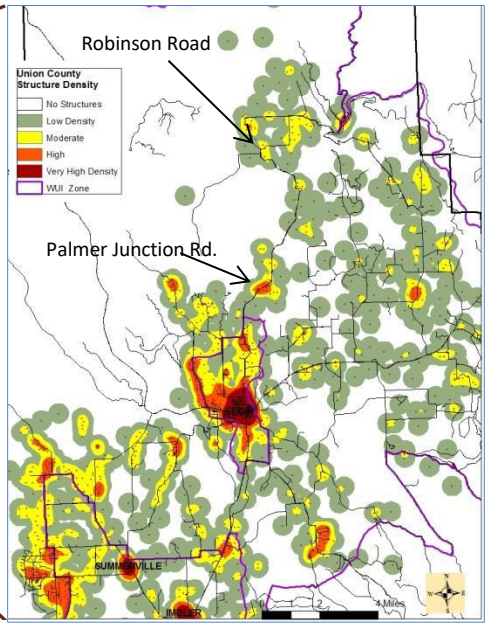

Figure VI – 18. Zoomed in to Elgin and vicinity Robinson Road-Palmer Junction.

Management Considerations

Residential homes in and near forested lands continues to increase making it increasingly difficult to assess already-existing properties and new construction. Union County recognizes the importance of accurate knowledge of property conditions to better prepare and respond to wildfires. There is currently an effort to conduct a more accurate tri-county structure assessment that may be beneficial as a future addendum to this document.

1. Collaborative efforts with local cooperators, infrastructure companies, and other stakeholders can better prepare communities for emergencies. Offers possibility to combine efforts with those proposed to protect the overall values impacted.
2. As new structures and homes are built, continue to record and update pertinent information that may be beneficial for wildfire preparedness and response. This is consistent with the Northeast Oregon Natural Hazard Mitigation Plan (NHMP) MH#12 Proposed Action for Union County.
3. Administering of programs that require standards for new development within a certain distance of forestland to meet Fire Siting Standards. Develop mitigations consistent with actions proposed in the NHMP for wildfire.
4. Utilize a workforce to:

- Record current residential locations, land conditions, access, and structures to better provide wildfire response. (Example: INTERRA)
- Maintain records as conditions change.
- Educate and assist landowners with wildfire mitigation

5. Develop avenues to reach out to homeowners to obtain property information regarding specific wildfire mitigation needs and accomplishments. Best available data leads to a higher level of wildfire response preparedness.
6. Unincorporated areas do not provide accurate data for census; these areas often have the longest fire response times.
7. Current information on residents can potentially change the CAR boundaries leading to changes in fire effects as well as changes in other attributes such as protection boundaries.

THREE PRIMARY OUTPUTS –

FIRE THREAT INDEX, FIRE EFFECTS INDEX, FIRE RISK INDEX

Fire Threat Index

This provides an index related to the likelihood of an acre burning. It integrates the probability of an acre burning and the expected final fire size, based on rates of spread in all four weather percentile categories into one single measure of a wildfire threat. It is a valuable input in displaying the "possibility of suffering harm or loss" (WWRA).

Overall Fire Threat

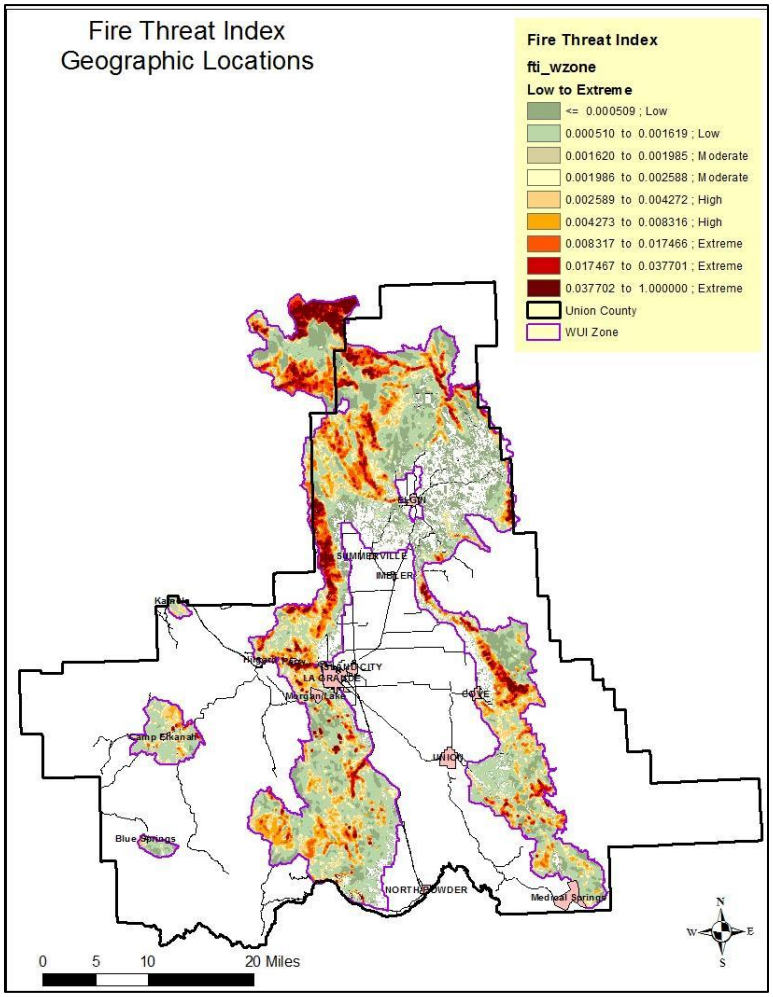

Figure VII – 19. Spatial distribution of low to extreme wildfire threat. Likelihood of an acre burning taking into account Probability of Fire Occurrence, Fire Behavior, and Suppression Effectiveness.

Management Considerations

Weather, fuels, and topography are the three parts of the fire behavior triangle. Although humans can develop plans based on expected weather and topographic conditions, altering them prior to ignition in an effort to influence fire behavior is unrealistic. Dead woody material and live vegetation, however, can be manipulated and treated in advance of an ignition to achieve a more desirable outcome by altering fire flame lengths and rates of spread, increasing opportunities for suppression resources effectiveness.

Fire as a threat has also been identified as one of the hazards facing Union County in the NHMP. The NHMP identifies wildfire as a common event to areas of central and eastern Oregon. It recognizes that wildfire is essential to the ecosystems, but also poses a serious threat to lives and property (Univ. of Oregon 2014).

Knowing where the fire threat exists is in itself an important tool for managers in the decision-making process. Figure VII – 19 provides several pieces of information for fire managers.

It provides knowledge of areas that can:

1. Be treated to reduce or manipulate available fuels to change fire behavior
2. Exhibit the highest threat potential near communities
3. Allow for priority setting by reducing fire ignitions, with focus on high fire start areas particularly where human caused starts occur
4. Highlight locations where fire suppression resources are likely to be most and least effective. This allows for preplanning prior to an ignition.
5. Offer opportunities to address multiple locations when utilizing funding for wildfire mitigations.

Areas of low fire threat *should not* be interpreted that these locations will not ignite and burn, it simply indicates that the threat is lower relative to the other geographic areas.

Fire Effects Index

Fire effects are used to identify those areas that have important values that can be affected by fire as well as to identify those areas that are difficult or costly to suppress. It is a valuable input in displaying the "possibility of suffering harm or loss" (WWRA). Fire effects takes into considerate a total of seven separate attributes that could influence the potential outcome of rating scores based on values impacted and suppression difficulty.

Fire Effects

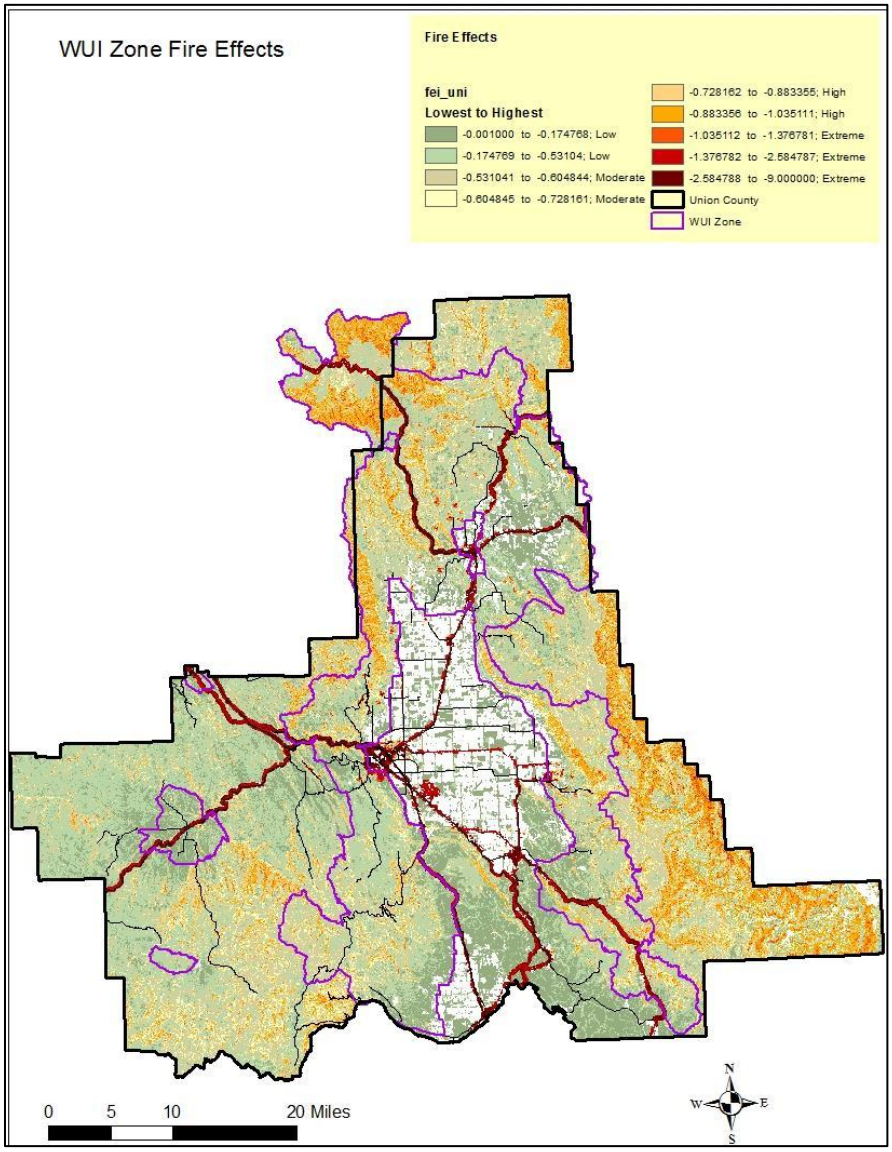

Figure VII – 20. Overall fire effects taking into consideration negatively impacted values and suppression difficulty based on fuels and topography.

Management Considerations

Knowledge of on-the-ground characteristics that impede fire suppression and locations of important values provides opportunities for advanced preparation to protect those values. This index can be used as a standalone tool for fire managers in the decision-making process both prior to and during wildfires for evaluating potential loss of valuable assets. Concentrating efforts to provide increased protection measures in advance of ignition will in turn decrease the likelihood of values lost. Again, fuels and vegetation are a subset of suppression difficulty and can be manipulated by management. Through examining detail mapping of communities and infrastructures, high potential locations can be identified.

Figure VI - 21 is a zoomed-in view of the La Grande/Mount Emily area, pulled from the Fire Effects Index map. It indicates where high potential values and suppression difficulty areas are located, resulting in areas of highest negative impact from wildfires

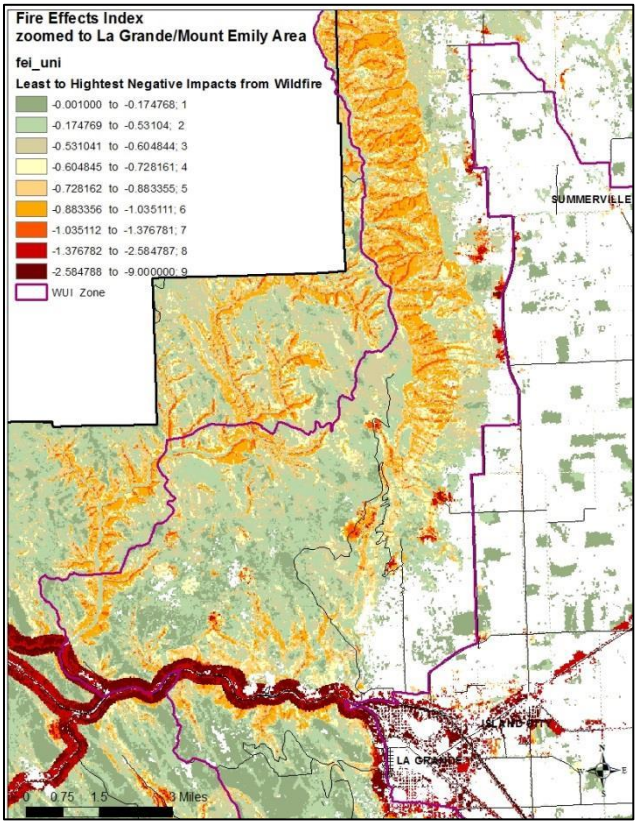

Figure VI - 21. Zoomed in view of La Grande/Mount Emily. Dark red line is Interstate 84, orange areas north of La Grande is slopes of Mount Emily on the west side of the Grande Ronde Valley.

Values with the highest potential for loss within the county can give managers a starting point for planning. Knowing crucial areas of possible negative outcomes helps for prioritizing. The Fire Effects Index can allow managers to:

1. Prioritize locations for protection based on highest negative fire impacts to values.

2. Reduce or manipulate available fuels to increase effectiveness of suppression efforts since surface fuels loads and stand conditions are related to line construction rates and flame lengths. (A component of Suppression Difficulty sub-set is fuel type.)
3. Identify communities with highest threat potential for loss.
4. Assess potential for impacts and locations for future infrastructure placement in the county.
5. Recognize outlying infrastructures and wildland-developed areas that may otherwise not be part of an identified community.
6. Communicate and educate stakeholders and partners about high loss areas.
7. Re-evaluate protection protocols with other fire protection agencies.
8. Identify forest assets that are likely to be large-scale losses on the landscape and develop opportunities for breaking up homogenous stands to preserve ecological integrity.
9. Use an approach that supports and is consistent with the NHMP's goal to protect human welfare, property, and natural resources. Combining goals and objectives of this CWPP with the goals of the NHMP allows for consolidated efforts toward natural hazards where wildfire risk mitigation is concerned.

Individually Mapped Fire Risk Index Levels

Fire Risk Index

It accounts for all 19 sets of input data used in the WWRA and provides a final Fire Risk Index displays the measure of overall fire risk. The Fire Risk Index provides a number of opportunities to agencies and landowners.

10. This can be used to identify areas where mitigation options may be of value
11. Allows for agencies and landowners to work together and better define priorities
12. Displays the risks across a complex landscape and potential fire situations
13. Provides a foundation for common knowledge and improved communication for all landowners in addressing priorities and needs.

The overall wildfire risk was separated out into individual maps of each fire risk levels in the WUIZ providing the best visual appreciation of the landscape distribution.

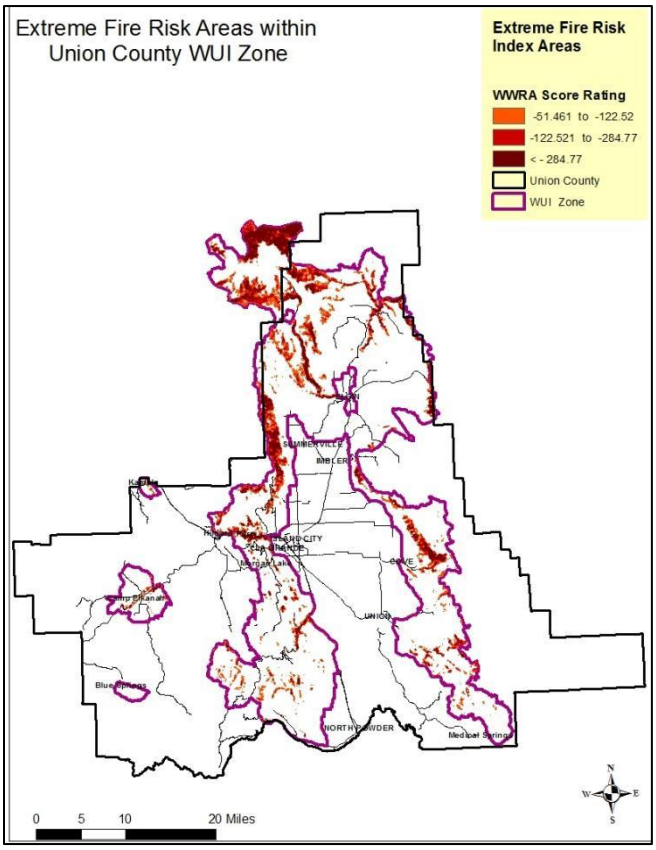

Figure VII-22. Extreme Wildland Fire Risk within the WUIZ.

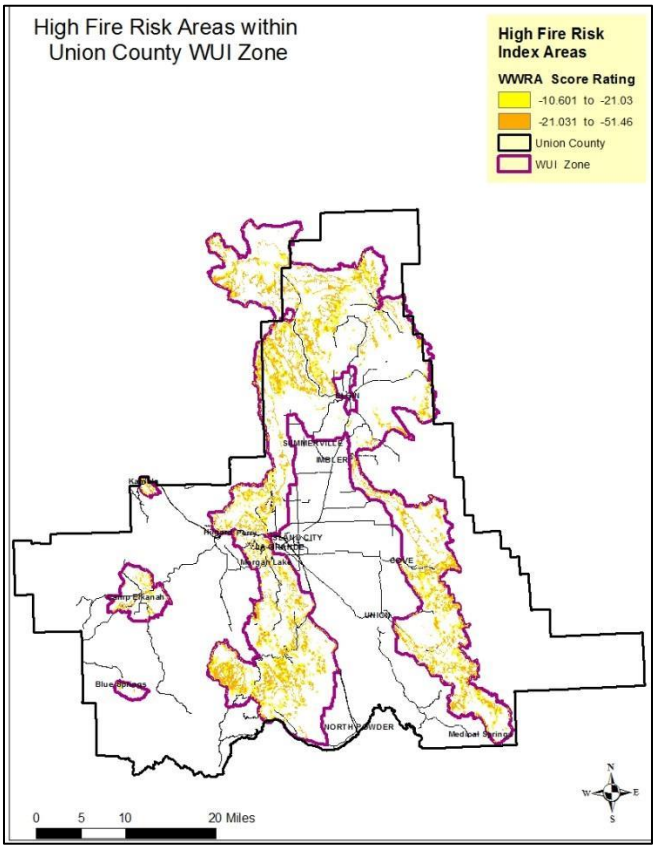

Figure VII – 23. High Wildland Fire Risk within the WUIZ.

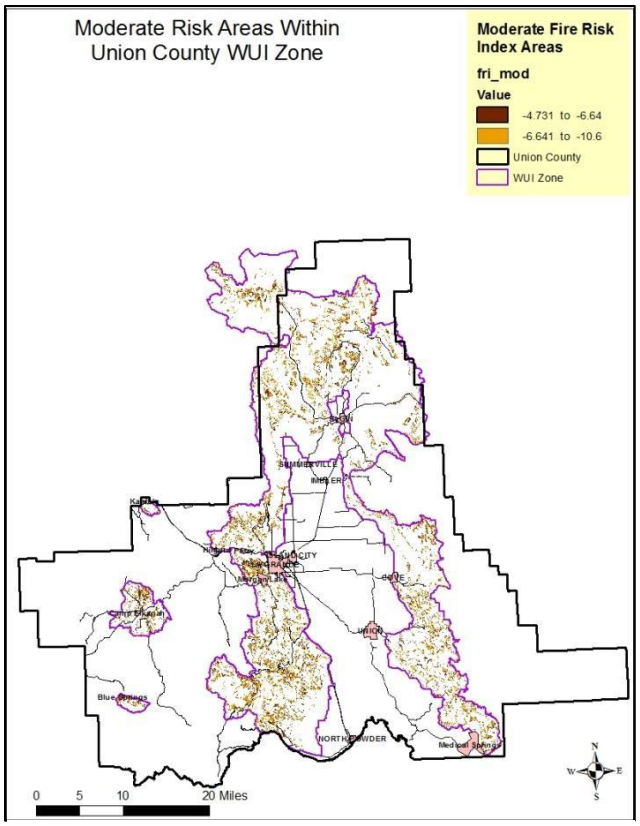

Figure VII – 24. Moderate Wildland Fire Risk within the WUIZ.

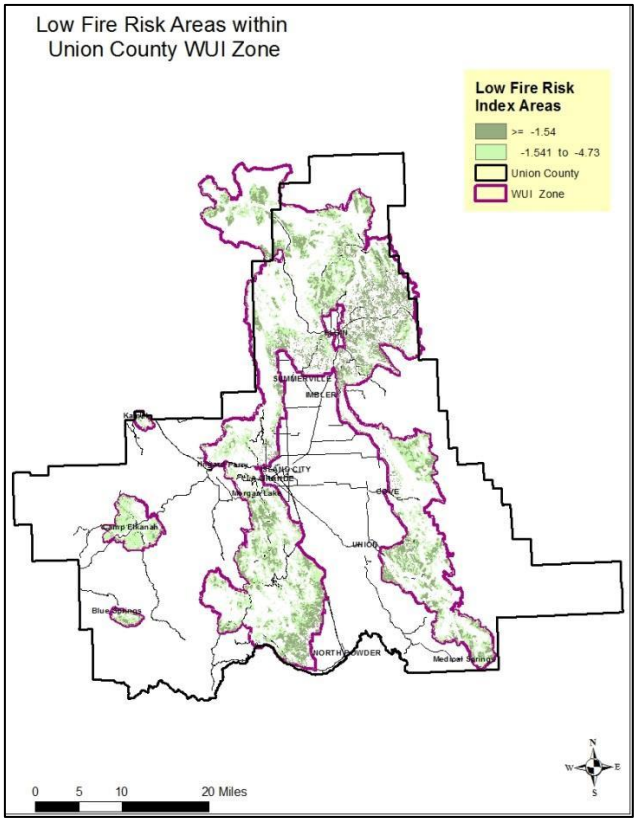

Figure VII – 25. Low Wildland Fire Risk within the WUIZ.

Management Considerations

The FRI can be used for multiple opportunities in efforts to reduce fire risk for the county. This allows for:

- Identifying areas where mitigation options may be of value.
- Allowing fire agencies and community members to work together and better define priorities.
- Developing a refined analysis of a complex landscape and fire situations using GIS.
- Visually communicating with local residents to address community priorities and needs.
- Placement of mitigations where multiple objectives can be achieved.
- A means of developing classifications of low, moderate, high, and extreme for subsets and the three primary outputs of Fire Threat, Fire Effects, and Fire Risk (See next section below).
- Provides rationale and justification for allocation of funds for mitigation purposes.
- Creates opportunities to incorporate maintenance of lower-risk areas with high-risk mitigation activities. Protects investments previously made and supports HFRA guidelines.
- Combining efforts with the NHMP (Univ. of Oregon 2014) to address wildfire.
- Movement in a direction that accomplishes the goals of this CWPP and the CWS of Wildfire Response: Fire Adapted Communities, and Restore and Maintain Landscapes.

These processes provide Federal agencies some opportunities for treating these areas that are consistent with the Health Forest Restoration Act planning direction described below:

- The HFRA identified a WUI as 1 ½ miles from the boundary of an at-risk community. This area does not require the USDA Forest Service and Department of Interior – Bureau of Land Management (BLM) to analyze any alternative to the proposed action as long as the proposed action recommendations meet the general location and basic method of treatments outlined in this CWPP.
- Areas within the Wildland Urban Interface - for Union County CWPP it would be within the WUIZ - but *farther* than 1 ½ miles from the boundary of an at-risk community, the USDA Forest Service and BLM are not required to analyze more than the proposed agency action and one additional action alternative (Section 104(d)(1)), (HFRA 2004). This area meets the "middle ground" locations consistent with the CWS.

To better display some of the important attributes of risk of a single area in the county the vicinity of the town of La Grande was used to zoom in and display the following conditions:

- the fire occurrence (fire start history and weather influence zones)
- the Fire Threat Index (Fire Occurrence, Fire Behavior, Fire Suppression Effectiveness)
- the Fire Effects Index (Values Impacted and Suppression Difficulty)
- the final Fire Risk Index

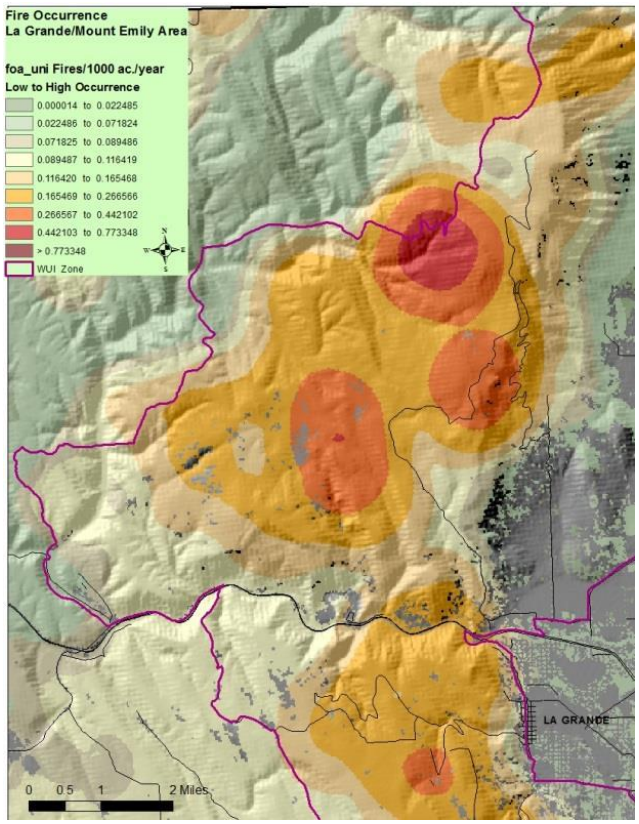

Figure VII - 26. Fire Occurrence for La Grande Area.

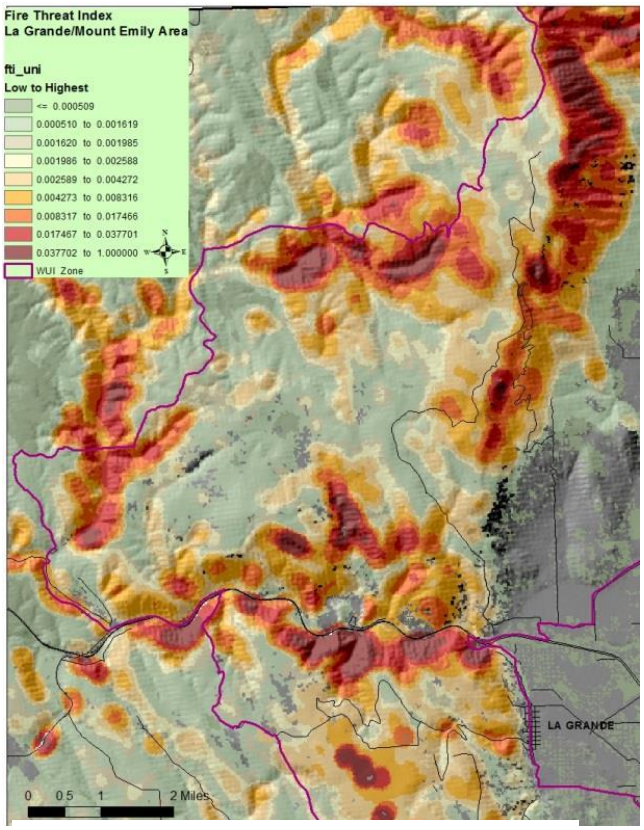

Figure VII - 27. Fire Threat Index for La Grande Area

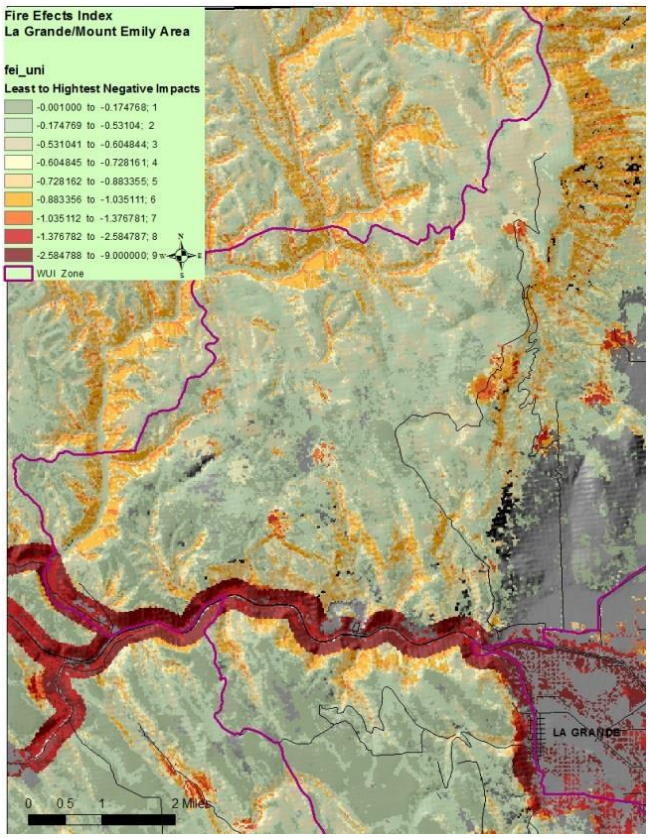

Figure VII - 28. Fire Effects for La Grande Area.

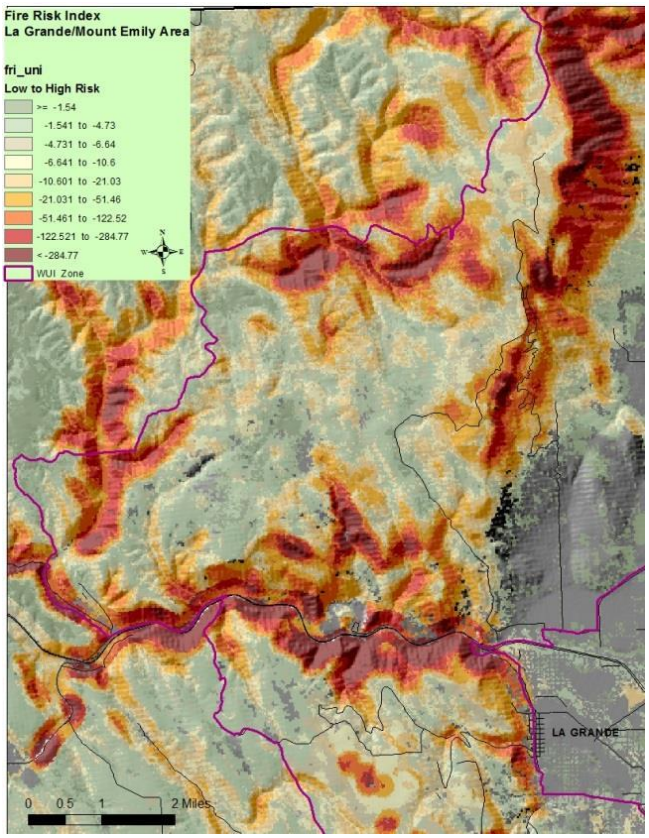

Figure VII - 29. Overall Fire Risk for La Grande Area.

WUIZ Percent of Land Coverage - Current Condition Level

	WUI ZONE ASSESSMENT												
	Condition Contributing to Fire Behavior					Wildland Fire Potential Percent (%) of WUI Zone							
Rating Level	Fire Occurrence	FRCC	Fire Type	Canopy Base Height (% of WUIZ)	Suppression Difficulty	Flame Lengths (no data for 13%)	Rate of Fire Spread (13% area missing data)	Probability of Canopy Fire (no data, or non-burn for 55%)	Values Impacted	Fire Threat	Fire Effects	Fire Risk	
Extreme	3	CC -III 50	Active .1%	86	6	26	1	40	54	14	6	17	
High	30	CC - II 19	passive 47	10	19	10	8	0	34	22	15	24	
Moderate	27	CC - I 18	Surface 42	2	31	27	47	0	7	16	31	17	
Low	40	13	No-burn 11	2	44	24	31	5	5	48	48	42	

Figure VII - 30. WUI Zone Risk Level Area Coverage. All numbers reflect the % of land area covered by each of the four ratings within the WUI Zone. A breakout of county wide acres for Fire Threat, Fire Effects, and Fire Risk can be found at the end of Chapter VI.

Summary

It was important for the CWPP committee to have the three goals of the CWS as a primary focus to successfully implement this plan. Wildfire resource response can be limited when high spread rates and flame lengths are generated; resilient landscapes can be expected to have high severity (high mortality to overstory vegetation) impacts after a landscape fire under current conditions; fire adapted communities must be created to promote collaborative efforts in order to prevent loss of life and property.

Since fire behavior is directly influenced by fuels, weather, and topography, landowners and fire managers are limited to fuels modification in order to be effective in changing wildfire behavior. Fuels, for the purpose of this document included any of the following: dead forest woody material, live forest vegetation, structures, and any combustible material that may burn in the event of a wildfire. There are opportunities to modify fuels through a wide range of approaches discussed in mitigation measures.

In areas where modifications have occurred emphasis in retaining the investment and stand conditions may supersede a higher risk area if location and cost of maintenance work is justified.

Fire protection and structure vulnerability put emphasis on fire adapted communities and wildfire response with some lessor degree of emphasis on resilient landscapes. Through this design managers are able to understand the areas of wildfire response that can influence outcomes.

CARs are scattered across Union County both in and out of the WUI Zone. Recognizing that these communities, regardless of location, are challenged by their own set of wildfire issues gives protection agencies and landowners tools to create fire adapted communities and build upon existing or create new fire response programs. Distinguishing between structure protection authorities and land protection authorities allows for collaborative efforts in fire protection. Condition indicators and issues facing the CARs can be addressed together or as standalone treatment approaches for fire protection. CARs are delineated to meet management direction and to identifying protection capabilities yet recognizing that mitigation measures do not stop at property lines. This is important for successfully meeting fire adapted communities goal in Union County.

Understanding how landscape conditions are linked together to influence fire behavior, suppression success, and public and fire safety can provides critical insight for landowners during the decision making process. Landscape characteristics are the building blocks that lead to the various levels of fire risk, no characteristic is a standalone issue. To mitigate fire risk, it is important to know which characteristics can be modified, should be modified, and realistically will make a difference once modified, and what the outcome will likely look like.

The WUI Zone provides a larger geographic image of conditions, allowing for potential use of single funding sources to be applied in multiple locations on the ground that meet identified criteria. Focusing on areas across the WUI Zone, of similar issues, increases the likelihood of meeting the “all hands all lands” approach. Understanding the “big picture”, land managers

can be opportunists, taking advantage of areas that currently meet the low fire risk rating by building on these locations, preserving the lower risk conditions, or linking nearby low ranked areas with high risk areas to increase potential for success with likely limited funding sources.

CARs and landscape conditions can establish increased opportunities for cross-boundary efforts with minimal funding. These conditions, along with local knowledge, provide the basis for the mitigation actions outlined in the next chapter. Application of mitigation measures can occur where multiple resource objectives can be met while meeting the three goals of the CWS.

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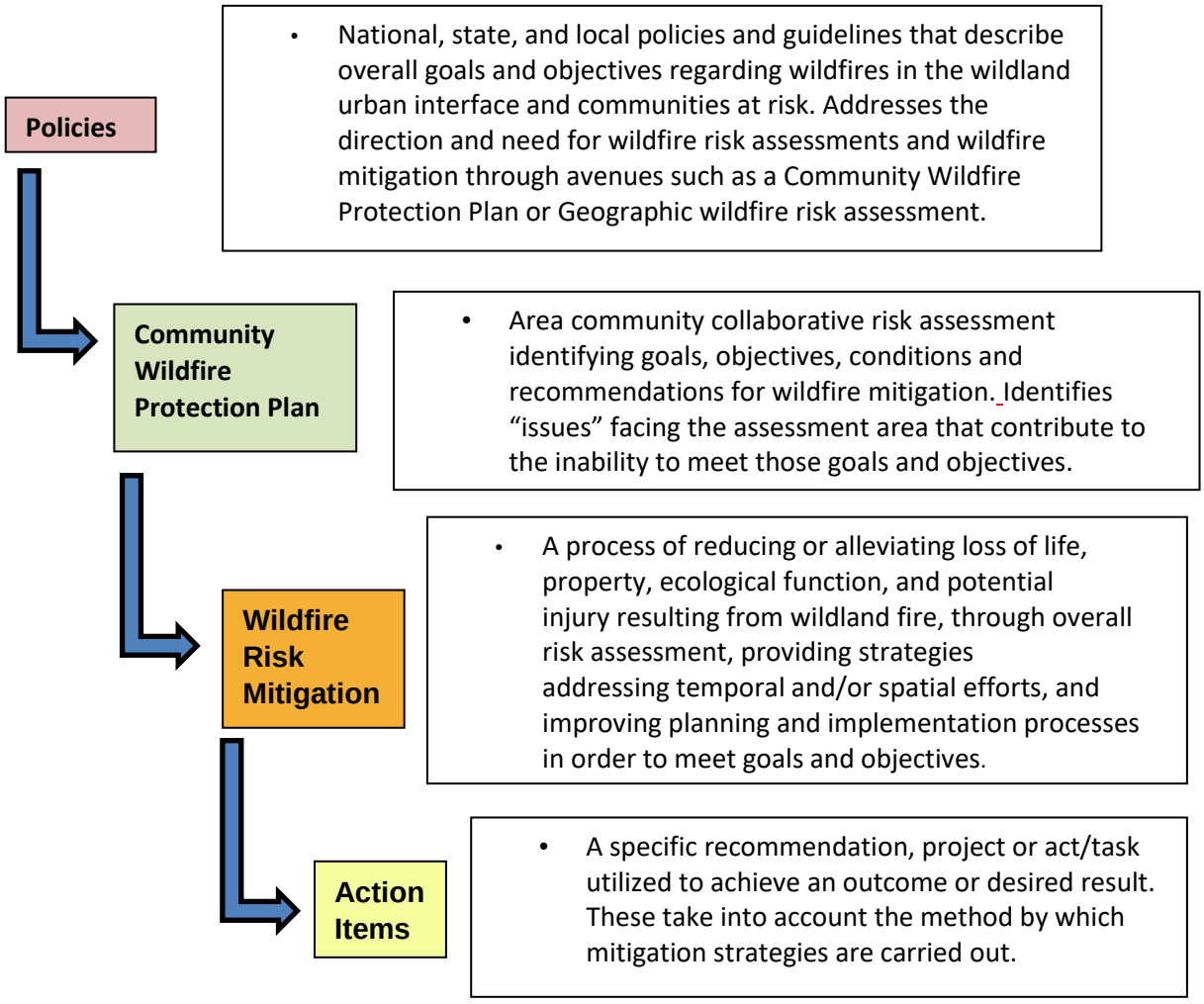
VIII Mitigation Action Items and Opportunities

Introduction

Union County is positioned in an area of Oregon that is considered a high wildfire prone location based on historic and current data. Until recent decades, issues of wildfire threat, effects, and risk were often treated more as a side conversation than a real possibility. The fire season of 2015 brought wildfire to the forefront of many local residents' conversations. By this time, the CWPP committee was well underway in the development of this document.

This chapter is designed to disclose risk assessment issues identified within Union County that were brought forward during collaborative meetings of the CWPP committee with local fire protection agencies, cooperators, and members of the public. These issues guided the development of the mitigation and action items designed to improve conditions and reduce wildfire risk.

The overall process is tiered to policies and guidelines that provide directions at the national, state, and local levels in an effort to reach actions that can be used to meet wildfire risk mitigation strategies in order to protect life, property, and ecosystems.



Mitigation Measures Guidance

The CWS has identified at a national level five basic factors that determine when, where, and how intensely wildfires burn: climate, topography, vegetation, ignitions, and suppression. Of these, three can be directly influenced by fire management – vegetation, ignitions, and suppression. Two, climate and topography, are realistically beyond the influence of wildland fire managers, but they cannot be ignored (CWS 2014).

Nationally there are four challenges that are considered high-priority barriers and critical success factors: managing vegetation and fuels; protecting homes, communities and values; managing human-caused ignitions; and effectively and efficiently responding to wildfire (CWS 2014). These are also applicable at a local level.

Mitigation and action items are supported by both local and national plans outlining recommendation and expectations needed to meet the policies and guidelines. These referencing documents are identified below with a description of how each supports the mitigation concepts within the CWPP. Many of the policies and guidelines also support one or more goals of this plan, which include: 1. Wildfire Response, 2. Fire-Adapted Communities, 3. Resilient Landscapes.

A corresponding number was assigned after each bullet to show which of the three goal(s) is being supported in reference to mitigation efforts.

The National Cohesive Wildfire Strategy

a. Addresses the importance of promoting community and homeowner involvement in planning and implementing actions to mitigate the risk posed by wildfires. (1) (2)
b. Recommends pursuing municipal, county, and state building and zoning codes/ordinances that mitigate fire risk to protect life and property. (1)(2)
c. Uses mitigation strategies that ensure protection of infrastructure and values such as: watersheds, cultural, recreational sites, transportation, utilities, communities, etc. (1) (2)
d. Connects with local experts to *sustain* mitigation efforts. (2)(3)

The Regional Natural Hazards Mitigation Plan for Northeast Oregon has a mission of: "*Create a disaster-resilient Northeast Oregon".* It supports mitigation efforts by:

a. Maintaining that mitigation is the responsibility of the "Whole Community" – individuals, businesses/industries, state/local government, federal government. (2)
b. Recognizing the need for pre- and post-disaster mitigation project grants. (1),(2)
c. Reduces the risk from natural hazards by identifying resources, information, and strategies for risk reduction. (1)
d. Union county wildfire probability and vulnerability are both ranked at the highest level in the Hazard Mitigation Plan.

The National Wildfire Coordinating Group through *Wildland Urban Interface Wildfire Mitigation Desk Reference Guide* 2014

a. Provides a reference to assist with integrating wildland urban interface mitigation principles into national wildland fire training. (1)
b. Promotes common wildfire mitigation language and culture. (1)
c. Recognizes Fire adapted communities, Firewise, Ready Set Go, Living with Fire. (2)
d. Recognizes the national CWS.
e. Promotes the concept of "Whole community approach". (2)
f. To become a fire adapted community is a continuous process that requires maintenance and adaptation to ensure actions are effective. (2)

Presidential Policy Directive/PPD-8, 2011. Directive PPD-8 recognizes wildfire threat as one of priorities of natural disasters and threats to the nation.

a. National Preparedness in terms of threats, including natural disasters encompassing actions taken to plan, organize, equip, train, and exercise to build and sustain the capabilities necessary to prevent, protect against, mitigate the effects of, respond to, and recover from those threats. (1),(2), (3)
b. Identify risk of specific threats and vulnerabilities including objectives to mitigate that risk.
c. Includes integrated planning that covers: prevention, protection, mitigation, response, and recovery. (1), (2), (3)

CRF-2011-title44-vol1-part 206 Federal Disaster Assistance including Subpart N – Hazard Mitigation Grant Program, section 206.431, 206.434, 206.435

a. 206.431 defines *Activity* to mean any mitigation measure, project, or action proposed to reduce risk of future damage, hardship, loss or suffering from disasters. (1),(2),(3)
b. Eligibility includes; 206.434 (c) (5), be cost effective and substantially reduce the risk of future damage, hardship, loss, or suffering resulting from a major disaster. (1),(2),(3)
c. 206.434 (c) (5) (i) addresses a problem that has been repetitive, or a problem that poses a significant risk to public health and safety if left unsolved. (1), (2)
d. 206.434 (d) (2) Eligible activities include projects of any nature that will result in protection to public or private property. (1), (2)
e. 206.435 Project identification and selection criteria. (a) Identification. It is the State's responsibility to identify and select eligible hazard mitigation projects. (b) Selection. (1) Measures that best fit within an overall plan for development and/or hazard mitigation in the community, disaster area, or State: (1), (2)
f. 206.435 (c) Other considerations. Consideration should be given to measures that are designed to accomplish multiple objectives including damage reduction, environmental enhancement, and economic recovery, when appropriate. (1),(2),(3)

The NE Oregon Regional Natural Hazard Mitigation Plan and FEMA define mitigation as:

> *"….the effort to reduce loss of life and property by lessening the impact of disasters…. through risk analysis, which results in information that provides a foundation for mitigation activities that reduce risk."*

For the purpose of this document mitigation is:

> *"A process of reducing or alleviating loss of life, property, ecological function, and potential injury resulting from wildland fire, through overall risk assessment, providing strategies addressing temporal and/or spatial efforts, and improving planning and implementation processes in order to meet goals and objectives."*

Mitigation strategies include policy changes, projects, modifications of current protocols, education and outreach, long- and short-term approaches, big picture designs, multi-jurisdictional activities, fuel breaks, and vegetation modification.

Mitigation measures for the WUIZ were designed with the three goals of the Cohesive Wildfire Strategy in mind.

- Restore and maintain landscapes
- Create fire-adapted communities
- Improve wildfire response (CWS 2014)

Progress Monitoring

There are multiple forms available in Appendix L that can be used to identify progress, obstacles, lessons learned during the implementation of the mitigation measures and action items.

Mitigation Progress Report

The Progress Report form is separated to address the three goals of the CWS. It allows for a detailed assessment of the individual mitigation measures, it's desired outcome, and what steps were taken to reach the desired outcome.

Project Achievement Form

The Project Achievement form focuses on a specific project designed to meet one of the three goals and corresponding mitigation measures. It allows for documenting a project's intent, actions taken, expected verse observed results, funding mechanisms, partnerships, challenges and other pertinent information that may improve future efforts.

Annual CWPP Evaluation Form

This form assesses the individual goals and objectives identified by the committee in Chapter II. This form provides a broad CWPP committee group approach to scoring achievements within the county in relation to the plan document and its intent. It looks at three primary areas of concern for each of the objectives: DEADLINES: expected deadlines of completion, COST: costs (below

cost, at cost, above cost). DESIRED OUTCOME: results were below, met, or exceeded expectations. It records the overall group assessment of the year through a numerical rating**.**

Action Items

Action items are a broad approach to accomplishing the recommended mitigation. Action items are a recommendation, project, act, or task to achieve a desired result. These are suggested methods by which the mitigation strategies may be implemented. One mitigation measure could potentially have several recommended action items that strive to achieve the desired outcome. Action items are not necessarily time-sensitive, spatially restrictive, or automatically consistent with current approaches. It was important to include new, innovative ideas in an attempt to improve efficiency and effectiveness of meeting desired results. Application of action items is achieved through applying more specific *concepts* toward implementation activities. The mitigation measure, action items, and applied concepts all build toward achieving the desired condition and meeting the guiding principles, core values, and the three goals outlined within the National CWS.

The Cohesive Wildfire Strategy outlined 11 guiding principles and core values that support the three primary goals. Four of these clearly support all the CWS goals, with the remaining seven more closely fitting one particular goal:

a. *Reducing risk to firefighters and the public is the first priority in every fire management activity.* Mitigation actions are designed for improving programs and management activities in an effort to create a safe working and living environment in terms of wildfire, shared knowledge and understanding of living in fire prone environments, and emphasis on protection of life first and foremost.
b. *Sound risk management is the foundation for all management activities.* Regardless of the mitigation or action item identified, the outcome for all activities is mitigation/reduction of wildfire risk. Education programs, fire agency improvements, and landscape treatments all have one overarching objective in mind: managing inherent risks and risks identified during this CWPP process.
c. *Fire management decisions are based on the best available science, knowledge, and experience, and used to evaluate risk versus gain.* The CWPP has taken the lead on this, using the most current data for the risk assessment. Information was obtained from multiple agencies, the 2014 West Wide Risk Assessment, recent research and a collective interagency, cooperator, and public knowledge base of county information.
d. *Fire management programs and activities are economically viable and commensurate with values to be protected, land and resource management objectives, and social and environmental quality considerations.* Budget shortfalls have resulted in developing collaborative, economical ways to meet the three goals and establish the mitigation action items outlined in this CWPP. Programs and projects should be designed that take a big picture approach where multiple objectives can be achieved. Often, large scale multi resource management considerations can be economically viable while protecting both ecological and social interests.

Through a collaborative effort, the CWPP Steering Committee identified county wildfire issues. Once the county issues and mitigations were acknowledged, they were then tiered to one of the three CWS goals, with some showing slight overlaps into more than one overarching goal. **These**

lists are not final, but are fluid in nature where amendments can be added if a new situation or strategy arises that needs to be addressed.

Rationale

Relates the need for mitigation and action items back to the County and local communities.

Desired Condition

This is the preferred outcome once the mitigation action items have been implemented.

How to implement and apply concepts

A variety of options, not exclusive to those listed, that provide a means implementing the desired actions and meeting the desired outcome. There are multiple ways to reach desired outcomes; the CWPP acknowledges that new avenues and tools will arise during the process.

CAR or area directly in need

Locations may change as projects are developed and work is accomplished. Locations listed were brought out during the CWPP process but does not limit the addition of new areas. This block is also a good location to add any additional information toward monitoring, such as new locations or areas accomplished.

Timeline

Insert a desired time frame for accomplishment. Funding sources are often time-sensitive and can be reflected here, as well as an actual accomplishment date.

Funding Source

Sources recommended for use and funding sources that have been used for this mitigation. This provides tracking of funding that is helpful for annual renewal and requests. **Additional grant and application web sites for funding can be found in Appendix – I Funding Mechanisms.**

Wildfire Response

Goal: ***All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.***

Core values and guiding principles of the wildfire response goal provide a path to developing mitigation action items. Activities that support interagency management decisions and are designed to achieve safe and effective fire management programs within Union County cannot be overemphasized. Fires that start on public lands and move onto private land, threatening communities, particularly in the west, are a major problem. The vast expanses of area and finite amount of fire protection resources, often less than one fire station per 100 square miles, contributes to the problem (CWS 2014). Core values and guiding principles identified in the CWS that emphasize management decisions of wildfire response include:

a. *Local, state, tribal, and Federal agencies support one another with wildfire response, including engagement in collaborative planning and the decision-making processes that take into account all lands and recognize the interdependence and statutory responsibilities among jurisdictions.* The CWPP was built on a collaborative effort forum between fire response agencies, cooperators, and members of the public. Identifying program impediments toward interagency fire support and jurisdiction will create a more effective Union County fire coalition. Developing opportunities such as training to meet standardized qualifications, common radio frequencies, and department upgrades establishes knowledge in capability awareness.
b. *Where land and resource management objectives differ, prudent and safe actions must be taken through collaborative fire planning and suppression response to keep unwanted wildfires from spreading to adjacent jurisdictions.* Shared knowledge of agency fire suppression missions and objectives can minimize confusion for both fire response personnel and agency managers when multi-jurisdictions are involved during wildfires. Preseason exercises and planning provide opportunities to work together, eliminating potential issues during an actual fire incident.
c. *Safe, aggressive initial attack is often the best suppression strategy to keep unwanted wildfires small and costs down.* Coordination of multi-agency resources is vital to aggressive initial attack on wildfires. Thunderstorms rarely deliver a single fire start. Multi-fire start situations can be aggressively suppressed if resource draw down is recognized in advance and reserve personnel and equipment are identified through interagency coordination efforts. Interagency coordination must include a strategic view of all available qualified resources including federal, state and local resources.

Wildfire response in Union County is comprised of multiple agencies, which include federal, state, county, rural, and city. The public and private land coverage are proportionately even in area covered, incorporating a mix of protection from rural, city and county fire agencies.

The La Grande Airport hosts a federal air base comprised of an air-tanker base, seasonally contracted helicopters with buckets, two national repel helicopters with crews, and two national Interagency Type I Hotshot crews. Depending on fire situations within the country, these resources could be committed elsewhere at times of local fires.

The county also has two designated dispatch centers that serve as contacts for both the public and agency employees. The Blue Mountain Interagency Dispatch Center (BMIDC) provides dispatch services to both federal and state wildland fire agencies. The primary mission of the dispatch center is supporting all wildland fire incidents within the BMIDC footprint. This includes initiating initial attack fire response through interagency-designed protocols and providing support to incidents with personnel, aircraft and equipment at a local, state, and national level. BMIDC also provides large fire support and resource tracking for field-going personnel.

The local 911 dispatch center primarily pages local fire resources and secondarily tracks and supports incidents within the county to include fire (structure, wildland, vehicle, etc.) in addition to addressing local police and EMS needs. To coordinate response between wildland fire agencies and rural and city fire districts, BMIDC will track all resources responding to wildland fire incidents within the BMIDC footprint, while the 911 center will continue to provide initial paging and additional support as requested by local responding units.

Efforts since the 2005 CWPP have been to initiate action to address several ongoing wildfire response issues. First, there has been work started toward increasing Union County's wildfire response capacity through meeting and updating local department needs. Through an MOU with the Forest Service on surplus equipment, the county rural fire departments have obtained numerous pieces of equipment they may otherwise have not acquired. Secondly, the county's co-op prevention program has higher multi-protection agencies participating in the school and community programs. However, the prevention program lead has recently retired which has caused the formation of the Grande Ronde Fire Prevention Association and created a funding need to maintain the county-wide prevention program. Third, efforts are being made to increase rural fire department training in wildland fire qualifications to increase county-wide capacity for utilizing local resources when state and federal resources are stretched.

Fire organizations continued to build partnerships in an effort to effectively work together with emphasis on safety, life, and property. Meetings with rural fire departments, cooperators, and members of the public have identified a comprehensive list of issues facing the county in terms of wildland fire. Using the list of issues developed, the CWPP committee identified mitigation measures and action items that support agency guidance and expand to new innovative ways to achieve the goals.

The following tables address issues identified in Union County through the collaborative process. The issues mitigation action items were divided out based on the three key goals of the CWPP - Fire Response, Fire-Adapted Communities, and Restore and Maintain Landscapes. Some of the issues and mitigations could potentially address more than one of the goals, in which case the mitigation number will be referenced under the additional goal.

Issue	There is no thorough assessment of all county structures and residences. Current data is not up to date.
Mitigation # 1	**Develop a complete assessment of all structures within Union County.**
ACTION ITEM(s)	1. Systematically visit all known residences in the county through an integrated agency assessment. 2. Dovetail onto INTERRA 3. Design system to input data accumulated for easy GIS access. 4. Establish reporting system of new residences within the county through tax lot information. 5. Collaboratively develop critical information needs of residents to aid in fire response and protection. 6. Link structure information to the NE Oregon Natural Hazard Mitigation Plan 2014.
Rationale	Union County has a high number of dwellings in wildland urban interface that are identified by address only. These addresses reflect homes with long driveways and are not indicative of actual home location. There is need for a comprehensive structure map and a plan to provide fire managers and homeowners key focus points for fire mitigation and provide fire response agencies with specific locations of actual structures versus street address. CWS stresses the importance of pursuant of building and zoning codes/ordinances that mitigate fire risk to protect life and property.
Desired Condition	A database and mapping system that can be periodically updated through the county tax assessor's information. Updated current home locations and conditions that provide accurate information to assist resources during wildfire response.
How to implement and apply concepts	a. Develop conduit to pass information off to non-local protection resources and management teams. b. Develop funding for a position that can input and maintain data. c. Design distribution channels for fire response personnel with current information regarding structures in the area. d. Can be linked to evacuation plans for sheriff's departments for easy home access. e. Design in new construction ordinances and statutes that pertain to new construction and upload of information to database. f. Work collaboratively with University students for opportunities to meet needs of education and county. g. Create a county wide "coordinator" position to facilitate data base management and uploading of intel as it is acquired.
CAR or areas directly in need	All CAR and WUIZ Entire County
Timeline	
Funding Sources	

Issue	No known decision protocol for identifying when to evacuate residents and activate conflagration act.
Mitigation # 2	**Design a county wide pre-fire suppression plan that includes an evacuation plan, trigger points/management decision points for evacuation orders, and conflagration activation.**
ACTION ITEM(s)	1. Organize a mapping exercise for defining and identifying trigger points. 2. Develop a plan with consistent protocols for interagency use. 3. Written plan with maps for interagency and public distribution. 4. Utilize and modify any existing evacuation plans and processes that are designed for multi-agency assistance. 5. Create structure/land information such as INTERRA utilizing tax lot information local knowledge.
Rationale	1. All agencies provide structure protection in some fashion and share the same road access as the public. 2. A pre-designed and shared interagency evacuation plan can minimize confusion during critical incidents for both the public and firefighters thereby improving safety while reducing risk and exposure. 3. Sharing the Plan with the Blue Mountain Interagency Dispatch Center (BMIDC) will provide global communications of the same information in the event of wildfire evacuation. 4. Provide plan knowledge to local cooperators that are likely to participate in an evacuation such as law enforcement agencies, American Red Cross, etc. 5. Presidential Policy Directive/PDD-8, 2011. Recognizes the need to integrate planning that covers prevention.
Desired Condition	An Organized, timely evacuation of residents.
How to implement and apply concepts	a. Increase local support for timeframes of evacuation through open communications well in advance. b. Involve emergency organizations outside of fire: Red Cross, Sheriff Dept., Public Works Department. c. Provides opportunities to link to conflagration act. d. Review protocols and decision points annually through coordinated meetings with homeowners and interagency simulations with the county fire response agencies and involved cooperators. e. Assure logistical procedures are known and in place for people needing assistance, livestock and pets. f. Review lessons learned and/or experiences of others.
CAR or areas directly in need	This is applicable to all Communities at Risk and areas within the WUIZ where residents may be found.
Coordinating Organization	Lead: Union County City and Rural Fire Departments Participants: State and Federal fire management and other agencies
Timeline	Develop at a minimum management decision criteria for areas of CAR within the first year of CWPP completion. Develop evacuation decision criteria for high forest use areas within the first two years of CWPP completion. Ongoing Efforts
Funding Sources	

Issue	Rural departments are functioning with minimum required Personal Protective Equipment (PPE) and no surplus materials.
Mitigation #3	**Improve type and amount of available equipment to meet all agencies' requirements, allowing for immediate availability of replacement supplies.**
ACTION ITEM(s)	1. Update and maintain Rural and City departments' wildland PPE/Equipment 2. Improve surplus equipment programs that allow for easy transfer of supplies from one agency to another. 3. Increase available funding and grant options for equipment acquisition. 4. Create a needs list and fill any gaps with updated equipment. 5. Identify shortages of Interface fire apparatuses.
Rationale	Past federal surplus fire equipment programs have been of tremendous benefit for local rural fire departments. Maintaining and improving upon these types of programs is a win/win for improving and maintaining the collaborative efforts, consistency of equipment, and safety of fire personnel. Equipment is essential for firefighter safety. Presidential Policy Directive/PDD-8, 2011 emphasizes preparedness in terms of natural disasters, including actions for equipment and sustained capabilities for protection.
Desired Condition	Rural Fire Departments are well furnished with up-to-date tools and equipment to safely do the job.
How to implement and apply concepts	a. Use available grant programs geared toward fire response for Rural Fire Departments. b. Develop collaborative agreements that provide easy transfer of equipment.
CAR or areas directly in need	Entire County
Timeline	
Funding Sources	Expand use of FEPP and FFP – Utilize Grant Program to acquire funds. **FEMA – Opportunity Title 9: Firehouse Subs Equipment Grant** – dedicated to improving life safety capabilities of emergency-service entities in communities served by Firehouse Subs. **FEMA – Opportunity Title 10**: **Firefighters Charitable Foundations Grant** – provide assistance to local fire/disaster victims, fire prevention education, volunteer fire department equipment purchase, community safety programs. FEMA - **Opportunity Title 14: Georgia-Pacific Bucket Brigade Grant** – supports volunteer and small town fire departments for equipment (water pumps/hoses/nozzles), resources, programming, and safety education materials. **FEMA – Opportunity Title 18: Lacy and Connor Search and Rescue Fund** - The purpose of the fund is to provide financial assistance to law enforcement agencies and nonprofit organizations involved in search-and-rescue operations. Equipment, training, PPE, medical-care equipment.

Issue	Expand local roles and experiences with wildland firefighting in order to create additional state and federal capacity.
Mitigation #4	**Identify opportunities to integrate local resources with existing Type 3 IMTs and/or develop a local incident management team.**
ACTION ITEM(s)	1. Provide course training opportunities to meet Federal Standards for wildland firefighting through uniform and cross-agency training. 2. Increase roles and experience by designing training opportunities for local fire resources. 3. Identify individuals currently with both wildland and structure qualifications to mentor others. 4. Develop incentive programs to encourage cross training. 5. Provide crosswalk opportunities where applicable and appropriate.
Rationale	Potential for reduced safety issues with cross training of structure and wildland fire fighting. Increases understanding of firefighting terminology and allows for common language between fire protection resources. Increases resource options during times of high draw down of personnel. Creates an Interagency fire response that is likely to increase opportunities for successful fire suppression and demonstrates multi-agency cooperation to the public sector. Wildland Urban Interface Wildfire Mitigation Guide 2014 promotes common wildfire language and culture.
Desired Condition	Local Fire Organizations have an increased role in wildland firefighting and can increase local capacity for State and Federal partners.
How to implement and apply concepts	a. Design a list of personnel interested or in need of training and use a rotation of personnel if needed. b. Develop liaison roles to help draw interest and slowly incorporate individuals into the IMT team structure. c. Integrate non-traditional partners into the Type III teams
CAR or areas directly in need	City and Rural fire departments.
Timeline	
Funding Sources	

Issue	Blocks of land within the county are under a variety of protection statuses. There are lands with no structure or wildland protection, lands with only wildland protection, and areas with only structure protection. (See Chapter XI for details)
Mitigation #5	**Fire agencies should collaboratively chart, with affected landowners, a path to incorporate these into protection areas.**
ACTION ITEM(s)	1. Identify response agency with fire authority, staffing needs, equipment. 2. Meet with homeowners within the unprotected areas, reach agreement on incorporating properties into protection jurisdiction 3. Opportunities to expand existing protection districts or establish new ones. 4. Educate homeowners on protection boundaries, opportunities, and consequences.
Rationale	Oregon Administrative Rules (OAR) support addressing unprotected lands: These rules allow for assessment of lands to determine zone type with the State of Oregon, depending on the zone 1 - costs, zone 2 - tax levy (allowing for establishing a rural fire protections district). These blocks of land support residential structures with no current fire protection jurisdiction, yet still receive protection through OAR Chapter 476 with post fire billing of property owner. Establishing a known fire jurisdiction will quicken fire response, resolve cost issues, and establish protection jurisdiction, which could otherwise result in the potential for increased fire size and property loss. CFR-2011-title44 section 206.434 (d) (2) Eligible activities includes projects of any nature that will result in protection to public or private property Presidential Policy Directive/PDD-8, 2011. Includes integrated planning that covers protection and response.
Desired Condition	All lands in Union County are under fire protection jurisdiction.
How to implement and apply concepts	a. Set lands with dwellings as a priority for protection and eventually incorporating all unprotected lands into a fire agencies jurisdiction. b. Determine land zone according to OAR 476.310 through 476.340 and work with landowners to incorporate properties for protection. c. Utilize statutes that incorporate new construction into a protection district. d. Renew and develop Memorandum of Understanding among agencies to increase protection areas.
CAR or areas directly in need	Within the entire county there is approximately 45,611 acres of unprotected lands, including Valley lands west of Cove, Lower Cove Area, and a thin strip of land adjacent to Mt. Glenn road, HWY 203 along foothills to Hot Lakes, SE of Union and west of Hwy 203.
Timeline	
Funding Sources	

Issue	Protection areas and satellite stations should complement one another.
Mitigation #6	**Identify locations that would benefit from new satellite stations and begin filling in any identified gaps where stations are needed.**
ACTION ITEM(s)	1. Fire agencies need to design a plan with maps identifying areas that would provide the highest coverage based on geographic placement. 2. Apply for funding to initiate a needs-based assessment of protection resources that includes: personnel, equipment, facilities, funding, and other key information. 3. Establish protocol for staffing at substations and retaining staffing levels at primary stations to support response to substations / remote areas. 4. Increase fire apparatuses and strategically locate them at an existing site or a new site.
Rationale	Union County has a wide scattering of small communities. There is a need to create opportunities to reduce the response time spent by suppression resources in reaching an incident. Improves area coverage within the county and reduces overextending current resources, particularly in times of high fire occurrence. Opportunities to provide a presence and further improve public relations in remote areas. CFR-2011-title44 section 206.434 (d) (2) Eligible activities include projects of any nature that will result in protection to public or private property. Presidential Policy Directive/PDD-8, 2011. Includes integrated planning that covers protection and response. OAR 478.260, 478.300,
Desired Condition	Provide protection capabilities to all remote communities through satellite stations.
How to implement and apply concepts	a. Utilize outputs from Fire Protection and Fire Structure Vulnerability assessment in Chapter XI and Chapter VII respectively, to aid in determining areas of high and extreme ratings and causal factors. b. Reach out to affected communities to educate them on current protection status and concerns under existing status. c. Assess level of community interest for facility and personnel staffing. d. Search out surplus material/equipment
CAR or areas directly in need	Starkey, Kamela, Spout Springs, Palmer Junction, Perry-Hilgard, Non-protected locations. Carry over from 2005 CWPP – explore adding a substation for Imbler Rural Fire Department. Develop Lower Cove substation for Cove Rural Fire Dept.
Timeline	
Funding Sources	National Fire Plan Assistance to Firefighters Station Construction Grants (SCG) FEMA –Opportunity Title 8: E-One Tell Your Story Fire Truck Grant – a competition that gives fire departments the opportunity to win a new commercial pumper by demonstrating a need. FEMA – Opportunity Title 9: Firehouse Subs Equipment Grant

Issue	Several water sites have limited access for large apparatuses, and finding alternative sites reduces resources firefighting time.
Mitigation #7	**Reduce drafting time and increase site options that will accommodate large engines and tenders.**
ACTION ITEM(s)	1. Extend boat ramps for summer water access. 2. Develop a pressurized system with locations to eliminate long drafting times. 3. Develop sites in the areas identified with limited or no access to accommodate large equipment. 4. Work with landowners to develop sites in strategic areas. 5. Improve large equipment road access and turn arounds to existing water sites. 6. Explore opportunities to create dry standpipes with improved access.
Rationale	Application of water to suppress wildfires and support fire resources can be a deciding factor on fire size. Increased options of fill sites can improve overall firefighting resources efficiency and effectiveness. Increases response capabilities by lowering turnaround time when needing to refill engines. Meets Presidential Policy Directive/PDD-8, 2011. Identify specific vulnerabilities, including objectives to mitigate that risk.
Desired Condition	A sufficient number of strategically located water fill sites that provide access and drafting capabilities for large engine/tenders.
How to implement and apply concepts	Work with landowners to create water fill sites in strategic locations. Increase/add large enough turn around spots for large equipment access at existing sites. Installation of Fire Hydrants where feasible. Ensure agency water source use agreements are in place well in advance. Work with agencies for extensions of boat ramps during low water levels.
CAR or areas directly in need	Anthony Lakes, Wolf Creek, Pilcher Reservoir Other identified sites
Timeline	
Funding Sources	

Issue	Some fire agencies (Rural) have little to no technological equipment for more effective geo-referencing that is consistent with other agencies and lack skills to use technology.
Mitigation #8	**Provide technology that is compatible/consistent with other cooperating agencies.**
ACTION ITEM(s)	1. Acquire any surplus up-to-date equipment. 2. Determine the current most commonly used equipment and begin process of acquiring additional equipment. 3. Bulk order at lower costs
Rationale	Provides fire resources the capabilities to access local terrain maps, up-to-date fire perimeter maps, road access points. Increases effectiveness of fire resources in both fire team support and fire line environments. Provides the ability to pre-load critical information in advance, such as structures, infrastructure, trigger points, escape routes and safety zones. Federal Assistance for Wildlfire Response and Recovery provide avenues for funding through partnerships with state forestry agencies; these programs provide funds for pre-fire community wildfire protection planning and preparation, hazard mitigation, equipment, and personnel training.
Desired Condition	Inter-agency ability to share essential information to improve fire response capabilities and safety using up-to-date technology.
How to implement and apply concepts	a. Provide training for fire departments for mapping and geo-reference on site. b. Obtain grant monies for acquiring equipment. c. Collaboratively work among agencies to acquire equipment.
CAR or areas directly in need	All affected fire resource agencies.
Timeline	
Funding Sources	Assistance to Firefighters Grants through FEMA

Issue	Limited training opportunities and qualifications skills for rural and structural personnel to fight wildland fires.
Mitigation # 9	**Uniform training and across agency development training for ALL agencies.**
ACTION ITEM(s)	1. Provide opportunities for training/experience with FS and ODF agency personnel. 2. Provide qualified instructors to provide training needs where scheduling accommodates volunteers with full time jobs – weekend, evening sessions. 3. Coordinate with local community colleges that conduct weekend training. – TVCC 4. Interagency cross training using simulations.
Rationale	Deficient fire qualifications and skill levels increase safety concerns in situations that are already inherently risky. A common training platform ensures that all fire resources have a consistent knowledge base. Developing training schedules to meet those with steady jobs increases the likelihood of gaining and maintaining fire qualifications. The National Wildfire Coordinating Group through *Wildland Urban Interface Wildfire Mitigation Desk Reference Guide 2014* promotes the concept of "whole community approach". Presidential Policy Directive/PPD-8, 2011. Directive PPD-8 recognizes wildfire threat as a priority and promotes preparedness including training and sustained capabilities.
Desired Condition	Training instructional program that is approved by all agencies in meeting wildland firefighting qualifications.
How to implement and apply concepts	a. Determine a need-based training of individuals and courses and then identify local instructors qualified to teach classes – FS, ODF, retired, contractor. Establish course dates at least six months in advance of training opportunities for highest attendance. b. Identify the qualification needs for Federal Agencies. c. Identify internship opportunities d. Create a county-wide "coordinator" position to facilitate off hour wildland fire training and coordinate federal and state agency training.
CAR or areas directly in need	Rural and Structure fire resources that participate in wildland firefighting incidents.
Timeline	
Funding Sources	Assistance to Firefighters Grants through FEMA Opportunity Title 11: Fireman's Fund Heritage Program – national community based providing funds for equipment, fire prevention tools, firefighter training, fire safety education and community emergency-response programs.

Issue	Separate information storage and dispatch centers can create confusion for resource check-in and information sharing.
Mitigation # 10	**Develop common storage and information sharing between dispatch centers.**
ACTION ITEM(s)	1. Connect BMIDC with Union County 911 to create backup reporting system and reduce confusion of resources onsite. 2. Co-locate access and sharing of information in common locality. 3. Update dispatch software. 4. Develop reporting protocol where rural and city fire status is shared.
Rationale	Resource reporting is sometimes doubled with the two dispatch offices when fire resources are on scene of an incident. Resource safety is priority and dispatch is required to track down the resource after hours or when a check-in status in not received, although one dispatch center has been in communication. The Oregon State Fire Marshall Strategic Plan 2015 – 2019. Goal 2 – Expand the OSFM's use of technology resources for internal and external customers. 2.1 Boost and maintain data storage and management. 2.2 Provide user-friendly technology, supporting systems, and documents. (OSFM 2015)
Desired Condition	Clear and concise one-step resource reporting with common links of communication between dispatch centers.
How to implement and apply concepts	a. Bring two dispatch offices together to jointly seek solutions. b. Develop compatible software between dispatch centers.
CAR or areas directly in need	Blue Mountain Interagency Dispatch Center and 911 dispatch
Timeline	
Funding Sources	

Issue	It is difficult for rural and city fire departments to recruit and retain quality volunteers from local communities.
Mitigation # 11	**Develop a firefighting recruitment program to increase the level of interest.**
ACTION ITEM(s)	1. Advertise training opportunities available for community members. 2. Firefighting presence at local gatherings (booth) with displays and simple physical challenges to draw interest. 3. Develop fun competitions between local fire agencies open to the public, demonstrating cohesiveness within the county. 4. Develop recruitment program designed for various groups including: high school, college, and other community members.
Rationale	Increasing the numbers of community members as part of fire organizations increases the available personnel to pull from, particularly during times of high draw down level, provides increased connection to local residents, and potential for new information sharing opportunities. Inability to properly staff rural and city fire departments is a high safety matter with potential high cost losses of both life and property. CRF-2011-title44-vol1-part 206 Federal Disaster Assistance including Subpart N – Hazard Mitigation Grant Program 206.434 (d) (2) Eligible activities includes projects of any nature that will result in protection to public or private property Presidential Policy Directive/PPD-8, 2011 build and sustain the capabilities necessary to prevent, protect against, mitigate the effects of, respond to, and recover from those threats that pose the greatest risk to the security of Nation. Oregon State Fire Marshal Strategic Plan 2015 – 2019. Goal 4 – Recruit, develop, and sustain a professional and diverse workforce
Desired Condition	To eventually have an adequate pool of individuals to select for positions. One large enough that provides a surplus of personnel that can be used as backup during critical times.
How to implement and apply concepts	a. Establish a position or shared job duties to focus on initiating recruitment ideas and outreach. There is also potential for a small interagency recruitment team to work together throughout the year with bi-annual showings of the local fire agencies. b. Create internship programs that increase interest and opportunities c. Conduct education forums on the importance, benefits, and rewards of being a volunteer. d. Benefits for District Volunteers. OAR 478.390 Investments authorized to fund length of service awards for volunteer firefighters.
CAR or areas directly in need	Rural and Structural Fire Agencies
Timeline	
Funding Sources	Staffing for Adequate Fire & Emergency Response Grants (SAFER)

Issue	Some rural local roads are not maintained, with an increasing amount of vegetation encroachment making entry with fire apparatuses difficult or impossible.
Mitigation # 12	**Develop an implementation plan to *maintain* public road right-of-ways to minimize fire risk including state highways.**
ACTION ITEM(s)	1. Develop an implementation plan to maintain key public road right-of-ways to minimize fire risk. 2. Utilize roads to create fuel breaks for defensible location. 3. Prioritize roads, including state highways, based on strategic fuel breaks. 4. Map all areas with egress issues that would pose safety issues for both firefighter and public.
Rationale	Firefighting personnel utilize roads for several reasons, including fire and community access, defensible space, and evacuation routes, all of which involve firefighter and public safety. These roads are also often directly situated for infrastructure access during emergencies. High levels of vegetation are counterproductive toward firefighter strategies and tactics. National Cohesive Wildfire Strategy supports mitigation strategies that ensure protection of infrastructure and values including transportation routes. CRF-2011-title44-vol1-part 206 Federal Disaster Assistance 206.434 (c) (5) (i) promotes addressing problems that are repetitive, or a problem that poses a significant risk to public health and safety if left unsolved.
Desired Condition	Build a plan to track access road treatments and asset up a rotating periodic maintenance schedule to ensure initial work and follow through maintenance are completed. Data base to track work accomplishments.
How to implement and apply concepts	a. Reference any existing evacuation plans and property assessments that may provide current road knowledge. b. Utilize any assessment being completed concurrently with road information, county/state road data. c. Use West Wide Risk assessment mapping identifying high fire threat and areas that exhibit as priority locations. d. As projects materialize, address specific road issues within the project to protect lives. e. Address issue during new construction as statutes for maintaining access.
CAR or areas directly in need	Initial focus on all areas currently exhibiting fire behavior characteristics of high spread rates, flame lengths that limit impede resource use, potential for crown fire.
Timeline	
Funding Sources	

Issue	Lack of information regarding critical access roads to structures. Information such as roadside vegetation, ingress/egress, turnarounds (large engines), road composition/surface, width, barriers, and bridge allowance.
Mitigation # 13	**Complete assessment of roads and driveways where data is missing. Connect assessment with INTERRA project currently underway.**
ACTION ITEM(s)	1. Design protocol/data base for collecting and storing information for easy access during fire incidents. 2. Conduct questionnaire surveys during public forums such as Wild Hog Days, County Fair, etc. 3. Consolidate any known assessment(s) already completed through the county, during wildfires, by local fire protection agencies. 4. Work with local INTERRA contacts to develop complete database.
Rationale	Road access issues often lead to extended response times in rural areas (CWS 2014). The federal register describes preliminary criteria for evaluating risk to communities Volume 66, no. 3 page 753 shows Risk Factor 3 Infrastructure, situation #2 for communities is cited as limited access routes and situation # 3 multiple entrances and exits well equipped for fire trucks, and wide loop roads.
Desired Condition	Emergency fire responders have data uploading access for local road conditions. Improve upon decision capabilities by having the most current situational awareness where road conditions are concerned.
How to implement and apply concepts	a. Hire personnel to accomplish countywide roads assessment. b. Assign individuals from local fire protection units to accomplish assessment within their specific protection areas. c. Dovetail onto structure assessments where applicable. (INTERRA example) d. Educate landowners on proper access needs for large apparatuses. e. Provide self-assessment techniques to landowners to expedite information gathering.
CAR or areas directly in need	Thief Valley Area – river creates a barrier for access to other side. Road connection to other side below dam would help. Current situation has long, extended response times.
Timeline	
Funding Sources	

Issue	Develop an all-hands-all - lands approach to wildfire response, including closest forces response and draw down move up across agency boundaries.
Mitigation #14	**Develop a county wide mutual aid agreement that allows for interagency utilization of local resources across the board.**
ACTION ITEM(s)	1. Create a common operating protection plan with all agencies. 2. Identify strength and weaknesses of current collaborative agreements. 3. Develop mutual aid or MOUs.
Rationale	Rural Fire Departments are currently picked up under ODF on a work agreement in order to be involved with a wildfire under federal agency jurisdiction. Policy Direction supports this action. Taken from the Guidance for Implementation of Federal Wildland Fire Management Policy 2009, Management Intent and Implementation Actions were the following recommendations: 1. Recognize that particular budget processes and external influences will affect capability and capacity. Realize efficiencies by incorporating other federal, tribal, state, and local agencies and nongovernmental organizations to meet peak demands for resources. Preseason agreements are an integral part of preparedness (Management Intent #10 Preparedness). 2. Agencies will develop agreements to efficiently utilize other federal, state, local, and non-governmental resources (Management Intent #10 Preparedness). 3. Agencies will streamline interagency transfer of funds to reduce fiscal inconsistencies. (Management Intent #13 Standardization). OAR 477.406 (1) The forester and a forest protective association may enter into a contract or agreement with each other, or jointly, …… for the prevention and suppression of fire on forestland or on land other than forestlands or both, to prevent and suppress fires.
Desired Condition	To have a streamlined interagency transfer of funds between all fire protection agencies in Union County.
How to implement and apply concepts	a. Develop agreements to clarify jurisdictional inter-relationships and define roles and responsibilities among local, state, tribal, and federal fire protection entities, based on each organization's enabling protection authorities and assistance/mutual aid responsibilities including streamlined fund transfers. b. Review current agreements and make needed modifications. c. Search out already-existing agreements in other geographic areas that meet this need.
CAR or areas directly in need	All fire protection agencies.
Timeline	
Funding Sources	

Fire Adapted Communities

Goal: *Human populations and infrastructure can withstand a wildfire without loss of life and property.*

The Cohesive Wildfire Strategy (CWS) through the this goals has identified some guiding principles and core values to direct fire and land management activities in terms of fire adapted communities. Included in these are:

a. *Reducing risk to firefighters and the public as a first priority.* Working with members of the public sharing information will provide across the board knowledge prior to a wildfire incident that could potentially save lives. Through pre-fire actions such as the reduction of structure flammability and property fuels-vegetation treatment measures, an environment is created for safer suppression actions, ingress and egress of both the public and firefighters.
b. *Improve and sustain both community and individual responsibilities to prepare for, respond to, and recover from wildfire through capacity-building activities.* Collaboratively working with communities in understanding how land and structure preparation ahead of time can provide them with a degree of comfort, knowing steps were made to improve the likelihood of structure survivability. Wildfire impacts can have a tremendous emotional impact if unprepared to respond during a potential wildfire threat.
c. *Rigorous wildfire prevention programs that are supported across all jurisdictions.* Developing a cooperative, multi-agency prevention program that works with members of the public to reduce the number of just human caused fires will significantly lower the number of fire starts that in turn will reduce the fire response calls particularly at the height of fire season.

During a wildland-urban fire a home ignites from two possible sources: directly from flames (radiant and convective heat) and/or from firebrands accumulating directly on the home (Cohen 1991). Structure survival involves several factors that influence fire ignition; and if an ignition occurs, the survival of a structure involves factors that influence fire suppression (Cohen and Saveland 1997). Structure survivability is impacted by pre-wildfire preparation in and around the properties to reduce structure ignitability, and the effectiveness of suppression resources that influence by their availability, firefighting capabilities, and accessibility options to the properties.

Homes in and near forested lands in the west are increasing at rapid rate. Over the past 50 years there have been 220 million acres identified as WUI in the United States, with populations exceeding 120 million people residing in 50 million housing units. This has created a growth rate of 300 percent in the WUI, more than the general population growth rate for the same time period (IAWF 2013).

Wildfires in the west are increasingly costly in many aspects from suppression efforts to stop the fire, to the loss of life and property that is occurring annually. Suppression costs alone have increased over the last 30 years from $240 million to $2.1 billion in 2015 (NIFC 2015). This does not take into account the loss of life, homes, resource values, and infrastructure. In 2015,

California lost 475 homes in the Butte Fire of 70,868 acres. The Valley Fire burned 76,067 acres destroying 1,280 single-family homes and 27 multi-family residences (FEMA 2015). The California Department of Insurance released an article indicating that these two fires alone totaled $1 billion in insured losses as of January 2016. The $1 billion dollars does not include all surplus insurance fire claims or damages to public infrastructure such as roads and utilities. Oregon, Washington, and Idaho also experienced a number of wildfires involving structures, such as the Lawyer Complex in Idaho that lost 50 homes and 75 outbuildings while the Okanogan Complex in Washington destroyed 154 structures and cost three firefighters their lives. Oregon's Canyon Creek Complex near the town of John Day also lost over 89 structures while over 900 residences were threatened.

Union County was no exception in 2015. Several wildfires plagued northeast Oregon including the Phillips Fire, which started on August 1. At approximately 2,600 acres, the fire threatened approximately 200 structures, the town of Elgin, and miscellaneous structures dispersed in the Sanderson Road area north of the town of Summerville and west of Elgin. Evacuation levels were put at "ready" with an estimated fire cost of $7.5 million dollars.

Increasing losses and suppression costs have shifted emphasis for both structural and wildland fire managers to expand work in an effort to speed up establishing fire adapted communities throughout the west. A concerted effort involving fire agencies, cooperators, and members of the public is needed. It is the desire of this CWPP to provide collaboration-based efforts that build toward living in fire prone environments and strive for adapting processes that create and maintain properties that can withstand a passing wildfire and allow for safe, defensible options for fire suppression resources to provide protection.

Although public input was limited at meetings, input was acknowledged through the mitigations provided by those in attendance. It was found that since the first 2005 CWPP local community protection projects in and near landowners homes have drawn a higher degree of interest and participation. Project proximity of the proposed treatment areas to homeowners property appears to play a key role in generating public interest.

Several members of the CWPP committee were also involved in a fire simulation in the spring of 2015, with various members of the local cooperators where needs were recognized. Additionally, survey forms were taken into account on concerns of those who participated. The CWPP committee incorporated several meeting results where emphasis was put on creating fire adapted communities within the county. The following issues, mitigations, and action items are a cumulative list developed from those meetings, designed for addressing communities living in fire prone environments.

Issue	Several responsibilities have been identified with no known capacity or individual assuming the duties to ensure follow through with community and fire agencies.
Mitigation #1	**Develop a position of County Fire Coordinator that can accomplish multiple missions.**
ACTION ITEM(s)	1. Identify specific roles and responsibilities such as database upkeeps. 2. Single contact for public and fire agencies in all hands all lands implementation 3. Coordinate with adjacent counties on cross boundary information sharing. 4. Update CWPP on new information and completed actions. 5. Coordinate training to increase rural certifications increasing overall wildfire response capacity. 6. Coordinate prevention efforts to include federal, state and local efforts
Rationale	There are several programs that are currently being administered by multiple individuals and agencies. By having a coordinator, consistency can be accomplished in training fire qualifications, training programs, up to date resource inventories and databases, and plan developments. This position can take an active role in planning and meeting the needs of the county in emergency response through coordinated efforts with fire agencies and members of the public.
Desired Condition	Integrates federal, state and local wildfire training, prevention and response.
How to implement and apply concepts	a. The position can be hosted by a local fire management organizations or consider a multi-county position to improve funding opportunities. b. Apply for two-year funding for a pilot first. c. Reach out to geographic areas that currently support a similar position. d. Modify a current position description to meet the needs of Union County.
CAR or areas directly in need	Countywide or multi-county wide with all agencies and community members
Timeline	
Funding Sources	

Issue	Public Information/Fire Prevention Officer retired and funding may not be available for replacement.
Mitigation #2	**Create a countywide multi-agency position to continue the work and build on the existing program.**
ACTION ITEM(s)	1. Develop a multi-agency funding mechanism to continue the position. 2. Develop a multi-level organizational structure for positions so community programs can continue to move forward with fire education. 3. Establish a Joint Information Center for all agencies.
Rationale	Having a multi-agency position allows for a common terminology and message for delivery to the public. In Union County, human-caused fires made up 38 percent of all fires from 1999 to 2008 and 47 percent of all fires within the WUI Zone area that is closer to communities. Potential benefits of this position would be to increase community connections; reduce the number of human caused fires through education and prevention programs; design a joint information center; involvement in the local Type III Incident Team Organization; prioritize and maintain an interagency blog. Presidential Policy Directive/PPD-8, 2011 recognizes actions taken to prevent natural disasters through integrated planning.
Desired Condition	Reduce the number of human-caused fires within the county, increase the wildfire education, and provide fire adapted community solutions to the public through a multi-agency forum.
How to implement and apply concepts	a. Involve all agencies in developing an agreement to fund and manage this position. b. Seek out other positions of this type that can be tiered to meet Union County needs. c. Possibly look at adjoining counties in developing a sub-regional/multi-county position to increase likelihood of a position and evaluate the needs of splitting it in the future. d. Roll responsibilities into County Fire Coordinator position should one be approved.
CAR or areas directly in need	The WUI Zone is a high priority for reducing human caused fires.
Timeline	
Funding Sources	**Fire Prevention & Safety Grants through FEMA** -The Fire Prevention & Safety (FP&S) Grants are part of the Assistance to Firefighters Grants (AFG) and support projects that enhance the safety of the public and firefighters from fire and related hazards. Volunteer Fire Assistance (VFA Grants) Oregon.govWildland-Urban Interface (WUI) Grants

Issue	Lack of interest and the public is unaware of home vicinity conditions and fire risks.
Mitigation #3	**Develop public education programs on infrastructure and homeowner risks, options, and funding opportunities.**
ACTION ITEM(s)	1. Set up a group that includes fire agencies and local residents to reach out to public. 2. Identify successful case studies both in and outside the county and identify guest speakers who have experienced wildfire. 3. Create educational programs that tier toward fire risk mitigation in the community. 4. Conduct field trips to areas within the county that have already taken initiative. 5. Support homeowners with "boots on the ground" concepts to provide onsite assistance. 6. Utilize recent wildfire issues that played a key role in protecting life and property. i.e.: road access, structure composition, property treatments.
Rationale	Collaboration of fire management agencies, cooperators, and residents within the county is vital to creating a true fire adapted community. Understanding existing conditions that lead to fire risk is essential in creating defensible space, home survivability, and safe deployment of fire-fighting personnel. Oregon State Fire Marshal Strategic Plan 2015 – 2019, Goal 1 – Engage communities and stakeholders in Office of State Fire Marshal programs and services. OAR 477.406 (1) The forester and a forest protective association may enter into a contract or agreement with each other, or jointly, …… for the prevention and suppression of fire on forestland or on land other than forestlands or both, to prevent and suppress fires.
Desired Condition	An all-inclusive community understanding and involvement in fire risk reduction and fire education.
How to implement and apply concepts	a. Work with local fire science programs at high school and college level to design an accredited course (even one hour credit) to draw interest. b. Utilize a Public Information/Fire Prevention position to take lead and work with fire agencies in getting the message out to communities. c. Use Mailer messages as a venue to get the work out. d. Provide opportunity for members of the public to observe wildfire simulation exercises.
CAR or areas directly in need	Union County Landowners
Timeline	
Funding Sources	

Issue	Multiple locations throughout the county within the WUI where large groups gather on an annual basis.
Mitigation #4	**Develop individual fire plans, evacuation plans, and defensible space plans for these locations.**
ACTION ITEM(s)	**1.** Work with activity organizers on annual dates and extent of geographic areas used. **2.** Educate landowners/organizers on fire risk mitigation and evacuation protocols. **3.** Focus should be for protection of life and property first. **4.** Overlap location of events with protection status to determine a lead agency.
Rationale	Several large gatherings occur throughout the county during the height of fire season. Many of these areas support week-long summer camp style settings for children and young adults. Some of these sites are located a distance from protection resources, resulting in long fire response times. With limited fire resources, these plans can provide preparedness opportunities. A fire plan will provide for some common protocols outlining protection of life as the number one concern. Most areas where events occur are under land protection only and often do not have structure protection. CWS stresses the importance to promote community and homeowner involvement when planning and implementing actions to mitigate the risk posed by wildfires. Presidential Policy Directive/PPD-8, 2011 recognizes wildfire preparedness in terms of actions taken to plan, respond to and recover from wildfire threat.
Desired Condition	Each gathering site will have an individual plan designed to reduce fire risk and protect life and property.
How to implement and apply concepts	a. The agency with protection authority for the area should take the lead on the coordination and plan development. b. If the area is not under protection authority, determine a lead in cooperation with local fire agencies. (Prevention personnel, County Coordinator) c. Onsite visits and opportunities for education could be incorporated with fire risk reduction efforts. d. Completed fire plan should be developed and shared with gathering groups, protection agencies, and local dispatch units.
CAR or areas directly in need	Camp Elkanah, Cove Christian camp, River Bend – Hilgard, 4-H camp Summerville, Other??
Timeline	
Funding Sources	

Issue	There is limited coordination for fire risk and fire emergency with local cooperators. i.e.: utility companies.
Mitigation #5	**Develop relationships with companies/cooperators that are likely to pose a fire risk or be involved in fire suppression situations.**
ACTION ITEM(s)	1. Utilize cooperators list developed during CWPP process. 2. Conduct several additional meetings revolving around cooperators' potential impacts to fire suppression efforts. 3. Identify fire suppression role cooperator may be involved with at time of a fire. 4. Continue to incorporate cooperators into the fire simulations in advance of fire season to educate all involved on potential interactions.
Rationale	During May 2015, some cooperators participated in the fire simulation conducted by Union County fire management agencies. This resulted in education of all parties on both the extensiveness of fire suppression and the overall likely involvement by cooperators. Some cooperators were involved only initially while others were involved for the entire fire duration. Current unforeseen risks can be communicated by working with cooperators ahead of time, providing opportunity for corrective actions prior to a fire incident. CWS supports mitigation strategies that ensure protection of infrastructure and values such as transportation, utilities, etc.
Desired Condition	Cooperators are involved in both fire prevention efforts and supporting suppression efforts.
How to implement and apply concepts	a. Send out letters to local cooperators identified in CWPP process. b. Increase cooperator types and numbers in the Fire Simulations. c. Conducted annual meetings with cooperators to share information on changes to cooperator coverage areas, fire protection coverage, and/or lessons learned from past fire experiences. d. Update agreements, plans, and CWPP to address new information. e. Develop opportunities for fire prevention; examples include railroad fires, powerline fires
CAR or areas directly in need	Power companies, Gas companies, American Red Cross, Local and State Law Enforcement, Railroad. Rinehart Hill and McCallister are hard pulls for trains and high fire start areas. Face of Mount Emily – sections of power lines are prone to coming down.
Timeline	
Funding Sources	

Issue	Existing homes continue to be at risk in many areas and new home construction considerations should include wildfire risk considerations.
Mitigation #6	**Use home improvement checklists that exist, develop new protocol for addressing home conditions to improve wildfire survivability.**
ACTION ITEM(s)	1. Educate the public in structure vulnerability and simple modifications that improve chance of positive outcome during wildfires. 2. Review/develop codes for Fire Siting Standards 3. Include landscape and ingress/egress issues that improve defensibility. 4. Work with interested landowners to be an advocate.
Rationale	The number of structures located in forested/grassland areas is continually increasing in comparison to the stagnant level of protection resources. In an effort to increase home protection and structure survivability fire siting standards should be applied to new construction. . Union County Zoning Partition and Subdivision Ordinance (UCZPSO) Fire siting standards. Specific section would depend on zone e.g. A-4 zone would be section 5.08. Senate Bill 360 for Oregon provides steps to create a more effective Interface protection system including education, prevention, and establishing standards for Interface property owners in managing or minimizing fire hazards and risk. The Oregon Forestland-Urban Interface Fire Protection Act supports enlisting the aid of property owners to turn fire-vulnerable urban and suburban properties into less-volatile zones where firefighters may more safely and effectively defend homes from wildfires. OAR 477.059 Obligation of landowner to comply with standards….(A) Fire hazards or risks on land within a forestland-urban interface due to the presence of structures or the arrangement or accumulation of vegetative fuels (B) Other fire hazards or risk or combination. CWS - The management option of developing building codes where ordinances will have a positive effect on reducing home loss was likewise considered.
Desired Condition	Decrease potential for structure loss and improve defensibility of structures throughout the county that provides a safer defensive zone for firefighters.
How to implement and apply concepts	a. Boots on the ground working with landowners. b. Continue efforts in public meetings. c. Establish future home construction building specifications. d. Conduct field trips and/or case studies to reinforce the concepts of defensibility. e. Continue to provide information on Firewise and other tools for reducing fire risk. f. Utilize Senate Bill 360 – Residential Assessment Checklist g. Reference Oregon.gov ODF-Fire Prevention Checklists
CAR or areas directly in need	All communities and residents.
Timeline	
Funding Sources	Wildland-Urban Interface (WUI) grants Volunteer Fire Assistance (VFA) grants

Issue	There is a lack of communication in conveying the current conditions of fire season (threat) and getting the message out for fire prevention and restrictions.
Mitigation #7	**Create consistent and a clear communication with posted signs and messages conveying fire prevention and fire threat level throughout the County Agencies.**
ACTION ITEM(s)	1. Collaboratively agree upon what the messages should say based on conditions in advance of fire season. 2. Develop new prevention sign selections that eliminate confusion. 3. Utilize message outlets to get the information distributed: web sites, blogs, Facebook, etc.
Rationale	The public is often confused on the rules and regulations of fire restrictions between agencies. Federal and state guidelines are not consistent across boundaries and utilize different protocols to band debris burning, campfires, and forest use. There is a lack of education and understanding of the rationale behind the regulations. The National Wildfire Coordinating Group through *Wildland Urban Interface Wildfire Mitigation Desk Reference Guide* 2014 promotes common wildfire mitigation language and culture. Oregon State Fire Marshal Youth Fire Prevention and Intervention Unit emphasize a collaborative fire service and community agencies program to develop and distribute prevention education. Cooperate with local, state, and national organizations to support professional and program development. OAR 477.406 (1) The forester and a forest protective association may enter into a contract or agreement with each other, or jointly, …… for the prevention and suppression of fire on forestland or on land other than forestlands or both, to prevent and suppress fires.
Desired Condition	Fire agencies send a clear consistent message to forest users on fire restrictions.
How to implement and apply concepts	a. Work with local PIOs/Prevention Officer to incorporate sign messages in workshops and school education programs. b. Increase signage in areas that are prone to human cause fires. c. Utilize funding sources to conduct education – East Face. d. Seek interest in local members of the public that are interested in volunteering in their community for fire prevention.
CAR or areas directly in need	Union County and communities.
Timeline	
Funding Sources	

Issue	Union County's economic stability was built on agriculture and forestry resources. It is a high concern that the local economy could be severely impacted long term if large scale, high intensity fires occur in the county.
Mitigation # 8	**Preserve and sustain wood products, view sheds, and recreation opportunities throughout the county.**
ACTION ITEM(s)	1. Treat "middle ground" areas within the WUI Zone aggressively. 2. Develop new utilization opportunities during vegetation treatment projects. 3. Explore creative project and implementation plans for fuels and vegetation treatments across ownerships lines. 4. Ensure wood products meet local needs through pace and scale while benefitting CWPP goals: firewood, biomass, timber, and forest products.
Rationale	Union County is reliant on a healthy land conditions in order to sustain economic stability. Local economics rely on highly diverse forest products such as timber, firewood, post and pole, forestry education programs, recreation (hunting, fishing, hiking/biking), ranching, and product gathering. Visitor spending is in the millions annually, with a high percentage coming from forest-related uses. (See Chapter IV) CRF-2011-title44-vol1-part 206 Federal Disaster Assistance 206.435 (c) Other considerations. Consideration should be given to measures that are designed to accomplish multiple objectives including damage reduction, environmental enhancement, and economic recovery, when appropriate. Oregon Department of Forestry continually invests in Oregon's environment to grow healthy forests. Using sustainable forest management tools that protect, maintain, and restore forest health to ensure Oregon's forest will remain a valuable asset.
Desired Condition	Community economic stability is designed to anticipate and meet current and future needs under a multi-year program.
How to implement and apply concepts	a. Landscape treatments should include multiple treatment tools, including biomass utilization, timber products, etc. b. Develop Pilot Projects or Study areas to implement and evaluate success/comparison of treatment methods. c. Expand on across-boundary treatments to create a larger wildfire risk mitigation area. d. Although high risk areas exhibit poorer vegetation conditions or a higher fire threat, provide opportunities to maintain low risk areas and improve moderate risk areas concurrently during project planning and implementation. e. Accelerate plan development; provide and streamline opportunities on both private and public lands that benefit local economies. f. Considerations of public input during planning that would limit comments from local community members and organizations. g. Firewood programs should include both live and dead products, where ladder fuel reduction is an objective.
CAR or areas directly in need	WUI Zone and communities at risk should be first priority. Areas beyond the WUI Zone and CAR should be considered if it logistically and economically makes sense for implementation. All high fire threat, fire effects, or fire risk areas beyond the WUI Zone should also be considered.
Timeline	
Funding Sources	Biomass Grant Resources - https://www.oregon.gov/ODF/ForestBenefits/Pages/Biomass.aspx

Issue	There is lack of education in communities on citizen's responsibilities and encouraging taking ownership of fire risk mitigation, and lack of capacity to implement a post-fire rehabilitation program.
Mitigation # 9	**Design an education campaign that is all-inclusive in terms of wildfire preparedness, prevention, evacuation, post-fire conditions, and living in a fire prone ecosystem.**
ACTION ITEM(s)	1. Present the benefits of being in a fire protection program 2. Discuss the importance of homeowners understanding of Evacuation protocols 3. Educate on Post Fire measures a property owner can take 4. Provide the public with a current assessment of the county's fire threat, fire effects, and fire risk. 5. Provide multiple education forums throughout the year to that cover: all hands all lands concepts, landowner responsibilities, what to expect pre/during/post fire.
Rationale	The 2015 fire season provided an example of overwhelming support by the community for our firefighting personnel, and yet illustrated how ill-prepared the citizens are in the event of a wildfire. Through public education and involvement, safety mitigations to protect life can also be addressed. Promotes partnerships between fire agencies, community members, and Firewise programs, Keep Oregon Green and the Oregon Office of the State Fire Marshal. Involving all agencies can mitigate public confusion in the event of a wildfire. The National Wildfire Coordinating Group through *Wildland Urban Interface Wildfire Mitigation Desk Reference Guide 2014* Recognizes Fire adapted communities, Firewise, Ready Set Go, Living with Fire (2) and whole community approach
Desired Condition	Full house in public education forums and overwhelming interest in landowner participation.
How to implement and apply concepts	a. Provide case studies, conduct site visits, use community volunteers to provide success examples. b. Utilize the local PIO/Prevention Officer to organize outreach and education forums. c. Share Checklists provided on Oregon.gov for fire prevention, fire programs and post fire land assistance. d. Design meetings and booths around public gatherings that draw large crowds. e. Develop activities within the community that involve local firefighting resources to build trust and public relations. For example, Monthly drawings for free mitigation treatments to promote boots on the ground, awareness, support and visibility of fire agencies. f. Integrate understanding and living in fire prone ecosystems in education through public forums/school programs/prevention workshops. g. Use FireWise, Ready-set-go concepts
CAR or areas directly in need	All CARs
Timeline	
Funding Sources	

Issue	There is a lack of understanding on smoke management issues and emission trade-off between prescribed burning, field burning, and wildfire.
Mitigation # 10	**Include smoke emissions information in public education forums on wildfire mitigations, project development, and treatment tools.**
ACTION ITEM(s)	1. Provide understanding and education on differences between prescribed burning and wildfire smoke emissions. 2. Develop countywide acknowledgement and flexibility regarding nuisance smoke during prescribed burning activities. 3. Review state smoke regulations that may currently impede successful implementation and achievement of wildfire mitigation objectives on the land. 4. Educate the public on cost benefits of prescribed burning where removal is not an economically viable option.
Rationale	Emissions trade-offs through utilizing management-ignited fire over wildfire has shown that fewer emissions occur from management ignitions. Prescribed fires generally produce two to four times less smoke than wildfires (Ottmar 1996). Additionally, the cost of fuels reduction through prescribed burning will be significantly less than wildfire suppression, and increases the likelihood of successful future suppression efforts in those areas.
Desired Condition	Leniency of smoke emissions released during management-ignited fires where objectives are related to wildfire mitigation, community protection, and future emissions reduction.
How to implement and apply concepts	a. Oregon.gov education management tools: brochure, guides, opportunities. b. Provide case studies and field visits pre and post burning for understanding of burning effects compared to wildfire effects. c. Initially focus prescribed burning in areas such as “middle ground” locations. d. Develop allowances for smoke impacts when fire mitigation is the primary purpose. e. Acquire and place additional smoke emission detection systems throughout the county to display comparisons of prescribe burning and wildfire emission. f. Team with Oregon Prescribed Fire Council in support of EPA’s Exceptional Events Rule (EER) changes of language in the revisions regarding management-ignited fires that meet pre-planned objectives. (including proposed rules: FR 72866, FR 75384 g. Establish research opportunities for individuals such as Roger Ottmar from Seattle lab that specializes in emissions.
CAR or areas directly in need	Union County and local communities.
Timeline	
Funding Sources	

Issue	There are still blocks of land within the county that are unprotected. Multiple areas exist where dwellings are in unprotected locations.
Mitigation #11	**Fire agencies should collaboratively chart, with affected landowners, a path to incorporate these into protection areas.**
ACTION ITEM(s)	1. Identify response agency with fire authority, staffing needs, and equipment. 2. Meet with homeowners within the unprotected areas. 3. Opportunities to expand existing protection districts or establish new ones. 4. Identify total number of structures that exist without protection and educate others on the need for incorporating those into a protection authority.
Rationale	Oregon Administrative Rules (OAR) support addressing unprotected lands: These rules allow for assessment of lands to determine zone type with the State of Oregon, depending on the zone 1 - costs, zone 2 - tax levy (allowing for establishing a rural fire protections district). These blocks of land support residential structures with no current fire protection jurisdiction, yet still receive protection through OAR Chapter 476 with post fire billing of property owner. Establishing a known fire jurisdiction will quicken fire response, resolve cost issues, establish protection jurisdiction, which could otherwise result in the potential increased risk to life, overall fire size and property loss.
Desired Condition	All lands and structures in Union County are under fire protection jurisdiction.
How to implement and apply concepts	e. Set lands with dwellings as a priority for protection and eventually incorporate all unprotected lands into a fire agencies jurisdiction. f. Determine land zone according to OAR 476.310 through 476.340 and work with landowners to incorporate properties for protection. g. Emphasize to landowners the benefits of being in a protected area. h. Establish additional protection facilities where necessary and link this to Wildfire Response Mitigation # 6.
CAR or areas directly in need	Within the entire county there are approximately 45,611 acres of unprotected lands including Valley lands west of Cove, Lower Cove Area, and a thin strip adjacent to Mt. Glenn road, HWY 203 along foothills to Hot Lakes, SE of Union and west of Hwy 203.
Timeline	
Funding Sources	

Restore and Maintain Landscapes

Goal: ***All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.***

In 2013 Thomas Tidwell, Chief of USDA Forest Service presented a Wildland Fire Management status before the Committee of Energy and Natural Resources, U.S. Senate on June 4, 2013. He provided a definition of restoration as:

> "By restoration, we mean restoring the functions and processes characteristic of healthier, more resistant, more resilient ecosystems, even if they are not exactly the same systems as before.
>
> Approaches to restoring fire-adapted ecosystems often require treatment or removal of excess fuels (e.g. through mechanical thinning, prescribed fire, or a combination of the two), reducing tree densities in uncharacteristically crowded forests, and application of fire to promote the growth of native plants and reestablish desired vegetation and fuel conditions."

This CWS goal recognizes that many geographic areas support ecosystems that are dependent of fire disturbance as an influencing agent not only for florae, but for all biotic life, including wildlife, aquatics, and insects. Guiding principles and core values outlined in the CWS take into consideration the need to sustain fire resilient ecosystems. These include:

a. *Reducing risk to firefighters and the public as the first priority in every fire management activity.* Designing large scale management activities that mitigate fire risk on the landscape will not only provide opportunities for successful fire suppression but change fire behavior where fire crew personnel can actively engage in suppression.
b. *Actively manage the land to make it more resilient to disturbance, in accordance with management objectives.* A resilient landscape achieves multiple fire management objectives, including restoration of ecosystem functions, opportunities to alter fire behavior for effective suppression efforts, overstory vegetation retention post fire, maintenance of previous management investments, and move stands to a more historical condition.
c. *Wildland fire, as an essential ecological process and natural change agent, may be incorporated into the planning process and wildfire response.* Union County supports fire return intervals of anywhere from 12 years to 75 years, which in ecological terms is a very short interval. Planning projects, particularly in the "middle ground" locations of the WUI Zone should be designed with this in mind.

Decades of successful fire suppression have provided opportunities for ecosystems to become overstocked, in effect elevating the level of ecosystem damage on landscapes. Managing for

landscape resiliency improves overstory sustainability post-wildfire, providing opportunities for natural regeneration and modification of wildfire behavior.

Landscapes throughout the United State, particularly in the west, have seen significant changes in forest conditions. Millions of acres of forestlands in the Western United States contain a high accumulation of flammable fuels compared to fuel conditions prior to the 20th century, which in turn have posed an increasing fire hazard for many decades (GTR 120, Skinner and Chang 1996, Covington and Moore 1994, Arno and others 1997, Hann and others 1997, Swetnam and others 1999). Fire exclusion over the last century has resulted in substantial buildup of surface fuels and increase in forest structure layers brought on by overstocking of forest trees. These changes have increased the susceptibility of once fire resilient stands. These conditions provide a ladder fuel, in which surface fires can transition into crown fires resulting in unprecedented fire behavior, stand mortality, and increased safety issues for firefighters and members of the public. Crown fire initiation is often influenced by fuel alignment from the ground to the canopy, with increased likelihood when sufficient fuel is available.

Prior to the 20th century, human and lightning caused fires frequently burned with low severity in most dry ecosystems throughout the west. This low frequency, low severity fires acted as a cleansing agent for forest ecosystems by accomplishing several actions:

a. A control agent for regeneration, often promoting only the fire-tolerant, healthy trees.
b. Prevented forest fuels and biomass buildup
c. Maintained a low stand density by promoting open forest structures
d. Low densities promoted healthy stands, in turn lowering potential impacts from insects and disease
e. Promoted landscape and biodiversity through natural burning, creating heterogeneous ecosystems

Large areas of western grasslands and fire-adapted forests are in need of restoration. The forest and rangeland health problems in the West are widespread and increasing, affecting wildlife habitat, water quality and quantity, and long-term soil productivity, while providing conditions for uncharacteristically large, severe, and costly wildfires, with increasing threats to human life and property (CWS 2014).

The U.S. Forest Service is governed by a variety of laws it must follow in carrying out federal forest policy. Included among these are, but not limited to: the National Forest Management Act, the National Environmental Policy Act, and the Endangered Species Act. All told, the United States Department of Agriculture (USDA) reports that more than 90 separate statutes affect management within the Forest Service.

Issue	Current landscape conditions if left unmanaged will impact *economic* stability of the County.
Mitigation #1	**Explore opportunities for projects and implementation plans to consider all tool options and potential economic impacts of wildland fire while protecting communities.**
ACTION ITEM(s)	1. Develop new utilization opportunities of fuels and vegetation 2. Maintain all hands-all lands concept for resilient landscapes 3. Retain allotments and grazing opportunities 4. Preserve and sustain view sheds and recreation opportunities 5. Increase pace and scale of treatments
Rationale	Local forests provide significant economic stability from timber, recreation, hunting/fishing, and gathering, as described in Chapter IV. Sustaining infrastructure (mills/contractors) is essential to provide cost effective management options and utilization. The average Environmental Impact Statement, which is used for large forest management projects, takes 37 months (McClintock 2015). The agency needs to continue to advance the Cohesive Strategy and treatment of landscapes collaboratively through our Accelerated Restoration Strategy to increase the number of acres and watersheds restored across the system, while supporting jobs and increasing annual forest products sales (Tidwell 2013). Simplify processes to expedite treatment within WUI Zone boundaries.
Desired Condition	Restoration and retention of forested lands that encourage visitor use, allow for wood products, and sustain fire resilient ecosystems across the landscape.
How to implement and apply concepts	a. Ensure vegetation treatments; attempt to utilize all wood products including firewood (live and dead), biomass, and timber. b. Provide Categorical Exclusions or expedited process in "middle ground" general forest areas regarding NEPA Environmental Assessments where objectives include community protection. c. Implement Section 428 of the 2012 Consolidated Appropriations Act - authorized the Agency to establish a pre-decisional objection process for projects. Considering public concerns before a decision is made aligns with and strengthens our collaborative approach to forest management increasing the likelihood of resolving potential concerns, and resulting in better, more informed decisions. d. Utilize the Collaborative Forest Landscape Restoration (CFLR) Program to restore large landscapes. CFLR projects that will emphasize restoration across large-scale landscapes in order to reestablish natural fire regimes and reduce the risk of uncharacteristic wildfire. Reach agreement prior to decision.
CAR or areas directly in need	All lands. Pace and scale on public lands particularly WUI Zone where communities are impacted and in general forest were natural resources are at risk.
Timeline	
Funding Sources	2014 Farm Bill expands the tools to support the Forest Service ability to accomplish restoration work on the ground (Tidwell 2015).

Issue	Current planning processes do not appear cost effective and are small acreage projects, which are ineffective in terms of fire behavior modification, ecosystem restoration, and improving suppression resource success in middle ground areas.
Mitigation #2	**Increase speed of project planning and implementation and scale of projects while emphasizing cross boundary all hands-all lands approaches.**
ACTION ITEM(s)	1. Produce watershed level planning that takes in big picture concepts to avoid multiple small planning areas. 2. Identify NEPA obstacles. Lobby for and identify policies that support accelerating projects toward the implementation phase. 3. Take advantage of opportunities of similar treatments across jurisdictional boundaries. 4. Utilize categorical exclusions whenever possible to expedite planning.
Rationale	The average Environmental Impact Statement, which is used for large forest management projects, takes 37 months (McClintock 2015). A way to increase pace and scale of forest restoration and management is to improve the efficiency of planning timber sales and stewardship contracts. There are currently efforts to identify and implement process improvements and efficiencies that help with increasing pace and scale of restoration, while also engaging the public and developing well-planned projects (Tidwell 2015).
Desired Condition	
How to implement and apply concepts	a. Use Good Neighbor Authority – 2014 Farm Bill. Allows the Forest Service to enter into cooperative agreements or contracts with States and Puerto Rico to allow the States to perform watershed restoration and forest management services on National Forest System (NFS) lands. b. Utilize the Collaborative Forest Landscape Restoration (CFLR) Program to restore large landscapes. CFLR projects that will emphasize restoration across large-scale landscapes in order to reestablish natural fire regimes and reduce the risk of uncharacteristic wildfire. Reach agreement prior to decision.
CAR or areas directly in need	Start with attention being near CAR and within WUI Zone areas with cross-boundary treatments and landscape approaches. Aggressive middle ground treatments. Beaver Creek Watershed.
Timeline	
Funding Sources	2014 Farm Bill expands the tools to support the Forest Service ability to accomplish restoration work on the ground (Tidwell 2015).

Issue	Post wildfire impacts currently have the potential to result in high mortality percentages at a landscape scale, similar to NE Oregon wildfires of 2015.
Mitigation #3	**Develop landscape treatment opportunities that reduce mortality and increase retention of overstory structure post wildfire.**
ACTION ITEM(s)	1. Utilize multiple tools for vegetation treatments 2. Plan resource goals and treatment strategies that are designed to reduce wildfire behavior. 3. Propose treatments that promote fire tolerant early seral species that historically existed on the landscape, in fire prone ecosystems. 4. Reduce homogenous landscapes thereby creating landscape diversity and species retention.
Rationale	Fire is recognized and accepted as a natural process that has been prevented from assuming its role in the ecosystem. It is necessary for the maintenance of many ecosystems; however successful suppression has allowed ecosystems to deviate from their historical conditions. Post-fire assessments show that fuels and forest health treatments are effective in reducing wildfire severity (Tidwell 2013, Ecological Resource Institute 2013) The Cohesive Wildfire Strategy and multiple federal policies address treatments that promote ecological fire restoration. i.e.: Department of Interior Budget Justification, Western Governors' Association, U.S. Department of Agriculture, Bureau of Indian Affairs, etc. Retention of ecological and landscape integrity protects county air and aesthetic quality, seed sources for future vegetation, lessens soil impacts and accelerates overall ecosystem recovery post fire.
Desired Condition	Fire resilient landscapes in areas of fire prone ecosystems through the retention and development of early seral species, diversity on the landscape with primary focus of the reduction of fire behavior characteristics.
How to implement and apply concepts	a. Provide opportunities for pilot projects to evaluate the cost of landscape treatments with the benefits of suppression and post fire costs. b. Promote fire tolerant species and stand structures, particularly in the middle ground areas, that exhibit reduced wildfire behavior characteristics during summer fire season. c. Approach projects on an all hands-all lands concept.
CAR or areas directly in need	WUI Zone and Communities at Risk followed by all other areas within the county identified as in need of restoration.
Timeline	
Funding Sources	

Issue	Some areas exist that have been previously treated and are not planned for maintenance of initial investment. These areas are at risk of transitioning back into their pretreated state.
Mitigation #4	**Although these areas may not all be at a high fire risk, approaching treatments with landscapes in mind will provide an avenue for maintenance of previous investments.**
ACTION ITEM(s)	1. Incorporate previously treated areas into proposed treatment projects. 2. Landscape treatments, regardless of tool used, must have a plan included for maintenance of investments for the future. 3. Include maintenance across boundary.
Rationale	Once treatments are achieved to move ecosystems to a more sustainable condition it is imperative to retain not only the investment, but the ecosystems themselves into the future. The Healthy Forest Restoration Act Section 102(g) (8) requires the USDA Forest Service and DOI BLM to develop a process for monitoring the need to maintain treated areas over time. Federal Wildland Fire Management Policy 2009 – Ecosystem sustainability. Agencies should use a full range of fire management options to sustain healthy ecosystems. Cohesive Wildfire Strategy identifies as one of its primary goals – "Restore and Maintain Landscapes"
Desired Condition	An organized process of *long term* treatment rotations, across jurisdictions, that provide re-entry opportunities to maintain initial investments and sustain healthy ecosystems.
How to implement and apply concepts	a. Develop a pilot project or research opportunity to evaluate the cost benefit of retaining initial investments. b. Outline a schedule of maintenance treatments into the annual program of work (USFS and DOI HFRA, p. 38). c. Look for opportunities for volunteer groups to assist with private landowner maintenance. d. Utilize local contractors on second entry prescribed burning where initial treatments have been completed, providing agency personnel to focus on first entry.
CAR or areas directly in need	WUI Zone and Communities at Risk Areas within Union County
Timeline	
Funding Sources	

Issue	Deficiency of public education forums focusing on ecosystem restoration and sustainability.
Mitigation #5	**Develop education and information sharing opportunities that address local issues and opportunities.**
ACTION ITEM(s)	1. Establish education programs or customize already-developed programs to meet local needs. 2. Collaboratively work together with the county to reach out to a diverse audience. 3. Improve and expand communication between knowledgeable experts, scientists, program managers, and stakeholders to ensure the best information is conveyed. 4. Create local community-based partnerships to focus on actions proposed.
Rationale	Destructive wildfires have occurred in both the Pacific Northwest and Southwest over the last decade. As a result, the public's perception of the fire environment is based on worst-case scenarios. Fire prone environments and ecosystem dependency on wildfires is not commonly discussed with community members and there is a need for education on ecosystem benefits and restoration treatments. Current ecosystem conditions are continually posing a safety threat to fire-fighting personnel and members of the public. Demonstrating how past successes have changed the outcome of wildfires and where treatments have benefited not only defensible space but landscape resiliency is key to program accomplishments.
Desired Condition	A program geared toward living in fire prone ecosystems that creates an informed public of all ages.
How to implement and apply concepts	a. Develop a program of fire prone ecosystems into a comparable forum similar to the fire prevention program. b. Capture successes of treatments vs. wildfires in non-treatment areas to demonstrate effectiveness of management. c. Utilize the PIOs and County Fire Coordinator (if created) to work together in the county. (Otherwise use local fire management staff.) d. Provide a comparison of costs of treatments verses suppression. e. Work with local communities, county, and colleges for guest speaker opportunities. f. Identify local and educational platforms that are open to guest speakers and/or subject matter experts. g. Start with internal education of agencies in order to provide consistent message.
CAR or areas directly in need	
Timeline	
Funding Sources	

Issue	Lack of public understanding of importance of prescribed fire use and smoke management trade-offs where wildfires are concerned.
Mitigation #6	**Educate community members of importance of fire in the ecosystem and associated smoke emissions.**
ACTION ITEM(s)	1. Collaboratively work together to provide consistent messages of why, how, when, and who should utilize prescribed fire. 2. Provide smoke emission comparisons for various stages of treatment and current landscape conditions. 3. Develop a Pilot project website and a system for internal and external communications and public relations (Blue Mnt. CWS) 4. Collaboratively work with Oregon Smoke Management on emissions flexibility for prescribed burning.
Rationale	Fire prone environments and ecosystem dependency on wildfires is not commonly discussed with community members and there is a need for education on benefits of "management prescribed fires" and smoke emissions tradeoffs. Prescribed fire is identified as a management tool that is not as severe under active prescribed fire regimes. Prescribed fire is one of the three primary means for managing fuels for ecological purposes and resource objectives. (CWS 2014). Some areas within Union County are non-accessible via motored vehicles and fit the characteristics where prescribed fire would be the appropriate management tool.
Desired Condition	Public understanding of importance of fire's role in the ecosystem and their role in living in fire prone ecosystems.
How to implement and apply concepts	a. Identify areas where prescribed fire is most appropriate during planning process. b. Invite subject matter experts to speak at local forums on emissions trade-offs. (Roger Ottmar – Seattle – PNW lab – 40 years research). c. Utilize Oregon Prescribed Fire Council to visit the county and work with local managers on getting message out to the public. d. Assess internal perspectives and educate agency personnel prior to public meetings for a clear consistent message. e. Provide information on summer wildfire emissions verses prescribed fire emissions.
CAR or areas directly in need	Middle ground area of WIU Zone and areas where landowners may have an interest in applying prescribed fire as a tool. Case by case basis. Other geographic areas in Union County not specified as part of WUI Zone or CAR
Timeline	
Funding Sources	

Issue	There is a need for creating both a resilient landscape and defensible space in the "middle ground" areas.
Mitigation #7	**Design projects that provide defensible space for suppression resources while retaining ecosystem integrity in fire prone environments.**
ACTION ITEM(s)	1. Use the all hands – all lands approach to project planning 2. Develop project planning objectives that promote fire prone ecosystems and opportunities for successful suppression in the middle ground area well beyond Communities at Risk. 3. Collaboratively work together to develop the most appropriate landscape projects.
Rationale	Union County's ecosystems are fire prone. Proactive aggressive treatments in the middle ground areas that protect both ecosystems and communities are needed. This area between communities and more distant wildlands provides fire managers with key strategic opportunities in fire suppression. Because of the vast lands in the west, including Union County, increasing the success of sustaining both ecosystems and communities in the event of a wildfire is imperative. The CWS clearly addresses the need for large landscape-scale changes in vegetation structure and fuel loadings to significantly alter wildfire behavior, reduce wildfire losses, ensure firefighter and public safety, and improve landscape resiliency.
Desired Condition	A landscape that provides long-term ecosystem benefits and opportunities for successful fire suppression well beyond communities.
How to implement and apply concepts	***a.*** Identify treatments that compliment objectives for both resilient landscapes and defensible space. ***b.*** Address attributes that impede suppression success such as fuels, topography, and home location. ***c.*** Encourage attributes that promote survivability such as strategic placement of fuel breaks and use of natural barriers; strategic types of treatments (encouraging fire tolerant species); maintenance of public road right-of-ways for defense. ***d.*** Present projects to Forest Collaborative to promote forward movement on implementation. ***e.*** Use Plans and Policies that guide land management and community protection.
CAR or areas directly in need	WUI Zone
Timeline	
Funding Sources	Good neighbor Authority – 2014 Farm Bill.

Summary

During CWPP committee discussions, it was recognized that wildfire suppression will continue to be a priority; as a result there is the need for preparation in advance of wildfires through agencies and landowners proactive actions toward structure composition and landscape scheme, adjacent vegetation treatments, and infrastructure design. Each of the goals of this CWPP plan was assessed for existing issues within Union County, particularly in the WUIZ and Communities at Risk. Mitigation measures were developed based on those existing issues.

Several local, state, and federal policies and guidelines stress the importance of designing mitigation measures to reduce wildfire risk and protect life and property. This CWPP recognizes wildfire mitigations recommendations with reference to those policies and guidelines.

By designing current issues based on local fire management, cooperator, and public needs, the county was able to create opportunities by way of mitigation action items to mitigate wildfire risk while meeting the CWPP goals and objectives. Action items tiered to the mitigations is designed with the desired outcome in mind. It is also important to recognize that as conditions change, both spatially and temporally; modifications will and should occur as needed as new issues arise and changes to mitigations are needed.

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IX. Fuels Treatment, Maintenance, and Biomass

Introduction

Fire is an important regulatory phenomenon in forest communities of the Blue Mountains as well as most areas of the intermountain western United States (Gast et al. 1991). Historically, in pre-European settlement periods, the Blue Mountains burned with relative frequency in a variety of forest types including ponderosa pine/Douglas-fir stand structures to moist mixed conifer type forests that under today's vegetation composition may not have necessarily been the same as vegetation that would have developed with historic disturbance regimes (Stine et al 2014). Drier sites generally experienced fires every 0 – 25 years, retaining predominately fire-tolerant species, while the historical vegetation of the moister mixed forest was controlled by frequent to moderately frequent fires (every <20 to 50 years) that burned with mixed severity, containing both low- and high-severity patches (Stine et al 2014).

During the dry season, wildland fires frequented the landscapes of Eastern Oregon, giving the area a blue tint from the smoke and haze, earning the mountains east of the Columbia Basin the Blue Mountains name. Many sites of the low and mid elevation areas where these fires burned, forests were park-like, dominated by fire-resistant pine, and on wetter sites, western larch (Mutch et al. 1993). Settlers in the nineteenth century reported riding horseback and pulling wagons or miles through the area (Wickman 1992).

Fire disturbance on the landscape is an important component for ecological process and promoting healthy forests. Through history, wildfire acted as a cleansing mechanism, shaping stand structures and characteristics across the landscapes. Historically, fire interaction in Union County's ecosystems accomplished several things.

1. Fire consumed dead material on the forest floor and prevented build-up of large quantities of forest debris.
2. Acting as a cleansing agent, fire killed some newly established regeneration, naturally thinning stands and preventing overstocking of landscapes and high competition for water.
3. Historic fires often burned as surface fires pruning lower limbs off the overstory trees thereby raising the height of the tree crown above the ground level (canopy base height). This sets the stage for future fires to actively burn with very little impact to overstory tree crowns.
4. Spatial extents of fires were often left unchecked, creating burning patterns that were mosaic, covered large areas with low intensities, and set the stage for minimal impact when another fire occurred in the area.
5. Frequent fires are often associated with lower smoke emissions due to shorter burning duration in grasses and fine fuels, versus current fires that exhibit high emissions from heavy ground fuels and fire-involved canopies.

6. Wildfires conducted periodic maintenance of the landscapes by killing non-fire tolerant species through natural thinning, leaving species that were fire resilient.

The wildland fire environment is directly related to fuel availability, which is directly related to fire frequency. Successful fire suppression brought to the forests in Union County and throughout the northwest an absence of wildfires that historically acted as a cleansing agent by removing both live and dead fuel.

When early explorers, missionaries, and settlers first entered the Blue Mountains in the mid-1800s, they encountered a vegetation mosaic that was the result of long-term wildfire interaction. Many areas were dominated by open, park-like forests of ponderosa pine, often with a luxuriant undergrowth of tall grasses reaching as high as their horse's belly. Those attractive landscapes had been created and maintained by low-intensity surface fires occurring at frequent intervals, usually every 8–20 years (Agee 1993, Anderson and others 1987, Cooper 1961, Franklin and Dyrness 1973, Hall 1977, Marouka 1993, Weaver 1947b).

The western United States has seen several shifts in the wildland fire environment. Forests historically experienced frequent low intensity surface fires. Then in 1910 large landscape wildfires occurred throughout the Northwest causing a change in fire suppression policies across the west. Wildfire starts were under the guidance of full suppression removing its interaction from the ecosystem. Through the mid-1970s to the present, there has continued to be a level of successful fire suppression. However, those that have escaped initial attack (about two percent) are exhibiting unprecedented fire behavior, resulting in stand replacement fires in locations that once supported low surface fires. As a result, Northeast Oregon currently has an overwhelming number of acres in need of forest management to transition the ecosystems to a closer representation of pre-European settlement open forests.

Forest Health

Fire exclusion in forests of the Blue Mountain Region of northeast Oregon has resulted in significant changes since European-American settlement. The forests of the Blue Mountains have evolved in the context of a disturbance regime dominated by fire (Agee 1996). Fire suppression over the past 80 years has led to significant accumulation of fuel, increasing the probability of catastrophic wildfire over much of the Blue Mountains landscape (Gast et al. 1991, Agee 1996). Inadvertently, the absence of fire over an 80 to 100-year period allowed Douglas-fir, grand or white fir to take over the forests, slowly replacing the pine and larch (Oester, et al. 1992. Forest Health in eastern Oregon).

A drastic change in the ecology of the Blue Mountains ecosystems began as a consequence of fire suppression, which became increasingly effective after the 1930s (Agee 1990). Changes to landscape environments over the last several

decades resulted in unprecedentedly poor ecological conditions today. These negative impacts are often interrelated, producing a ripple effect resulting in multifaceted contributing factors. These factors include: encroachment of shade-tolerant, fire-intolerant species, stands at very high stocking levels in spaces which historically were open with a low number of trees per acre, high tree stress due to competition for water, and widespread impacts from insect and disease. Exacerbated by an extended drought in the Blue Mountains, they have led to unprecedented wildfire behavior on the landscape.

Overstocking created ideal microclimate conditions across the Blue Mountains for insect infestation and disease. As early as the 1980s, landscape conditions in and around Union County experienced high levels of tree mortality. In northeast Oregon, including Union County, 655 million board feet of timber were lost to bark beetle between 1986 and 1991. An estimated 4 million acres were defoliated in 1991 alone by the western spruce budworm (Oester et. al 1992).

The lack of fire activity on the landscape allowed for additional increases in both stand density and fuels accumulation. Stand structure composition and spatial patterns on the landscape have also shifted. Today's landscapes are now more consistently uniform in nature, with most timbered stands exhibiting characteristics that contribute to extreme fire behavior.

Patch sizes of high severity have increased, leaving less low and moderate severity patterns on the landscape. Fire intensity (amount of heat energy generated) has increased, surpassing the past fire-intensity range, because of fuel buildup and "ladder" fuels enabling surface fires to move into the canopy (Agee 1994). Landscapes that were once accustomed to surface fires are now experiencing thousands and thousands of acres of stand replacement fire. The Windy/Cornet fire south in Baker County, and the Grizzly Fire north in Wallowa/Umatilla County both burned with extreme fire behavior and exceeded 40,000 acres. If left untreated, stands will continue to experience larger patches of torching and crown fires and the potential for non-historical unprecedented extreme fire behavior.

Eliminating wildfire from the landscape is not realistic, particularly in a fire prone ecosystem where natural fires are the predominate source of ignition. Changing how fire burns on the landscape, however, is possible. A century of fire suppression, low pace and scale, delays in project implementations, treatment restrictions based on land base and limited commercial logging opportunities have compounded landscape conditions. Proactive management toward the goals of this CWPP will provide mechanisms for living with fire.

Importance of Fuels

Wildland fuel has always been classified as vegetative material that will burn during a wildfire. These fuels include dead and down material, live vegetation,

lichen, mosses, and organic material such as duff (organic material immediately above the soil) and roots. Recently however, the increase of homes in forested areas has compounded an already complex fuel composition. As a result, fire and land managers have combined efforts to address the increasing difficulties of pre-fire planning, fuel modifications, and fire suppression.

Landscape fuels play a significant role in wildland fire fighting. Stand and fuels structure influence several aspects of the wildfire environment such as: the likelihood of a fire ignition, fire behavior characteristics on the land including flame lengths and rates of spread, and how fire will spread on the landscape once an ignition does occur. In the wildland fire setting, fuel is the only constant in both the fire triangle requirements for ignition (heat, fuel, oxygen) and the fire behavior triangle (fuel, weather, and topography), referencing the influences of wildfire behavior characteristics.

Fire Triangle

Fire Behavior Triangle

Figure IX – 1. Fire Triangle – components needed for an ignition to occur. Fire Behavior Triangle – components that dictate how a fire will burn. Fuel is the common denominator between the two.

Even more importantly, fuel is the one component of both fire triangles where management activities can manipulate part of the fire equations and influence the fires interaction on the landscape through planning and implementation well in advance of an ignition. It is important to know how fuel arrangements can affect fire behavior and what impacts fuels modifications can have on wildfire behavior. There are several layers of a forest fuel bed that influence wildfire.

Ground Fuels

- Duff - organic matter just above the soil such as some rotten logs and needle mat
- Mosses, litter, needle cast

Surface Fuels

- Woody fuel – small limb wood, logs, dead down fuels (large quantities can act as ladder fuels)
- Low vegetation – grasses, shrubs, herbs

Aerial Fuels

- Ladder Fuels - Tall shrubs/brush, suppressed understory
- Tree canopy – dominant and co-dominant overstory, suppressed understory, snags

Each of these fuel layers can be can be manipulated to create a change in the fire behavior environment. However, the focus of this document is on how management can play a role in altering the influence of surface fuels and aerial fuels on fire behavior.

SURFACE FUELS

Surface fuels consist of grasses, shrubs, litter, and woody material lying on, or in contact with the ground surface (Sandberg and others 2001). These fuels are often used as indicators of surface fire spread rates. Dead woody material is critical in predicting fire potential because they are controlled exclusively by their exposure to environmental conditions such as humidity, shading, proximity to soil that influence fuel moistures levels.

Live fuels in the category are considered a dynamic type fuel because fuel moisture levels will differ depending on which growing season phase is occurring. Live fuels have a high fuel moisture content in the spring growing season and begin to cure throughout the fire season, eventually losing most if not all their moisture by mid-summer into the fall season. Many of the live surface fuels, particularly grasses, eventually transition into the dead woody material category increasing the available dead fuel component and potential fire behavior as the season progresses.

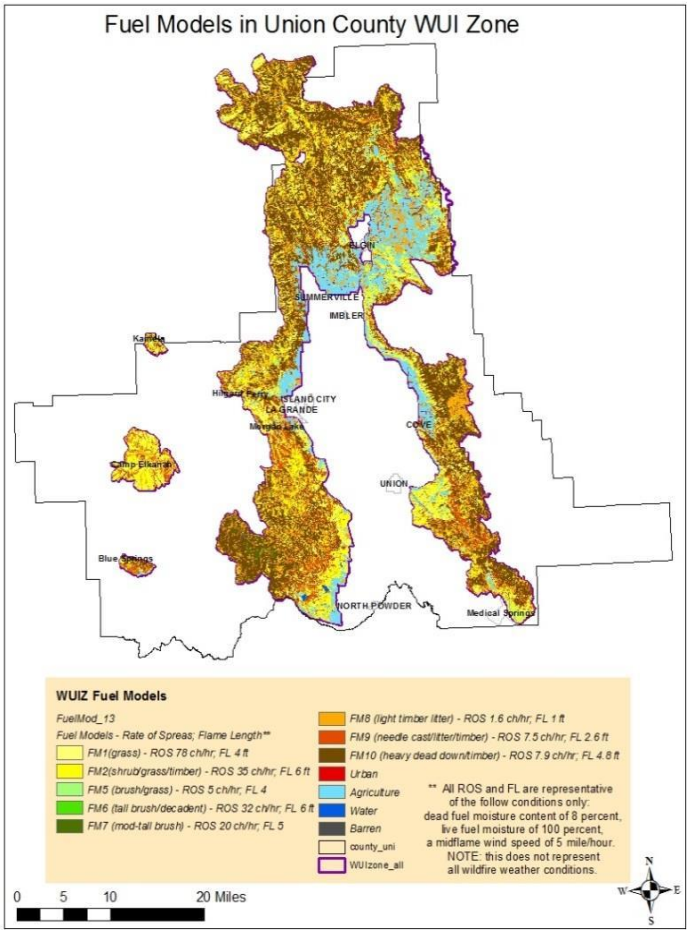

Table IX-2. Fuel Model composition within the WUIZ. Data from the WWRA. Fire Behavior is based on Anderson 1982. Aids to Determining Fuel Models for Estimating Fire Behavior.

Because there has been a shift in stand conditions, there has been a direct effect on fuel loadings. As stands become denser, there is more available woody material to contribute to the forest floor (Oliver et al., 1996). The shifting of stand condition has contributed to higher than historic accumulations of dead, down woody material. Stand characteristics are directly related to and influence the amount, size and arrangement, and distribution of surface fuels at ground level, both live and dead. These surface fuels are often at the heart of crown fires since most ignitions initially begin as ground fires and transition to the canopy.

Different fuel treatment approaches can be designed for targeting various components of the fuel bed and stand structures. Prescribed burning and piling and burning woody debris will target surface fuels, while pruning and stand thinning will mainly treat aerial fuels.

Fuel models are broken out into four groups: grasses, brushes, timber, and slash. Surface fuel mapping shows approximately 86 percent of the WUIZ is comprised of a variety of fuels including: grass, grass/brush, brush or timber litter with a down woody fuel component. Nine percent of the WUIZ is non-timbered grass or brush with the remaining 77 percent of the surface fuel nestled within timber. Timbered stands that have been allowed to transition through the last 80 years without disturbance have a higher likelihood of exhibiting a fuel model 10. This fuel model supports the highest component of fuel size classes with a high level of large fuels.

Fuel model 10 often displays greater fire intensity than the other timber models. The larger quantities of both fine fuels (0 – 3 inch) combined with greater amounts of large woody material from three inches in diameter to large logs increase fire behavior. Stands that support large woody material size and amounts also exhibit long residence times (when a fire sustains itself in one location for extended periods), resulting in possible additional fire effects in terms of destruction of organic soil material (soil sterilization), an increase erosion potential, and the loss of site productivity.

Sixty-seven percent of the WUIZ is timbered, and 67 percent of the timbered areas in the WUIZ are supporting fuel loads that are outside of historic conditions. Crowning out, spotting, and torching of individual trees are all more frequent in this fuel situation, leading to potential fire control difficulties (Anderson 1982). Figure IX - 2 displays the landscape distribution of fuel model 10 within the WUIZ.

Aerial Fuels

Heavy down fuels, ladder fuels, and poor health of the overstory are prime conditions for high-severity fires. Crown fires caused by excessive fuel accumulation are generally a severe threat to ecological and human values as well as to infrastructure; they pose a major challenge to fire management (USDA Forest Service 2003).

Identifying attributes that contribute to torching/crowning during wildfire is important in order to successfully create conditions that allow for protection of life and property, create resilient landscapes, and satisfy the three goals of the Cohesive Strategy.

Aerial fuels are typically trees and other vegetation suspended above the ground, often in the form of tree foliage such as branches, needles, lichen, leaves, tall

bushes, etc. Tree boles are included, but often play less of a role in fire behavior. Stand characteristics such as tree canopy cover, canopy cover distribution, tree crown ratio, and forest composition interact and influence the amount, composition and distribution of live and dead ground-level vegetation (Barnes and others 1998, Oliver and Larson 1990).

Historically, fires pruned the lower limbs of trees as they matured or killed the trees entirely, leaving primarily healthy stands where large spacing occurred from tree to tree and open spaces from lower tree limbs to the ground. Suppressed understory, when allowed to persist in stands, creates a continuous fuel bed both horizontally and vertically across the landscape. The lower limb distance from the tree boles to the ground is known as the canopy base height. As fire-intolerant vegetation continues to accumulate on the landscape, forest stands become increasingly denser, creating a homogeneous structure with low crown base heights resulting in an increased potential for crown fires in many forests of the Western United States (Cooper 1960, Dodge 1972, Van Wagner 1977, Parsons and DeBenedetti 1979, Bonnickesen and Stone 1982, Arno and Brown 1991, Agee 1993, Mutch and others 1993, Hann and others 1997). Changes in structure and composition have dramatically altered how wildfires now burn in these forests versus how they burned historically (Graham et al. 2004).

An increase in stand density also creates an increase of available fuels suspended above ground. These continuous aerial fuels escalate the likelihood of sustained crown fires, whereas breaks in stand continuity and structure can interrupt fire spread. The closer the gap from surface fuels to aerial fuels, the higher the potential for canopy involvement during wildfires. The greater the distance between surface fuels and the base of tree crowns, the more difficult it is for surface fires to torch trees or become crown fires. The increase in canopy bulk density (available canopy fuel in a stand) will increase the potential for a crown ignition to become an “independent” crown fire in which surface fuels no longer are needed to generate crown fire spread.

Photo 1

Photo 2

Figure IX - 3. Heavy crown fuels and low canopy base height provide pathway for overstory mortality and crown fire (photo 1), compared to high canopy base height and lower crown density (photo 2) where stands are likely to withstand a wildfire.

Ladder Fuels

Ladder fuels can be comprised of both surface and aerial fuels. Heavy down woody material, brush, understory growth, or overstory with low hanging foliage can provide a path for fire to move from a surface spread into the canopy. These stand characteristics can be a single contributory factor to canopy involvement during wildfires, or as more commonly seen, they can function as one of multiple conditional factors working in concert to generate canopy involvement.

The shrub/small tree stratum is also involved in crown fires by increasing surface fire line intensity (heat/energy release) and serving as "ladder fuels" that provide continuity from the surface fuels to canopy fuels, thereby facilitating crown fires. These intermediary fuels essentially bridge the vertical gap between surface and crown strata. The size of this vertical gap is critical to ignition of crown fire from a surface fire below (Van Wagner 1977).

Down Woody (Fuel Model 10)

Combination brush/second growth

Figure IX - 4. Examples of ladder fuels that promote the transition of surface fires to crown fires.

A century of widespread fire exclusion combined with the reduction of active forest management has resulted in a buildup of surface fuels and the overstocking of forests with trees and ladder fuels (CWS 2014). As a result, forest and rangeland health problems in the West are widespread and increasing, affecting wildlife habitat, water quality and quantity, and long-term soil productivity, while providing conditions for uncharacteristically large, severe, and costly wildfires, with increasing threats to human life and property (CWS 2014). Union County's WUIZ is comprised of an extensive amount of area with a canopy base height in close proximity to the surface fuels at ground level. Approximately 32 percent of the WUIZ is non-forested and is predominately located within the Grande Ronde Valley agricultural area. The remaining WUIZ is comprised of a high percentage of low forest canopy vegetation. Vegetation that supports canopy from forest floor to

two feet (24 inches) above ground accounts for 41 percent of the forested areas, 13 percent between two and four feet above ground, 4 percent between four and six feet above ground level, 7 percent between six and seven feet with only a total of 3 percent extending seven feet above ground level. Figure IX-5.

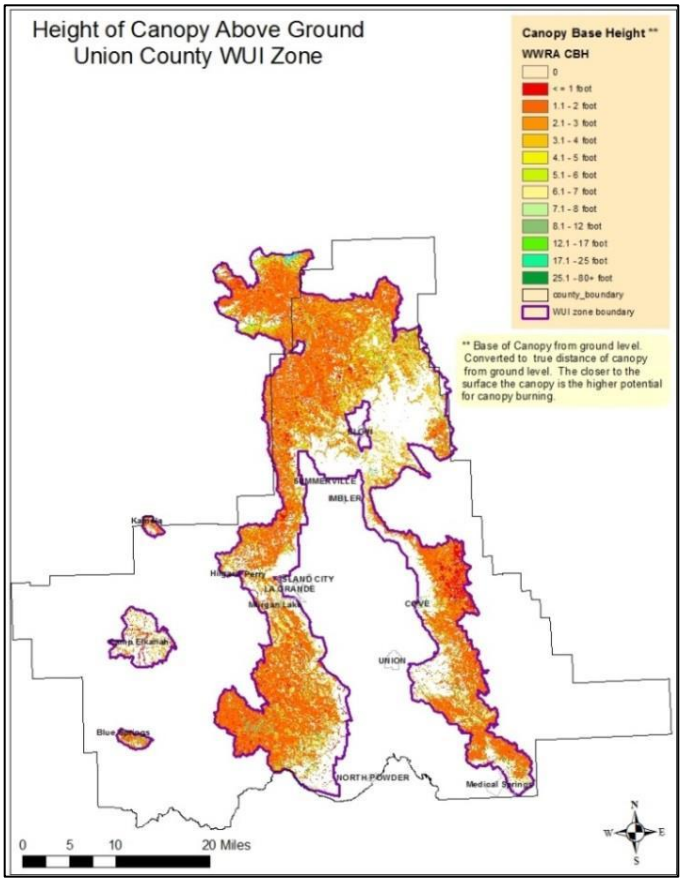

Figure IX - 5. The closer the canopy base height is to ground level, the higher the probability of canopy involvement during wildfire events.

A forest with heavy down woody material in combination with low canopy base heights not only has an increased potential for canopy involvement during wildfires, but also has a higher likelihood of long range spotting and large scale landscape fires.

The probability of a canopy fire in or near the county's communities is very high, as well as widely distributed throughout the WUIZ. Locations where the probability of canopy fire is highest are areas that support heavy down woody fuels in timbered stands, a low canopy base height or both (Figure IX – 6).

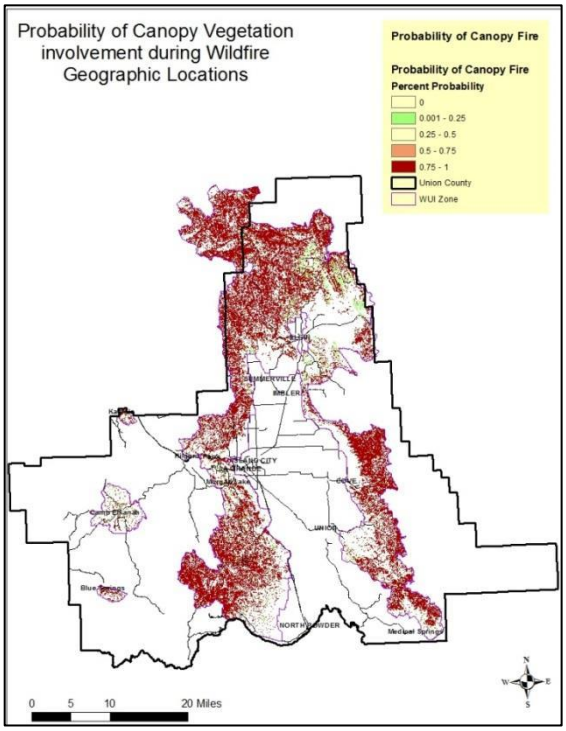

Figure IX - 6. The highest probability of canopy fires account for 60 percent of WUI Zone.

Fuels Treatment

Modification of any dead down woody fuel or live vegetative layers has implications for fire behavior, fire suppression, and fire severity (Graham et al. 2004). Active forest management, including thinning, reduces flammability in the mid-story and over-story, while treating surface fuels, including those resulting from thinning, decreases surface fire potential (Forest Service, 2003). The most effective strategy for reducing crown fire occurrence and severity is to (1) reduce surface fuels, (2) increase height to live crown, (3) reduce canopy bulk density, and (4) reduce continuity of the forest canopy (Agee 1996, Graham and others 1999, Scott and Reinhardt 2001, Cruz and others 2002).

WUIZ and Communities at Risk assessments show a need for treatment for several reasons, including expected fire flame lengths, fire spread rates, and probability of canopy fire, as outlined in Chapter VII of this CWPP. These expected behaviors do not reflect the worst-case weather conditions; under extreme weather it is expected that behaviors will be worse. Again, fire behavior is a reflection of the weather, topography, and fuels (burnable material). Manipulation of fuels is the option that can be realistically accomplished through management efforts. Fuels treatment to alter fire behavior is supported by several case studies, scientific communities, research laboratories, fire management, leaders of federal, state, and local agencies and community members. A detailed table of the implication of stand conditions and fuel types along with wildfire behavior and management considerations is located in Appendix K.

Union County is part of the Pilot Project for the National Cohesive Wildfire Strategy. The Northern Blue Mountain-Cohesive Strategy Pilot Project Action Plan has recommended actions for fuels management in an effort to meet the goals of the Cohesive Wildland Fire Management Strategy. Actions associated specifically with fuels management are identified below. Tasks to accomplish these actions are located in The Northern Blue Mountain-Cohesive Strategy Pilot Project Action Plan:

1. **Action:** Promote forest restoration/fuels treatment in and around communities. Also promote wildfire mitigation efforts in the "middle ground" further from communities.
2. **Action:** Promote collaborative forest management and restoration planning.
3. **Action:** Identify and Prioritize Landscapes for Treatment.
4. **Action:** Improve efficiencies and economics of forest biomass removal and marketing; improve understanding of biomass utilization resources, opportunities, and challenges; and improve understanding, acceptance and support and of biomass utilization as a tool for enhancing forest health and fuels reduction.
5. **Action:** Seek understanding, acceptance and support for managed wildfire (prescribed and natural).

There are several fuels management options available to modify fire behavior and reduce crown fire occurrence and overstory post burn severity. Appendix K describes the influence of fuel characteristics on fire behavior and management considerations. Current fuel characteristics have multiple influences on fire behavior that are counterproductive to meeting the CWS goals. Management considerations should include a variety of treatment objectives intended to improve suppression efforts, modify fire behavior, and mitigate fire effects while working toward a sustainable community that is designed to adapt to fire-prone environments.

Through landscape treatments of stand characteristics treatments have proven successful in modifying fire behavior. Some vegetation treatments may solely focus on one or more fuel stratums (layers) while other options may change dead fuel and vegetation both horizontally and vertically. Management treatments may also focus on altering forest species composition and stand structure to improve landscape resiliency by promoting healthy stands that include fire-tolerant species that can survive after a wildfire.

Four principles exist when considering treatments of forest fuels for fire resistant ecosystems, particularly in dry forest types like Union County's forests: reduce surface fuels, reduce ladder fuels, reduce crown density, and retain large fire-tolerant tree species (Agee and Skinner 2005). These principles also apply to altering fire behavior for protection of life and property and creating fire adapted communities.

Several case study reports are included in the CWPP files for reference. These include:

- The Hayman Fire Case Study where wildfire burned into previously treated mechanical and prescribed burning units.
- The Mountain Fire burned through approximately five types of fuels treatment. The document discusses how effectively fuels treatments reduced fire behavior or immediate effects on vegetation and soil.
- The Cone Fire, Blacks Mountain Experimental Forest burned over 2000 acres in an area where a large project was being conducted to study ecological responses to different stand structures. All treatments were less than 6 years old when the wildfire occurred.
- Evaluation of fuel treatment effectiveness and suppression costs. The case study focuses on the landscape on the Deschutes National Forest.

Aerial Vegetation Treatment

Thinning

The term “thinning”, for the purpose of this document, refers to stand treatments designed to modify standing vegetation where residual stems are distributed in such a manner that wildfire behavior and its effects on overstory vegetation is reduced and where suppression resources have increased the opportunities for successful fire suppression. Ladder and overstory vegetation stratum are often the target layers within a stand where thinning occurs, including: overstory, second growth or co-dominant species, suppressed understory, and brush. Several types of approaches or combinations of approaches may be used to accomplish management objectives. Depending on desired results, these include: cleaning, sanitation, selection cuttings, thinning from below, pre-commercial thinning, overstory harvest, species modification/eradication, etc. These applied approaches can alter fire behavior by meeting objectives that prevent surface fires and isolated tree torching from transitioning to crown fires. These treatments interrupt fire spread across the landscape by breaking up the homogenous stands and continuity, decreasing mortality of overstory from wildfire, and preventing insect infestation and disease, which contribute to the available dead fuel component. Available tool options include hand tools, machinery, prescribed fire, or a combination of methods.

Timber stand thinning of both commercial and non-commercial material is prudent for changing wildfire behavior on the landscape. High density canopy fuels if ignited can result in a spreading crown fire than low density canopies (Graham et. al. 2004). Canopy base height (distance of lower limbs from ground level), canopy bulk density (canopy weight for a given volume), and canopy continuity (continuous) are key characteristics of forest structure that affect the initiation and propagation of crown fires (Albini 1976, Rothermel 1991). Mechanical thinning is a more precise method that can target specific stand structures. It allows for accuracy in selecting both removal and retention of stand components. Used

alone, mechanical thinning, especially emphasizing the smaller trees and shrubs, can be effective in reducing the vertical fuel continuity that fosters initiation of crown fires (Graham et. al. 2004). Thinning to reduce continuous canopy horizontally can interrupt crown fire spread and reduce spot fire ignition probability.

Stand thinning provides benefits in wildfire behavior modifications and should be conducted in conjunction with follow up treatments of surface fuels. Without follow up treatment there is potential for an increase surface fuels loadings from thinning. Therefore, when considering stand thinning, due to the high percentage of heavy fuel loads within the WUIZ stands may require multiple treatment approaches to address residual surface fuels that may have previously existed or were generated during thinning. Unless the resultant thinning fuels slash is removed or treated, fire behavior could potentially increase in some areas.

Combining stand thinning with surface fuels reduction is the most effective approach in altering fire behavior on the landscape. The most appropriate fuel treatment strategy is usually thinning (removing ladder fuels and decreasing tree crown density) followed by prescribed fire, piling and burning of fuels, or other mechanical treatments that reduce surface fuel amounts. This approach reduces canopy, ladder, and surface fuels, thereby reducing both the intensity and severity of potential wildfires (Graham et al. 2004).

Pruning

Torching occurs when the surface flame length provides convective heating to tree limbs, and moisture content in the crown and the vertical distance to live crown from the ground supports ignition. This distance from ground to lower crown height of the tree is called canopy base height. Historically, low-intensity fires would burn as surface fires through the stands and scorch lower tree limbs, leaving the majority of the tree crown intact. Natural pruning has been largely absent from forests for more than 80 years due to successful fire suppression and a lack of active management.

Thinning of small-diameter material and pruning branches are more precise methods for reducing the likelihood of a surface fire transitioning into a tree crown or stand canopy. Manually pruning trees is a viable option in and near communities and structures. Prescribed burning is beneficial for targeting ladder fuels and surface fuel components at the same time, especially in the middle ground areas. The effect of removing ladder fuels is that surface fires burning through treated stands are less likely to ignite the overstory canopy fuels (Graham et. al. 2004).

Surface Fuel Reduction

Models and observations of landscape-scale fire behavior and the impacts of fuel treatments clearly suggest that a landscape approach is more likely to have significant overall impacts on fire spread, intensity, perimeters, and suppression

capability than an approach that treats individual stands in isolation (Graham et. al. 2004). Application of fuel reduction techniques prior to a wildfire can affect fire behavior.

Reducing the amount of fuel and changing its arrangement before a wildfire erupts can affect fire behavior. Recent examinations of wildfires in the West show that where fuels have been reduced beforehand, fire intensity and severity are usually reduced. Thus, removing or reducing fuels in strategic locations on your property can lower fire risk and help make your property more resistant to wildfire.

Surface fuel reduction alone can change fire behavior; however, in cases where stand structures support low canopy base height and high crown density, a combination of thinning and surface fuel reductions may be needed. Environmental conditions such as remote, steep areas with limited access may limit the treatment tool options available due to management direction, remoteness, and cost effectiveness.

Prescribed Fire

Prescribed fire is a useful tool that can effectively alter potential fire behavior by influencing multiple fuel bed characteristics (Graham et al. 2004). Frequently used and cost effective, prescribed fire treatment is highly effective for surface fuel reduction, raising the canopy base height, and promoting fire tolerant species. Fire can be applied under specific management-identified environmental conditions that apply to weather and fuel (moisture) conditions allowing for control of fire.

Prescribed fire can target the surface fuels, increase canopy base height by scorching lower tree bole limbs, and reduce the amount of ladder fuels. It also has benefits through promoting fire-tolerant species and groundcover vegetation such as grass and forbs over woody debris that support the CWS goals.

Figure IX - 7. Yellow arrow indicates the canopy base height (1-3 feet) of the stand prior to prescribed burning; white arrow indicates post-burn canopy base height. Photo was taken in the Minam wilderness approximately six years (2010) after burning.

Biomass Utilization

The forests in Union County continue to exhibit an overabundance of material considered to be forest biomass, with a great percentage of this material in the form of woody residues such as tree tops, limbs, non-merchantable logs, small-diameter trees and heavy down woody fuels. Forest biomass is generated by fire and fuels reduction activities, conventional timber management such as harvesting, non-commercial thinning, timber stand improvement (TSI) activities, and natural accumulation. Non-commercial thinning includes pruning, tree removal or thinning designed to help shape and guide development of forest stands, and ladder fuel reduction. It generally does not result in removal of trees that can be used to manufacture products, but it could be used in renewable energy production (heat, steam, electricity, and fuel).

Concerned about the health of Oregon's forestlands, increasingly large and frequent wildfires, and associated expenditures and impacts, the 2005 Oregon Legislature passed Senate Bill 1072 (Chapter 772, Oregon Laws, 2005). In November of 2005 the Oregon Forest Biomass Working Group (OFBWG) was established to meet the directives in established by that bill and subsequent law, as well as to accomplish the biomass goals in then-Governor Kulongoski's 2005 Renewable Energy Action Plan (Oregon.gov 2005).

The utilization of woody biomass has the potential to provide Union County with both direct and indirect societal, economic, and environmental benefits. These include:

- Creates jobs for local companies hired for removal.
- Reduces fire risk through vegetation and fuels management.
- Improves air quality, lessen impacts on public health.
- Reduces the cost of hazardous fuels treatments in the future.
- Encourages economic development by supplying material to local mills, and creates opportunities for innovative/new infrastructure for processing and using the material.
- Enhances and/or preserves ecosystems.
- Reduces smoke emissions during landscape burning, improving fire-related health and safety issues.
- Provides a market for insect- or disease-infested trees, invasive species, and other woody biomass removed, and improves forest health.
- Increases availability of renewable fuel through bioenergy, promoting energy independence, and rural economic development.

Union County currently supports three Boise Cascade-owned processing facilities: a plywood plant located in the town of Elgin, a sawmill, and a particleboard plant in La Grande (Boise Cascade 2016). The closest facility for biomass product is located in Wallowa County, with an expansion in progress to include the production

of wood bricks at Integrated Biomass Resources in Wallowa County next to a post-and-pole plant owned by Community Smallwood Solutions (Davis et. al. 2010).

Union County Economic Development Corporation is focusing business recruitment efforts on transportation equipment manufacturing and forestry and wood products sectors. The strength of these sectors is largely influenced by environmental regulations. The forestry and wood products sector (including biomass and other diversification strategies) could grow if more timber resources were harvested from federal forests (NEOEDD 2013 – 2018).

Most of the material generated from fuels reduction activities is not suitable for commercial wood products manufacturing, so many times the biomass from these activities is left on site and burned. There is currently a strong push in Oregon by county commissioners, industry leaders, local businesses, agencies, landowners, and some conservation groups to create opportunities from forest biomass while achieving the goals of the community wildfire protection plan for fire risk reduction.

The program distributes firewood to limited capacity citizens across Baker, Union, and Wallowa Counties. Unfortunately, the program utilizes only a small percentage of the biomass generated and usually utilizes smaller thinning projects. An additional alternative outlet for small diameter wood could help reduce the costs of thinning and help mitigate environmental impacts associated with prescribed burning and wildfires.

Timber stand improvement can accomplish similar goals, but often results in removal of some commercially valuable trees. Wood manufacturing residues including bark, sawdust, chips, and veneer cores are additional sources of raw material for renewable energy production. A biomass plant is currently operating in Grant County, but high transportation cost makes the exportation of small diameter wood material cost-prohibitive.

Hand and Machine Piling

Hand and machine piling are effective ways to achieve surface fuel and ladder fuel reduction that is not marketable. Hand piling even though not the most cost effective, can be very effective in fuels reduction. Hand piling often requires manual labor with chainsaws, handsaws, and a substantial workforce (depending on acreage) making it more time consuming. This option allows choices on pile placement to reduce damage to residual vegetation for the future. Machine piling can handle larger numbers of acres, and is more cost-effective than hand piling, however it requires machinery large enough to be efficient and still have maneuverability within designated areas. Residual trees can be preserved with machinery but some damage may occur. Debris piles are typically larger than hand piles and emit more radiant heat.

In urban interface areas, piling of fuels is a common approach to reducing surface and small-diameter ladder fuels near structures. This is beneficial particularly in areas where smoke issues are present or prescribed burning is not a favored option

Summary

Three primary components impact how a fire behaves on the landscape: fuels, weather, and topography. Management efforts are most effective through altering fuels composition and characteristics. There are multiple tools available, based on stand conditions, providing options for diverse treatments. In order to protect our firefighters, communities, and natural resources a “one shoe fits all” approach cannot be used. A variety of vegetation mitigation methods should be considered and utilized to promote the three goals of the CWS. Emphasis should be placed on landscape-level projects, maintaining the local mill, and skilled workforce infrastructure.

Continuing to use and improve treatment methods through new and innovative approaches will advance Union County’s fire management efforts and landscape resiliency. Developing activities and treatments that can be tailored to meet local needs increases opportunities for homeowner and community proactive actions.

Fuels treatment has an added benefit beyond reducing danger. Thinning overstocked stands will increase tree diameter growth and enhance tree vigor. Healthier trees are more resistant to pests, disease, and increase in value both ecologically and commercially. Treatment should be site- and species-specific, while keeping the goals in mind.

Forests are dynamic, and reducing competition often promotes increases in diameter, height, and crown width. Fuels reduction activities that include thinning are very beneficial for modifying fire behavior, but thinning without consideration for forest health doesn’t provide the benefits of pest resistance or healthy, resilient landscapes. Management for risk reduction should be linked to a future maintenance program to protect first entry investments.

The National Strategy’s first and highest priority is safe and effective response preparedness. The second priority, also the most challenging, is vegetation and fuels management. Fuels management approaches that are strategically placed to interrupt fire spread across the landscape (CWS 2014) provide opportunities for successful suppression and lessen negative impacts. Several supporting case studies have proven successful in which previously managed areas have had a crown fire encountered a treated area, resulting in fire transition to a surface fire in pre-treated areas. Learning from others’ success stories can provide Union County with a foundation for landscape treatments.

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X. Accomplishments and Challenges

Introduction

Since 2005 Federal, State, and private landowners have joined forces in an effort to begin mitigating wildfire risk. Projects included hazardous and ladder fuels reduction, raising canopy base height, and reducing stand densities. Through multiple funding mechanisms these agencies have begun the extensive work of reducing wildfire risk in Union County.

The 2005 CWPP provided avenues for funding for treatments in Wildland Urban Interface (WUI) areas with much of the revenue designated toward an individual WUI area and a specific action.

The new WUI Zone provides some added flexibility for funding distribution toward multiple areas meeting the same criteria. This allows funds to be distributed throughout the County's WUI Zone giving fire managers increased opportunities for fire mitigation. Cross boundary treatments, through multiple landowner involvement, creates the most effective defensible space for suppression resources. While treatments within the middle ground areas are often a single landowner or just two ownerships. Opportunities for large-scale projects are possible under both scenarios however proximity to private lands can play a role in treatment options. The middle ground locations often provide more diverse options for treatments such as landscape prescribe burning.

Oregon Department of Forestry and Private Lands

Oregon Department of Forestry in cooperation with private landowners has accomplished approximately 10,851 acres of work throughout the county. Nearly 9,510 of these acres are within the new WUIZ with the remaining 1,341 acres scattered about the county. Accomplishment dates for the work vary from 2004 to as recently as 2014. Geographical information system (GIS) mapping entries of project work on the ground were not available at the time of this document. Approximately 3,949 acres of work has occurred along the foothills of the Blue Mountain west of Hunter road between the towns of La Grande and Elgin and another 1,483 acres along Fox Hill. An estimated 778 acres of work has been completed east of Cove as well.

A variety of treatment tools were used on private lands including timber/overstory removal, ladder fuel reduction, thinning, down woody debris pile and burn, mastication, etc. Prescribed burning is occasionally used but less often due to proximity of treatments to structures.

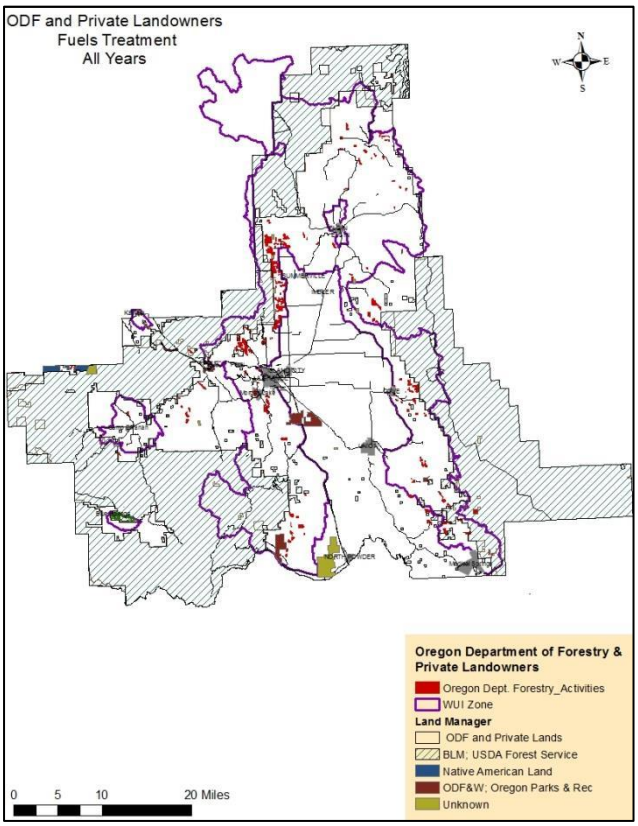

Figure X - 1. Oregon Department of Forestry accomplished acres (red). Majority of acres fall within newly identified WUI Zone.

Wallowa-Whitman National Forest

The Wallowa-Whitman National Forest has complemented these private landowner efforts with some additional cross-boundary fuels and vegetation management projects. The La Grande Ranger District is the representing Forest Service unit involved in the cross-boundary treatments. Projects were planned with both fuels and stand vegetation management activities in mind. These treatment activities were designed for the following purposes: modifying fire behavior potential, reducing surface fuel loadings and ladder fuels, reducing overall canopy density, improving firefighting opportunities by creating and maintaining defensible fire breaks, improving firefighter and public safety, and protecting resource and property values at risk on private and public lands.

Recent projects that supported these treatment activities include:

- Mount Emily II, 2005; Mount Emily
- Blue Fly Fuels Reduction Project, 2010; Blue Springs WUI
- Cove II WUI Project, 2011; Cove WUI
- Rooster Vegetation Project, 2010; Vey Meadows
- Sandbox Vegetation Project, 2013;

- Upper Catherine Creek Watershed, 2016

Figure X - 2. Mount Emily WUI project (Forest Service photo). Photo on the left is pre-treatment taken August 2011 and photo on the right is post treatment taken October 2012. Blue painted trees were marked for removal to open the stand and understory was removed as part of ladder fuel reduction.

Figure X - 3. Pre-treatment photo (left) taken June 2010, Post treatment photo taken August 2011 (Forest Service photo). Crown density was reduced and canopy base height was increased. Fire tolerant species were retained in an effort to create resilient stands in fire-adapted ecosystems.

Treatment activities are designed with resource goals in mind, causing the same section of ground to possibly have multiple activities for a single goal. For example, fire risk mitigation, depending on site conditions, may require several treatment activities including overstory thinning, ladder fuel reduction, down woody fuels treatment, with a final treatment of prescribed or pile burning. Since 2004, there have been approximately 18 different types of treatment activities implemented for fire risk mitigation within the WUIs identified in the 2005 CWPP. These were associated with 6,618 acres of fuels treatment activities, such as machine or hand piling followed by pile burning or thinning for fuels reduction followed by prescribed burning. Vegetation activities that were associated with aerial fuels treatments account for 7,494 acres implemented under the 2005 CWPP. Treatments included overstory and ladder fuel thinning, pre-commercial and/or commercial thinning, all of which now fall within the newly designed Wildland Urban Interface Zone (WUIZ).

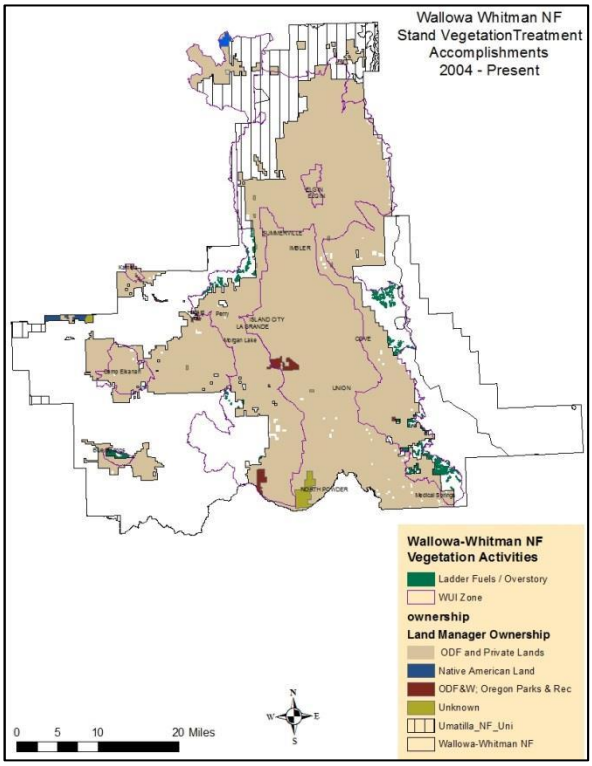

Figure X - 4. Approximately 7,494 acres treated under the 2005 CWPP fall within the current WUIZ. Treatments include: overstory thinning, ladder fuels reduction, pre-commercial thinning, etc.

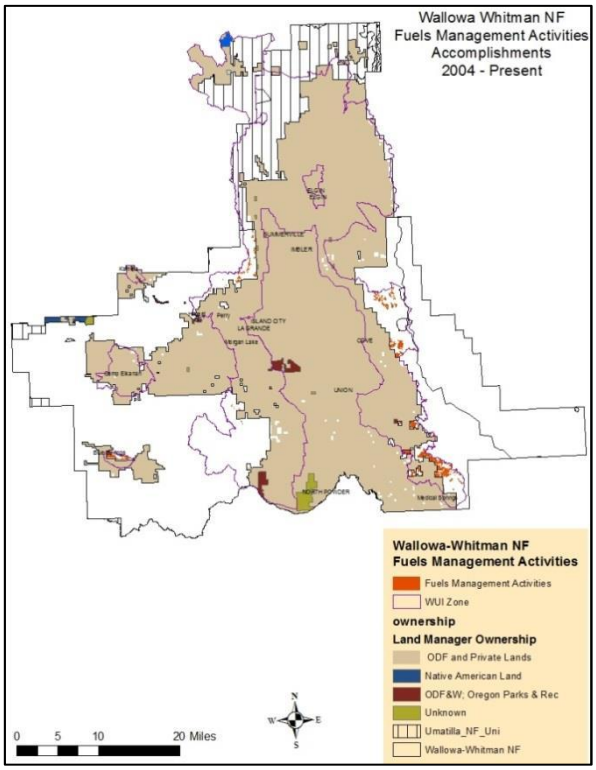

Figure X - 5. Fuels treatments was applied to approximately 6,618 acres with some locations receiving more than one treatment type. Treatments include: debris piling, then burning of piles, underburning, etc.

Many of the treatment acres received both crown density and down woody fuels reduction activities; multiple management activity types often occurred on the same section of ground. Crown density and ladder fuel reduction occurred under vegetation management, followed up by some type of down woody fuels reduction treatment such as underburning, fuels removal/rearrangement, or machine/hand pile and burn. Treatment activities are designed to complement one another to meet the overall goal of fire risk mitigation.

Umatilla National Forest

Union County and the WUIZ section that extends into Umatilla County hosts approximately 109,372 acres of the Umatilla National Forest, which has accomplished 7,190 acres of fuels and vegetation project since the year 2000. All treatment activities are located northwest of Elgin, where private lands and the Umatilla Forest meet. In addition to the fuels activity projects there are a number of identified firebreaks to the northwest and southwest of Union County that can be used during suppression efforts.

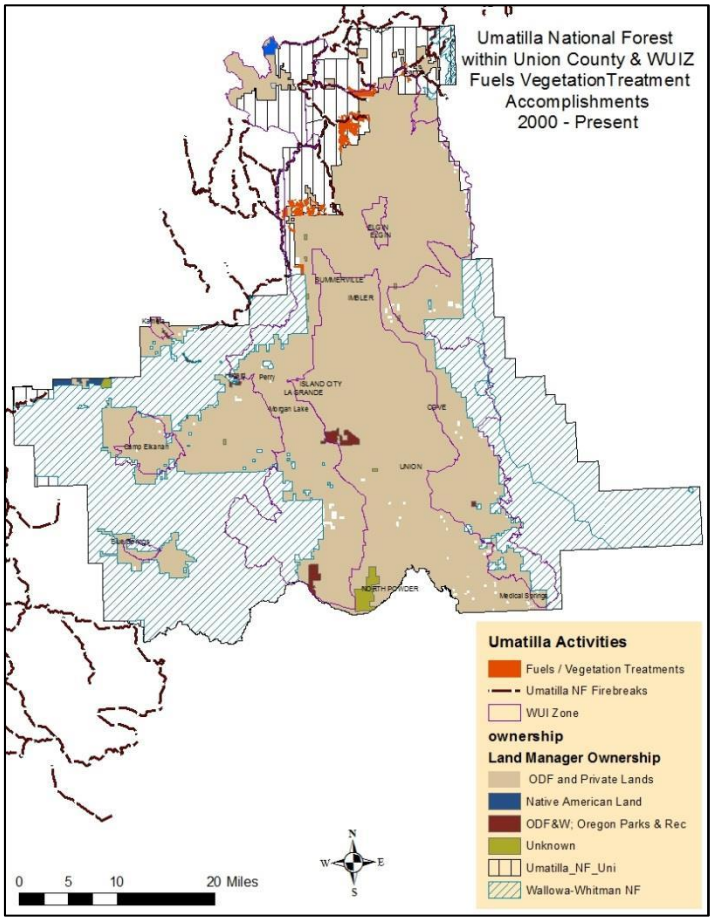

Figure IX - 6. Fuels and vegetation activities accomplished by Umatilla NF adjacent to private lands and identified fire breaks.

Although efforts to minimize fire risk have been initiated, wildfire risk often requires a multiple-phase approach to fully accomplish wildfire risk mitigation. Post-treatment site visits will be needed to assure activities on the ground have met the expectation of wildfire mitigation.

Challenges

Project Planning, Pace and Scale

Over the last decade, the issues of pace and scale continue to be at the forefront as millions of acres of forest lands are blackened annually from wildfires. According to Tom Tidwell, Chief of the USDA Forest Service while addressing the House Committee on Appropriations in 2013, "Between 65 and 82 million acres are in need of fuels and forest health treatments—up to 42 percent of the entire National Forest System."

Federal agencies, including those in eastern Oregon continue to face challenges when attempts are made to increase pace and scale. In 2014, the Oregon Department of Forestry presented Oregon Senate Bill 357, a report to the state legislature on, Federal Forest Management. Section 1(1) of SB 357 requests, *"The identification of potential approaches to diversifying revenue sources and improving the level of revenue available to increase the pace and scale of federal forest management."* In other words, finding ways to expand funding sources and the availability of funds is crucial to increasing the timeliness and size of forest management projects. The report also indicates the amount of NEPA completed is a limiting factor for increasing the pace and scale of restoration work on federal forest lands. Projects that are implemented are often found to be too small of acreage size or the treatment prescribed is not extensive enough for overall wildfire mitigation upon first entry. Other contributing factors include reduced staff, extensive detailed environmental analysis to avoid litigation, competing priorities (ODF 2014) or actual litigation.

Litigation of projects continues to occur for many Federal Agency projects. In 2015 a U.S. Government Accountability Office (GAO) provided, *A Report to Congressional Requesters*, on Forest Restoration. Agencies reviewed by the GOA were the Forest Service (FS), Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), Fish and Wildlife Service (FWS), and National Park Service (NPS). Part of the challenges of project litigation for federal agencies occurs from stakeholders that opted out of collaboration invitations, were not involved from the local area, or from the collaboration participants within the group itself. Litigation is time consuming, costly, strains agency/stakeholder relationships, delays or limits restoration activities and can discourage participation in future projects (GAO 2015).

The GAO report also reviewed 34 collaboration landscape-scale forest restoration projects (projects larger than 50,000 acres with a focus on forests) that occurred over a 10 year period, from 2004 through 2014. The Forest Service reported conducting 24 of the 34 projects; BLM, 8; and NPS, 2. Several project managers in the GAO reported that upfront collaboration during planning resulted in increased pace and scale, however large-scale projects continued to be subject to litigation just like small projects. Litigation often arrives when commercial logging is a key component of fuels reduction projects, however, changing fire on the landscape is ineffective and/or

hindered when litigation slows project implementation particularly when mortality rates have increased due to overstocking leading to insect and disease. First entries must be aggressive not only in pace and scale but in thoroughness of treatment applications to avoid the need for additional entries in the near future.

The vulnerability of federal lands is occurring from a wide range of impacts that include, increase in wildfires and drought, stressed forests and vulnerability to insect and disease, and potential loss of critical habitat some of which is being contributed to climate change according to a May 2013 GOA report. As a result, there is growing agreement among land managers that efforts to restore forests should be undertaken at a scale commensurate with the scale at which disturbances, such as unnaturally severe wildfires that burn millions of acres annually, are occurring—that is, at a landscape scale (GAO 2015). The Blue Mountains of eastern Oregon historically experienced a surface fire, resulting in 25% or less mortality in the upper canopy of ponderosa pine plant associations, that burned an estimated 75% of the Fire Regime Condition Class I areas prior to Euro-American settlement (pre 1850). Union county is largely a Fire Regime I as per Chapter VI figure VI-9. To fully meet the GOA's pace and scale recommendations sub-basin or larger approaches would be needed to adequately address conditions of Union County. Union County CWPP supports landscape scale approaches for both restoration and fire mitigation that not only promote the three goals of the Cohesive Wildfire Strategy, but also provide sustainable forests, recreational opportunities, and economic stability for the community in the future.

The House of Representatives H.R.2647 passed the Resilient Federal Forests Act of 2015, on July 9, 2015. Title I of the Act is designed to expedite environmental analysis and availability of categorical exclusions to accelerate forest management activities. Forest management activities for NEPA included under this act are those developed through collaboration, a resource advisory committee, or covered by a community wildfire protection plan. Primary purposes of the activities include: insect and disease infestation, reduction of hazardous fuel loads, protection of municipal water sources, maintain, enhance, or modify critical habitat to protect it from catastrophic disturbances; increase water yield or any combination of these. The bill is currently awaiting Senate approval.

Maintenance

Many older environmental documents and some recent documents fail to include a plan for maintaining treatment investments. Acknowledgement of retaining post treatment site conditions in plans will preserve accomplished fire mitigation measures and reduce future costs when follow-up activities to sustain initial investments of treatments are needed. Designing a plan to maintain treatment accomplishments and protect costs is identified in Section 102(g) (8) of the Healthy Forest Restoration Act (HFRA) that requires the USDA Forest Service and DOI BLM to develop a process for monitoring the need to maintain treated areas over time. Proposed actions and

alternative descriptions should include an estimated maintenance treatment schedule and cost (USDA 2004).

Since 2005, Federal, State, and private landowners have joined forces in an effort to begin mitigating wildfire risk. Projects have included hazardous and ladder fuels reduction, raising canopy base height, and reducing stand densities. Oregon Department of Forestry, in cooperation with private landowners, has accomplished work throughout the county, with a large proportion along the Blue Mountain foothills between the towns of La Grande and Elgin.

Although efforts to minimize fire risk have been initiated, wildfire risk often requires a multiple-phase approach to fully accomplish wildfire risk mitigation. Post-treatment site visits will be needed to assure activities on the ground have met expectation of wildfire mitigation.

The length of time before treated areas require re-treatment is dependent on several inter-related factors including:

- Past treatment level (e.g., how much biomass [fuel] was removed initially in the under story and over story);
- Site productivity;
- Rate of fuel accumulation;
- Fuel structure (i.e., condition class)
- Historic fire regime;
- Desired fire behavior (for effective control)
- Climatic regime.

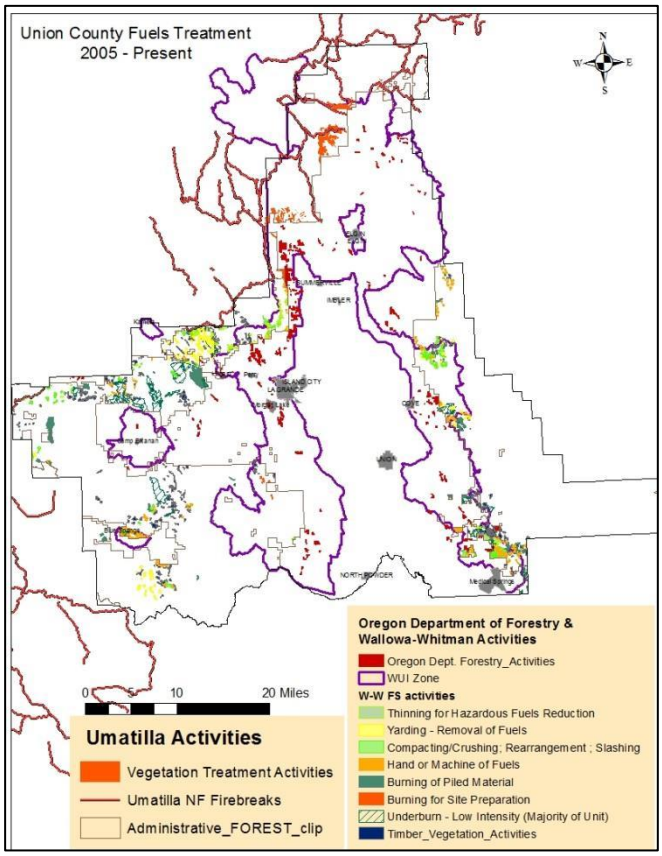

Figure IX - 7. Fuels and vegetation activities accomplished by landowners, State, and Federal agencies since 2005.

Developing a rotational monitor program that allows for periodic site visits and updating of the CWPP fuels layer allows managers to review risk reduction efforts. The mapping of initial treatment information and fire regime assists in future CWPP updates identifying changes in risk.

Ninety-four percent of wildlands across the conterminous United States is dependent on wildfire as a fundamental ecological component (Stein et. al. 2012). Limited funds and workforce can leave fire managers with critical decision for application of treatments. New wildfire mitigation actions must be augmented with maintenance of previously treated areas to in order to provide the highest level of success.

Projects that have occurred are often too small to be effective, treatments are too passive, and sites are not re-entered for several decades, resulting in lack of progress toward changing fire behavior on the landscape. Designing projects of adequate size and thoroughness in management approaches can provide the highest level of

community benefit and safety. Recent wildfires have displayed destructive behavior, and management must be aggressive in order to prevent further landscape damage.

Inventoried Roadless Area (IRA)

The Wallowa-Whitman National Forest supports a dispersion of designated roadless areas. Roadless areas make up approximately 69,418 acres of public lands within Union County. Forest Service lands within the new WUIZ alone contain 36,914 acres of inventoried roadless areas (IRA) in six separate locations. There is a total of roughly 24 miles of boundary where roadless areas borders private property. (Figure X - 9)

The interface of roadless areas and private lands presents several challenges when attempting to meet the national fire policies for reducing wildfire risk in wildland urban interface areas in order to protect communities at risk. Some of the key challenges include:

- Several roadless areas are displaying some of the highest fire risk ratings near communities (see Figure X - 8 and X - 9). The towns of Cove and Summerville are two examples where the roadless areas are exhibiting extreme fire risk and are located directly adjacent to the private lands. Costs associated with wildfires moving from public lands (roadless in this case) on to private lands are anticipated to be far higher than providing advance treatments.
- There are additional planning and implementation considerations (legal, social, ecological) and costs in order to treat across roadless boundaries for fire risk reduction.
- Past WUI treatments since 2005 have occurred within the Inventoried Roadless Areas of Mount Emily and Cove.
- According to May 31, 2012 letter from the Chief of the Forest Service, Road management activities and timber harvest within roadless areas must generally be approved by Chief or the Regional Foresters.

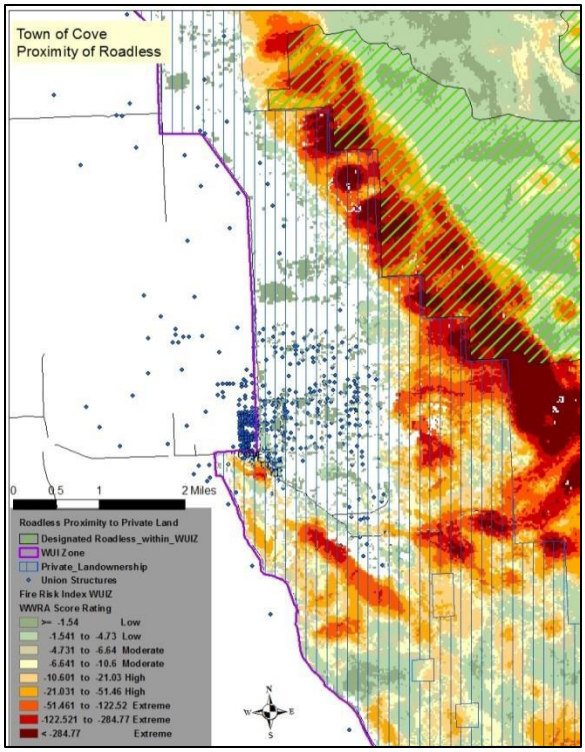

Figure X – 8. Wildland fire risk near town of Cove with roadless areas less than a half mile from nearest residence. Closest structure is located on Fletcher Lane.

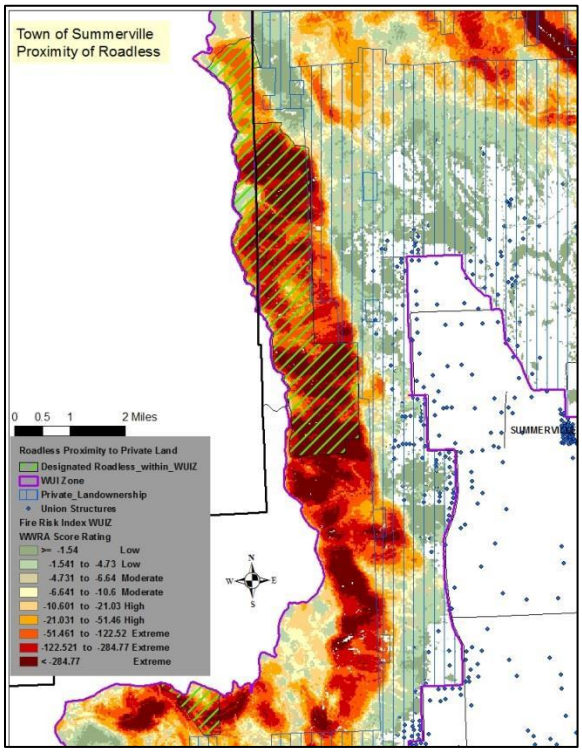

Figure X – 9. Wildland fire risk west of Hunter Lane, just north of La Grande near Mount Emily. Closest structures are on Dial Lane less than a quarter mile from the roadless boundary.

Policies and guidelines provide direction on treatments types, material for removal, road construction, and authorities to approve entries within the IRAs. The Forest Service 1900 Manual, Chapter 1920 – Land and Resource Management Planning, lists exceptions regarding the need for approval at the Chief or Regional Forester level in inventoried roadless areas including:

- The removal of small diameter material to maintain or restore the desirable characteristics of ecosystem composition and structure to reduce the risk of uncharacteristic wildfire effects (FS Manual 1925.04a – Chief).
- The cutting, sale, or removal of timber is incidental to the implementation of a management activity and not otherwise prohibited under the land and resource management plan (FS Manual 1925.04a – Chief).
- Decisions when a road is needed to protect public health and safety in cases of an imminent threat of flood, fire, or other catastrophic event, that without intervention would cause the loss of life or property (FS Manual1925.04b – Regional Forester).

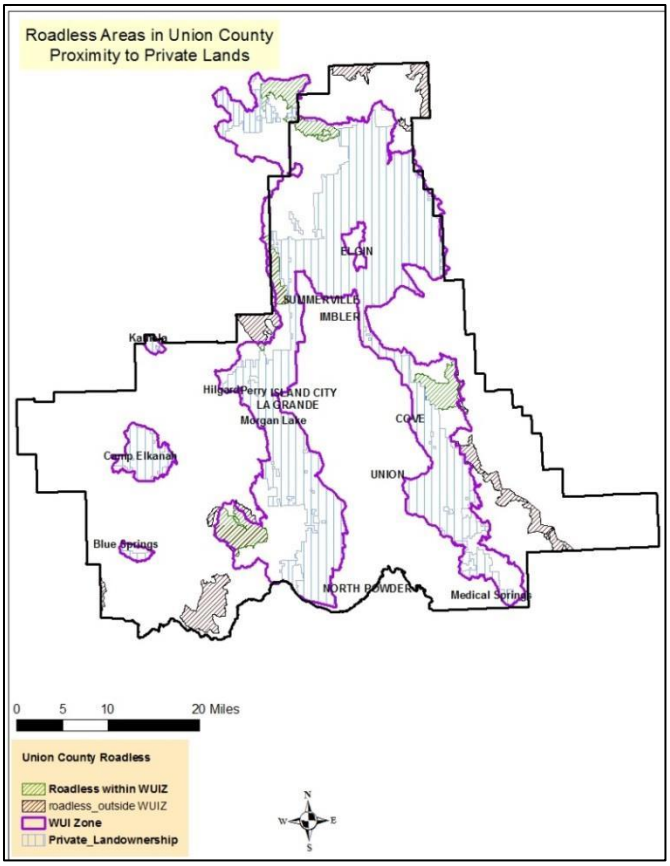

Figure X - 10. Designated Roadless areas within Union County and within the WUIZ boundary.

The roadless area northwest of Elgin (Figure X – 10) in the corner of the WUI Zone is identified in the Federal Register Vol. 75. No 201, October 19, 2010 as part of the Oregon Tollgate Fuels Reduction Project. The Lookingglass IRA is part of the Forest Service proposal to treat targeted areas along the edge of the IRA boundary where it coincides with private inholdings and Forest Road 6400 (Federal Register 2010). According to the Record of Decision signed in 2014, treatments types were limited in the Lookingglass Potential Wilderness Area (LG PWA) to trees less than 8 inches in diameter and timber stand thinning changed from commercial treatments to non-commercial treatments. The Lookingglass IRA was modified from a commercial option to no commercial component with restrictions of treating trees only less than 8 inches in diameter and with removal of down woody material less than 14 inches in diameter (Umatilla NF 2014).

Union County's 24 miles of roadless areas bordering private lands presents a number of challenges for both the Forest Service and adjacent landowners. These challenges must be addressed through a collaborative and a responsible program that puts firefighters and public lives first, while improving ecosystem characteristics that support wildfire disturbance. Retention of the current characteristics of the roadless areas is at

times contrary to wildland urban interface protection objectives, direction manuals, and ecosystem management direction outlined in the Cohesive Wildfire Strategy.

Infrastructure

Union County hosts one of the few mill infrastructures remaining in the region, including a dimensional lumber mill, particleboard plant, plywood mill, and stud mill. The presence of the mill allows significant efficiencies to be realized for properly developed management projects. Transportation costs are a significant limiting factor in many forest management strategies. The CWPP committee recognizes the importance of maintaining this infrastructure for the success of future management projects. Along with the mill infrastructure, Union County supports the skilled workforce necessary to accomplish management strategies. Significant emphasis should be placed on management strategies that maintain these two valuable resources within the local community. If the mill infrastructure and local skilled workforce are not maintained, the cost of management implementation will be significantly increased in the long term.

Infrastructure challenges are often associated with material size, haul distance, limited contractors with appropriate equipment for the job, and assurance of products over long term.

Eastern Oregon has very little infrastructure that are capable to utilize biomass. Several challenges exist for biomass usage, including: potential start-up fees for new companies, hauling fees of removing the material from site to the facility, limited contractors with appropriate equipment for the job, and limited assurance of product supply over the long term. Initiating the project is often based on estimates of available supply when considering a business plan and facility. This is often expressed as an assurance that a supply will be available from private, state, and federal lands within a realistic haul radius. The timeliness at which restoration activities occur on much of the public land has been slow due to lack of agreement on forest management and limited funding and staffing in the Forest Service and BLM (Davis et al 2010).

Additionally, finding contractors willing to work with biomass can be difficult partially due to the low value of the product, cost of removal, and in many areas the haul distance to processing sites. Because markets for commercial biomass products such as pellets, mulch, firewood, and animal bedding are limited, it is of little economic value to stewardship contractors, who could otherwise offset the agency's costs of restoration by taking the value of the biomass as full or partial payment for their work (GAO 2015).

Air quality concerns

Air quality is important for aesthetic, public health, and many outdoor community events. Some project managers, in the GAO report, prescribed burning, one of the primary methods for forest landscape restoration, continues to be a challenge do to air quality and safety concerns.

Public perception of air quality standards and lack of education on smoke emissions trade-offs compared to wildfire, limits the opportunities of prescribed burning in an already restrictive program. In many areas smoke emissions constraint are implemented during community events further limiting the number of days a burn may be within the legal parameters of the burn plan.

According to the Oregon Administrative Rules (OAR) division 48, 629-048-0140, the city of La Grande is listed as a smoke sensitive receptor area which increases the cost of wildfire mitigation if limits are put on prescribed fire, particularly where public lands are concerned and management options are limited. Air quality impacts include both local and offsite sources. Transport winds have been found to carry prescribed fire and wildfire smoke from neighboring lands, further limiting local agencies' burning opportunities.

Tradeoffs between smoke generated by a prescribed burning under which management-designed prescription conditions are provided, with specific weather and fuels parameters, and summer wildfires in which fire location and conditions are unpredictable are significant. Smoke emission tradeoffs are beneficial where prescribed fires managed at specific times of year produce less particulate than wildfires that burn during the peak of fire season. Roger Ottmar, one of the leading researchers on fire effects, fuel consumption, emissions production, and impacts on air quality and human health uses the following graph (Figure X - 11), during a Forest Service smoke management class, displaying the amount of particulate matter (PM) emitted from both wildfires and management prescribed fire.

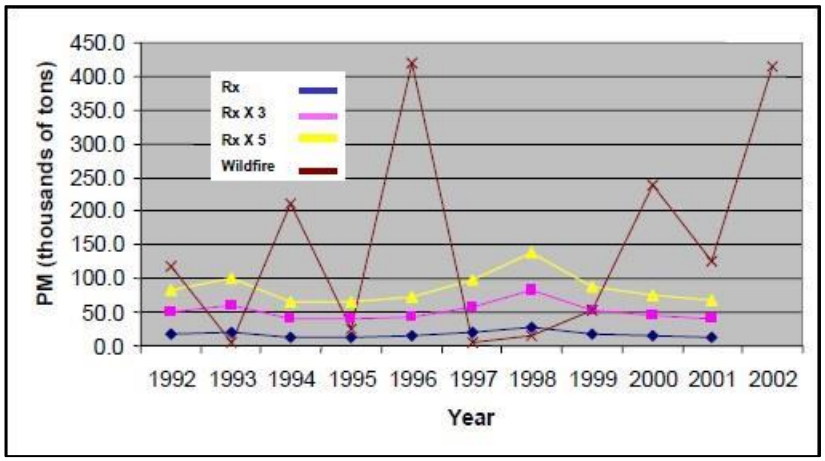

Figure X - 11. Prescribed fires consume less fuel, producing 2 to 4 times *less* smoke. Prescribed fires can be planned when meteorological conditions are favorable for dispersion, and can include smoke reduction strategies (Ottmar 2002).

There are multiple options available to further reduce smoke emissions to support air quality concerns and impacts to community health. These include:

- Woody biomass utilization
- Mechanical processing/removal
- Firewood programs
- Burn fuel concentrations, creating mosaic burns, pile and burn
- Grazing
- Converting an area; heavy timber into timber/grass
- Burn in advance of precipitation
- Portable incinerators (Ottmar 2002).

Beyond the WUI Zone

This CWPP emphasizes lands within the identified WUIZ for the best protection of local communities, but wildland fire issues do not stop at the WUIZ boundary. Union County is 1,303,680 acres in size, encompassing a WUIZ of 503,575 acres, and leaving an additional 800,105 acres outside the *primary* focus of this document. However, consideration must be given to outliers not within the WUIZ that may need both fire mitigation and protection actions.

In 2013, Phase III of the National Cohesive Wildland Fire Management Strategy (NCWFMS) was developed called the Western Regional Action Plan. This plan was developed with stakeholder input and is a science-based roadmap to provide a truly western approach to wildland fire that addresses the three goals of the CWS (NCWFMS 2013). An important element of the Action Plan is, *"the emphasis on fuels treatments from the community outwards, into the middle lands and toward the wildlands."*

When appropriate, allowance for the incorporation of areas supporting the mitigation actions of this plan can further increase a holistic approach to the CWS goals. Identifying complementing actions that promote a collective and responsible approach to wildland fire mitigation is necessary. This type of approach will assist managers in several ways by:

- Reducing the need for separate funding acquisitions just outside the WUIZ.
- Expanding upon the WUIZ edges when it meets a wildland risk or ecological objective.
- Contributing to the landscape-scale approach.
- Increasing protection for structures not included within the WUIZ.
- Allowing for local, state, tribal, federal agencies as well as the community to support one another by taking into account all lands and acknowledging the interdependence of actions (keeping in mind the differing land and resource management objectives).
- Increasing the economic viability of projects through single NEPA and planning.

With wildland urban interface areas as a focus in current fuels reduction budgets, there is an increased need for creative approaches in spending.

Summary

Since 2005, several thousand acres of fuels reduction have been accomplished in Union County for wildland fire mitigation near communities. This marks the first step for local agencies and landowners in progress toward collectively working together for a common cause. This cause must be carried forward to areas that are still at risk while preserving investments already established.

Through the Cohesive Wildfire Strategy's emphasis on the inclusion of middle ground areas, the west has the ability to expand fire mitigation actions beyond the initial wildland urban interface areas. This ability to expand into middle ground areas combined with the degree of departure of western fire regimes from historic conditions supports the need for landscape scale projects. Wildland conditions in Union County mirror those fire regimes and ecosystem departures of the western forests prompting a need for action.

This philosophy of scale provides several benefits for suppression resources, communities, and ecosystems. A balance of both utilization and consumption of fuels will address many concerns from air quality, economic stability, and fire risk mitigation. Through a diverse use of management tools, a variety of treatments can be applied toward management objectives.

However, several issues continue to challenge agencies and landowners in their efforts to reduce wildland fire risk. Small projects are a starting point but are not effective in cost or timeliness against the continued possible threat of severe wildfires. Large-scale approaches that mimic historical landscape disturbance where a diversity of management tools can be utilized will provide not only success in suppression efforts near communities, but support for economic and ecological resiliency in Union County.

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XI. Emergency Management

Introduction

Regardless of protection authority, all lands in Union County are susceptible to wildland fire. Therefore, it has been important for local agencies to develop cooperative agreements outlining how agencies will respond in providing mutual aid and cost effective fire protection for public lands, private lands, and surrounding communities.

Union County is host of several emergency services with protection jurisdiction that play a key role in actively responding to, participating or supporting wildfire events. Taking the lead during fire emergencies are federal, state, city, rural firefighters, law enforcement, and emergency management, making saving lives their number one priority.

Union County communities under an “average” occurrence of wildfire, are likely to have more than 10 percent of their populations and property affected, giving them a HIGH in community vulnerability (U of O 2014).

Fire protection capabilities are most often challenged during the summer months, when thunderstorms can initiate multiple fire starts over a matter of hours or days. This type of occurrence quickly depletes available resources locally, requiring out of area assistance. Unfortunately these storms often originate over central eastern Oregon, leaving numerous fire starts in their wake prior to reaching Union County, resulting in limited outside resources, as well.

Infrastructure

Infrastructure plays an important role not only in Union County’s local economy, but is also critical during disasters and emergency events for proper functioning and response capabilities. Facilities such as police, fire, hospitals, and government are important to successful wildfire emergency response, while support infrastructures such as airports, utilities, and transportation systems provide play an important role as partners in the fire mission.

Damage to or inability to use infrastructure can negatively affect a community’s ability to cope, respond, and recover from a wildfire situation. Highways are a primary means of shipping access in and out of the valley for goods and supplies. Protecting and maintaining infrastructures is essential for a higher degree of wildfire suppression success. Firefighting supplies often arrive via state and federal highways. The three highways that access Union County are Interstate 84, a major transportation corridor that connects to the county westward to Portland and Boise to the east, State Highway 204, connecting Union County with Umatilla County, and State Highway 82, which connects Union County with Wallowa County in the very northeast corner of the state. Both 84 and 204 are major travel routes over the Blue Mountains.

Union Pacific Railroad is also a transportation system connecting La Grande to the adjoining states and counties. The railroad transports numerous products and goods to and from the Grande Ronde Valley.

Union County has roughly 198 bridges, with 128 bridges owned by the state that service railroad, highway, and waterways. The county owns approximately 66 bridges with the remaining scattered between State Parks and railroad.

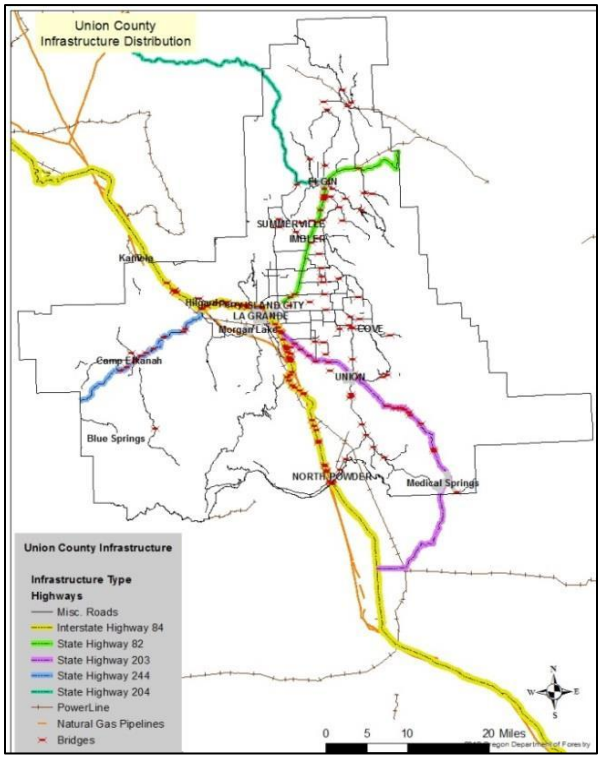

Figure XI - 1. There are approximately 124 miles of State Highway in Union County and 88 of those miles have high potential for closure due to wildfires

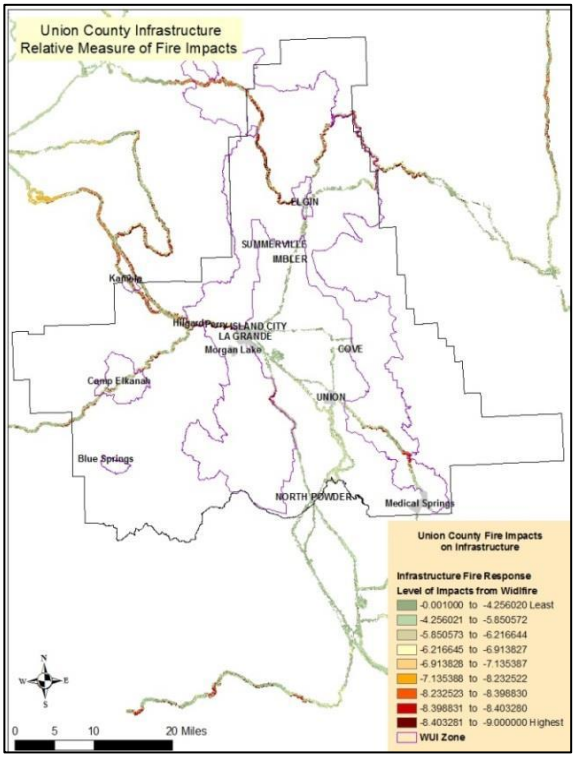

Figure XI - 2. Infrastructure most likely impacted from wildfire. Results are based on West Wide Risk Assessment.

Avista Utilities natural gas line connects Pendleton to the west, paralleling Interstate Highway 84 through Union County, to Baker City to the southeast.

Union County hosts a number of other miscellaneous type infrastructures that are primarily situated in forested areas. These are often located either at a high point where fire will burn rapidly uphill toward its location, or in a narrow canyon where fire will be funneled due to surrounding terrain and wind patterns. These areas often have limited access, making evacuation and firefighting difficult. These areas include:

- Fire detection lookouts: Point Prominence, Johnson Rock
- Lookingglass Fish Hatchery
- Multiple developed campgrounds: Bird Track Springs, North Fork Catherine Creek, Catherine Creek State Park, etc.
- Communication sites: Mt. Emily Cell tower, Mt. Fanny Structures and Radio Towers, Mount Harris Communication site
- Wind turbine towers in the Medical Springs Area

- OSU Research Study Area
- Starkey Experimental Forest
- scattered farm/ranch communities

Land Protection

Union County recognizes the importance of interagency efforts in wildland fire situations. Wildland fire protection is included in the county's Emergency Operations Plan that addresses four phases of emergency management: (1) mitigation: (2) preparedness: (3) response: and (4) recovery.

In June 2015, Union County Emergency Services updated the *Union County Emergency Operations Plan*. There are identified agencies for Emergency Support and Emergency Incident extensions. In the Emergency Operation Plan chapter 3 outlines the roles and responsibilities of the different agencies that may be involved in an urban/wildland interface fire, with the main goal of protecting life and property during a wildfire event.

In Union County fire protection can be found in three tiers:

1. Unprotected areas
   a. Any area of the county that does not have fire protection for land or
   b. Any area of the county that does not have fire protection for structures.
2. Single protection from rural districts, city departments, or wildland agencies (structures are protected, but not the land; or vice versa).
3. Dual protected (both structural and wildland protection).

These lands are delineated in Figure XI - 3, displaying areas of unprotected, single protection, and dual protection.

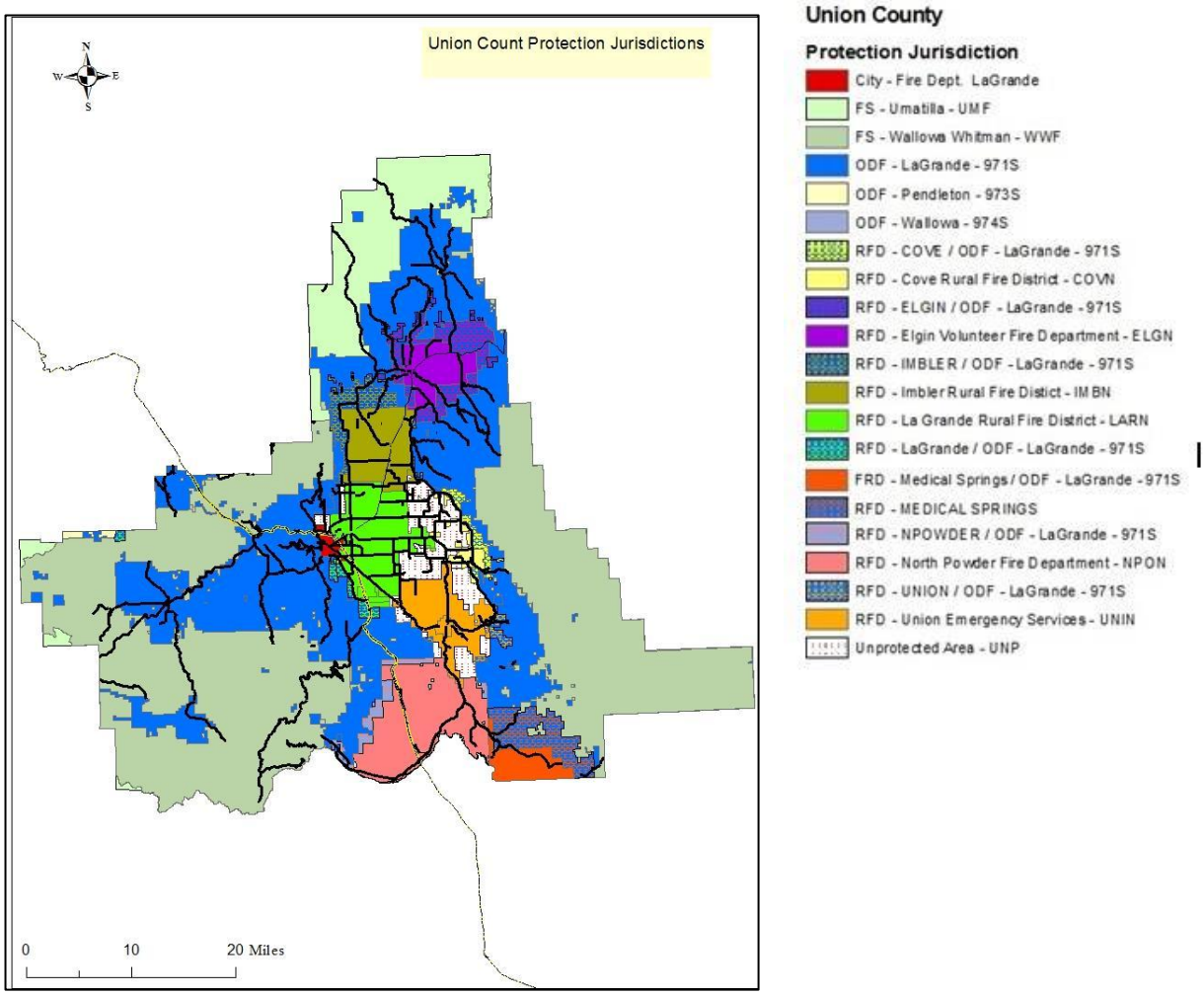

Figure XI – 3. Union County Protection Authority. Geographic coverage for Union County fire protection agencies. Types of coverage include land only, structure only, and dual protection of both land and structures.

Unprotected Lands

There are approximately 56,976 acres unprotected in Union County that have neither wildland nor structural protection. These areas are associated with three prime locations near La Grande, Cove, and Union/Medical Springs.

East La Grande Valley – Cove - Unprotected Areas

Approximately 34,185 acres (60 percent) of the unprotected lands lie between Cove Rural Fire protection area and La Grande Rural protection or Union Rural Fire protection. Although much of the unprotected areas are irrigated farmlands to the west and north of town, the area to the south is open grassland. The slopes east of Cove have one of the highest ratings for fire risk. The large amount of unprotected lands complicates already difficult existing protection issues, further elevating the fire

vulnerability of Cove and its surrounding areas. An estimated 30 structures are peppered throughout the unprotected area, most of which are residential.

North of La Grande – Uprotected Area

This unprotected area north of La Grande includes residential communities, farmlands, forest, and grass slopes. An estimated 240 structures over 2,479 acres have neither land nor structure protection. Locations include Owsley Canyon Road, Mt. Glen, and Hunter Road north to Standley Lane area. Thirty-six structures are located near the base of Mount Emily.

Southeastern County Area Union – Medical Springs Unprotected Areas

The remaining 20,312 areas of unprotected lands are scattered parcels of land on the outskirts of the town of Union, with a large area near the Baker County Line in the Medical Springs area. An additional 14 structures are located in these unprotected areas. The majority of these areas are grass slopes in the Antelope and Thorn Creek area that climb toward the forested ridgelines above Catherine Creek drainage.

To the extent possible, new developments abutting fire districts can be annexed into the district via landowner petition. Oregon Revised Statue 477.225 allows State Forester to propose changes to or establishment of new protection boundaries after presenting the changes at a public meeting (Oregon 2015). Collectively working with landowners to incorporate properties into protection districts can provide benefits to both landowner and protection agencies through quickened fire responses and avoiding jurisdictional concern. As protection districts grow, so does the need for funding, equipment, and personnel to improve response capabilities.

Land Protection Without Structure Protection

Properties without structural protection are comprised primarily private lands; while federal lands are without structure protection there are few buildings in comparison to private lands. Both, however, encompass the largest contiguous blocks of land in the county. One of the overlying issues facing the county is these lands have unincorporated small communities scattered throughout with no structure protection, as well as some scattered farm and ranch dwellings without structure protection. The Governors Conflagration Act allows for movement of structure protection resources, however, the conflagration act is designed for land within a structural fire protections area, and typically conflagration requests occur when a fire is already posing a serious threat to the communities. Lack of structure protection is compounded by response distance and time for structure protection resources to assemble, travel, and take action in these areas.

Travel alone to some populated communities without structure protection are listed in the figure below, listing the point of origin as the closest responding City or Rural Fire Department with structure protection capabilities. Not included are home clusters spread out around the county that lack a community name.

Structure protection response in non-structural protected areas			
Closest city/rural Fire Dept.	Destination Community/area	Distance (miles)	Estimated drive time (minutes)
Elgin	**Palmer Junct. Rd/Bowman Loop/Mosses Creek Ln**	14	35 - 45
Elgin	Spout Springs	8.5	29
La Grande	Kamela	19.7	28
La Grande	Starkey	25	42
La Grande	Perry	7	15
La Grande	Hilgard	12	25
La Grande	Morgan Lake	4	15
Union	Medical Springs	20.3	25

Figure XI - 4. Response times are travel only and an average. Times may vary depending on circumstances.

The majority of the small, unincorporated communities have very few population statistics available. The community of Starkey, for example, is estimated to have a population of around 304 people. A mile away from Starkey, a highly popular summer youth camp called Camp Elkanah sponsors multiple overnight sessions ranging from three to six days. These sessions occur throughout the peak of fire season, hosting well over 200 participants per gathering, mostly children.

Oregon Department of Forestry Protection

The bulk of the non-protected structures are located within the ODF wildland protection jurisdiction. Private lands are protected under agreements with ODF and local landowners. Oregon Department of Forestry has the largest block of single land protection that is not publicly owned. These privately owned lands are either within the La Grande or Pendleton, Oregon Department of Forestry's protection jurisdiction. This area completely encircles the Grande Ronde Valley, taking into account much of the valley's foothills that include both forested and grass areas, encompassing nearly 375,726 acres and 989 structures. This is a significant issue throughout the state, because the number of structures located within forest protected lands without structure protection continues to grow. Oregon Department of Forestry's Pendleton office has 1578 acres within Union County and an additional 12,581 acres as part of the WUI Zone that stretches into Umatilla County.

Protected lands of ODF have several small clusters of unprotected structures, primarily located along the foothills of the Grande Ronde Valley. Some additional areas include:

- Mount Emily and its foothill residences along Aspen and Mount Glenn Road.
- Cove has several unprotected structures along Mount Fanny foothills that are situated between dual protection to the west and roadless areas to the east.
- Catherine Creek, east of the town of Union, both before and after the State Park.
- North of Medical Springs along the section of Oregon Highway 203 that parallels Beagle Creek

Forest Service Protection

The Forest Service protected public lands include the Wallowa-Whitman and Umatilla National Forests with approximately 520,423 and 132,488 acres respectively, of which 29,907 acres of Umatilla N.F. lands are within the WUI Zone area that reaches into Umatilla County. These public lands are found on the ridges above the La Grande Valley extending away from valley communities into large forested land blocks, including the Eagle Cap Wilderness and the Blue Mountains. Structures within the public lands are primarily associated with administrative sites, ski areas, privately owned small land parcels, and administrative sites, such as developed campsites, guard stations, lookouts, and communication facilities.

When looking at the WUIZ alone, approximately 79 percent of the area is without structure protection, accounting for nearly 950 structures.

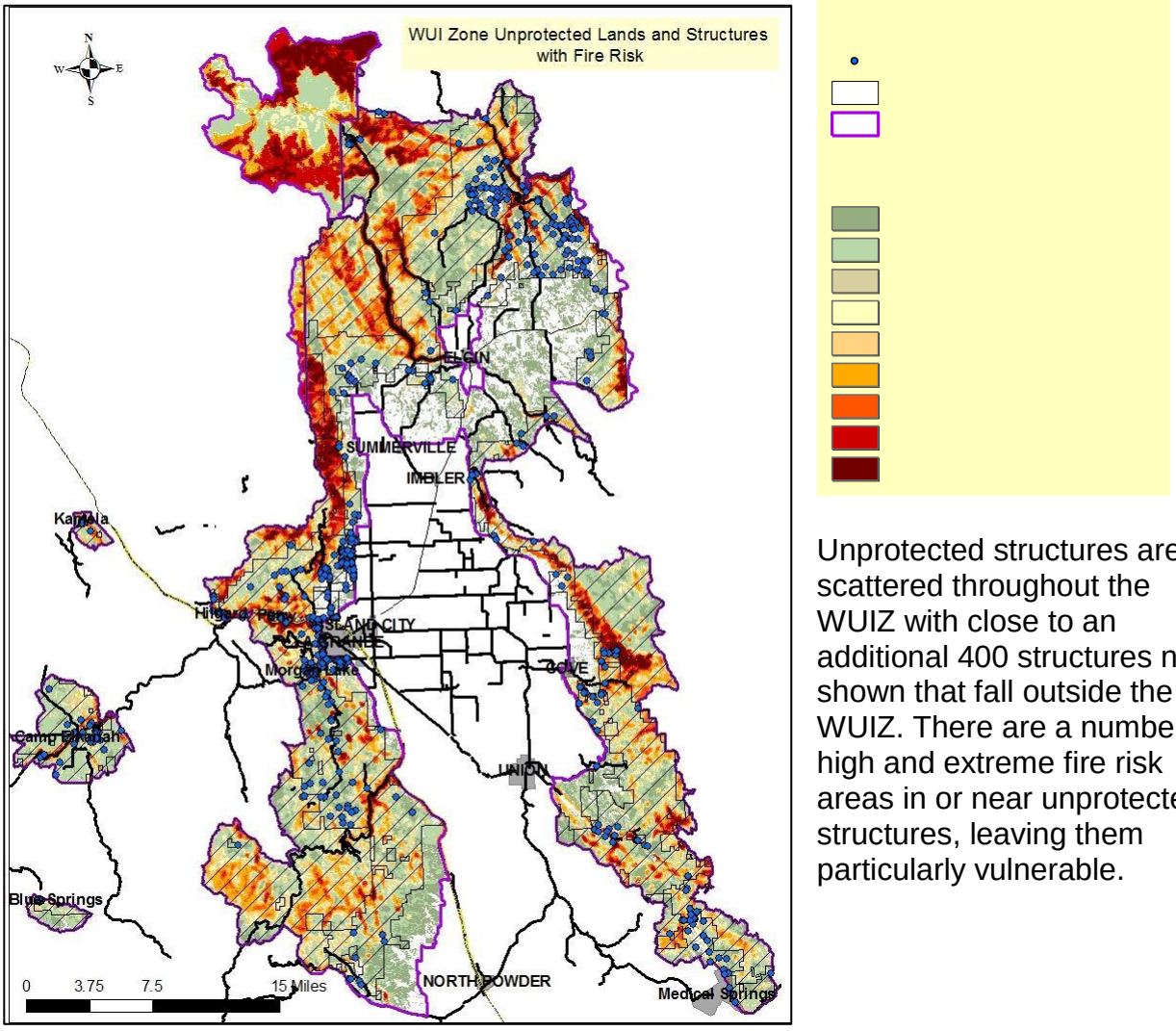

Figure XI – 5. Unprotected Structures within WUIZ against Fire Risk. The hash mark areas show landscapes in which structures (blue dots) are not under a protection jurisdiction.

Unprotected structures are scattered throughout the WUIZ with close to an additional 400 structures not shown that fall outside the WUIZ. There are a number of high and extreme fire risk areas in or near unprotected structures, leaving them particularly vulnerable.

Dual Protection Areas

Rural Fire Departments and ODF are working together to provide areas of dual protection providing fire response for both land and structures. Dual protection areas increase when newly created residences are annexed into the rural protection areas. There are currently 71,613 acres of dual protection in Union County with the number expected to rise as home developments occur. These blocks of land are primarily associated with the outside borders of the rural protection areas.

Dual Protection Agencies	Acres		Dual Protection Agencies	Acres
RFD Cove/ODF	5,596		East Umatilla/Pendleton ODF	9,664
RFD Elgin/ODF	27,436		RFD Imbler/ODF	13,091
RFD La Grande/ODF	4,533		RFD North Powder/ODF	7,910
			Union RFD / ODF	3,083

Figure XI - 6. Dual protection coverage between Oregon Department of Forestry and Union County Rural Fire Departments.

Protection Capabilities

Union County has a vast landscape of forest and a finite amount of fire protection resources, making for extended response times, prioritizing of areas, and putting emphasis on pre-fire mitigation treatments. There are a total of 2,039 square miles in Union County with eight fire protection stations, giving Union County less than one fire station per 250 square miles. Six of these fire stations are located in the Grande Ronde Valley proper, with the remaining two located in the Medical Springs and in North Powder. Response times range from 30 minutes to two hours, depending on availability of personnel, proximity to station, single or multiple fire starts, and draw down levels of local resources.

Additionally, the US Forest Service (USFS) and the Oregon Department of Forestry (ODF) provide wildland fire protection for timber resources. Though many rural fire protection districts are certified in wildland firefighting, wildland firefighters are not equipped or trained in structural protection. The Bureau of Land Management (BLM) also manages land in Union County, but is in agreement with the USFS for initial attack responsibilities on BLM land.

Protection capabilities are impacted by both response time and staffing issues. The County has five rural fire departments (RFD) that are fully staffed by volunteer firefighters, accounting for 45 percent of the county's fire staff. Imbler RFD has 12 part-time firefighters, and La Grande RFD has one full-time firefighter. Paid part-time fire fighters make up 29 percent of the fire protection service, leaving 9 percent as full-time employees (Figure XI -7).

The following table lists Union County's Fire Departments, and indicates protection area, number of staff, and pay status at each protection district.

Fire Department/ Agency	Protection Area in Sq. Miles	No. of Stations	Number of Staff					Estimated Structure Count
			Firefighters (FF)			Non-FF		
			PFT	PPT	V	P	V	
Cove RFD	36	1			25	1		583
Elgin RFD	71	1			23			1159
Imbler RFD	69	2		12			3	698
La Grande City	77	1	17	20		1	1	1013
La Grande RFD	84	1	1		16		2	1354
Medical Springs RFD	117	1			12		4	82
North Powder RFD	173	1			13			440
Union RFD	52	1			25		5	171
Oregon Dept. Forestry	683	1	2	11 1 -D				1648
U.S. Forest Service	963	1*	15	20				Misc. Scattered Buildings

Figure XI - 7. Non-government firefighters consist of 89 percent non-pay status volunteers. * Numbers do not reflect nationally shared resources such as hotshots, helitack rappel crews, seats. PFT = Paid Full Time, PPT = Paid Part-time, V = Volunteer, P = Paid, 1 – D = dozer. See chapter IV for city populations. RFD sq. miles include mutual protection with ODF.

It is worth mentioning that La Grande City Fire Department responds to a variety of fire types, including wildland fires. The department is staffed by 20 part-time firefighters and 17 full-time paid firefighters, including three career captains, 12 career firefighters, one administrative assistant, and one fire chief. The city fire departments respond to roughly 2,500 calls annually, of which 77 percent are medical emergencies. Fires for La Grande City averaged 13.3 per month during 2013-2014, including outdoor and wildland fires with August as the second highest fire month after December.

In rural Oregon, when fires occur in woodlands near homes, those first to arrive are often friends and neighbors acting as volunteer firefighters. Oregon rural areas depend on volunteer firefighters to maintain service to the local communities. However, recruitment both nationally and in Oregon has fallen. Between 2005 and 2010, Oregon's volunteer firefighting numbers were in line with a national decrease of 12 percent. Oregon has 10,000 firefighters, of which approximately 8,000 (four-fifths) are volunteers (Oregonlive.com 2011). A 12 percent drop in volunteers would reduce the numbers by 960 individuals. Additionally, many of the current volunteer firefighters are required to maintain full time jobs elsewhere, resulting in fire responses not being staffed to optimum levels.

One of the topics to surface during the meeting with county fire chiefs is the low interest in firefighting from the local community. Volunteerism and low recruitment impact protection capabilities in several ways:

1. Staffing of equipment is minimal, multiple positions must be filled to meet safety standards for firefighting, i.e.: pump operator, Incident commander, safety officer, span of control, work rest protocol, etc.
2. Not all volunteers can respond to all individual calls for service
3. 72 to 80 hours minimum of training for entry-level. If training is typically during the week, causing the volunteer to miss paid work, but a weekend would require the volunteer to forgo home responsibilities.
4. Volunteers sometimes pay out of pocket for training
5. Many Structure firefighters are cross-trained for wildland fire. Structure fire regulations require firefighters to work in pairs, with two entering a building and two others staying outside. Engine staffing for wildland firefighting requires a minimum of two personnel when responding to a new fire incident. This results in a mandatory minimum number of personnel to be present.

In an attempt to attract new firefighters from the local area, this CWPP identified it as a mitigation measure with corresponding action items in Chapter VIII, to develop a firefighting recruitment program to increase level of interest. The firefighting capacity is not commensurate with the local fire workload and risks posed by wildfire in Union County. Investments into new equipment and increased firefighting workforce in conjunction with wildfire mitigations must occur to improve firefighter and public safety, and success of initial attack efforts.

Protection Compliance

Should a wildfire reach the threshold for declaring a conflagration (per the Oregon Conflagration Act), the Union County fire chief will request assistance and support for structure protection. In order to meet the criteria in 2016 Fire Service Mobilization Plan set forth by the Office of the State Fire Marshall for conflagration declaration, Union County is currently compiling this plan in accordance with the following:

1. National Cohesive Wildland Fire Management Strategy 2014

2. 2009 Guidance for Implementation of Federal Wildland Fire Management Policy

3. Oregon Senate Bill 360 (The Act of 1997)

4. Health Forests Restoration Act, 2003

5. FEMA National Fire Plan

6. The 10-year Comprehensive Strategy

7. Regional Natural Hazard Mitigation Plan (Baker, Grant, Union, and Wallowa Counties)

8. Union County Emergency Operations Plan

9. Federal Register, 2001 listing High Risk WUI Communities

10. Oregon Administrative Rules Chapter 477, Fire Protection of Forests and Vegetation

The Union County Board of Commissioners has adopted fire siting standards within the Union County Zoning, Partition and Subdivision Ordinance (UCZPSO). These have been modified over time using Oregon Department of Forestry fire siting standards. The County's IT Department is working on changing the designation that appears on property tax statements from "fire patrol" to "ODF non-structural protection". Other criteria required by the Office of the State Fire Marshall for 2006 include the active implementation of this community wildfire protection plan (Union County CWPP 2005).

Mitigation Action Plan for Emergency Services

The focus of this section is Union County's Emergency Services participation and efforts regarding wildland fire. County led efforts are centered on fire fighter and public safety; increasing opportunities to promote community awareness and involvement; collaboratively working with local agencies to improve emergency response.

Information Dissemination

Union County has many public information options today designed to educate the public on several emergency fronts, including wildland fire. Emergency Services has developed a Facebook page titled "Union County Emergency Services" (UCES) that provides 1,423 followers with real-time updates to wildland fire events. In the summer of 2015 during the wildfire season, members of the public were able to view fire information as it was released.

Union County web site, http://union-county.org/, has a link to Emergency Services that provides access to Emergency Preparedness and planning for a wildland fire. This site also provides a link for the public to opt-in for the County's emergency notification system, hosted by AlertSense. The system allows targeted, expedited public information release during emergencies that include natural disasters such as wildfires.

A blog site called, Blue Mountain Fire Information has been established for information regarding current wildfire activity in the Blue Mountains areas of northeast Oregon and southeast Washington. This site is hosted by the Blue Mountain Interagency Dispatch Center, Oregon Department of Forestry's Northeast Oregon District, Umatilla National Forest, and Wallowa-Whitman National Forest. This site provides recent news releases

as well as real time forest conditions, local and regional wildfire conditions, current activities planned, and links to several agencies' Facebook pages and websites.

County Wide Fire Simulation Scenarios

County emergency and fire management agencies, along with local cooperators, have been proactive in preparing for wildfire events. In May of 2015, Emergency Services hosted a wildfire simulation event with 63 individuals in attendance. The simulation involved all fire response agencies and 17 cooperators, including local law enforcement, American Red Cross, etc. (Appendix H). This provided opportunities to filter out potential issues in advance of a wildfire threat. Simulations are planned to occur every three years, with the expectation of increased cooperator involvement.

Zoning and Standards

New construction and zoning opportunities will provide the best possible protection for both land and structures. As new construction occurs, defining local protection districts and wildfire mitigation needs upfront will increase opportunities for successful home protection during wildfire events. The Cohesive Wildfire Strategy emphasizes a need for assessing urban interface growth, land development, and zoning laws where communities can be proactive in developing defensible space and wildland fire risk reduction actions during new development (CWS 2014). Maintenance of previously completed fire risk reduction should also be an important topic during zoning assessments (CWS 2014).

Fire Siting/Zoning Standards information

Union County Planning Department has released its 2016 standards for dwellings in or near forested areas. Union County Articles 8.0 Subsection 8.06 and 9.0 Subsection 9.06 Fire Siting Standards provides information for new dwellings and related structures in the R-3 and R-4 Zones where the predominant use is forestry and where dwellings are on rangeland within one quarter mile of forest land areas (Union County 2016).

Both Articles 8 and 9 discuss new dwellings and fire protection. Subsections 8.06 (2) and 9.06 (2) state that new dwellings shall be located upon a parcel within a fire protection district. If the inclusion of the new dwelling into a fire protection district or a contract for residential fire protection is impractical, then the applicant shall provide an alternate means of protection the dwelling from fire hazards (Union County 2016).

Standards in subsections 2 thru 5 discuss multiple protection needs both in and outside the fire protection districts. Items include:

- Water resources, capacity, and access
- Road construction and access
- Turnarounds
- Signage
- Defensible space – fuels reduction, clearance, landscaping, maintenance
- Building construction

Defensible Space

Defensible space is an area designed to improve structures' chances of surviving a wildfire. Defensible space provides an area that increases options for firefighting resources during a wildfire event. It includes areas in which vegetation has been altered or reduced in an effort to modify fire behavior, reduce structure ignition, and increase opportunities for firefighters to defend structures or critical infrastructure. It often increases the probability of structure survivability, even at times when fire conditions limit engagement of firefighting tactics.

There are four primary objectives when developing defensible space:

1. Safer locations for firefighters to engage wildfires.
2. Modify fire behavior through changes to vegetation.
3. Stop fire spread prior to it reaching communities, in effect reducing fire size and commitment of firefighting resources.
4. Landscape fragmentation of vegetation continuity, which accomplishes the first three.

Residential defensible space takes many forms that could include planting and maintaining a lawn, thinning/clearing underbrush and dense stands, and providing adequate road access for firefighting equipment. Residential defensible space is often in close proximity to structures. The areas can receive layered treatments of the vegetation in a vertical primary, secondary and tertiary format. Different treatments and maintenance can occur in each portion of the space depending on needs. The size of a defensible space will vary, and is dependent on many factors such as slope, fuels, climate, and fire history.

Community defensible space in the middle ground can also provide advantages to firefighting by changing fire behavior well outside the residential areas in an effort to prevent direct threats to communities. The primary purpose of a fuel treatment is to change fire behavior if a wildfire should enter a fuel-altered zone, thus lessening the impact of the fire to communities as well as ecosystems. This change in fire behavior is often quantified as a reduction in flame length, intensity, or rate-of-spread, and manifested as a change in severity or growth of the fire. This is best achieved by fragmenting the fuel complex and repeatedly disrupting or locally blocking fire growth, thus increasing the likelihood that suppression will be effective or until weather conditions change (Finney 2001). In other words, by treating areas on the landscape in order to break up the fuel continuousness of both standing live and dead down material, these treated areas will disrupt the wildfire behavior and modify the fire growth to allow suppression resources to be effective. Vertical and horizontal vegetation treatments, vegetation modification along primary roads, and strategically placing treatments as part of a defensible plan all provide a means of fragmenting the fuels to disrupt fire spread.

The number of resources needed to protect a structure that has a properly maintained defensible space is usually lower. Union County is prone to multiple lightning fire starts

and has the potential for a major fire in a WUI, thus, conserving resources will be a priority in an effort to defend as much property as possible.

Interoperability Between Dispatch Centers

The county currently has two primary dispatch centers that notify emergency resources, including wildland fire, of needed assistance at an incident. The Blue Mountain Interagency Dispatch Center (BMIDC) is designed with wildland fire in mind. The Dispatch Center employs personnel from both the U.S. Forest Service and ODF dispatchers, who handle both wildfire initial attack dispatching and wildfire logistical support.

The Communications Division for the City of La Grande includes the emergency 9-1-1 center for all of Union County dispatching both emergency and non-emergency calls for service including La Grande Police Department, La Grande Fire and Ambulance and through cooperative agreements the Union County Sheriff's Office, La Grande Rural and QRT, Imbler Rural and QRT, Elgin Rural Fire and Ambulance, Cove Rural and QRT, Union City Fire and Ambulance, Union Rural Fire, North Powder Rural Fire and QRT and Medical Springs Rural Fire and QRT. The 9-1-1 Center is the 9-1-1 Public Safety Answering Point (PSAP) for all of Union County and provides emergency dispatch services for 22 Law Enforcement, Fire and EMS agencies throughout the County (City of La Grande 2016).

A Computer Aided Dispatch (CAD) link between dispatch centers does not currently exist, and as wildland fire response continues to evolve to include more interagency involvement CAD connections are needed at a minimum. The development of compatible computer systems and/or software between Union County and the Blue Mountain Interagency Dispatch Center will assist emergency services in a number of ways.

- Allows for real time information between Emergency 911 and wildland fire dispatch offices.
- Provides for a centralized data base where all information can be obtained
- Increases efficiency in communication between the county, state, and federal agencies.
- Disseminates consistent information between dispatch centers and fire response agencies.

Training

Most wildland fires are either on State protected private lands or Federal lands, which often results in reciprocal agreements between agencies on training requirements to qualify for wildland firefighting. This provides consistent training qualifications for wildland fires. The Forest Service and ODF offer a variety of opportunities to help rural firefighters with wildland fire training.

The State of Oregon has the Department of Public Safety Standards and Training that serves career and volunteer structural fire fighters, providing entry-level, specialized,

leadership, and maintenance training to Oregon's fire service professionals (Oregon State 2016). Many of the Forest Service and ODF training classes provide student classroom space for structural firefighting personnel.

The U.S. Forest Service, BLM, and ODF provide a wide range of courses for wildland fire professionals to update their knowledge and skills. Many of these courses are interagency in nature.

Rural Fire Departments are hired for fire response and training under the State of Oregon because there is no avenue for the Forest Service to develop a mutual response agreement with Rural fire departments. Currently, Rural Fire departments cannot be hired directly by the Forest Service. This creates obstacles when Rural Fire departments are the closest resource for initial attack on public lands, resulting in inefficient uses of resources, slowed response times, and more acres burned.

Training can also be an obstacle for rural fire departments, since they are not on an agreement for federal training program. Rural fire departments must find qualified instructors and sponsors to conduct classes or pay for classes at local community colleges. This requires time and money for individuals who are also holding down other full-time jobs. Developing local trainings where rural departments can maintain and increase their qualification would benefit the local, state, and federal partners. Developing a program through the Northwest Coordination Training Group (NWCG) to include rural firefighters will result in increased state and federal response capacity.

Union County fire response may differ depending on agency and burnable material involved, however, to assist on publicly owned lands, federal wildland fire standards for training must be met. This training provides consistent safety procedures, language, processes, and knowledge.

Summary

Union County is 2,039 square miles (1.3 million acres) in size, supporting an estimated population of 25,652 people. The larger percentage of infrastructure and communities are centered within the Grande Ronde Valley and its surrounding foothills with some isolated outlying communities that currently have no structure protection.

Fire protection in the county ranges from wildlands only, structures only, to no protection at all. The lack of fire protection for all structures is Union County's highest concern in this CWPP. A total 432,701acres of privately owned property lacks structural fire protection, where the bulk of the structures exist. The 652,911acres of Forest Service managed public lands is under wildland protection only. These lands have very few structures, most of which are not residential. .

Rural fire departments are the most affected in maintaining response capabilities for several reasons. Rural fire departments are hired for wildland firefighting through ODF, they have had low recruitment, they are almost entirely volunteers, and have limited access to training.

Collaborative efforts are continually being built upon through countywide fire simulations that provide fire scenario situations before they occur in which cooperators and agencies have an opportunity to understand their roles prior to a wildfire occurring. New technology has improved outreach to county residents through Facebook, blog sites, and agency-specific websites to engage them in risk reduction and defensible space measures.

Several opportunities exist through this CWPP that will improve fire response capabilities. Collaborative working together to advance information sharing, fire siting, communications, and training can save lives and property.

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Web Links:

Fire Department.net.
http://www.firedepartment.net/nearest-fire-department#location=Union+County%2C+OR

City of La Grande 2016. http://www.cityoflagrande.org/muraProjects/muraLAG/lagcity/index.cfm/city-offices/police/about-us/misson-statement/

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National Interagency Fire Center 2016. https://www.nifc.gov/training/training_main.html

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