Hood River County
Community Wildfire Protection Plan

2013

Prepared by Jon Kelter Gehrig in coordination with Hood River County Fire Services and the Oregon Department of Forestry


city of
HOOD RIVER
est. 1895


HOOD RIVER
FRUIT RECREATION
INDUSTRY
COUNTY


HOOD RIVER
FIRE/EMS


CAREER
VOLUNTEER


WY'EAST
FIRE
DISTRICT


FAIRDALE


Hood River Soil & Water
Conservation District


CASCADE LOCKS
FIRE/EMS


OSU
Oregon State
UNIVERSITY
Extension Service
Hood River County


MT. HOOD
National Forest


OREGON
DEPARTMENT OF FORESTRY


FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE


COLUMBIA
RIVER GORGE

Acknowledgments

I would like to acknowledge the many people within the county that contributed and helped in the formation and completion of this document. Without the collaboration, sponsorship, support, and dedication of the Hood River County Fire Chiefs, much of the local knowledge would remain untapped.

Much of the data collected to identify hazards and risks within the county will continue to be of great value to emergency services planners; whether it is utilized for fuels management or fire suppression purposes.

Special thanks to:
Peter Mackwell for his inside input and organizational support; Mike Schrankel for his contribution of data; the Hood River Watershed Group and Cindy Theiman for their open support throughout the process.

Signature Page

The contents of this document have been agreed upon by the Hood River county, Board of Commissioners, the District Forester of the Central Oregon District for the Oregon Department of Forestry, and the Hood River County Fire Defense Board Chief. This plan is not legally binding as it does not create or place mandates or requirements on individual jurisdictions. It is intended to serve as a planning tool for the fire and land managers of Hood River County, Oregon, and to provide a framework for those local agencies associated with wildfire suppression and protection services to assess the hazards associated with wildland urban interface areas and to identify strategies for reducing those risks. This is working document to be reviewed by the steering committee and updated as necessary.

Ron Rivers, Chair Hood River County Commissioners	Date
, Central Oregon District Forester, Oregon Department of Forestry	Date
Jim Trammel, Hood River County Fire Defense Board Chief	Date

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Chapter 1
Introduction

Source: Adam LaPierre, Hood River News 2011

Introduction

Nestled between the active volcanoes of the Cascade Range and the Columbia River, Hood River County is at risk to many different natural hazards. The chance of a major flooding event or landslide is high, and could potentially cut the county off form the rest of the state. Severe storms and drought could devastate agricultural production, one of the county's top economic drivers. Less likely but far more destructive, Hood River is also at risk from volcanic eruptions, much like the 1980 eruption of Mt. St. Helens only 75 miles away. While any of these events could occur, the most likely natural hazard that we face is wildfire (see Table 1).

Table 1: Hood River County Natural Hazard Risk Assessment.

Hazard	Probability Total	Vulnerability Total	Total Threat Score	Severity Impact Score	Relative Probability	Relative Risk	Hazard Ranking
Wildfire (WUI)	70	30	190	3.5	5	17.5	1
Severe Storm	63	45	216	3.3	4.5	14.9	2
Flood - Riverine	63	25	172	2.8	4.5	12.6	3
Drought	56	40	192	2.9	4	11.6	4
Earthquake	28	25	111	3.3	2	6.6	5
Landslide / Debris Flow	35	20	103	2.3	2.5	5.8	6
Volcanic Event	7	10	61	4.6	0.5	2.3	7
Tornado	7	5	24	2	0.5	1	8

Source: Hood River County Natural Hazards Mitigation Plan, August, 2012.

Hood River is reminded of the threat of wildfire every year. The Dollar Lake Fire burned nearly ten square miles of the Mt. Hood National Forest in 2011. Burning for over a month, it endangered homes, power transmission lines, and the Bull Run Watershed. Similarly, the Gnarl Ridge Fire of 2008 burned five square miles, shut down portions of Oregon Highway 35, threatened a municipal water supply, and came within yards of burning the Historic Cloud Cap Inn. The impact of these two fires on the landscape will not be forgotten soon: burning in the canopy of the forest, they caused a near 100 percent tree mortality, leaving the appearance of matchsticks poking out of bare earth (Figure 1). Striking closer to home for Hood River residents was the Microwave Fire of 2009. Burning parallel to the Columbia River, the Microwave Fire endangered hundreds of homes, Interstate 84 traffic, and stood the realistic chance of running past the community of Mosier and towards The Dalles.

Hood River has been fortunate thus far. Relatively few losses to life and property have been suffered. Looking at other wildland/urban interface communities throughout the western United States shows how lucky Hood River has been: Colorado's Black Forest Fire in 2013 destroyed 486 homes, resulting in $85 million in damages; the same year suppression of the Yarnell Fire resulted in the death of 19 firefighters. This was the biggest loss of life in a single wildland fire in over twenty years. At the time of this writing, Oregon alone had suffered the loss of three firefighters in the line of duty only midway through the fire season. Each year the intensity and

frequency of wildfires increases across the country. More homes are threatened, more lives are endangered, and the cost of suppression increases. Moving forward with this in mind, we can easily say that it is not if a catastrophic wildfire will strike, but when.

Figure 1: Tree mortality on the Dollar Lake Fire of 2011.

Source: Jon Kelter Gehrig, 2013

Accepting that living without wildfires is not an option allows communities to become proactive in the face of fire. Planning, education, and the reduction of hazardous fuels that could potentially take a fire from controllable to uncontrollable are steps that communities can take to better live with fire. It allows us to understand the risk and hazard that we face and to take control of a natural phenomenon that so often seems unmanageable. This is Hood River County's Community Wildfire Protection Plan and it is designed to turn increased awareness into sustained action.

VISION

The Hood River County Community Wildfire Protection Plan (HRCCWPP) takes a holistic approach to wildfire mitigation and preparedness. At the individual level, it seeks to foster an understanding of fire risk to homes, property, and health. At the same level, it also seeks to identify solutions that can be taken to prepare and mitigate in the event of a fire. At the community level, the HRCCWPP seeks to start a dialogue and build strong partnerships between public and private organizations. These partnerships will identify the roles of each organization in the event of a fire. A strong and educated community is a fundamental aspect of a disaster prepared community.

GOALS

- Save lives
- Protect homes and property
- Reduce the risk of a catastrophic wildfire
- Foster strong community ties
- Support the management of a fire adapted and sustainable environment

PURPOSE

- To identify and prioritize areas that are at an increased risk of a catastrophic wildfire due to human development in the wildland/urban interface and the buildup of fuels from fire exclusion and suppression.
- To prevent and mitigate the frequency and intensity of wildfires in and around Hood River County
- To help restore forest and grassland ecosystems of Hood River County to healthy levels and consistent with their historical fire regimes
- To reduce the cost associated with wildfires. This includes reducing the costs associated with suppression, as well as economic losses caused through property damage and productivity losses
- To support fire education through collaboration with various fire agencies and community organizations
- To unite the entire community of Hood River in a collaborative and inclusive effort to reduce the risk and damage of wildfire

WHO

Wildfire prevention and mitigation falls into the hands of all people associated with the wildland/urban interface. From recreationists using the forest and residents living within the WUI, to firefighters and planners, everyone has a responsibility. While we typically consider firefighters to have the main role of fire suppression, much can be done at the individual level to reduce the risks of fire vectors (making firewise choices while using the forest) and mitigate the effects of fire damage to personal property (clearing hazardous fuels away from homes). How individuals and organizations can cooperate with each of Hood River County's seven fire jurisdictions is essential in identifying the unique roles that each group plays in fire mitigation and preparedness. In one word, *collaboration* can significantly reduce the threat and hazard associated with wildfires.

What is the CWPP?

The CWPP Is:

- A collaborative planning document that identifies and assesses possible wildfire hazards and risks
- Open and available to help the public mitigate and prepare for wildfires
- A mechanism to identify areas for hazardous fuels reduction projects
- Designed to meet the standards of the Healthy Forest Restoration Act and Oregon Senate Bill 360

The CWPP Is Not:

- A scientific report
- A legal document
- A complete account of past fire occurrences
- A comprehensive assessment of all risk and hazards that Hood River County faces

WHAT

Community Wildfire Protection Plans are designed to create and compile a list of action items that need to be accomplished to create a fire safe community. These action items range from community outreach steps to hazardous fuels reductions projects. Fuels reductions projects seek to remove large buildups of fuel in areas that have an increased susceptibility to wildfire, while community outreach programs seek to build community and create public awareness. Increased awareness leads to sustaining action. The HRCCWPP is designed to be accessible and informative for a wide range of actors, from the individual citizen or tourist, to the city planner and state forester.

WHERE

The HRCCWPP focuses on the entire County of Hood River. It is designed to fit the unique cultural, social, and environmental needs of Hood River County. At some times, the greater region will be referenced to add context and depth. At other times, individual fire jurisdictions will be referenced in regards to their own fire protection capabilities and individual areas that are viewed as high hazard.

WHY

Hood River lies in a region that is prone to wildfires. It is surrounded on four sides by forests and grasslands, steep terrain, and receives extreme weather events and high winds. Given the wrong combination of these factors, a wildfire in any part of the valley could prove catastrophic. This plan is a planning tool to inform the public and mitigate the risk and damage from potential wildfire. In the words of Benjamin Franklin, 'an ounce of prevention is worth a pound of cure.'

The 2013 update of the CWPP looks back and assesses the strengths and weaknesses of the 2006 plan. It seeks to utilize the strong points, build on the gaps, and align with the ever-changing economic, social, and ecological needs of the community. Updating and maintaining the Community Wildfire Protection Plan benefits Hood River County from an awareness perspective. It also benefits the County as it allows county leaders to define their own wildfire Fuels Management Areas based on local knowledge, and allows Hood River County to receive federal priority for implementing fuels reduction projects which are identified within the CWPP.

WHEN

Wildfires know no temporal boundaries. The updated HRCCWPP builds on the 2006 version, with updates to suit the dynamic nature of Hood River County's forests and citizenry. Written in 2013, it will help guide Hood River County well into the future.

An accessible approach…

The 2013 HRCCWPP aims to suit the needs of various interests. Fire personnel, foresters, planners, and private citizens can all benefit from a CWPP in different ways. The updated version is designed to reflect the needs of planners and citizens by:

- Eliminating the use of acronyms and scientific jargon where possible
- Including images, diagrams, and maps to illustrate major points
- Creating chapters which are accessible out of the contextual whole

HOW

The HRCCWPP focus takes a two pronged approach to achieve its goals; can roughly be divided into two separate parts: what items need to be done and how to accomplish them. The *what* establishes action items based on wildland/urban interface fire risk and hazard. These include suggestions on how to reduce hazardous fuels, improve access and egress to high hazard areas, and how each individual homeowners can improve their own surroundings to make their homes fire safe. The *how* focuses on creating an organizational framework to establish action items and monitor progress towards these goals. The *how* seeks to create sustaining action through empowered citizens, organizations, and groups.

ORGANIZATION

The HRCCWPP is organized into ten main chapters. Each chapter builds upon the previous and is designed to give the broadest view possible of the hazards, risks, and consequences that Hood River faces from wildfires. The information in each chapter is unique to Hood River County, and written to fit the needs of the community; however, each chapter is written to loosely parallel recently updated CWPPs of neighboring counties. These include Clackamas and Multnomah Counties.

The HRCCWPP is divided into 13 chapters. Each chapter adds to an understanding of the risks that Hood River County faces in terms of wildfire risk, consequence, and probability. Some chapters are designed for public education and unpack some of the negative views of wildfire, while other chapters are specific to hazardous fuels reductions projects, which are managed by ODF, USFS, and local fire agencies.

Chapter 2—*Impetus and Planning Steps*—details the impetus for updating the CWPP. Looking at national and state policy, this chapter discusses how the large destructive fires of the past two decades have raised public awareness about homes on the edge of the forest. It defines what the wildland-urban interface is, and the planning steps that Hood River County has taken to create wildfire awareness and plan for disaster. Chapter 3—*Community Profile and Values*—talks briefly about the economics and culture of Hood River County, and includes a look into the main sectors of the economy and how they relate to the forest and wildland-urban interface. It additionally suggests the different social, cultural, and economic values which should be protected from wilfire. *Fire Supression in North America: Cause and Consequence* (Chapter 4) discusses some of the history of fire in North America. From Native American burning prior to European arrival, to the fire suppression policies of the 20th century, this chapter gives insight to how our forests have changed in the past 300 years, and the implications this has for those living in the WUI.

Beginning in Chapter 5—*Historic Wildfires and Forest Conditions*—the CWPP addresses Hood River County specifically. It answers such questions about Hood River County forest types and dominant tree species. Additionally, it discusses some of the larger fires that the Hood River area has experienced in the past decade. Under the banner of forest conditions, Chapter 5 also touches on some of the recent changes to our forests, including the infestation by the California Fivespined Ips. Chapter 6 (*Communities at Risk*) looks at population density in Hood River County and determines some of the risk factors that we face. Chapter 7, entitled *Wildfire Risk Assessment*, takes an in depth look at the main risk factors that are considered when looking at

fire probability and consequence: fuels, terrain, weather, elevation, and fire response times. It also looks at some of the spatial patterns of wildfires in the county and what has historically caused the most fires that we have experienced. *The Active Citizen: Home Protection and Defensible Space* (Chapter 8) is designed exclusively for use by the public. It gives suggestions for creating defensible space around the home, how to create and emergency evacuation plan, and what different evacuation levels mean.

A deep look into the specific hazards that Hood River faces is detailed in Chapter 9 (*Identification and Prioritization of Fuels Management Areas*). This chapter includes fire district specific assessment of possible fuels reduction areas, and prioritizes them based on risk, hazard, probability, and overall. Maps are included and illustrate areas of high concern. Emergency response operations are discussed in Chapter 10. Here, the way that Hood River County Fire Services functions as a working unit comprised of individual members is illustrated. It includes a brief assessment of water and transportation infrastructure. *Structural Ignitability* briefly looks at fire codes that the county and state have adopted and suggests the need for the County wide adoption of the International WUI Building Code.

The final two chapters (*Community Wildfire Prevention and Public Outreach* and *Sustaining Efforts*) detail some of the community education and prevention actions that have been taken in Hood River. These include awareness campaigns for those living in areas of extreme hazard, and continued actions that Hood River County Fire Services is taking to reduce overall risk.

FUNDING

The 2013 update of the HRCCWPP is made possible with funding from the U.S. Department of Agriculture Title III grants and generous support from the Hood River Fire Chief's Association.

Chapter 2
Impetus and Planning Steps

"Plans are nothing; planning is everything"

~Dwight D. Eisenhower

Impetus and Planning Steps

POLICIES AND TOOLS

For nearly 100 years, actors from all levels of government sought to exclude and eliminate fire from forests and rangelands. Fire, which was popularly seen as a negative forest disturbance, was deliberately suppressed and excluded from federal, state, county, and private lands as a way to protect recreation areas, resources (timber), and homes (Pyne, 1982). By the end of the 20th century, fire exclusion and suppression had led to forests and rangelands that were significantly altered from their natural state, laden with heavy and dense fuels that were prone to severe fire events (McLoone, 2006).

In 2000, the U.S. experienced the worst fire season since 1910 (see Chapter 4 for greater detail). Fueled by overgrown forests and unusually dry fuels from a previous La Niña weather cycle, wildfires burnt over 7 million acres of land—roughly twice the national average. By August, over 29,000 personnel were working to suppress the fires across the nation, which included firefighters from Australia, Canada, New Zealand, Mexico, and the Army. In the end, the 2000 wildland fires would cost over $10 billion dollars in suppression costs and economic losses, kill 15 firefighters, and destroy hundreds of homes (U.S. Fire Administration, 2000). The two main fires—the Bandelier Fire in New Mexico and the Bitterroot Valley fire of Montana destroyed 1,000 structures and $1.3 billion dollars in suppression costs alone.

The destruction caused by the 2000 wildfire season was a dramatic wake-up call to the federal government and general public. It made clear that past forest management practices of fire exclusion and suppression, combined with increased human development in western forests, and a lack of coordination between federal, state, and local agencies could spell a recipe for disaster. As a result, governors from six western states, including Wyoming, Utah, Oregon, Idaho, Montana, and South Dakota met with the Clinton Administration to seek $2.8 billion in wildfire prevention money to replace some of the money spent on the 2000 fire season (Pinchot Institute for Conservation, 2002). This meeting would eventually lead to three pivotal policies that focused on wildfire prevention and preparation through planning, collaboration, and the reduction of hazardous fuels.

The National Fire Plan

The first of these policies was the National Fire Plan (NFP). Developed in August 2000, was designed to strengthen individual communities' ability to fight and prevent wildfires, by providing funding and tools for fire mitigation. The plan consists of five key tenets. They are: firefighting, rehabilitation and restoration, hazardous fuels reductions projects, community assistance, and accountability. Alongside these tenets, the NFP encourages communities to find local and collaborative solutions to mitigating fire risk and hazard within the wildland/urban interface.

NFP Goal

"To provide invaluable technical, financial, and resource guidance and support for wildland fire management across the US"
~www.fireplan.gov

The Healthy Forest Initiative

Building on the successes and failures of the NFP, the Healthy Forest Initiative (HFI) was launched in 2002 following yet another destructive wildfire season. Seeing that the destructiveness of wildfires was largely a result of fire exclusion and fuels buildup, the HFI focused on the reduction of hazardous fuels as a fire mitigation technique (Staychock, 2008). Understanding the urgency for fuels reductions projects, the HFI allowed for expedited environmental assessments to encourage action on the ground as timely as possible.

The Healthy Forest Restoration Act

Building on the HFI came the Healthy Forest Restoration Act (HFRA) of 2003. Considered by many to be the first major piece of forestry legislation since the 1970's, the HFRA combined parts from both the NFP and HFI in a comprehensive plan to return forests to their healthy state through the reduction of fuels. The HFRA has six main purposes (HFRA, 2003):

- Reduce the risk of wildfires to communities, water supplies, and federal land through prioritized and collaborative hazardous fuels reductions projects
- To authorize grant programs to improve the commercial values of forest biomass
- To enhance efforts to protect watershed and to address wildfire's threat to forest and rangeland health
- To systematically track information about pests and diseases that can damage forest and rangeland health
- To improve disease and insect tracking in hardwood forests in a timely manner
- To protect, restore, and enhance forest ecosystems

Alongside these purposes, the HFRA introduces the concept of the Community Wildfire Protection Plan (CWPP). The plan is designed for communities at a high risk of wildfires. It identifies collaboration, the identification and prioritization of areas for hazardous fuels reductions projects, and measures to reduce structural ignitability, as three minimum qualifications for a CWPP. While not essential, a CWPP may include community wildfire risk assessments, community preparedness, and emergency procedures (Staychock, 2008). Giving local communities and municipalities a central role in shaping forest management on federal, state, county, and private lands, this ground-up framework means that each CWPP will be dynamic and uniquely suited to community needs.

The CWPP evaluates the current situation with regards to wildfire hazard and risk, and plans for the protection of human welfare, economic opportunity, social and cultural values, and ecological assets. Essential to accomplish these tasks are the identification of the wildland/urban interface (WUI). This is where homes, structures, and populations intermingle or intermix with wildland fuels, such as those found in and around forests or rangelands.

Oregon Senate Bill 360

The Oregon Forestland-Urban Interface Fire Protection Act of 1997 (SB360) is the State of Oregon's response to the escalating cost and loss associated with wildfire: growing numbers of

homes being built within the WUI are putting firefighters in inreasingly hazardous situations; limited fire resources are being spread thinner and thinner each year, reducing the ability to provide structural protection in the interface; fire suppression costs have skyrocketed over the past ten years, economically straining an already cash-strapped state. SB360 addresses these concerns and enlists the aid of the only people who can make fuel reduction changes to residential property: the landowners and residents themselves.

Under the bill, homeowners are encouraged to apply simple and inexpensive measures to reduce the risk of wildfire around their home, as well as increase the ability to for fire personnel to safely protect their home in the event of a fire. This includes the removal of fuels to varying degrees in buffers around the home and ensuring adequate space for fire apparatus to move. The Forestland-Urban Interface Fire Protection Act of 1997 is intended to be both voluntary and self-certifying by the homeowner.

By design the Oregon Department of Forestry developed a program that recruits the assistance of each homeowner, offers defensible space prescriptions and allows affected homeowners the option of certifying their property or not. The act contains no statutory provisions, homeowners will not be cited or required to appear in court if they choose not to participate. The act does contain a potential civil liability if the homeowner does not certify their property in two years after notification. If a fire originates on that property and spreads through the area that should be treated and the Oregon Department of Forestry must utilize extraordinary suppression efforts to contain that fire, a home owner could be liable for up $100,000 of suppression costs. Home certification and treatment suggestions are detailed in Chapter 8, *The Active Citizen*.

Defining the Wildland/Urban Interface

The wildland/urban interface (WUI) is defined as areas where residential developments intermingle with fire adapted vegetation (Cova, 2005; Fried, 1999; Theobald, 2007). This basic definition has been expanded and often includes other human developments, such as roads and critical infrastructure. Areas within the WUI pose several problems in regards to wildland fires. Natural fuels in these areas are abundant due to a century of fire exclusion and suppression. Human developments in the WUI are often built in terrain that inhibits the construction of roads, thus ingress and egress can be highly limited. Additionally, infrastructure commonly associated with structural fire protection is minimal or non-existent. This includes fire hydrants, stand pipes, and municipal water lines. These factors place firefighters and residents in the WUI at an increased risk of disaster. Identifying the WUI is the first step in mitigating these hazards.

The WUI

"The Wildland/Urban Interface is defined as areas where homes are built near or among lands prone to wildfire."
~Ready, Set, Go

Defining the WUI for a Community at Risk depends on multiple factors. By default, the WUI is defined where there is at least 1 home per 40 acres within 1.5 miles of a vegetated area (Silvis Forest Lab, 2013). This default definition includes both houses that directly intermingle with continuous vegetation and houses that are in the vicinity of highly vegetated aresas. This definition indicates that even those homes that are in relative proximity to forest can be in danger

of a wildland fire (Stewart et al, 2007). The 1.5 mile buffer identified with the default definition is considered to be the distance that a firebrand can be carried from the forest and start a spot fire. In this sense, a wildfire can potentially ignite a home from 1.5 miles away (State of California).

The Hood River WUI is demarcated outside communities at risk that is strategically important for their protection. In this manner, the WUI is a defensible space that may include mitigation plans (escape routes) as well as offensive firefighting plans (known fire breaks and water sources).WUI boundary areas are shown by fire district, city, unincorporated and federal lands. The boundary represents a planning zone that is defined by topographical and man-made barriers that represent reasonable access areas for fire suppression activities/planning.

While the WUI is delineated by a line on a map, in the face of fire emanating or approaching that line, fire suppression efforts by practical necessity may show little or no regard for that boundary. Every effort in planning the boundary has been focused on natural barriers such as roads, and ridges (i.e. places that are commonly utilized in fire suppression activities). Fuel loading, topography and weather patterns also effect the placement of the WUI boundary. The Hood River WUI is discussed further in Chapter 7.

PLANNING STEPS

No single CWPP can suit the needs of all communities throughout the state, let alone the country. The needs of each community vary greatly depending on social circumstances (community values, critical infrastructure, economic priorities) and geographic conditions (forest structure, weather, terrain). In 2004 the National Association of State Foresters developed a handbook to guide in the creation of Community Wildfire Protection Plan.

The guide helps communities—typically at the county level—to create a customized fire protection plan that fulfills both the needs of the community and the core requisites under the HFRA. In "Preparing a Community Wildfire Protection Plan: A Handbook for Wildland Urban Interface Communities," eight basic steps are identified to create a CWPP. Each step is designed to help a community identify and clarify the hazards and risks of wildfire, as well as critical infrastructure and values in the wildland-urban interface. The Eight steps are identified below:

Planning Steps as defined by the National Association of State Foresters

- Convene Decision Makers
- Involve Federal Agencies
- Engage Interested Parties
- Establish a Community Basemap
- Develop Community Risk Assessment
- Establish Community Priorities and Recommendations
- Develop an Action Plan and Assessment Strategy
- Finalize Community Wildfire Protection Plan

THE 2005 HOOD RIVER CWPP PLANNING PROCESS

The initial planning process followed the eight steps as outlined above and recommended by the NASF. Decision makers—identified as the "Core Team"—included: Planning, Public Works, and Forestry Representatives from Hood River County; City of Hood River Fire Marshal; the Hood River County Fire Chief's Association; Oregon Department of Forestry (ODF); Private Residents for Hood River County; the Oregon State Fire Marshal's Office; the Hood River County Sheriff and OEM. Members of the Core Team are required under HFRA guidelines to mutually agree on the final contents of the CWPP (HFRA, Sec. 103 (b)(2). Federal agencies included in the planning process were primarily from the USDA Forest Service Region 6—representatives included those from the Mt. Hood National Forest and the Columbia Gorge National Scenic Area administrative areas. The majority of federal lands within Hood River County are managed by these two agencies. In addition to the Core Team, contact and collaboration was also sought with the Oregon Department of Transportation (ODOT), Hood River Soil and Water Conservation Group (HRSWCD), the Cooper Spur Collaborative Working Group, water and irrigation districts, and the Hood River County Chamber of Commerce. These interested parties were essential in the ongoing process of managing and implementing action items recognized in the CWPP. A community basemap was developed using information collected, organized, and produced with a Geographical Information System (GIS).

Initial GIS data collection was initiated on a four county regional basis by grant funding through the National Fire Plan. Data collection was administered by Washington State University and served Skamania, Klickitat, Wasco and Hood River Counties. Data collected was collated with existing data to provide a suite of basemaps to serve County Planners, 911 Emergency Dispatch, Fire and EMS Personnel, Police, County Emergency Managers, Oregon State Fire Marshall, Oregon Department of Forestry, and interested community members. Data gathered was organized and presented to the Core Team to develop a county-wide Community Risk Assessment. The risk assessment focused on Bonneville, Cascade Locks, Coburg, Dee, Eagle Creek, Hood River, I-84 Corridor, Mosier, Mt. Hood, Parkdale, Pine Grove, Viento, West Side, and Wyeth. These areas all fall within the Hood River Community at Risk, which was identified in the Federal Register as "Urban Interface Communities within the vicinity of Federal Lands that are at high risk from Wildfire" (Vol. 66, 2001). Hazardous fuels reductions projects were then prioritized for the above areas with input from the Core Team and interested parties.

HOOD RIVER CWPP UPDATE PROCESS

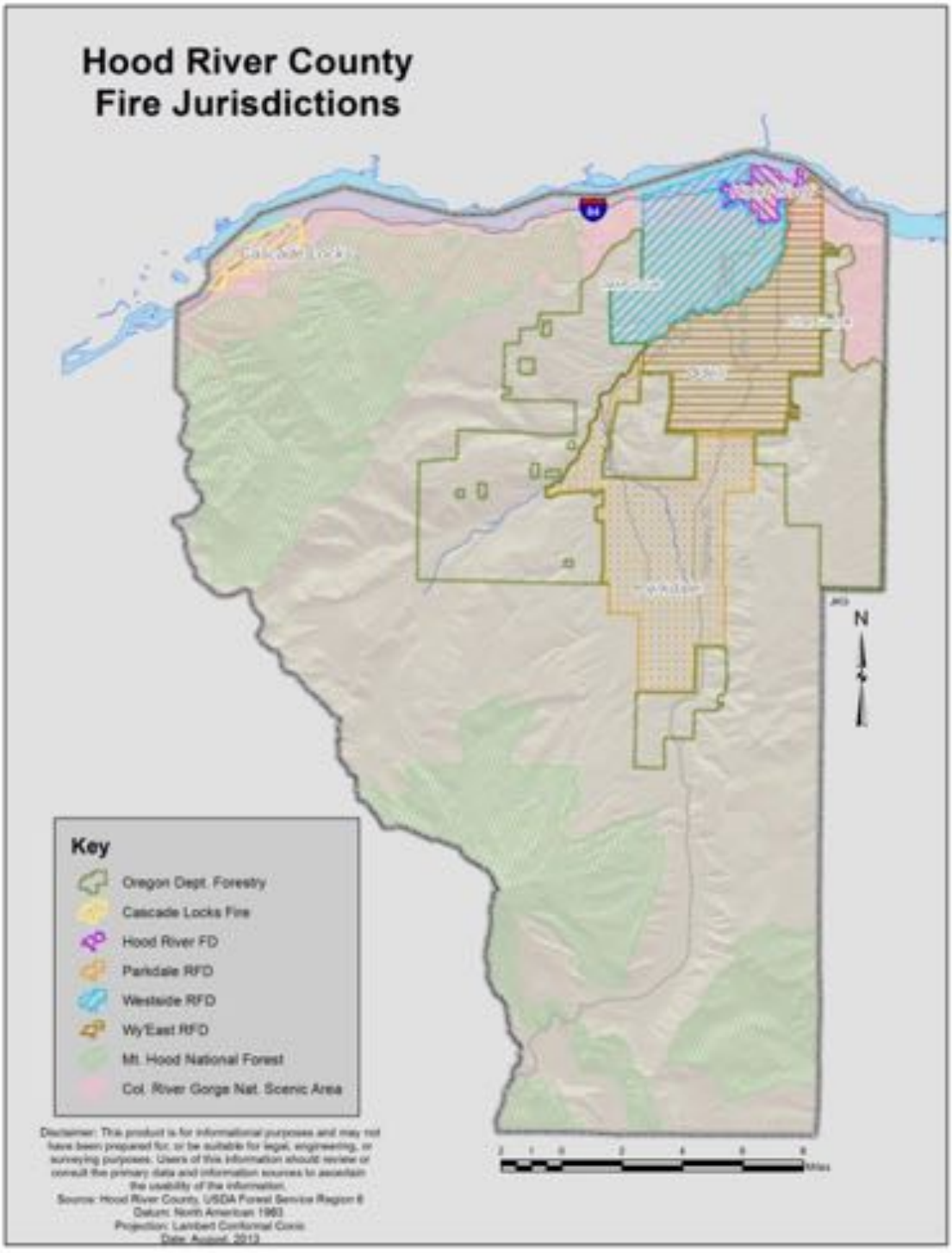
The 2013 update to the Hood River County CWPP builds on the collaborative processes described in the previous iteration and the utilization of technical subcommittees. The update was funded by Title III grants allotted to the Hood River Fire Chief's Association and administered through the City of Hood River. The update seeks to accomplish two main tasks: identify and reevaluate hazardous fuels reductions projects in Hood River County and develop a community outreach and education plan for those living within the wildland-urban interface. To be consistent with neighboring CWPPs (Clackamas and Multnomah), these two goals will be achieved by focusing on the following five areas: 1) wildfire risk assessment; 2) hazardous fuels reduction 3) wildfire prevention and community

education;4) emergency response operations; 5) structural ignitability. Each focus area will require collaboration and input from different agencies and members of the community identified below. It will also draw heavily from the 2005 HRCCWPP. Teams and work groups will provide feedback loops to augment data gathered and collated for the CWPP.

Local Fire Agency Organization and Participation

Fire protection for Hood River County is divided into five separate local jurisdictions, state jurisdiction, and federal jurisdiction. They include Hood River Fire and EMS, West Side Rural Fire Protection District, Wy'East Rural Fire Protection District, Parkdale Fire and EMS, Cascade Locks Fire and EMS, ODF, MHNF, and CRGNSA. These agencies were consulted regularly and updated on the progress of the CWPP. Input from these agencies provided empirical insight in addressing issues and concerns at the local scale. Hood River County Fire jurisdictions are identified in Map 1 below.

Map 1: Fire jurisdictions of Hood River County.



COLLABORATIVE TEAMS AND TECHNICAL WORK GROUPS

Participation by a variety of interests is required in the CWPP. Listed below are some of the core groups that may assist in completing the CWPP. Considered *Collaborative Teams* and *Technical Work Groups*, the below actors were consulted as necessary throughout the update process.

Wildfire Risk Assessment

Collaboration with Hood River County Fire Chiefs, ODF, and representatives from the MHNF and CRGNSA was necessary to complete an updated wildfire risk assessment. Areas that were perceived to be at an increased risk to wildfire were identified by Fire Chiefs for each individual fire district. These Hazard Areas (HA) were analyzed with a GIS by the Hood River Fire Services Wildfire Prevention Coordinator.

Hazardous Fuels Reduction

Hazardous fuels reduction projects on private lands are typically implemented through the Oregon Department of Forestry with funding from the NFP. Collaboration with ODF, HR County Fire Chiefs, and Private Citizens is required for these fuels reduction projects. Fuels reduction projects on federal lands are planned and implemented by the MHNF and CRGNSA. A large number of these projects fall in or near wilderness areas and require increase public input on proposed fuels reduction sites. The Mt. Hood National Forest Stewardship Crew (Stew Crew) was developed to foster public input. Members of the Stew Crew include representatives from Bark, Oregon Wild, HRSWCD, USDA Forest Service, Hood River County Fire Services, Hood River Watershed Group (HRWG), Confederated Tribes of Warm Springs, and individual citizens. The Stew Crew meets throughout the year as needed to discuss proposed fuels reductions projects.

Wildfire Prevention and Community Education

Wildfire Prevention and Community Education occurs at multiple levels. The Mid-Columbia Fire Prevention Cooperative consists of representatives from the city to federal level. They include Hood River County Fire Districts, Mid-Columbia Fire and Rescue, Underwood Conservation District, USFS Region 6, MHNF, CRGNSA, U.S. Fish and Wildlife Service, ODF, and the OSFMO. The Mid-Columbia Fire Prevention Co-op meets quarterly to discuss outreach and education opportunities. In addition to the Co-op, each individual fire district carries out education throughout the year within their jurisdiction. Other actors in community education and outreach include Columbia Gorge Community College and Hood River County School District Community Education Services.

Emergency Response Operations

Emergency Response Operations include members from Hood River County Fire Districts, 911 Emergency Dispatch, Hood River County Sheriff, and the Hood River Emergency Manager.

Structural Ignitability

Homes within the wildland-urban interface are at an increased risk to fire starts. Assessments of structural ignitability are carried out at the fire district level, typically by the Fire Marshal or Fire Chief. In 2009 Hood River County incorporated Oregon SB 360 to address structural ignitability. Adoption was funded with USDA Title III grants in cooperation with the Oregon Department of

Forestry and Hood River County. SB 360 is administered on a five year cycle, when new self-evaluation forms and treatment information are sent to homeowners.

Chapter 3
Community Profile and Values

Community Profile and Values

Hood River's economic drivers tell much about the values and residents of Hood River. The Hood River Chamber of Commerce identifies outdoor recreations, agriculture, food, beer, wine, arts, tourism, and tech as cornerstones of the economy. The above aptly describes many of the interests that are present in Hood River, and why the Columbia Gorge has become such a popular destination over the past 20 years. The following chapter describes some of the values that define Hood River and how these values are threatened by wildfire each year. An accurate assessment of values—from cultural to economic—helps to contextualize the threat that wildfires have to the way of life in Hood River.

LIVING AND RECREATION IN THE WUI

Current estimates put the population of Hood River County at 22,584 permanent residents (U.S. Census, 2012). Over the past thirty years, the overall population has seen a growth of around 30 percent. This estimate indicates that the county has experienced relatively slow growth compared to some of its neighboring counties, such as Jefferson and Multnomah, however it does not accurately reflect the human impact on the valley—especially with regards to wildfires and the WUI. High rates of tourism increase traffic and use within and near the WUI. Additionally, many of the homes built in the wildland/urban interface are not primary residences, and as a result are not counted in U.S. Census estimates. A recent (2013) study by Headwaters Economics indicates that 15 percent of homes in the WUI are second homes or vacation getaways. These trends are not unique to Hood River and have been noted by Cova (2005) and Vogt (2002).

Land use within the wildland/urban interface works in two direction: increased human use in the WUI increases the costs of fire protection as well as the risk to human life and property; human use also increase the probability of fire starts (a large percent of wildfire vectors are human induced). Residents living permanently within the WUI have local knowledge of the risks that they face and the consequences that their actions may have. Resident awareness can lead homeowners to take greater care in maintaining the property around their home, and reduce the impacts should a wildfire strike. A 2003 study of seasonal and permanent home-owners living in the WUI indicates that permanent residents take significantly more precautions with regards to wildfire prevention and mitigation than seasonal residents (Vogt, 2003). While these data were collected in Colorado and California, parallels are likely to be found in Hood River.

As suggested above, human use of the wildland/urban interface increases the probability of loss to fire and fire ignition. Hood River has become famous for its plentiful recreation opportunities across the nation. As a result, the county has experienced more tourism from outdoor enthusiasts in the form of mountain biking, hiking, camping, wind surfing, kite boarding, and fishing. The peak month for these activities is August, when fire season is at or near its peak. Weather tourism increases the risk of a fire ignition, or wildfire endangers tourists in the area, there is a significant relationship between the two.

ECONOMY

Forests

The National Forest covers roughly half of Hood River County's 533 square miles. Private and county forestland covers another rough 20 percent of land within the county. In the early 20th century, these forested lands were one of the largest drivers of the Hood River economy, fueling mills in Dee, Mt. Hood, Odell, and Hood River. The abundance of trees in Hood River County has contributed significantly to the infrastructure that exists today, helping to clear the way for highways and railroads.

These lands still see regular harvesting today, however it has become a much smaller part of the Hood River economy. Recent estimates put those working in forestry and logging just under 300 people, accounting for only $10 million in annual payroll (U.S. Census, 2012). The downturn in forest operations is not recent, but has been changing over the past 20 years. The shift away from forestry as an economic driver comes from a variety of reasons: environmental regulations make tree extraction more difficult; increased costs from fuel and equipment increase operational costs of logging; smaller and difficult to access trees decrease profits; changing social values have shifted, seeing forest resources as more than just timber.

The shift away from the timber industry does not mean that forests are not a large part of the Hood River economy. Today, forests in Hood River County are seen to provide recreation opportunities, scenic beauty, and ecosystem services that help maintain air and water quality. Forestlands can be seen to as a compliment to Hood River's ever growing tourist economy, encouraging visitors who will in turn contribute to the service sector economy.

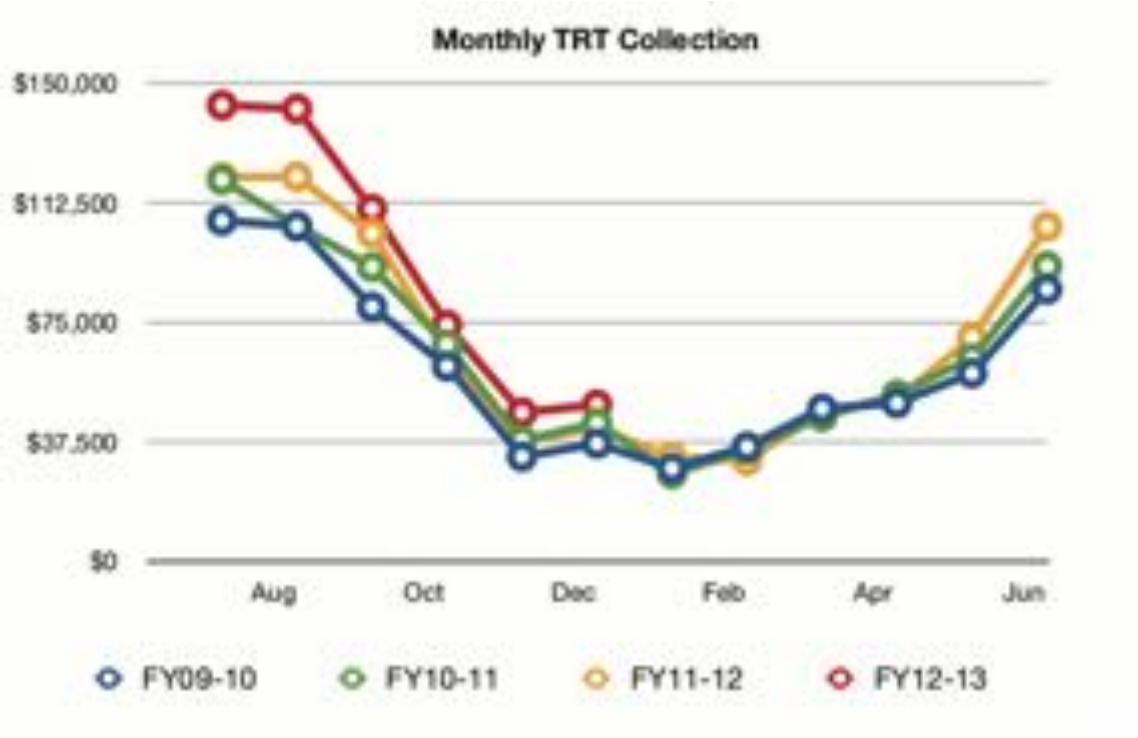
Tourism

As noted above, tourism contributes to the Hood River economy. The number of tourists and the dollars that are contributed to the economy are difficult to assess, however the Hood River Transient Room Tax (TRT) is a relative proxy to tourism patterns in the county. Known as the "Heads on Beds" Tax, the TRT assesses a nine percent tax for hotel and registered vacation home rentals. TRT receipts between 2009 and the time of this writing indicate that tourism is still on the rise, with 4.1% increase from 2010-2011 and a 12.1% increase from 2011 to 2012 (See Figure 2) (Hood River Biz Buzz, March 26, 2013).

Assessing the percentage that tourism contributes to the various aspects of the Hood River economy is difficult. Service sector industries (restaurants, coffee shops, and retail shops) depend largely on seasonal tourism for income to stay open through the slow winter months (Nate Devol, Personal Communication 2013). Tourism is closely linked to outdoor activities—wildfires in and around the WUI endanger both tourists and the Hood River economy.

Related to tourism is real estate. Real estate continues to be very active with values appreciating sometimes more than 300% in a ten year period. Houses are built and many times are sold before completion as is evident by the speculation house starts in the City and Westside districts. House starts in the fringe areas of the County (Urban Interface) at this time are limited at this time by zoning regulations.

Figure 2: Transient Room Tax, indicating summer tourism influx.



Agriculture

While Hood River has become renowned for its outdoor recreation and tourism, agriculture remains one of the top three drivers of the overall economy. According to the most recent data from the USDA Agriculture Census (2007) 553 farms were reported in the county, covering a total of nearly 27,000 acres. One-hundred seventy-five farms were reported as small (1-9 acres), 205 as medium (10-49 acres), and 173 as large farms (under 900 acres). The average farm size is 59 acres. Cropland in Hood River is reported as high value: $18,000 per acre average value. The high value of cropland in Hood River comes from a variety of reasons. Hood River is geographically constrained on three sides by mountains and one side by the Columbia River, leaving little room for agricultural expansion. Steep slopes on the periphery of the valley make farming difficult and expensive. Recently, the high demand for property in Hood River driven largely by tourism and those seeking a high quality of life and working in high tech or medicine has increased the overall value of Hood River cropland.

Multiple types of agriculture can be found in the Hood River Valley: cattle, sheep, pigs, hay, alfalfa, row crops, wine grapes, and tree fruit. The large majority of agricultural land in the basin is orchards (14,741 acres in 2007). Consisting of pears, apples, and cherries, orchard production accounted for $56 million in gross sales in 2006. During the fall months, fruit harvesting can employ up to 2,000 people (Hood River County Background Report on Agricultural Lands) with 1,700 people involved with packing, canning, and shipping post-harvest in the late summer, and fall. As a result, the 350 fruit growers in the county have a disproportionate impact on the overall economy of the basin.

In recent years Hood River has become known several other agricultural commodities: wine grapes and berries. In 2010, the USDA Agriculture Census reported the valley to have 175 acres planted in wine grapes. Although the acreage in grapes and berries is relatively small compared with tree fruit, they have made a significant contribution to the economy, attracting tourists to travel the valley in the Hood River Fruit Loop. The Fruit Loop, guides travelers through the valley's many agricultural realms, taking them along both the west and east sides of the valley as far north as Mount Hood.

Much of the agricultural land in the valley that is not orchard, berry, or grape production falls into livestock grazing or hay/alfalfa production. These areas are typically small in size (under ten acres) and can be found in patches throughout the valley. At the time of this writing, no reliable data could be found identifying the economic contribution of grazing lands or lands used for animal feed production.

Technology

Technology has become important in the Hood River Valley and surrounding areas in recent decades. In 2006 the search engine and technology giant Google opened a $600 million data center in neighboring The Dalles. While Google is by far the biggest technology operation in the area, myriad high technology manufacturers and designers have chosen to make the Columbia River Gorge their home. The high quality of life and temperate climate are seen as two of the primary drivers of the arrival of high tech in Hood River, attracting talent from across the globe.

Contributing to the high tech economy found in the Hood River and surrounding areas are companies associated with unmanned aircraft and drone technology. Some of these included Boing owned Insitu, Cloud Cap Technology, Hood Technology, and PARADIGM.

Industry

Industry plays a critical role of the Hood River economy. From sporting goods manufacturers like Dakine and Real Carbon to beverage companies like Full Sail Brewing and Hood River Distillers, many businesses can be classified as industry. One of the largest employers is Cardinal Glass IG, which came to Hood River in 2004. Cardinal Glass employs roughly 116 people on their 12 acre campus outside of Odell. Other major employers include Tofurky and Double Mountain Brewery.

SOCIAL, CULTURAL, AND ENVIRONMENTAL VALUES

Residents of Hood River County have a wide range of social, cultural, and environmental values which influence how the WUI is treated. As the above sections indicate, Hood River depends on the use of natural resources for many parts of the economy. Forests, mountains, and rivers add to the quality of life that can be found in Hood River, encouraging not only tourism, but also attracting many of the employees that fill Hood River's manufacturing and technology sectors. The use of natural resources is also part of what makes Hood River a productive agricultural region, with over 18,000 acres of irrigated land contributing to the production of a wide variety of crops.

Although it is the abundant and varied natural resources which drive many parts of the economy, natural resources are not seen the same in all parts of the county. Geographically the Hood River Basin is divided into three conspicuous topographic divisions or plateaus: the Upper Valley near Mt. Hood to the south, the Middle Valley occupying the lowlands near Odell and Pine Grove, and the Lower Valley, characterized by the lands nearest the Columbia River. Historical factors, including logging, transportation, and agriculture have shaped the social and cultural aspects of each topographical division. These distinct values are largely still relevant today.

Early and mid-20th century logging made the Upper and Middle Valleys largely dependent on forest resources as drivers of the economy. Lumber mills were built near close proximity to major transportation routes, including the Dee Mill near the Mount Hood Railroad and the two Hanel's Mills near Highway 35. As a result many of the residents in the communities of Odell, Parkdale, and Dee were in some way associated with the timber industry until the downturn of logging in the 1990's. While this was upwards of twenty years from present, many of the social values remain the same, seeing the forest as an economic resource to be utilized to the fullest. Use of forest resources is still in practice today, however the mainstays of these economies are agriculture and manufacturing.

Nearly 80 percent of lands in Hood River County are forested, with the large majority federally owned. Of the remaining forested lands, Hood River County controls 31,000 acres of dedicated forestlands, of which 27,000 acres are suitable for timber production. In addition to forested lands situated within the county, Hood River owns and manages 18,000 acres of forest in Grant and Umatilla Counties. Economically speaking, these timberlands make up 1/3 of Hood River County's overall budget. These timber revenues help fund county programs and offset property taxes for county residents.

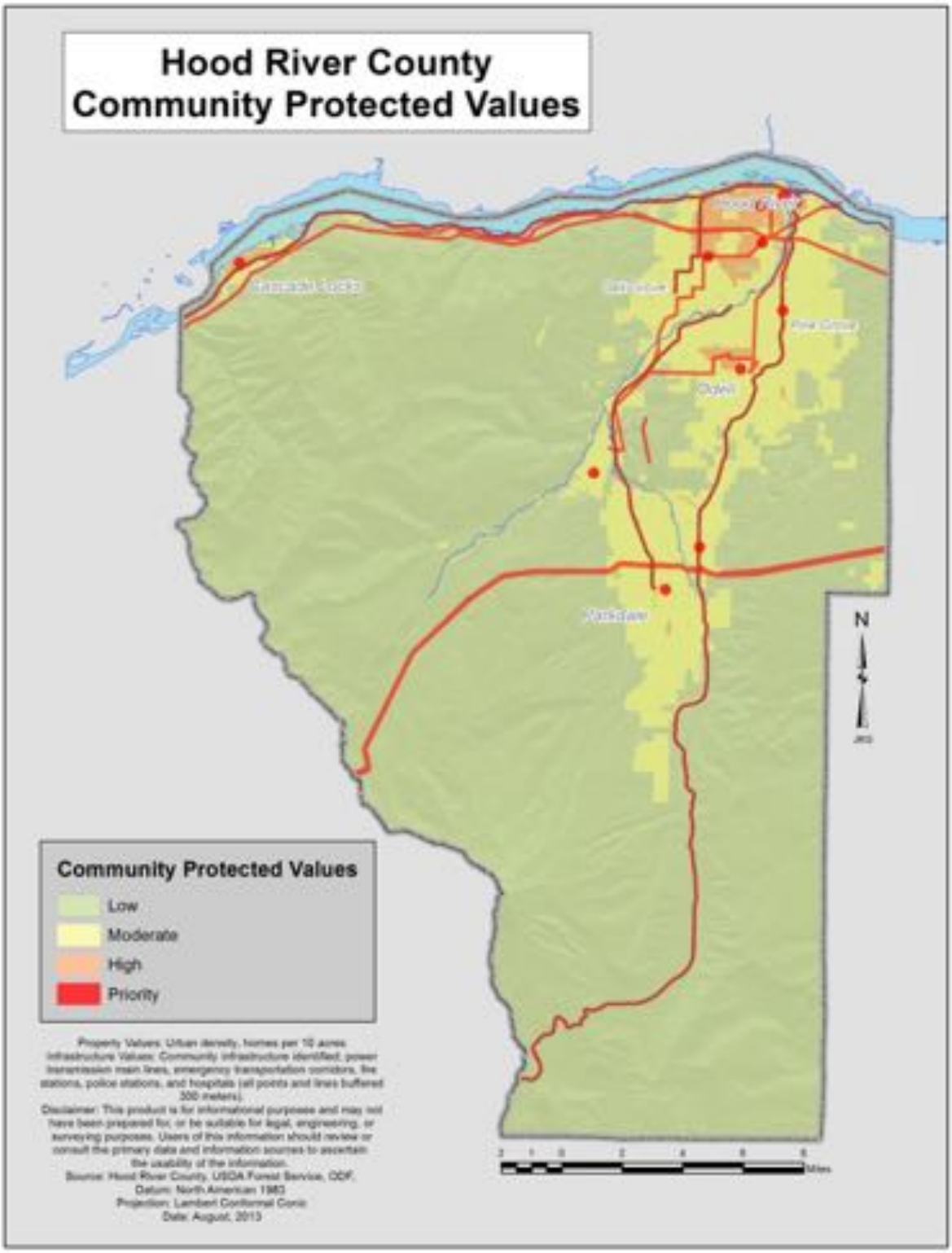
As a transportation hub for the Hood River Basin and the Columbia Gorge, the Lower Valley developed distinctly from its southern counterparts. Cleared of forested lands in early settlement, the economy of the Lower Valley depended on supplying goods and services that supported the agricultural needs of the valley. An urban center, residents of the Lower Valley have depended on many different economic drivers. Largely a result of these differences, residents in the Lower Valley view forest resources as aesthetic rather than economic.

These brief descriptions of the Hood River basin are essential to our understanding the many different views of forest resources and how they should be treated. Historical resource use has had a lasting impact on public perception. Residents of the Upper and Middle Valley's appreciation for forest resources stems from economic as well as recreational reasons: logging is still a viable opportunity for many living in rural Hood River County; recreation opportunities that are provided by the forest include camping, fishing, and hunting. Residents in the Lower Valley on the other hand often see the forest differently, and as something that is natural and to be preserved. While it is not the purpose of the CWPP to discuss and interpret these differences, it is important to understand that the Hood River Valley has many different views when it comes to the protection of forest and other natural resources.

PROTECTED VALUES

Hood River County has many values that deserve protection in the event of a wildfire. However, due to the complexity of identifying all community values at stake, protected values are identified as the critical infrastructure essential to the protection of life and property in the event of an emergency. Community values in this sense include all emergency transportation corridors, communication infrastructure, hospitals, fire departments, police stations, power substations and main power lines, and areas of high housing density. These values are consistent with the Multnomah County Community Values Methodology (MCCWPP, 2011). Hood River Protected Values are identified on Map 2.

Map 2: Community Protected Values in Hood River County



Chapter 4
Fire Suppression in North America: Cause and Consequence

Fire Suppression in North America: Cause and Consequence

Wildfires are no stranger to the American landscape. As a natural part of our ecosystem, wildfires are instrumental in shaping the environment. Known as *fire regimes*, fires historically cycled through the landscape, helping to recycle nutrients, provide habitat for wildlife, improve soil health, and help flora succession. Each one of these aspects contributed significantly to the overall health of the watershed (Dombeck 2004, Pyne 1991). These fire regimes varied in frequency and intensity depending on the surrounding environment and geography. Flat grasslands experienced frequent burning or low intensity, growing rapidly and spreading across large swaths of the landscape. Other fire regimes, such as those associated with the dense Douglas Fir and Western Hemlock forests of the Cascades, experience fires with lower frequency, but of high intensity, potentially causing stand-replacing mortality.

Keeping the different fire regimes in mind, one can see that not all fires are created equal. The intensity, frequency, and environmental feedbacks of wildfires depend largely on the terrain, fuel type, fuel density, and weather patterns of any specific area. On a large scale, it is immediately evident of these differences. Each year the arid highlands of Colorado, New Mexico, and Arizona burn hundreds of square miles, spreading rapidly through grasses and small trees. The Oregon Cascades sees an entirely different fire regime, often starting small and slowly gaining momentum as it burns through dense, moist conifer forests. On a much smaller scale, the fire regimes of Hood River act the same way: the dense forests of the Columbia River Gorge and Mt. Hood National Forest can start slow and burn for months, while the lighter grasses associated with rangelands burn and spread rapidly.

> *"Where such forest lands have been protected from fire, as they are very largely through the progress of settlement, young trees have usually sprung up in great numbers under or between the scattered veterans which had survived the fires, and a dense and vigorous young growth stands ready to replace, by a heavy forest, the open park-like condition which the fire had created and maintained"*
> *~Gifford Pinchot. 1899*

Regardless of the fire regime, causes have always been both natural and anthropogenic. Lightning has always been a fire vector in North America, a natural part of the ecosystem that helped to trigger forest succession and stimulated watershed health. Human events, prior to European settlement also helped to shape the landscape: indigenous burning was frequently carried out to thin the forest, stimulating deer and elk habitat, while fostering growth of forage plants (Pyne 1991). In the area now known as Hood River, forest near Mt. Hood were managed to increase the production of fruits like the huckleberry, while lowland oak woodlands on the eastern side of the valley were managed for the production of acorns. Occurring in mosaics across the landscape, this Indigenous burning was the first land management technique, helping to maintain ecosystem balance and contributing to the character of the forest that surrounds us today. As Pyne (2001) suggests, the American forest is "more a product of settlement than a victim of it". The following chapter gives a brief historical account of fires in North America and the origins of fire suppression policy.

NATIVE AMERICAN BURNING

Both natural and anthropogenic wildfires have always been a part of the American landscape. Journals entries of early explorers to the west note many instances of fires and how they impacted the land. As opposed to white settlers in the West, who burnt to create uniform swaths of land for agricultural purposes, Native American burning occurred in mosaics across the landscape. Historian Gerald Williams (2003) notes, Native American burning served to create edge effects or fragmented habitats that encouraged a diverse biotic community. Edge effects increased forage for animals and people, which added stability and security to Native American life.

> *"At the time, there was not a bush or a tree to be seen on all those hills, for the Indians kept it burned over every spring, but when whites came, they stopped the fires for it destroyed the grass, and then the young spruces sprung up and grew as we now see them"*
> *~Warren Vaughn, Tillamook County, 1890*

There are indications that Native American burning served between 70 and 300 unique purposes, all of which fit in one of ten categories: hunting, crop management, improving grass growth, fireproofing, insect collection, pest management, felling trees, clearing travel zones, and clearing riparian areas (Lewis, 1985). Naturally occurring fires combined with Native American burning helped shape western forests and grasslands, eliminating underbrush and impacting the succession of opportunistic species of trees and other plants. As a result early descriptions of the North American landscape describe forests with clear understories free of brush and small trees.

With European settlement in the west came drastic changes to the landscape's composition. Practices that were once common, such as burning the understory of the forest ceased, allowing succession of r-strategists—opportunistic species that produce rapidly after a following disturbances. In the forests of the Cascades this was often in the form of Grand Fir and Spruce trees growing densely beneath the canopy of ancient conifers. Understanding the differences between forest structures during times of Native American burning and post-European settlement is important to understand the state of the forests today. The changed forest practices of settlers allowed for a buildup of fuels beneath the canopy of the forest, setting the stage for the large wildfires that would eventually become the impetus 20th century fire suppression policies. As Pyne (1982) suggests, "wherever the European went, forests followed."

THE BIG BLOWUP OF 1910

With changes in forest composition, came changes in the way that fires burnt within forests. In August 1910 came a pivotal change in how Westerners in particular, and policymakers in general, viewed fire. Starting early in that summer, fires were ignited and continued to burn throughout western Montana and northern Idaho. By mid-August over 1,700 fires were burning throughout the region, but most forest managers figured the area could weather these fires if no dry strong winds developed. On August 20 and 21, the dry winds did blow, and by the time the flames subsided over 3.1 million acres of the northern Rocky Mountains burned. These fires killed 78 firefighters and seven civilians and burned several communities including one-third of Wallace, Idaho (Pyne 2001, USDA 1978). This event solidified the negative aspects of wildfires in the view of the public and policymakers and led to the strong firefighting ethic that prevails

yet today (Pyne 2001). Wildfires continue to be aggressively extinguished with smoke-jumpers, hot-shot crews, retardant bombers, and sophisticated firefighting organizations. Even with this aggressive approach, wildfires continue to burn throughout the West, and the total area burned in the United States decreased until the 1960s when the trend reversed with the number of acres burned each year increasing (Agee 1994).

Figure 3: Aftermath of the Big Blow Up, Lolo National Forest

This trend was exemplified by the fires that burned in and around Yellowstone Park in 1988 and once again brought under scrutiny the wildfire policies in the United States (Carey and Carey 1989). What appears to be different about the recent fires is the number of ignitions that contributed to burning large areas. More than 1,700 fire starts were responsible for burning the 3.1 million acres of the Northern Rocky Mountains in 1910, and 78 starts burned more than 350,000 acres in the Bitterroot Valley in western Montana in July 2000 (USDA 1978, USDA 2000). Contrast these fire events to the Rodeo-Chediski Fire where only two fire starts burned more than 450,000 acres in 2002 in Arizona. Similarly, on June 8, 2002, one start along the Colorado Front Range of the Rocky Mountains led to the Hayman Fire burning more than 138,000 acres in 20 days. The weather systems along the Colorado Front Range beginning in 1998 tended to bring below-normal precipitation and unseasonably dry air masses. These conditions occurred approximately the same time as the phenomenon known as La Nina began forming in the eastern Pacific Ocean. The winter of 2001 and 2002 saw a marked worsening of drought conditions. The predominantly ponderosa pine and Douglas-fir forests throughout the region became drier with each passing season, and by the spring of 2002 the fuel moisture conditions were among the driest seen in at least the past 30 years. The moisture contents of the large dead logs and stems along the Front Range were extremely low: most less than 10 percent and some less than 5 percent moisture content.

The above excerpt from the Hayman report shows that forest fire suppression practices, disruption of the natural fire cycle (Managing the Impact of Wildfires on Communities and the Environment 2000) and changing weather patterns can lead to an increased rise of catastrophic wildfire. This scenario can be applied across many regions of North America.

RESULTS OF SUPPRESSION POLICY

As a result of the all-out effort to suppress fires, the annual acreage consumed by wildfires in the lower 48 states dropped from 40 to 50 million acres a year in the early 1930s to about 5 million acres in the 1970s. During this time, firefighting budgets rose dramatically and firefighting tactics and equipment became increasingly more sophisticated and effective. While the policy of aggressive fire suppression appeared to be successful, it set the stage for the intense fires that we see today. Full suppression of all wildfires initially gave our forests and wildlands a chance to heal, creating a false sense of security. However, after many years of suppressing fires, thus disrupting normal ecological cycles, changes in the structure and make-up of forests began to occur. Species of trees that ordinarily would have been eliminated from forests by periodic, low-intensity fires began to become a dominant part of the forest canopy. Over time, these trees became susceptible to insects and disease. Standing dead and dying trees in conjunction with other brush and downed material began to fill the forest floor. The resulting accumulation of these materials, when dried by extended periods of drought, created the fuels that promote the type of wildfires that we saw in 2005. The problems of unnaturally heavy undergrowth have been exacerbated by the introduction in the 1800s of nonnative invasive weeds and grasses. These plants corrupt a region's ecological processes, robbing the soil and native plants of vital nutrients and water. Invasive species such as cheatgrass, which is pervasive on today's Western landscape, is one of the first plants to establish after a fire. It grows earlier, quicker, and higher than native grasses. Then it dies, dries, and becomes fuel. In short, decades of aggressive fire suppression have drastically changed the look and fire behavior of Western forests and rangelands. Forests a century ago were less dense and had larger, more fire-resistant trees. For example, in northern Arizona, some lower elevation stands of ponderosa pine that once held 50 trees per acre now contain 200 or more trees per acre. In addition, the composition of our forests has changed from more fire-resistant tree species to non-fire resistant species such as grand fir, Douglas-fir, and subalpine fir. As a result, studies show that today's wildfires typically burn hotter, faster, and higher than those of the past.

THE CHANGING WEST

In addition to the unnatural fuel buildup developing in our forests and rangelands, wildland firefighting has become more complex in the last two decades due to dramatic increases in the West's population. Of the 10 fastest-growing states in the U.S., eight are in the interior West. While the national average annual population growth is about one percent, the West has growth rates ranging from 2.5 to 13 percent. As a result, new development is occurring in fire-prone areas, often adjacent to Federal land, creating a "wildland-urban interface" -- an area where structures and other human development meet or intermingle with undeveloped wildland. This relatively new phenomenon means that more communities and structures are threatened by fire. Wildland firefighters today often spend a great deal more time and effort protecting structures than in earlier years. Consequently, firefighting has become more complicated, expensive, and dangerous.

While this report to the President serves to show the effects of differing management plans, it is important to note that this CWPP wishes to promote healthy and responsible forest practices.

THE PROBLEM OF FIRE EXCLUSION

These photos, all taken from the same point, show changes resulting from fire exclusion and removal of large pines. Fire scars, show that between 1600 and 1895, low-intensity fires burned through this forest every three to twenty years. Fires have been excluded from this area since 1895. About half of the large pines were harvested from this site before the 1909 photo was taken.

Figure 4: Stand Growth 1909

The stand is open and park-like, and the few stumps and slash indicate recent light cutting. This would be the general appearance of the typical pine forest – less any human intervention that nineteenth century settlers saw in eastern Oregon.

Figure 5: Stand Growth 1948

Considerable under-story has developed with small openings in the forest

Figure 6: Stand Growth 1979

Now the under story has developed with dense thickets of Douglas Fir and Ponderosa Pine.

Figure 7: Stand Growth 1997

Note how different the stand is from 1909. Patchy under burning in 1933 killed some conifers, and selective logging removed some of the larger trees. Snags indicate that a recent beetle infestation killed some trees.

Chapter 5
Historic Wildfires and Forest Conditions

Historic Wildfires and Forest Conditions

Wildfires in the Northwest burn millions of acres each year and cost local, state, and federal agencies millions of dollars in both firefighting expenses and damages. In 2012 wildfires in the Northwest burned 1.6 million acres and cost $250 million in suppression (NWCCW). As costs of fighting fires increase and budgets are cut, fires are seen as an increasing risk throughout the county. Although Hood River's share of large fires is relatively small, the county still remains at a high risk for wildfires.

The Forests of Hood River County

Forest composition in Hood River is varied. Douglas Fir and Western Hemlock dominate forests of the western Columbia River Gorge, while Ponderosa Pine and Oregon White Oak are characteristic towards the east. The differences in these forest compositions are largely a result of geography: orthographic lift causes clouds rising over the Cascade Range to lose much of their moisture on western slopes, often leaving a rain shadow as the clouds descend on the lee side of the range. As a result the west side of the Cascade Range receives nearly twice the amount of precipitation than the eastern side. Forests that thrive in damp environments with high precipitation dominate the west, while dry woodlands dominate the east. Each different forest type has distinct characteristics when it comes to fire ecology. Where the damp forests of the west Cascades tend to see fewer fires, fires tend to be large are cause high rates of tree mortality; the east Cascades sees increased fire frequency, however fires tend to be less intense. The following paragraphs describe forest compositions in Hood River. While these are generalizations, they will help to understand how fire ecology varies across the landscape and how best to manage fires in the human impacted environment.

Dominant Species and Fire Response

Many different species of trees and plants are found within Hood River County. Growing in different ecological zones, each species has characteristics that can inhibit or allow fire growth. Some of the dominant tree species found in Hood River is described below, along with some of the characteristics that pertain to fire progression. These photographs provide an example of how different tree species can impact forest structure, and in turn affect fire behavior. Note the stark differences in tree density depending on species type. Ponderosa Pine and Oregon White Oak are both adapted to frequent, low intensity fire regime. As a result, these species are typically associated with sparse undergrowth. Douglas, Grand Fir, and Hemlock on the other hand, have infrequent fires, however fires tend to be intense with high tree mortality rates. Dense sub-canopy fuels often carry wildfire to the canopy of the forest, causing stand replacing crown fires. Not all fires are created equal. Many different factors play into the manner in which a fire will burn. Tree species, size, canopy cover, density can drastically alter the way a fire behaves, as can under-canopy composition and terrain.

Ponderosa Pine

The Ponderosa Pine is classified as a fire resister. Older trees have a thick bark, deep roots, and insulated bud scales to protect against fire. Older trees are also self-pruners, reducing damage from crown fires, which is the main cause of tree mortality. Seedlings are well adapted to the fire ecosystem and prefer the bare mineral seed bed provided by fire, generally colonizing 1-2 years post fire from off-site seeds. Stands in the late 19th century are described as open and park like with tree density as low as 25 trees per acre. Current stands are as dense as 1,000 trees per acre.

Douglas Fir

Young Doug Firs are fire avoider, while old trees are resisters. Slow moving fires tend to damage cambium beneath the bark. Foliage is highly flammable, which can result in significant tree mortality from crowning in the event of a large fire. Like the Ponderosa, re-colonization can occur in 1-2 years from offsite seeds. Douglas Fir trees have moderate survivability to fire events when mature.

Grand Fir

Grand Firs are fire avoiders. Shallow roots, moderately thick bark, and low, dense branches are characteristic. Trees tend to be resistant to frequent ground fires but suffer high rates of mortality from infrequent, hot fires from both root char and crowning. Trees are prone to heart rot following fire episodes. The Grand fir dominates where fire has been excluded. The fire return interval for Grand Fir ecoregions in Oregon should be between 5-50 years.

Western Hemlock

The Western Hemlock is a fire avoider with very low fire resistance. Much like the Grand Fir, it shallow roots and high foliage flammability make it susceptible to root char and crowning. The fire return interval is high (between 150-400 years) and regeneration typically occurs 50-80 years post fire.

Oregon White Oak

The Oregon White Oak is well suited to the frequent fire regimes east of the Cascades and is a fire resister. Mortality is rare from fire. White Oak depends on periodic fires (3-30 year return intervals) to limit succession by opportunistic fir species. Historic surveys indicate that Oregon White Oak thrive in low densities (70 trees per hectare).

Western Larch

The Western Larch is highly fire resistant. Its bark is thick with low resin, deep roots, and low foliage flammability (the larch is deciduous and therefore has a higher moisture content than most conifers). The larch is highly adapted to fire burned soils, and rapidly develop following a fire event. The two fire regimes suggested for the Western larch are 25-75 years with mixed severity fires, and 150-350 years of stand replacing fires. The larch is considered the most fire resistant tree species in the Pacific Northwest.

Historic Wildfires in the Columbia River Gorge and Mt. Hood

Wildfires are historically a part of the Columbia River Gorge and Mt. Hood ecology. Geographically situated between the temperate forests of the coast range and the arid uplands to the east, the Columbia Gorge and Mt. Hood have a unique wildfire history. The largest wildfires in the state have typically been associated with the coastal range such as the Siletz Fire (1849), Coos Bay (1868), Tillamook (1933), Wilson River (1945), and Biscuit (2002). These fires are low frequency, but high intensity and are fed off of coastal winds and the heavy fuel loads associated with the wet climate. The arid uplands of Oregon are also prone to large fires. These include the Awbrey Hall Fire (1990), Sage Flat (1992), Skeleton (1996), and Sheldon Ridge (2002). Fires of the arid uplands can be characterized as moderate intensity, high frequency. The West Cascades have been described by forest ecologists as infrequent, but of high intensity (Agee, 1996). Heavy precipitation on the west end of the ecoregion allows for the buildup of dense fuels which are often fueled by high winds and steep terrain. The east end of the region receives less than half of the precipitation of the west end (Table 1). As a result, eastside fuels are far drier and more susceptible to fire starts.

Figure 8: Precipitation differences between the west side and east side of Hood River County (Taylor, n.d.).

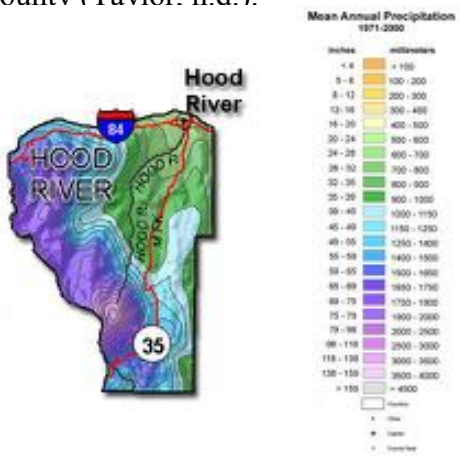
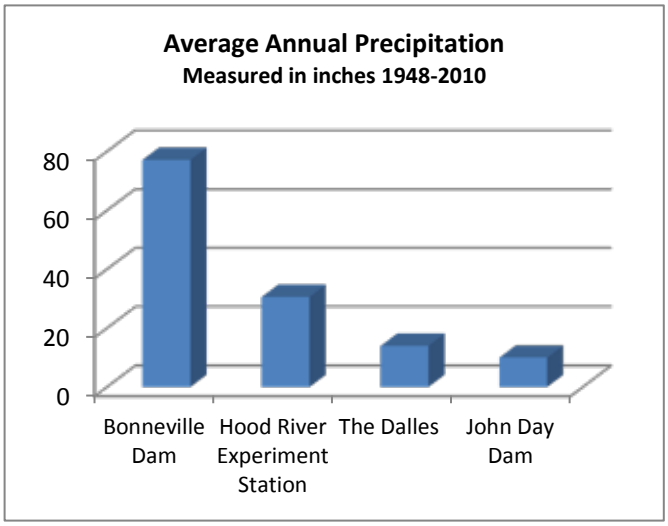


Figure 9: Average Annual Precipitation of the West Cascades.



LARGE FIRES OF THE WEST CASCADES AND COLUMBIA GORGE

Figure 10: The Government Flats Complex, with Mount Hood in the Distance. *Credit: ODF; J. Pricher, 2013*

September, 1902—Yacolt Burn: The Yacolt Burn is the remains the largest wildfire in Washington State history. The Yacolt Burn was burned on both sides of the Columbia, and is believed to be started by abandoned slash piles. The fire spread rapidly through dense slash piles from several years prior. Driven by high winds and an abundance of dry fuels, the fire burned nearly 239,000 acres in only two days, spreading over 20 miles in 12 hours, and leaving 38 people dead in its wake. The devastation caused by the Yacolt Burn helped to set precedence of organized fire suppression in the Pacific Northwest.

1927—Rock Creek Fire: The Rock Creek fire burnt 50,000 acres in what is now known as the Gifford Pinchot National Forest in Skamania County. The fire effectively reburnt the area damaged from the Yacolt Burn 25 years prior. The cause of the fire is believed to have been lightning striking a snag from the previous burn.

1929—Dole Valley Burn: Similar to the Rock Creek Fire, the Dole Valley Burn was caused by a lightning strike to a snag in the area of the Yacolt Burn. At 227,500 acres, the Dole Valley Burn was the largest of the 26 reburns in the Gifford Pinchot from 1910 to 1952. Fire ecologists suggest that fires

such as the Dole Valley Burn and Rock Creek Fire have had a lasting impact on the environment through decreased soil fertility and water retention capacity.

September, 1971—Skyhook Fire: The Skyhood Fire burned an estimated 5,000 acres in the Mt. Hood National Forest and U.S. Plywood Co. lands just 12 miles southwest of Hood River. The fire is believed to have started by a discarded cigarette during a helicopter logging operation. Fanned by wind gusts of up to 60 miles per hour causing spotting up to two miles away. Over the eight days that the fire raged, 550 personnel were called to suppress the fire, twelve dozers were employed to construct a fire line, nine helicopters, and five aerial tankers. The Skyhook Fire again illustrates the hazard of human interaction on the natural environment.

October, 1991—Falls Fire: In 1991 the Falls Fire burned 1,000 acres between Multnomah Falls and Bridal Veil. 1,400 firefighters were initially deployed to fight the fire, which burned in heavy fuels and steep terrain and threatened the historic Multnomah Lodge, caused the evacuation of 75 residents near Bridal Veil, and threatened Interstate 84. The Falls Fire holds the record for the amount of retardant dropped from the Troutdale Air Tanker Refueling station in one fire, at 228,000 gallons.

July, 1998—Cleveland Fire: Burning in rural Klickitat County in Washington state, the Cleveland Fire threatened four lives, burned 15 homes, and killed an entire herd of cattle (143 head). After the fire, a review board found that the blaze burned out of control largely due to a lack of effective radio equipment amongst fire personnel.

August, 2006—Mt. Hood Complex: The Mt. Hood Complex began from multiple lightning strikes in the Mt. Hood National Forest and consisted of two main blazes—the Gumjuwac Fire on the east side of Highway 35 and Bluegrass Ridge Fire on the west side of Highway 35. Dense beetle killed pine (lodgepole and white pine) fueled the blaze, shutting down Highway 35 and threatening homes in the Parkdale area. The Bluegrass Ridge Fire alone grew to 1,850 acres and cost upwards of $10 million to extinguish.

July, 2008—Cold Springs Fire: The Cold Springs Fire near Mt. Adams mirrors many of the fires that have occurred within montane Hood River County. The fire was started by lightning during low pressure system, causing warm, dry, and unstable weather, which spread rapidly in downed and standing bugkill trees (up to ¼ per hour during the initial two burn periods). The fire, which grew to 8,000 acres, took $5 million dollars to suppress and caused the evacuation of recreationalists on the mountain.

August, 2008—Gnarl Ridge Fire: The Gnarl Ridge Fire burned for nearly two months in the Mt. Hood National Forest. The fire started in early August 2008 from a lightning strike. The fire was initially contained to 500 acres after an unusual three inches of rain fell in August. One month later the fire took a run, a result of a seasonal easterly wind event. The fire grew to 3,280 acres before it was contained in mid-October. Much like the Cold Springs Fire, the Gnarl Ridge Fire burned timber with beetle-killed subalpine fir.

August, 2011—Dollar Lake Fire: Caused by a lightning strike in late August, the Dollar Lake fire grew rapidly in closed timber and surface litter, eventually reaching 6,304 acres. Costing upwards of $15 million dollars to contain, the fire again threatened

the historic structures of Cloud Cap and Tilly Jane, private homes and timberlands, Bonneville Power Main Lines, and the Run Watershed which supplies the drinking water to the City of Portland. While no structures were lost in the fire, it caused a row with the public, who believe that the fire could have been contained within the first few days; however, steep terrain and a lack of resources delayed response until the fire grew in size.

September, 2012—Cascade Creek Fire: The lightning caused Cascade Creek fire burned 20,500 acres near Mt. Adams. Fuels included standing timber and 60 percent heavy bug-killed timber. Similar to other large fires in the region, the Cascade Creek fire illustrates the hazard that lightning poses to remote areas with a large percentage of dead and dying trees.

August, 2013—Government Flats Complex: The Government Flats Complex fire began as a result of multiple lightning strikes near and within The Dalles Municipal Watershed. The complex was made up of three fires, the largest of which—Blackburn—burned 11,000 acres of forest fuels and timber. Fueled by strong winds and exacerbated by dense fuels and steep terrain, 13 structures were lost. At the time of this writing, suppression costs exceeded $12 million.

OREGON'S WILDLAND URBAN INTERFACE HISTORY

As evidenced above, many of the larger fires in the west Cascades and Columbia River Gorge burned in steep, forested terrain—a geography where few human settlements exist and the main hazards are to infrastructure such as water supplies and high-voltage power lines. Fires in the Wildland Urban Interface pose completely different hazards to Oregonians, not only threatening infrastructure, but increasing the risk to life and structures. Amongst the worst of these WUI fires include the Bandon Fire on the Oregon Coast, which burned 30,000 acres, 484 structures, and nearly the entire town of Bandon. While fires of the Bandon magnitude are uncommon, any fire within the WUI poses a grave threat to life and property. As Table 2 indicates, there have been many significant fires within the WUI in the counties surrounding Hood River. The following section of the CWPP describes recent fire patterns in Hood River County.

RECENT WILDFIRES IN HOOD RIVER COUNTY

Between 1991 and 2012 Oregon Department of Forestry reported over 300 wildfires in Hood River County, burning over 18 square miles of land. While the majority of these fires remained small, they still posed considerable threat to the residents and economy of the county. The Herman Creek fire (2003) was suppressed at 375 acres, however it was not before the fire jumped Interstate 84 five times, destroyed three structures, and cost local, state, and federal agencies over $600,000 (Hood River News 2005). It was caused by downed power lines during an east wind event characteristic to the area during late summer. The Herman Creek fire came at a relative low cost—no lives were lost and little economic disruption was caused. The Herman Creek fire serves as a reminder that it only takes one spark to threaten a community, and even with the rapid response and cooperation of multiple fire agencies, a wildfire can spread rapidly.

Looking at Hood River County in a broader context, there have been relatively few fires that have posed a large risk to structures and residents living near the WUI. In the past decade, the largest fires that have occurred in Hood River have been contained to the forested areas on Mt. Hood (Table 2). Most of these were caused by lightning in rugged terrain with limited access for fire crews, such as the Dollar Lake fire (2011). Cost of suppression of these remote fires is up to five times the national average of $979 per acre (Gebert 2007). Large lightning induced fires will continue to pose a significant risk to Hood River County and the surrounding area, especially as a warming climate is predicted to contribute to a longer growing season and increased lightning frequency (Bachelet 2007).

Table 2: Fires within Oregon's WUI

Year	Fire Name	Acres	County	Structures Lost	Cost
1936	Bandon	N/A	Coos	484	Unknown
1987	Bland Mountain	10,300	Douglas	14	Unknown
1990	Awbrey Hall	3,400	Deschutes	22	$2.2 million
1992	Sage Flat	991	Deschutes	5	$1.2 million
1992	East Evans Creek	10,135	Jackson	4	$8.2 million
1992	Lone Pine	30,727	Klamath	3	$500,000
1994	Hull Mountain	8,000	Jackson	44	$10 million
1996	Skeleton	17,700	Deschutes	17	$10 million
2002	Eyerly	23,573	Jefferson	37	$10.7 million
2002	Cache Mountain	4,200	Deschutes	2	$4.3 million
2002	Sheldon Ridge	12,761	Wasco	8	$3.3 million
2002	Squire Peak	2,804	Jackson	6	$2 million
2002	Biscuit	499,965	Josephine/Curry	14	$150 million

Source: http://www.oregon.gov/odf/pages/fire/sb360/wui_history_table.aspx

While the largest fires have been caused by lightning, human induced fires present a significant risk to Hood River. Industrial ignitions from power lines (Microwave, 2009) and railroad (MP 66, 2012) are likely to remain constant in the valley and their risk is mitigated through the clearing of ladder fuels in the right of way. Fires caused by vehicles are also likely to remain a constant risk for fires due to high traffic volumes. In 2012, Interstate 84 had an annual average daily traffic volume (AADT) of 20,800 vehicles, while Oregon Highway 35 has an AADT of 1,200 (Oregon Department of Transportation).

Table 3: Significant Wildfires in Hood River County, 2003-2012

Year	Fire	Acres	Cause	Area	Cost	Cost/Acre
2003	Herman Creek	375	Power lines	Columbia Gorge National Scenic Area	600,000	1,600
2004	Panorama Point	95	Lightning	Pine Grove Fire District	N/A	N/A
2006	Mt. Hood Complex	1,859	Lightning	Mt. Hood National Forest	10,000,000	5,379
2008	Gnarl Ridge	3,280	Lightning	Mt. Hood Wilderness	14,200,000	4,329
2008	MP 63	40	Vehicle	I-84 Corridor	N/A	N/A
2009	Microwave Fire	1,224	Power Lines	Mark O'Hatfield State Park	2,750,000	2,247
2011	Dollar Lake	6,304	Lightning	Mt. Hood National Forest	15,800,000	2,506
2012	MP 66 – I84	60	Railroad	I-84 Corridor	N/A	N/A
2013	Government Flats	11,434	Lightning	The Dalles Watershed	N/A	N/A

Looking at the largest fires in Hood River only paints part of the picture of fire risk—over the past two decades ODF reports that 310 fire ignitions burned 204 acres, with the mean fire size just over 0.6 acres. While these fires are small, every ignition is a risk of becoming a fully involved wildfire. Table 4 lists fire ignition counts and causes for smaller fires in Hood River County. Looking at these historical sources of fire ignition, Hood River fire prevention should focus on landowner education to reduce fire starts caused by debris burning and equipment use. Further preventative education should focus on the education of recreationalists.

Table 4: Fire Ignition Causes in Hood River County, 1991-2012[1]

Arson	22	Miscellaneous	24
Debris Burning	63	Railroad	27
Equipment Use	63	Recreationist	31
Juveniles	7	Smoking	49
Lightning	31		

[1] This data was retrieved from Oregon Department of Forestry and represent fires reported and responded to by the ODF. The data is not an accurate representation of fires in Hood River County, as it does not include all data from USFS and County fires. The above data is only a sample of fire ignitions and should not be used for statistical purposes.

FOREST CONDITIONS

Foresters have long sought to quantify the changes that Western fire suppression policy has had on the landscape since the early 20th century. Historical fire regimes take into account both fires caused by natural processes (lightning) as well as fires caused intentionally by aboriginal peoples (Agee 1993; Brown 1995). Over the last two decades, ecologists and forest managers have come to agree that forest disturbances (fires) play an instrumental role in determining forest composition and structure, and in turn impact everything from soil quality to plant biodiversity to fauna health (Arno 1996). As such, an understanding of how fire frequency, intensity, and severity impacted the natural vegetation is essential to better our understanding of how to manage forests and fires that often burn within.

In short, forest composition since the European arrival has changed. Forest fuels that were once removed every few decades by low severity surface fires have built up through years of fire suppression and forest 'management' which broadly includes logging, grazing, and tree planting. Arno (1996) notes that much of the Pacific Northwest was dominated by ponderosa pine trees and Oregon oak, where regular 'non-lethal' fires were not uncommon. Today, many of these landscapes have been overgrown with brush, blackberries, and litter from the forest canopy. The long-term buildup of these fuels created a virtual tinderbox within the forest that has the potential to burn uncharacteristically intense (Agee 2003).

Fire regime groups were developed as a national standard to quantify wildfire frequency and intensity of fires on the natural landscape, without mechanical intervention or modern human influence. In short, fire regime groups identify natural fire tendencies prior to Indo-European arrival in the Americas. Classifying a fire regime requires looking at the extent, return interval, and severity of a fire. As not all forests are created equal and different forest structures have a historically different fire regime depending on their composition, geographical extent, and climate setting. Nationally, five different fire regime condition classes are recognized. In the Pacific Northwest, fire regime groups have been further refined to suit the region and often include subgroups.

The five fire regimes that were developed by Hardy et al (1998) identify fire regimes based primarily on return interval (e.g.: the average interval in which a repeat fire will move through the forest) and fire severity (e.g.: whether the fire predominantly burned underbrush at the ground level or if it caused significant mortality to trees comprising the canopy). Hardy's fire regimes have been refined to include the following, where the asterisk represents sub-categories identifies for the PNW:

> **Fire Regime I—**less than a 35 year return interval with low and mixed severity. These fires are typically superficial and non-lethal, and are common in Oregon oak, ponderosa pine, oak scrubland, and dry-site fir trees.
>
> **Fire Regime II—**less than a 35 year return interval and are high severity. Stand replacement is greater than 75 percent, meaning that the majority of overstory vegetation is replaced. Common in shrub-steppe environment characteristic East of the cascade range.

Fire Regime III—between 35 and 200 year return interval with mixed severity fires. Fire Regime III is associated with wet-site or high elevation fir trees and western hemlock found in the forests of the west and east cascades. This is the dominant fire regime of Hood River County.

***Regime III A**—less than a 50 year return interval in dry-site oak stands of mixed severity fires.

***Regime III B**—between 50 and 100 year return intervals of mixed severity fires. This is often characterized by damp forests of white fir and low elevation hemlock trees.

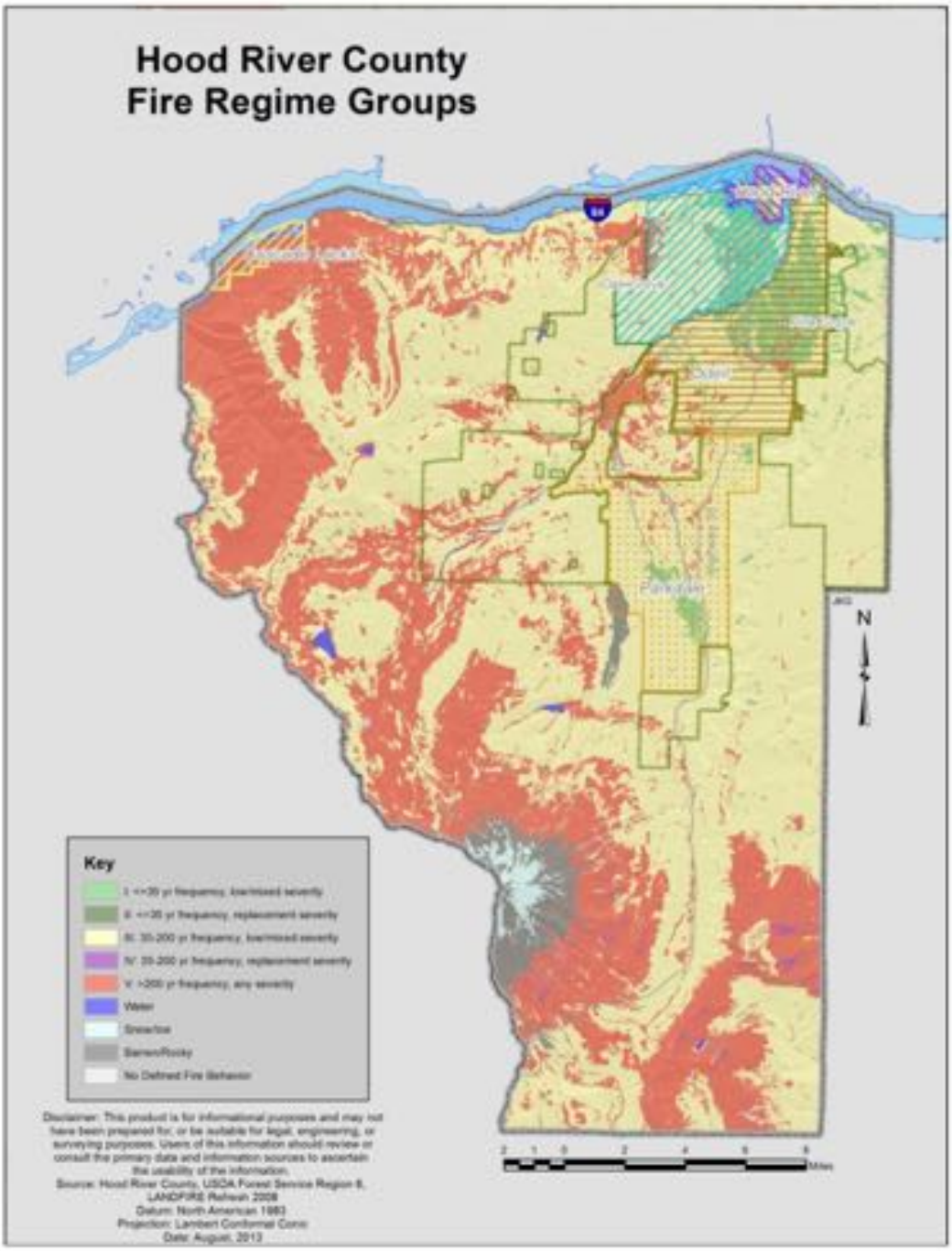
***Regime III C**—between 100 to 200 year return interval fires, again of mixed severity. Regime III C is found in high elevation white fir stands.

Fire Regime IV—between 35 and 200 year return interval with high severity (stand replacement). Associated with red fir and cedar forests, group IV is often associated with the coastal regions and the west Cascades of the Pacific Northwest.

Fire Regime V—any fire regime over 200 years. These fires are of any severity, and are associated with both fir and pine forests. Regime V dominates western Hood River County and the forests of the western Columbia River Gorge and Mt. Hood National Forest. Fires in this regime tend to be rare, but large and intense.

Map 3 below identifies the historic fire regimes associated with Hood River County, based on the most recent information available from Landscape Fire and Resource Management Planning Tools (LANDFIRE), an interagency fire mapping program sponsored by the U.S. Department of the Interior and the USDA Forest Service. The fire regime groups identified by LANDFIRE are considered to be a 'reasonable approximation' of past forest conditions. For the purpose of the Hood River County Fire Regime Group map, the sub-categories for the PNW were omitted to maintain alignment with national standards, however the sub-categories do exist within FRG III, which dominates the HRC landscape.

Map 3: Fire Regime Groups in Hood River County



As illustrated by Map 3, three primary fire regimes can be found within Hood River County. Fire Regime Group I is found predominantly in the lower parts of the valley on both sides of the Hood River. FRG 1, while significant, only covers around four percent of the total county area, or about 21 square miles. The majority of the valley is comprised of FRG III. Historically, FRG III consists of wet-site hemlock and fir trees and can be found in middle elevations. In Hood River, this fire regime covers 60 percent or 320 square miles of the county area. FRG V covers

roughly 30 percent of the valley. It is found on the upper flanks of Mt. Hood, surrounding Lost Lake and the Bull Run Watershed, east of Highway 35 around the Badger Lake Wilderness, and in the western Columbia River Gorge. Regime Group V is typically associated with large fires with return intervals greater than 200 years. The recent fire history described above puts FRG V's hazard into context: the largest fires in and near Hood River County have occurred in this regime group, and while this regime tends to be rare and farther from Communities at Risk, the tendency for these fires to become uncontrollable is significant (Yacolt Burn, Dollar Lake Fire, Gnarl Ridge Fire).

With a baseline for historical fire conditions established, forest managers can quantify the departure from each fire regime group. Developed in 2003 and initially known as the Fire Regime Condition Class (FRCC), the departure measures how much each forest group has been altered from the 'natural' conditions found prior to European settlement (Barret 2010). In late 2011, LANDFIRE—the leading distributor of these data—changed the name to Vegetation Condition Class (VCC) to better reflect the nature of the data[2]. VCC assessments use two predominant areas of the ecosystems to measure departure: fire regime groups and vegetation types. Departure and condition class data can be used by forest practitioners to measure changes to one or more of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and disease mortality, grazing, and drought) (Brown and Smith 2000; Schmidt et al 2002; Tausch and Hood 2007).

Three VCCs have been developed to identify these patterns throughout the wildland landscape: low departure (VCC 1), moderate departure (VCC2), and high departure (VCC 3). There are no wildland vegetation and fuel conditions that do not fit within one of the three classes. Departure in the sense of the VCC can be described as the percentage of difference between current conditions and reference conditions (the central tendency of the natural fire regime). The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated natural disturbances. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside.

The three Vegetation Condition Classes are described below:

VCC 1: Fire regimes are within the natural (historical) range, and the risk of losing key ecosystem components is low. Vegetation attributes (species composition, structure, and pattern) are intact and functioning within the natural (historical) range. Management often involves using fire as a fuels treatment to maintain vegetation composition.

VCC 2: Fire regimes have been moderately altered from their natural (historical) range. Risk of losing key ecosystem components is moderate. Fire frequencies have departed from natural frequencies by one or more return intervals (either increased or decreased). This result in moderate changes to one or more of the following: fire size, intensity and severity, and landscape

[2] Many CWPPs and fire literature still refer to the departure from the historic fire regime as FRCC. The HRCCWPP however, chooses to use VCC as it recognizes the most current data available.

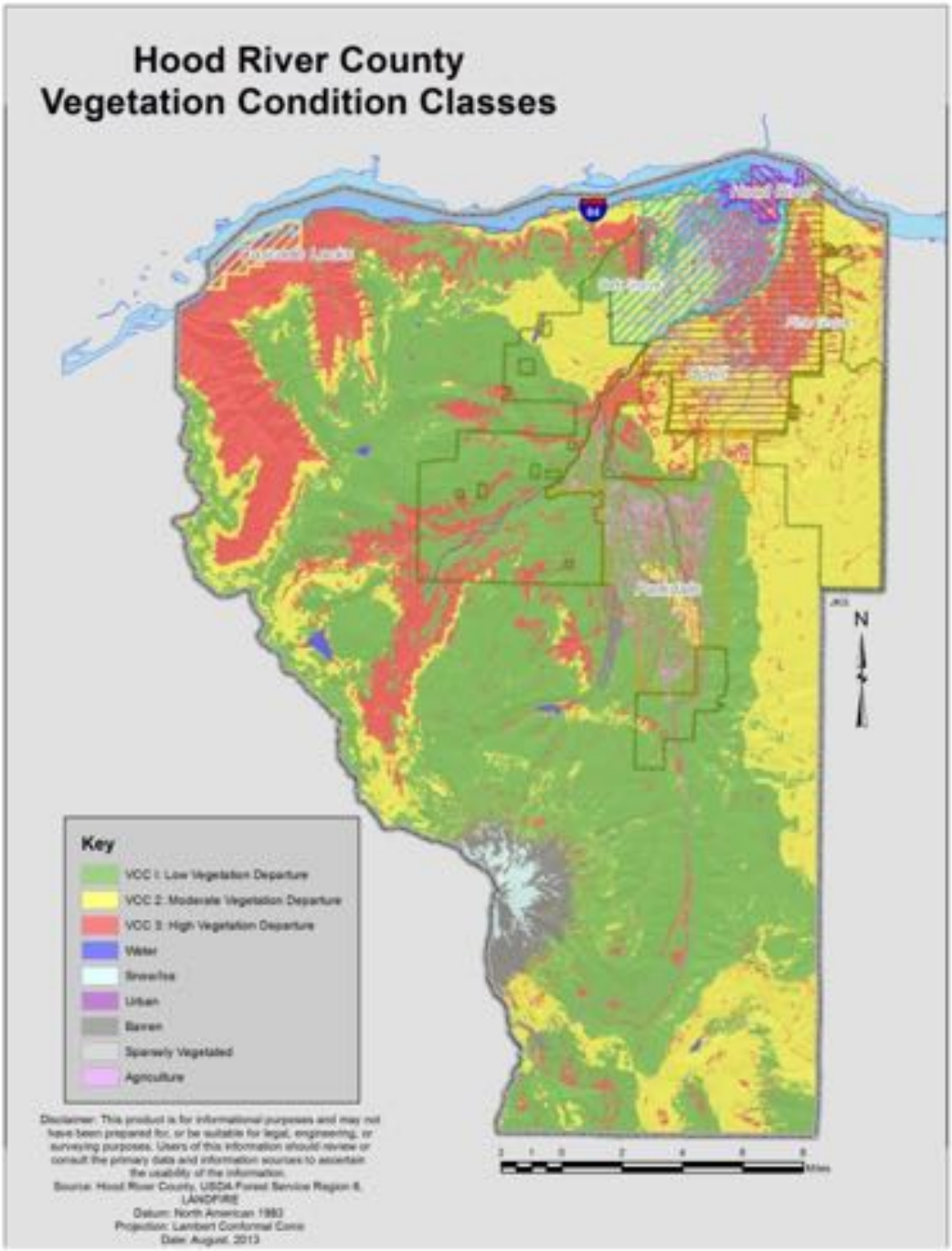
patterns. Vegetation and fuel attributes have been moderately altered from their natural (historical) range. Where appropriate, management may include moderate levels of restoration treatments, such as fire use and hand or mechanical treatments, to be restored to the natural fire regime. Thinning of ladder fuels and removal of heavy brush is typical.

VCC 3: Fire regimes have been substantially altered from their natural or historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from natural frequencies by multiple return intervals. Dramatic changes occur to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been substantially altered from their natural (historical) range. Fire is not used as a management practice until forests have been thinned by hand or mechanically.

Map 4 illustrates the VCC for Hood River County. This landscape level assessment reflects the most recent data (2008) available through the LANDFIRE Data Distribution site. The VCC acquired through LANDFIRE uses three hydrologic units to determine the resolution of the data. Sub-basin, watershed, and sub-watershed levels represent areas between 700 and 40 square miles. Based on the resolution of these data, Hood River County can be divided nearly equally between the condition classes. VCC I, which represents a low departure from natural conditions, covers around 50 percent of the area of the county, and is mainly present in and around the Mt. Hood National Forest. Condition Class I is generally seen as desirable, as forest conditions are similar to those naturally found in the region. Moderate departures from natural vegetation covers roughly one-third of the county. Although it is present throughout, it is mostly found in low elevation regions of the valley and the east hills, from the Columbia River to the Badger Lake Wilderness. Moderate departure from the natural fire regime puts VCC II at a moderate risk of both losing key components of the ecoysystem, as well as burning more intensely than is natural. A majority of homes within the WUI are found in condition class II. VCC III, the highest departure from the natural fire regime is found in the forested area near Lost Lake and in the western portion of the Gorge within the Columbia Gorge National Scenic Area. Representing a high departure, these areas have been significantly altered since the Indo-European arrival and put Hood River County at an extreme risk of severe wildfire. Covering over 90 square miles, fires within VCC III are subject to extreme behavior, intensity, and frequency. Condition Class III lands should be considered a priority for fuels reduction treatments.

Identifying both the Fire Regime Groups (historical fire characteristics) and the Fire Regime Condition Classes (changes from the historical fire characteristics as a result of human influence), we can begin to identify ways to alter current forest conditions in order to decrease fire's detrimental effects (Jain and Graham 2004; Scott and Reinhardt 2001; Agee 2002). Reducing the detrimental impacts of wildfires is the leading goal in the National Healthy Reforestation Act of 2003, which is the impetus for the CWPP. Given historical forest conditions and the modern state of the forests, the following chapter identifies the major risks found within Hood River County and suggests mechanisms to mitigate them.

Map 4: Vegetation Condition Classes of Hood River County



THE MOUNTAIN PINE BEETLE AND FIVESPINED IPS

The bark beetle is native to western forests. Of the over 6,000 species of bark beetles documented globally, only a few have caused widespread damage in the Pacific Northwest. Typically targeting trees within the same species, bark beetles bore beneath the bark of a tree and reproduce in the inner bark, weakening the tree and in many cases, such as the Mountain Pine Beetle and the California Fivespined Ips (CFI), causing high rates of tree mortality. Hood River County and the Columbia River Gorge have suffered outbreaks of the Mountain Pine Beetle in the past (1994). At the time of this writing, the California Fivespined Ips has caused rapid and significant tree mortality throughout Hood River County.

The California Fivespined Ips (*Ips paraconfusus)* was first documented in the Columbia River Gorge in 2012 (Murray, 2012). Bark beetles are a natural part of forest cycles, infecting and killing trees within stands that are already weak. Many see bark beetles as a natural mechanism of forest thinning (Franklin et al, 1987; Jenkins et al., 1998; Kulakowski el al., 2003). The recent infection of the Ips is considered the combined result of climate changes (increased drought) and forest disturbance (fires, logging, and the storm damage). Infecting many species of pine trees (including western white pine, ponderosa, lodgepole, and sugar pine), CFI outbreak is easily identified by 'topkill' in large mature trees. Topkill occurs when the CFI infects the upper crown of a mature tree where the bark is typically thinner, and results in trees fading from green to reddish brown. Once the top of the tree is infected, the Ips moves down the stem of the tree, at which point the tree is dead and will not recover (Murray, 2012). Infection of trees often occurs in stands (Figure 11) but can impact individual trees as well.

Figure 11:Trees infected by the California Fivespined Ips and characteristic needle discoloration.

As noted above, identifying outbreak of the CFI is visually apparent from topkill (infection by the Mountain Pine Beetle begins at the basal area of the tree). Other visual clues can indicate infection by the CFI. Reddish-brown dust around the base of the trees or on the bark of the tree from beetle bore holes can indicate infection. 'Pitching' is a tree response to beetles that attempts to flush out beetles by exuding sap through beetle bore holes (Figure 12). CFI infection is often accompanied by infection by the red turpentine beetle, which further weakens the tree. The presence of the red turpentine beetle can is evident in Figure 12 in the small white pusstules in the upper right corner.

Figure 12: An infected pine tree exuding sap through beetle bore holes (center) and evidence of red turpentine beetle pusstules (top right).

The significant tree mortality caused by the CFI has raised many concerns about the hazard is posed with regards to wildfire in the wildland/urban interface. Public perception is that standing dead trees killed by the Ips pose significant risks of wildfire, primarily in terms of fire ignition. Recent studies on the subject indicate that the impact of beetle-killed trees on wildfires is complex and changes temporally (Hicke, et al., 2012). Jenkins et al. (2008) note that trees killed by pine beetles at times increase the risk of potential ignition and crown fires, and at times reduce the risk. During initial infection (red stage as picture in Figure 12 above), reduced foliar moisture content can increase the risk of ignition and crown potential; however, as foliage drops

from the dead tree (grey stage) ignition risk and running crown potential decreases, while increased risk of surface fires increase.

The threat that CFI infected trees pose to wildfire varies, largely depending on the time since tree infection. Management of infected trees remains disputed, as the context for each tree or stand infected is highly important. Public safety, time of year, cost, and access are all critical factors when addressing management strategies of infected trees. The following management recommendations are provided by the Skamania County Extension Service. These are consistent with Jenkins (2008):

- **Keep forests healthy**: the Ips and Mountain Pine Beetle tend to target trees that are under stress. These conditions can be catalized by drought or forest disturbance, but are typically qualified by unhealthy forest stands. Properly thinned trees will maximize forest health and help forests withstand beetle outbreaks. Thinning should be carried out during fall/winter months when trees are in hibernation and under reduced stress.
- **Prompt sanitation of infested trees:** prompt removal of trees that are infested (yellowing or orange foliage) can hep to reduce beetle populations. Removal of green slash should be under 3 inches in diameter from January to June.
- **Timing with beetle flight:** the Ips and Mountain Pine Beetle have two flight periods that can infect host material. The first brood occurs from roughly May to June and the second occurs from July to September. During these times, trees should not be cut or removed as removal can increase beetle spread. If trees are cut or removed during times of beetle flight, slash should be destroyed or chopped into small sections and debarked. Chips or small sections of slash can be covered in clear plastic to increase solar radiation and reduce the time that it takes to dry out.
- **Reduce the stress to trees in summer months:** during the summer months when trees are at increased stress, water can be applied to reduce the strain to the tree. Water should be applied twice a month for an hour at least 3-5 feet from the trunk of the tree.

Ultimately, the responsibility of pine beetle mitigation and prevention lies on the property owner, however, the Hood River County Wildfire Prevention Coordinator recemmends that communities at risk to pine beetle infestation talk to their neighbors to discuss how risks, hazards, and consequences of beetle outbreak. Infected trees pose a threat not only to wildfire from an unstable and changing forest structure, but also to public safety, as standing dead trees are more susceptible to falling during extreme wind events.

Chapter 6
Communities at Risk

Communities at Risk

The cost of fighting wildfires has increased substantially over the past 20 years. A recent report by Headwaters Economics suggests that fire suppression costs have doubled since 2003. The U.S. Forest Service alone spent nearly $3 billion during the last fire season (2012), which accounted for over half of their budget. Research suggests that the steep increase in wildland firefighting costs is closely related to growth in the Wildland /Urban Interface (Mercer 2005). Growth within the WUI has placed more citizens and property at risk to wildfires; in the case of a wildfire, resources are often directed to protect homes in and near the WUI. Identifying these areas is necessary for both suppression and mitigation efforts.

A Community At Risk (CAR) is a geographic region with a minimum housing density of 1 house per 40 acres. Typically, these communities must have basic infrastructure and must be located within an organized local fire district or other local government, and needed to be proximate to federal or tribal lands. A national effort to identify CARs began in 2001 and was initially problematic for many states. In 2004, a statewide task force was formed in Oregon to assess Communtities At Risk. The assessment rated communities *low, medium,* or *high* based on their overall rating for *Risk, Hazard, Protection, Capability, Value,* and *Overall* (Oregon Community At Risk Assessment 2006). As a result, 564 CARs in Oregon were identified and added to the federal register. In Hood River County, eight communities were identified, all corresponding with the local fire jurisdictions at the time. These include: the City of Cascade Locks, Dee RFPD, the City of Hood River, Odell RFPD, Pine Grove RFPD, West Side RFPD, Parkdale RFPD, and Hood River County as a whole. All eight communities received a state rating of high.

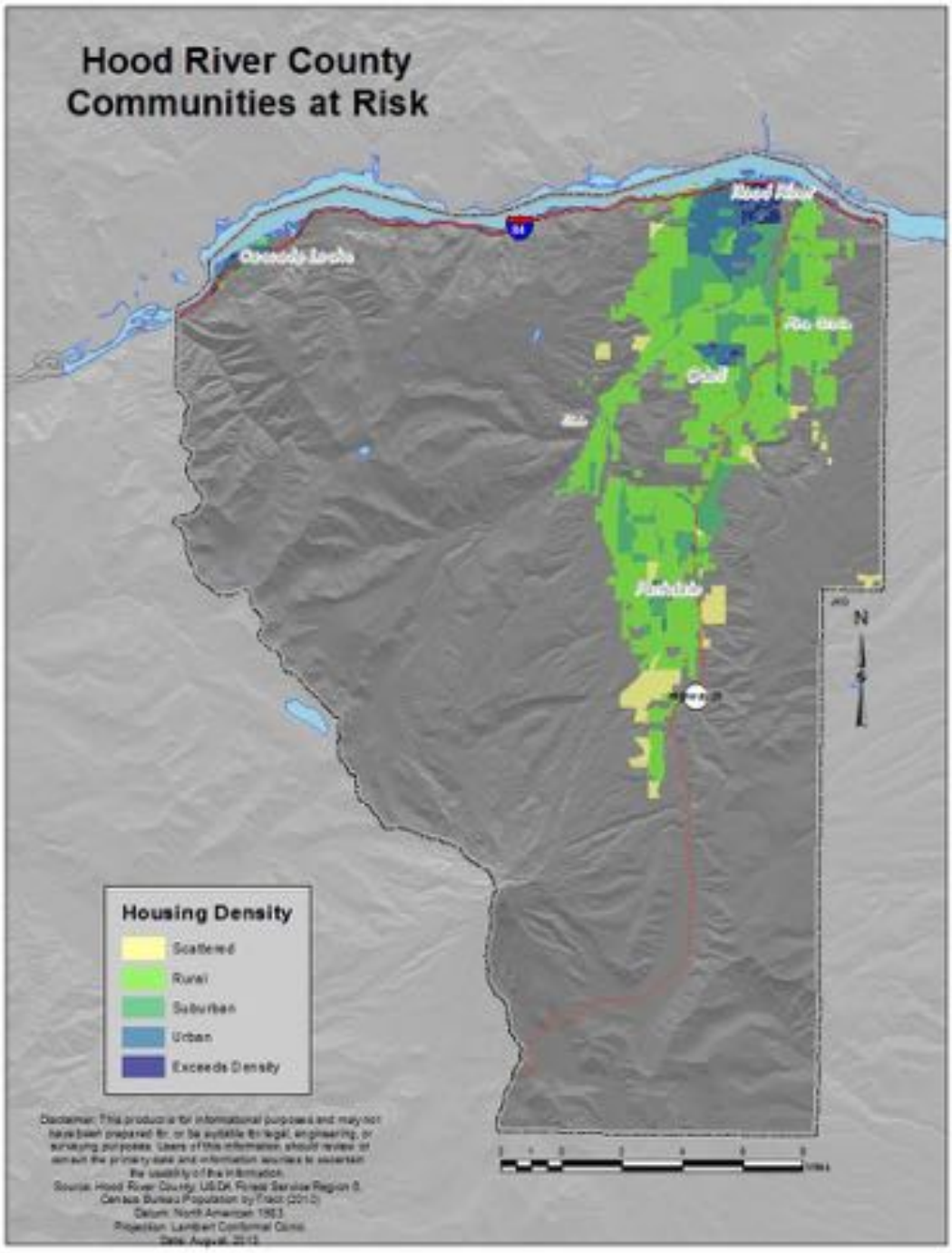
HOUSING DENSITY

In order to be considered a community at risk, areas must have a minimum housing density of 1 house per 40 acres. The assessment carried out at the state level considers the entire county to achieve this minimum housing density. This is likely as a result of the coarse scalar nature of the Oregon assessment: countywide, Hood River has a rough population density of 2.5 houses per forty acres. This however, is misleading, as only 75 square miles of the county's 534 square miles is populated, the majority of lands (71 percent) are either federal, state, or county owned. I In order to better evaluate communities at risk in Hood River County, a finer scale assessment of housing density was conducted using data acquired from the 2010 U.S. Census. The Census block level was chosen for the housing density assessment, as it is the smallest reporting unit available from Census data. Census Block data is used for administrative purposes only and does not account for zoning, parks, or other private forest lands, and may include blocks with a population or zero. It is therefore not a useful tool for ecological mapping. To fully understand population densities in HRC, a *Public Land Assessment (PLA)* was used to remove geographical areas within blocks that could

not hold a population. These geographical areas included those owned by the Federal Government, the State of Oregon, and the County. Data was further refined to exclude lands designated as commercial forest land. This method is consistent with other assessments, such as Helmers (2013). Housing unit data was then redistributed for the portions of the census blocks remaining. The resulting housing density map (Map 5) displays reallocated population density for these spatial regions.

The HFRA classifies housing density into five categories, only three of which are considered to be appropriate for a CAR. Areas with less than one home per forty acres are considered to be Scattered and do not meet the NFP/HFRA criteria for a CAR. Rural areas are considered to have between one and four homes per forty acres; these meet NFP/HFRA CAR criteria. Suburban areas are those which have a density not exceeding 10 houses per forty acres—these fit both Senate Bill 360 and HFRA definitions of a CAR. Urban areas are defined as having up to 99 homes per forty acres and also meet HFRA and SB 360 criteria. Any population density that exceeds 100 homes is considered to exceed the density for significant fire growth and meet neither HFRA nor SB 360 guidelines.

Map 5: Communities at Risk in Hood River



OTHER RISK FACTORS

Aside from the guidelines set forth by the state task force, there are other factors that may place a community at risk of catastrophic wildfires. Looking at each fire protection district individually is necessary to gain a full understanding of the risks that a community faces. Local communities at risk based on empirical knowledge are listed below. Further refinement of these communities may include the following factors:

- Access, egress, and road width
- Vegetation and fuel loading
- Defensible space
- Housing material
- Water sources available
- Utilities (power lines, gas lines)
- Recreationalists and transient populations

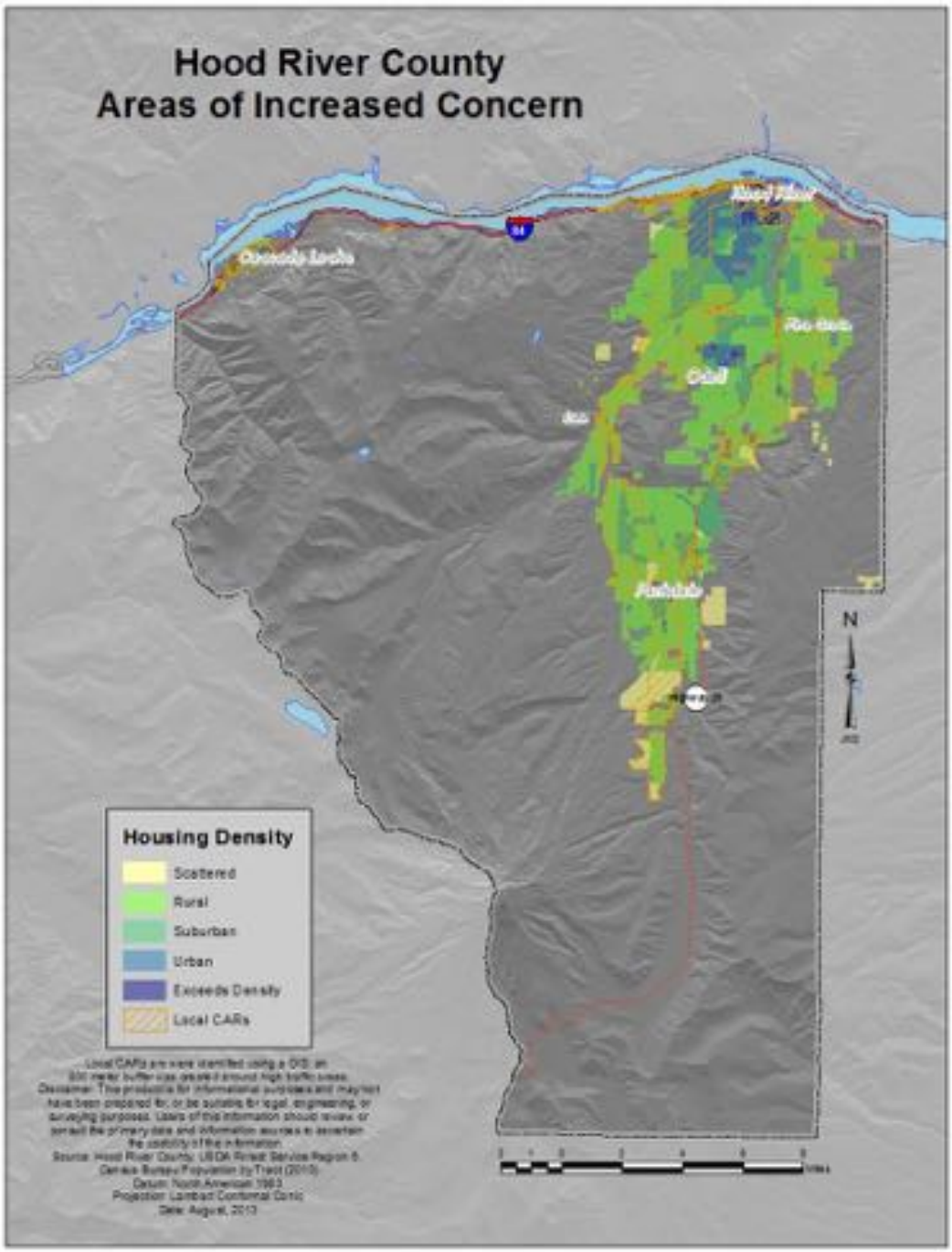
Areas of Concern in Hood River County

City of Hood River	I-84 Corridor, East East Hazel & East Fourth Indian Creek Watershed Sievercrop Development	Rio Bella Apartments West of Rand Rd. & West Sherman St. Country Club Rd. West May St. & Rocky Rd.
City of Cascade Locks	Herman Creek	I-84 Corridor, East
West Side RFPD	West of Country Club Rd.	West of Reed Rd.
Odell and Pine Grove RFPD	Fir Mountain Oak Ridge Neal Creek	Dee Highway Corridor Gilhouley
Parkdale and Dee RFPD	Pine Mont Cooper Spur Red Hill	Trout Creek Ridge Dee Highway Corridor

The areas of concern described above were chosen after consultation with the local fire chiefs. The criteria for choosing these regions were based on each individual chief's knowledge of their own fire protection district; this included an analysis of fire risk, as well as consequence. Within the City of Hood River, these areas included those near areas of high traffic, with a high invasive fuel loading. High invasive fuel loading for the city include dense thickets of blackberries and scotch broom, which is known to burn readily and carry fire long distances. Figure 1 illustrates one such hazard located in the Rio Bella CAR along Interstate 84 Eastbound. County CARs were identified near the peripheries of each Rural Fire Protection District where heavy fuels tend to load. These areas typically corresponded with a longer emergency response time and hazardous access and egress.

Figure 13: Thickets of dead blackberries abut the property line of the apartments to the south; the distance between the fuels and structures was less than six feet.

Figure 6: Local CARs identified using an 800 meter buffer around hazard roads.


Hood River County
Areas of Increased Concern
Housing Density
Scattered
Rural
Suburban
Urban
Exceeds Density
Local CARs
N

Chapter 7
Wildfire Risk Assessment

Wildfire Risk Assessment

The impetus for creating a CWPP comes out of the National Healthy Forest Restoration Act (HFRA) of 2003 in a call to prevent the occurrence of disastrous wildfires, such as the Rodeo-Chediski fire of 2002. Combined, the Rodeo and Chediski fires burnt over 700 square miles of woodlands, destroyed 426 homes, and cost $43 million to extinguish. The devastation caused by the Rodeo Fire sparked both a public and political debate on the state of the West's forests. Some argued that strict environmental protection laws and opposition to forest thinning through logging allowed for catastrophic fire growth; others argued that there was little effort to thin the forests through removal of underbrush and controlled burns. Coming out of this debate, the HFRA called for new forest resource management practices to prevent fuel loading caused by fire suppression and exclusion. While the debate continues today, the HFRA maintains that the removal of excess (or hazardous) fuels from the forest is a critical step to returning forest land to a more natural and less destructive fire regime. In short, the primary concern at the heart of the HFRA is forest management.

The CWPP is a critical piece of the HFRA. It encourages communities to pre-plan for wildfires. This includes the assessment of hazardous fuels and community resources (natural, cultural, social, and economic) that are threatened by the potential of wildfire. As stated in Chapter 1, the CWPP at minimum must be collaborative, identify hazardous fuels reduction projects, and assess structural ignitability. In this sense, the CWPP is concerned dually with forest management and development within forest lands. While the HRCCWPP is also concerned with forest management and development, the driving force is the protection of life, property, and resources. The following chapter details the risks to life, property, and resources within Hood River County.

OBJECTIVES

- Using the Areas of Increased Concern assessment, create an education plan to target those living within geographically significant wildfire hazard areas.
- Evaluate the wildland/urban interface planning boundary.
- Assess areas in the community where infrastructure limitations may inhibit effective protection in the event of a wildfire.
- Create a Wildfire Hazard map of Hood River County based on terrain, fuels, and weather to categorize areas of increased hazard/risk.
- Analyze historic fire occurrences within Hood River County to help identify modes and areas of fire ignition.
- Identify unique factors within the community of Hood River that increase the consequence of wildfire (hazardous materials in the WUI, critical infrastructure, etc).
- Assemble an overall Wildfire Risk Index for Hood River County based on the objectives above.

Wildfire Mitigation Zones and Education

The CARs identified in Chapter 6 indicate areas where populations are at a greater risk of wildfire. The assessment was based on empirical knowledge of local fire experts, and coincides with rural, urban, and suburban populations. The local CARs further pinpoint where mitigation efforts and public education should occur. This includes areas within the city limits. Contrary to common belief, residents living within the city limits are still at a high risk from wildfire—as a result, this assessment includes both city and county residents.

According to U.S. Census Data (2010), about 16,000 residents—or 70 percent of the total population—live within a community at risk. Providing individualized fire prevention and mitigation plans to these 7,000 housing units is impractical due to a lack of personnel and economic resources. Providing education is further complicated by a high proportion of homes owned by non-residents living out of the area (recent estimates using county assessor data suggest that nearly 10 percent of homes within a CAR are owned out of state). Contacting non-resident owners poses additional challenges for education within CARs.

Of the 7,000 homes within a Community at Risk, 1,700 were targeted for a targeted wildfire prevention and preparation mailing. These residences were targeted from within Hood River, Wy'East, Parkdale, and West Side Fire Districts. Selection of these homes utilized the Local Community at Risk assessment from Chapter 6, combined with aerial image overlays. Homes within LCARs were selected based on their relative proximity to dense wildland fuels. Fire prevention flyers were targeted to the site of the structure rather than the mailing address of the owner. This methodology targeted residents, whether owner or renter, while attempting to minimize mailings to non-resident owners. Flyers (see Appendix B) included steps to minimize fire hazards around the home, how to create areas of defensible space, and what to do in the event of a fire induced evacuation.

Roughly 16,000 people live in a Community at Risk in Hood River—that's 70 percent of the total population

The WUI

As defined in Chapter 1, the default definition of the WUI is accepted to be 1½ miles from a Community at Risk. By this definition, a buffer could easily be drawn extending this distance around all CARs, however this would not take into account the many geographical characteristics that aid in wildfire suppression. As a result, WUI boundaries for Hood River County are designated geographically to the West and East side of the lower Hood River Valley. Both of these areas represent a significant fire hazard and threat to private lands. The interface/intermix zones of Communities at Risk have limited potential at this time to grow. This is due to the fact that much of the private lands are surrounded by federal, state, county and private forest lands; however, some WUI boundaries have been established well beyond the 1 ½ mile mark. The following excerpt from the 2006 Edition of the HRCCWPP describes the WUI definition process:

WUI Justification and Description, HRCCWPP 2006

Within the WUI boundary along I-84, ownership lays almost entirely with State and Federal agencies. This sensitive area, administered by the Columbia Gorge National Scenic Area, represents an area of heavily wooded, steep, and inaccessible terrain. The challenge in placing a WUI boundary here is the fact that fire may scale the canyons and cliffs very quickly, especially on days where the wind is blowing and also on days where there is low humidity and hot temperatures. The WUI boundary is located along the Bonneville Power Administration (BPA) power line access Right of Way (ROW). At times the ROW provides an area that could be a fire break and at other times (where the power lines span gullies or canyons) do not act as a fire break. Actions at these points should be aimed at reducing the chance of fire escaping the railroad and freeway ROW.

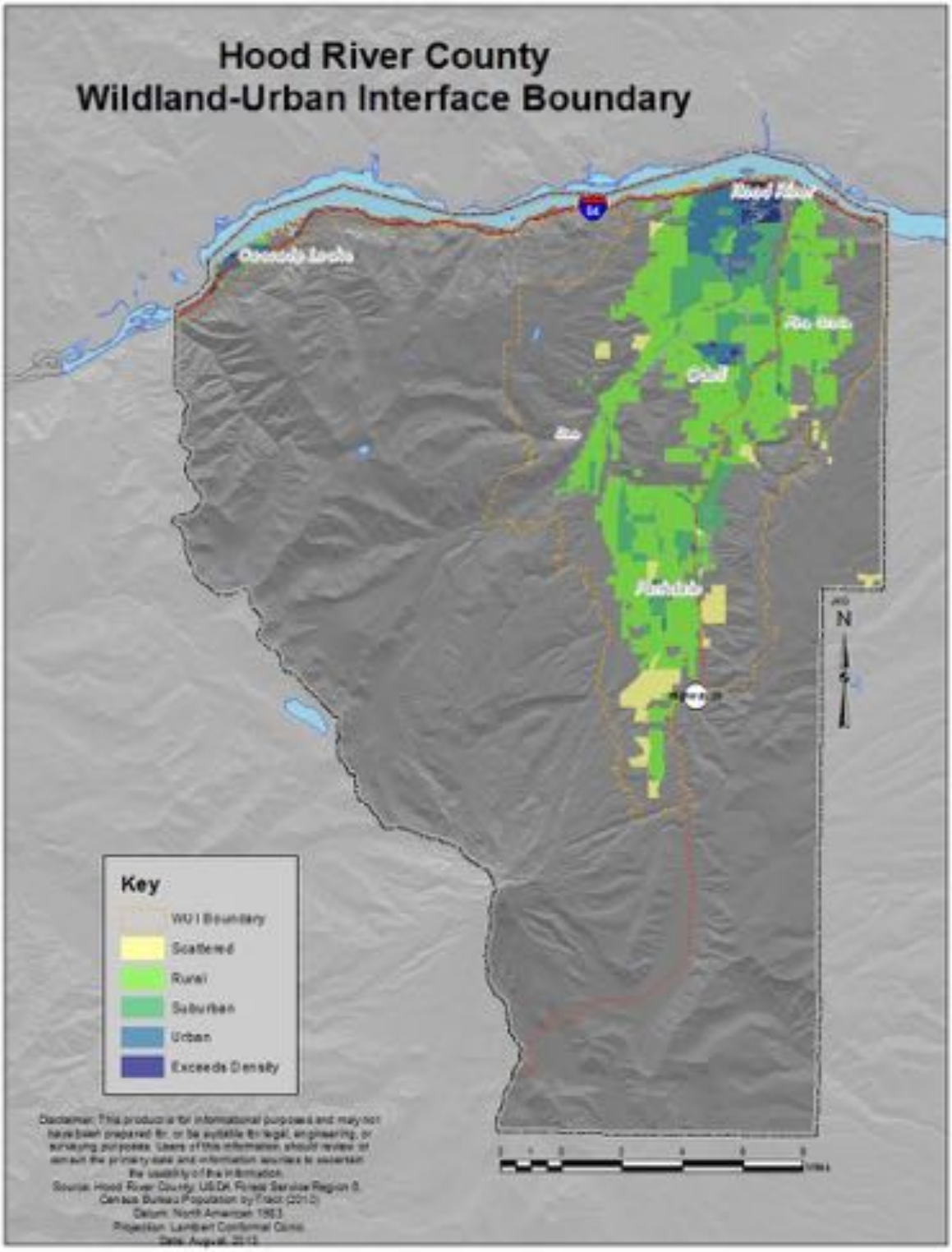
For a graphic representation of Federal lands (Mt Hood Ranger District and the Columbia Gorge Scenic Area) and how those lands interact with the WUI boundary. This is an important aspect to study as future grant funding will be tied to this relationship.

The Cooper Collaborative work group is currently formulating and discussing efforts for the unincorporated area south of Parkdale Rural Fire Protection District. As of this printing no clear consensus has been reached on the placement of a WUI boundary. Displayed on the WUI boundary map for the Cooper area is a "Planning Boundary" that may become the WUI boundary. By default, until such times as the Cooper collaborative group reaches a clear consensus it is the opinion of this group that the State designated WUI boundary be accepted.

A significant issue in this area is reaching a balance between man and the environment. As already identified; the significance of the watersheds rates very high in the county infrastructure. The Crystal springs zone of contribution lays within the greater Cooper planning area. This watershed will be more susceptible to the effects of catastrophic wildfire than other watersheds that draw their water from a source much deeper such as Ice Fountain.

Constrained politically by Private Timber, County, State, and Federal lands, there has been little room for new housing growth on the outside peripheries of the WUI. Strict planning and development laws at both the state and county level have also limited housing growth on the edges of the wildland/urban interface. Furthermore, the geographic considerations that helped to identify the WUI have remained unchanged. These include power line ROWs, major transportation routes, waterbodies, ridges, and clearcuts. These geographic considerations still function as defensible breaks in the event of a wildfire. These evaluations of the wildland/urban interface boundary suggest that the 2005 iteration remain unchanged, with the exception of the Cooper Spur WUI boundary, which will be incorporated into the Parkdale Fire Protection District in 2014.

Map 7: The Hood River County WUI as defined in 2005 with 2010 population density by modified census tract.



WILDFIRE RESPONSE TIME AND INFRASTRUCTURE LIMITATIONS

Two human factors can greatly reduce the extent of wildfires: early detection and early initial attack. Early detection is difficult to quantify. A majority of fires are detected by the general public, who may see a fire near their home or during their transit to or from work. Wildfires double in size every five minutes in normal conditions (Georgiev and Kancheva 2011). For example, it will take less than 40 minutes for a one square foot fire to grow to an acre. This doubling time is exacerbated by fuel loading, fuel moisture content, slopes, and weather. In Hood River County, steep slopes and extreme winds often fuel fires, significantly reducing the average doubling time. Delayed response and initial attack of wildfires can easily put a fire over the threshold of manageable. In Hood River County, 75 percent of wildfire starts reported by ODF are below one tenth of an acre. For Hood River, it is critical to suppress a fire before it grows larger than one tenth of an acre, as fires that surpass this size exponentially increase the cost of suppression and consequence of loss.

Methodology

Although many variables exist, local knowledge indicates that in order to keep a fire below this threshold, response time by emergency personnel should be less than ten to twelve minutes (Personal Communication). This assumption is consistent with neighboring CWPPs, including Multnomah County, which identifies a response threshold of ten minutes. Varied response times do exist for each fire district within the county, and depend largely on the availability of volunteer personnel. Response times at night are significantly reduced, as is initial detection. Response time within the county also varies temporally, as many volunteer personnel are associated with the tree fruit industry, the busy season of which corresponds directly with peak fire season.

A GIS was used to estimate approximate response times for wildfires within each fire district. These *Wildfire Service Areas* (WSA) identify regions in Hood River where the potential response time is within the twelve minute estimated response time. As response time for fires is primarily concerned with the WUI and structures located in or near it, the county was first divided into those areas within an organized fire protection district, and those outside of one. This helped to initially categorize structures within the community that are protected under current bylaws. WSAs were further refined using a network analysis of the area through ArcGIS 10.1 to identify areas that were above or below the twelve minute response threshold. Four of the five fire districts in Hood River County depend predominantly on volunteer response, hence a ten to twelve minute response time must additionally include transport time to the fire station to retrieve necessary apparatus.

Assuming that half of the response time to an incident when it is initially toned out is used for transit to the station, then the remaining six minutes is a reasonable estimate for distance that can be reached from the fire station to suppress a wildfire before it reaches the one tenth acre benchmark. A network analysis was used to estimate approximate response buffers from each fire station. Response areas below are estimations only and are subject to change based on a variety of conditions, including weather, traffic, road hazards, road construction, and time of day.

WILDFIRE HAZARD—TERRAIN, FUELS, AND WEATHER

Fuels, weather, and terrain contribute to wildfire behavior and severity. These three factors can be used to define wildfire hazard. As stated previously, the impetus for the CWPP comes from the HFRA, which seeks to reduce fuel loading which can create hazardous wildfire situations. In terms of fuels, it is not only the density of fuels that contributes to wildfire behavior, but the type of fuels available. Fine flashy fuels—such as grasses—will burn at a faster rate than brush or heavy fuels. When fanned by wind on a low humidity day, fuels will be consumed more rapidly. As topography changes from flat to steep ground, significant preheating of fuels occurs in front of the flame, increasing fire intensity and rate of spread. Hood River County has many areas of dense and heavy fuels that exist in steep terrain. Combined with the driving winds that are in the Columbia River Gorge, the recipe for intense burning and rapid fire growth exist.

Fuels

Fuels are divided into many different categories, all of which are interrelated to weather and topography. Hood River County climatic regions vary; to the east more grasses, oak and pine trees dominate the drier natural terrain as opposed to the west side where fir trees are more normal for a climate that is a little wetter. To the South, there is a mixture of conifers that make up the forested lands beyond the urban interface. Not only does precipitation contribute to fuel differences in the valley, but elevation is also critical. Higher elevations often see significantly lower fuel loading as a result of a shorter growing season. A combination of shortened growing season, changes in available oxygen, and fuel drying lead to sparser fuels and a shorter fire season at higher elevations, typically accompanied by an increase in natural burn interval.

Describing the fuels available for a wildfire is difficult. As a result, many different classification methods are used to describe fuels and their burn characteristics. One such designation uses fuel diameter to approximate moisture content. Designated in terms of *Hour Fuels*, these classifications describe fuels on the rate of moisture loss that they experience. The hour designation, rates the time that a particular fuel will lose 2/3 of its moisture internal moisture content. For example, a 100 hour fuels—designated as between 1-3 inches in diameter—will only retain 1/3 of its original moisture content after 100 hours of drying conditions. Examples of drying conditions include radiated heat from the sun, an approaching fire front or direct impingement by flames. Most commonly, natural drying occurs (i.e. a warm/hot day, lower humidity with wind present). Moisture changes within fuels works both ways: fine fuels have the ability to both lose and regain moisture quickly, whereas the 1,000 hour fuels take much longer to complete the same cycle. It is the evaluating of fuel moisture content that forest closure and burning regulations are evaluated on each year. Fuels are rated according to the following table.

Table 5: Fuel designations based on moisture loss times and relative diameter.

Fuel Classification		Size - Inches	Type
1 Hour Fuel	Fine	0 – ¼	Grass- Pine Needles
10 Hour Fuel	Small	1 /4 – 1	Twigs – Branches
100 Hour Fuel	Large	1- 3	Small Trees – Branches
1,000 Hour Fuel	Large	3 – 8	Trees

Another common method of describing fuels was developed in the early 1980's by Forester Hal Anderson. Known as the 13 Anderson Fire Behavior Fuel Models, this classification system classifies fuels based on the characteristic of burn—both in terms of fire spread and fire intensity. Fuels modeled under this method take into consideration: fuel load and ration of surface area to volume for different size classes; fuel bed depth; fuel moisture (Anderson, 1982). All wildland fuels are categorized into these 13 classes. Fire fuel behavior models found in Hood River County are listed below (Anderson, 1982):

Fire Behavior Fuel Models In Hood River:

Fuel Model 1: Short Grass

Fuel Model 3: Tall Grass

Fuel Model 2: Grass with Timber Overstory

Fuel Model 4: Shrub/Chaparral

Fuel Model 5: Light Brush

Fuel Model 6: Hardwood Shrub

Fuel Model 8: Closed Timber Litter

Fuel Model 9: Hardwood Litter

Fuel Model 10: Timber with Litter and Understory

Fuel Model 11: Light Logging Slash

Fuel Model 12: Medium Logging Slash

Fuel Model 13: Heavy Logging Slash

Classification of these fuel types is provided by LANDFIRE—a federal government clearinghouse of wildfire related data. Forest cover is classified using moderate resolution imagery using the Landsat 8 Satellite operated by the USGS and NASA. These classifications provide a rough basis for estimating potential wildfire severity and spread in Hood River County. Using a GIS, the Anderson Fire Fuel Behavior Models were assigned a point score depending on fire severity and rate of spread associated with each model. Fuel Models 1, 5, and 8 were assigned a point value of 5; Fuel Models 2, 6, 9, and 11 assigned 15; Fuel Models 3, 4, and 10 assigned 30. Low values represent a low hazard, while high values represent a high hazard. Assignment of points is consistent with other CWPPs, including Multnomah and Clackamas Counties.

Weather

Hood River County is subjected to weather patterns that can contribute significantly to extreme fire behavior. The Columbia River Gorge provides the path of least resistance through the Cascade mountain range for pressure systems to equalize. With a westerly gradient, Hood River can see 20 – 30 mph winds daily, sometimes with little or no nighttime relief. Peak gusts can exceed 40 mph. Humidity associated with the westerly flow is generally around 30 – 50 %; however these sustained winds coupled with high daytime temperatures account for overall lower fuel moisture content. With an Easterly gradient, the drier air from the desert pushes towards the coast in an attempt to equalize and significant drying occurs. Winds in the east end of the gorge tend to be minimal; however in the west portion of the gorge from Viento to the county line the winds can build and at times exceed 40 mph. Winds generally tend to die down at night as the desert cools off or the gradient may even reverse. Associated humidity can be in the teens or single digits. With humidity less than 28% embers and sparks may be expected to ignite fine fuels as they are carried ahead of a fire front by the wind. The weather patterns, while somewhat more extreme along the Columbia River Gorge, are also significant proceeding further south to Parkdale and to up Highway 35 to Mt Hood. Weather throughout the county is considered to be in the same Fire Weather Zone: East Slope of the Cascades.

> Extreme winds are experienced in all of Oregon's eight regions. The most persistent high winds occur along the Oregon Coast and the Columbia River Gorge. The Columbia Gorge is the most significant east-west gap in the mountains between California and Canada. It serves as a funnel for east and west winds, where direction depends solely on the pressure gradient. Once set in motion, the winds can attain speeds of 80 mph, halt truck traffic, and damage a variety of structures and facilities. The average wind speed at Hood River is 13 mph.

Source: Ole Helgerson, Washington State University—Skamania Extension Service

Terrain

Hood River County is defined by its steep and rugged terrain that surrounds it. While contributing to the scenic beauty and tourism draw, these conditions provide an environment that puts Hood River at greater risk of catastrophic wildfires. The extreme terrain of the region make fires spread rapidly and can make suppression difficult. Two current examples of how steep terrain has influenced fire growth and suppression difficulty are the Dollar Lake Fire (2011) and the Government Flats Complex (2013). Started by lightning, these fires began small but grew quickly due to steep terrain and difficult access for fire crews. The terrain characteristics that influence fire behavior are: slope, aspect, and elevation.

Aspect is defined as the direction a slope faces the sun. North facing slopes tend to be more heavily fueled. These slopes tend to be shaded the longest and are, as result, wetter. South facing slopes, while they may have the same fuel load, will shed fuel moisture at a faster rate through direct heating from the sun. These slopes typically receive the most sunlight during the summer months. Classifying hazard in Hood River County uses aspect to help predict fire hazard. Consistent with Multnomah and Clackamas Counties, the HRCCWPP assigns a point value of 1 for North facing slopes that tend to be the dampest, 5 for south facing slopes, which receive high exposure to the sun, and 3 for east and west facing slopes.

Slope is a measurement of the amount the terrain changes in relationship to flat ground. This measurement can either be described in degrees or as a percentage. The slope of a hill greatly affects fire spread: the greater the slope, the more preheating of fuels (Butler et al, 2007; Weise, 1993). Convection currents will move the heat and other products of combustion rapidly ahead of the flame front drying and heating unburned fuel. Fire intensity will increase many fold as the fire runs up a hill. In narrow canyons and draws the heat radiated by a fire making a run up the canyon wall in many cases is sufficient to ignite the opposing canyon wall. Steeper slopes intensify fire behavior and therefore contribute to wildfire hazard; rate of spread of a 30% slope is about twice that of flat ground. For the purposes of the HRCCWPP, slope was classified into three classes: slopes less than 25°; between 25° and 40°; and slopes greater than 40°. These are considered threshold slopes that significantly increase rate of spread and inhibit fire suppression (Butler et al., 2007). Slopes less than 25° were assigned a value of 1; slopes between 25° and 40° assigned a value of 2; and slopes greater than 40° assigned a value of 3. This is consistent with Multnomah and Jefferson County CWPPs.

Figure 15: Steep terrain and roadside fuels along I-84 can make fire protection and supression difficult (Source: Peter Mackewell).

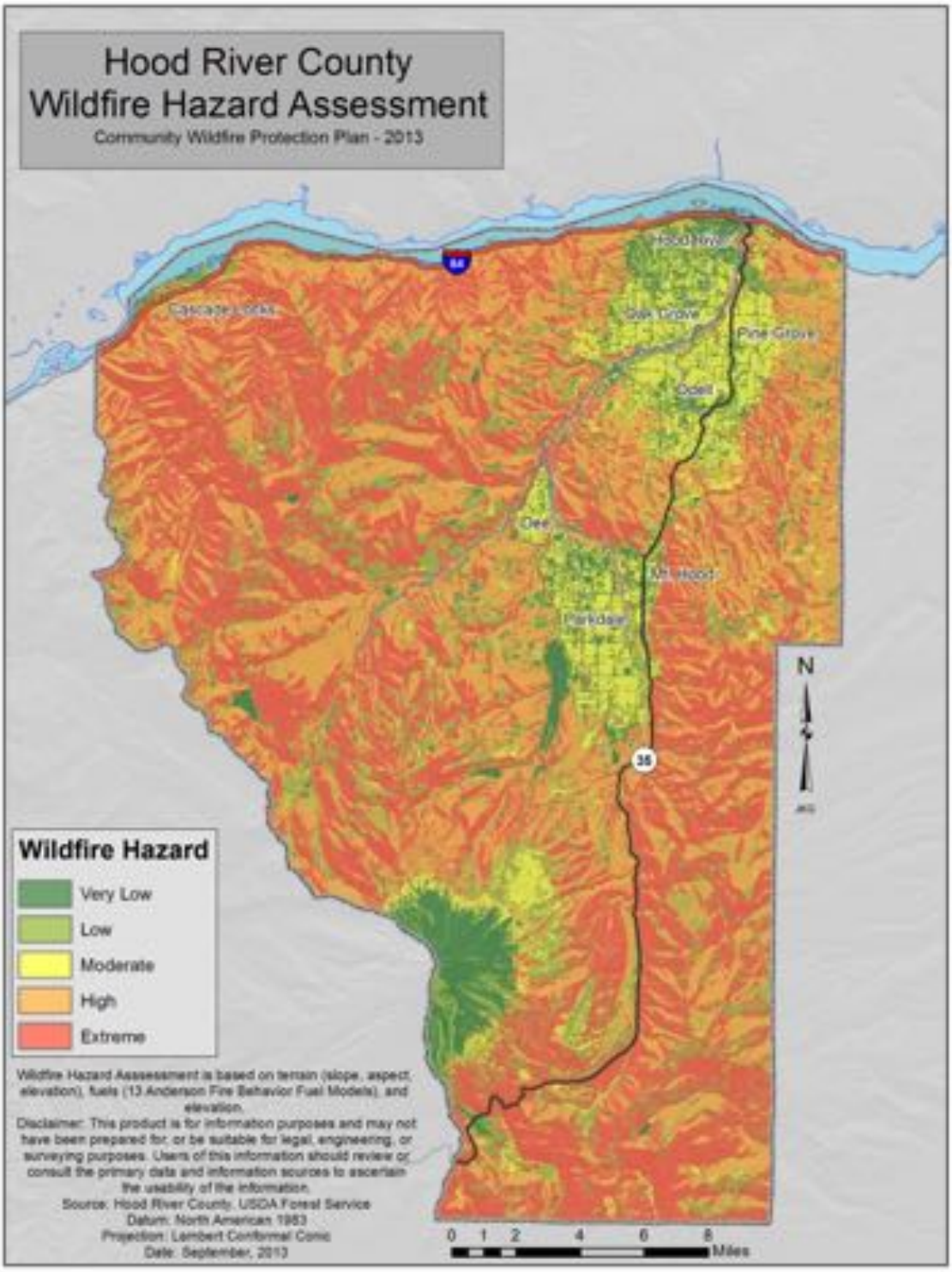
Elevation

Elevation has a significant impact on fire vectors and fuel moisture content. Fires that are caused by lightning are often located at higher elevations, while anthropogenic fires are started at lower elevations (Keeley, 1981). The majorities of large wildfires that Hood River County has experienced is lightning caused and occur at higher elevations where access and suppression are difficult. Elevation also plays a critical role in fuel moisture contents. Lower elevations tend to experience fuel drying earlier in the season. This is due to higher temperatures and lower precipitation. In Hood River County, fires are both spatial and temporal: fires in the early season tend to be in the lower valley where fine fuels dry the quickest; as the season progresses and fuels in the upper elevations dry out and the snow melts, fires spread outward to the upper reaches of the valley. For the HRCCWPP, elevations below 3,500' were assigned a value of 1 and elevations about 3,500' were assigned a value of 2.

Terrain, Weather, and Fuel Risk Map

Using fuels, weather, and terrain as parameters to assess wildfire hazard, an overall hazard assessment map was created. The wildfire hazard map uses the methodologies from above compiled through a GIS (Map 9). The hazard analysis indicates that much of Hood River County falls in areas that are at an elevated risk to wildfire; this is especially true in the National Forest land to the west of Hood River's Communities at Risk. High to extreme risk also lies in the areas south of Parkdale (e.g.: Cooper Spur), Middle Mountain, and Bald Butte.

Map 9: Hood River County Wildfire Hazard Assessment



HISTORIC FIRE DENSITY AND FIRE VECTOR

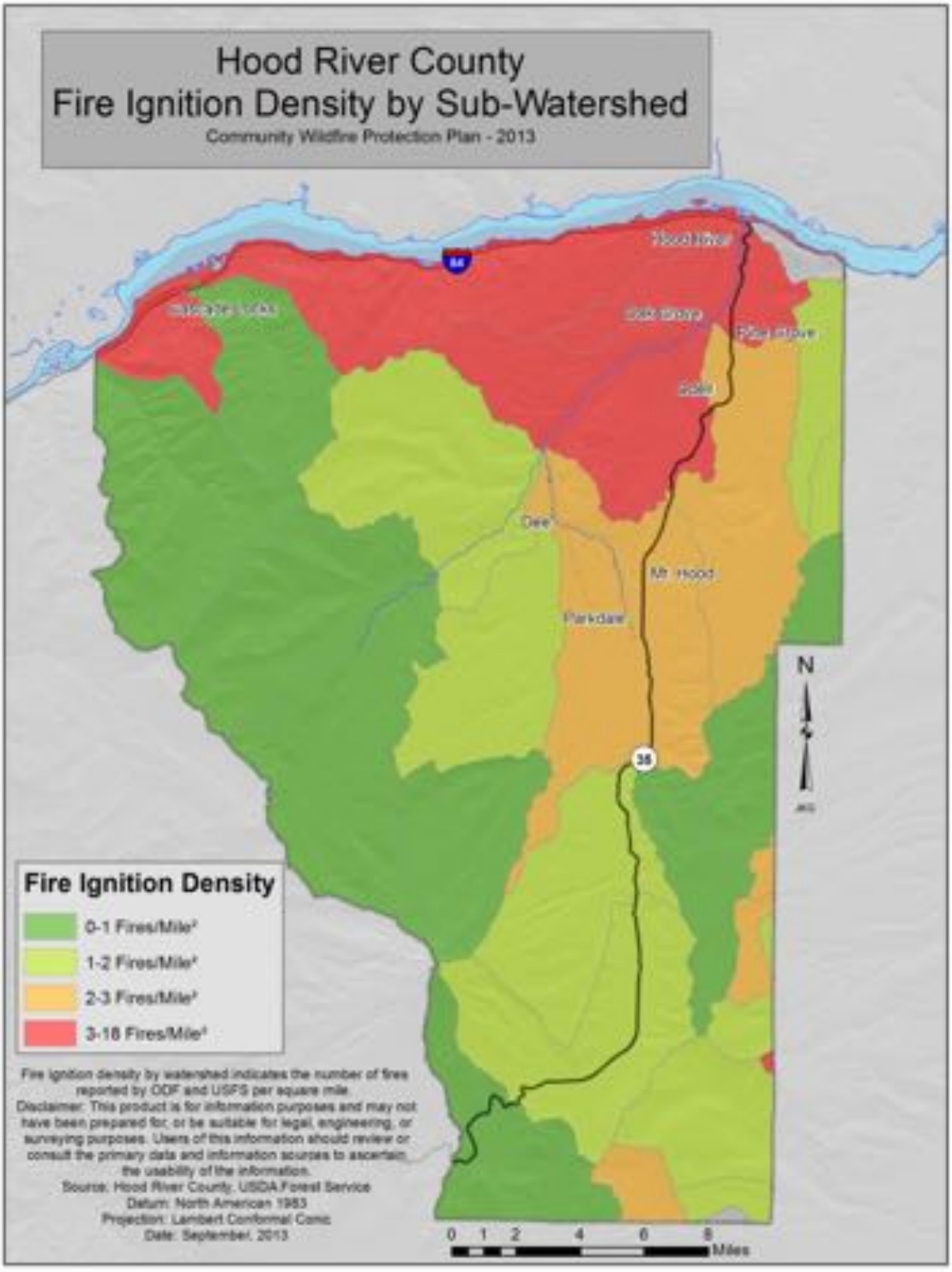
Historic fire density and fire vectors can be used as a method to estimate areas that should be targeted in terms of fire prevention, mitigation, and education. For example, areas that see a high frequency of anthropogenic fires can be isolated for increased public outreach, while areas that see a higher frequency of natural caused fires can have pre-fire plans specific to that hazard area that address water sources, access, egress, and infrastructure to protect. While it is impossible to predict where a wildfire will occur, an understanding of past fire ignitions can help with where to focus resources during fire season. Knowledge of past fires additionally helps to identify which areas are at increased risk of catastrophic wildfire.

To look at historic fire density, areal boundaries were chosen at the sub-watershed level. The sub-watershed unit represents the smallest readily available natural boundaries to map fire density. Natural areal units were chosen over smaller political areal units, because natural units account for differences across a broad geographical landscape. Data points for fires were acquired from both the USDA Forest Service and Oregon Department of Forestry. Fires reported are from 1967 to 2012 for ODF data and 1975-2012 for USFS data. Fires are normalized by area (square mile) within each sub-watershed (about 40 square miles). At 40 square miles in area, the sub-watershed is rather large to map fire density (Map 10), however it illustrates where fire ignition is most frequent in the county.

In contrast to the Wildfire Hazard Assessment, Fire Ignition Density by Sub-Watershed indicates that the majority of fire ignitions occur outside of high hazard areas. Fire ignitions are more likely around the urban interface, as a high percentage of fires within the county are anthropogenic in nature. The most common causes are equipment use, recreationists, transportation, and agriculture burning. Oregon Department of Forestry's fire history database contains information on fires started on private or state lands—these data show that roughly eight percent of fires were caused naturally (lightning) on state or private lands. USFS data does not indicate fire cause.

Assessing fire density by fire size reveals a different pattern. Most large fires that have occurred within Hood River County occur in steep, inaccessible terrain. They are typically caused by lightning (e.g.: Dollar Lake, Gnarl Ridge, Bluegrass Ridge, and Government Flats). These fires tend to cluster in the Mt. Hood Wilderness and Badger Lake Wilderness at elevations between 4,000 and 6,500 feet above sea level. A complete analysis on fire ignition cause and size is difficult, as changing technology over the past five decades and a lack of a coordinated database throughout the region have changed or do not exist.

Map 10: Fire Ignition Density by Sub-Watershed 1965-2012. Fires density is displayed as



HAZARDOUS MATERIALS AND CRITICAL INFRASTRUCTURE IN AND NEAR THE WUI

Many hazardous materials are found within Hood River County. At the smallest scale, private residences contain cleaning supplies, paint, gasoline, and other substances that can pose a health risk in the event of a fire. At a much larger scale, commercial enterprises may have large quantities of hazardous materials that are both toxic and flammable that pose a significant public health and safety threat. Additional hazardous materials are also found throughout county forestlands that are unaccounted for. Illegal dumping of trash—including tires, appliances, and furniture—pose secondary threats to fire personnel. While it is impossible to quantify all of the hazardous materials within Hood River County, some of the largest hazards that exist are mentioned below based on the probability of contact with a wildland fire and the consequence that they pose.

Hazardous materials are reported to the Oregon State Fire Marshal's Office. Hazardous materials that are stored in quantities deemed dangerous must be reported annually. The volume threshold depends largely on the type of material and the hazard that it poses. Hazard classes are divided into the following categories:

- Combustible Materials (e.g.: petroleum hydrocarbons)
- Corrosives (e.g.: ammonia, sodium hydroxide)
- Explosives (e.g.: gun powder)
- Flammables and combustibles liquids (e.g. petroleum distillates)
- Flammable gases (e.g.: propane)
- Miscellaneous hazards (e.g.: calcium nitrate and other agricultural chemicals)
- Non-flammable gases (e.g.: nitrogen)
- Oxidizers (e.g.: oxygen)
- Pesticides (e.g.: paraffinic distilliates)
- Poisonous gases (e.g.: chlorine)
- Poisonous materials (e.g.: paraquat dichloride)
- Reactives (e.g.: urea)

Hazardous materials found within the valley serve a wide variety of purposes, and the hazard that they pose varies greatly depending on the material, the location of the material, and storage. Materials may be solids, gases, or liquids. Reportable quantities of hazardous materials are listed below:

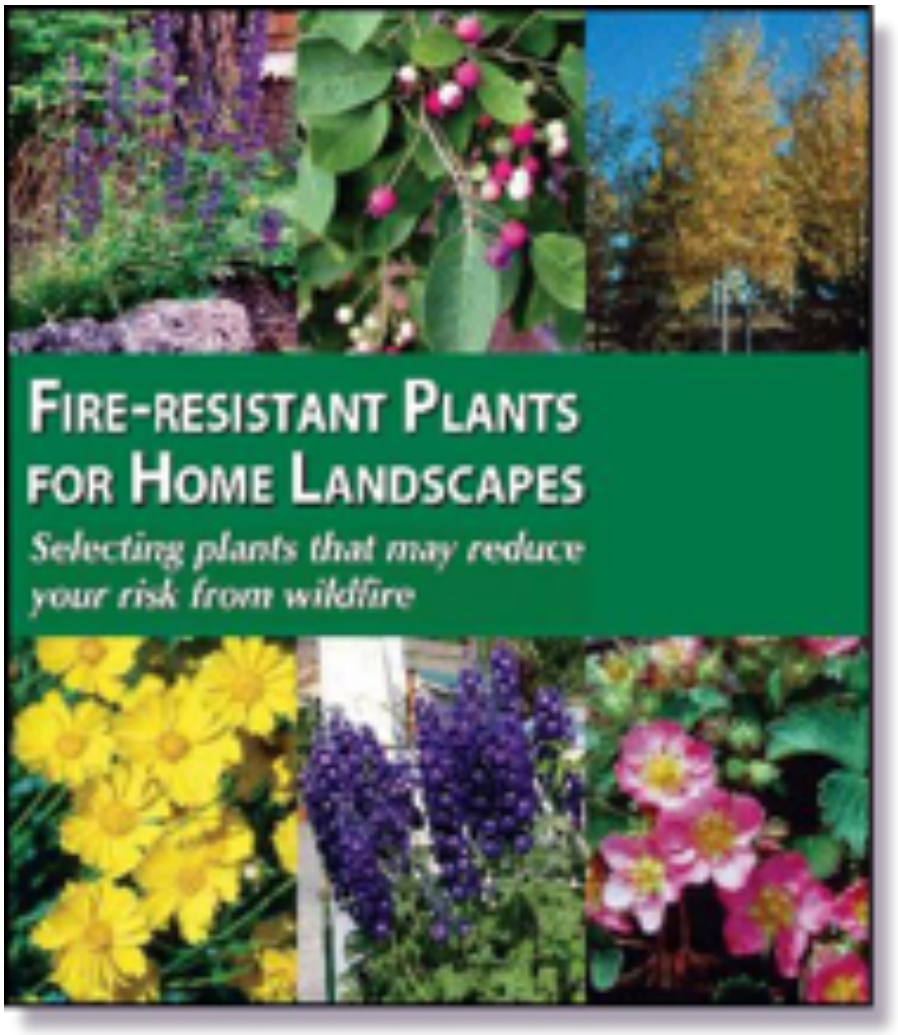
Reportable Quantities of Miscellaneous Hazardous Materials	
Liquids	50 gallons or more
Solids	500 pounds or more
Gases	200 cubic feet or more
Poisons or Explosives	
Liquids	5 gallons or more
Solids	10 pounds or more
Gases	20 cubic feet or more

Areas on the periphery and nearer the WUI or near ignition sources that contain hazardous materials pose the most significant threat to Hood River County. These threats can be broken down into health hazards and explosion hazards. Explosion hazards may come from a variety of sources, including propane storage facilities, distilleries, and even from sewage treatment plants. Myriad other explosion hazards dot the valley, often in the form of propane or gasoline storage tanks that are used for agricultural purposes. Chemicals that pose a significant health risk are found at agricultural chemical depots, public and private swimming pools (e.g.: chlorine), and cold storage facilities.

Perhaps the most significant hazardous materials threat comes in the form of hazardous materials in transit. Hood River County sits along a transportation corridor that is used for transporting goods from states as far as Wyoming and Montana to ports located along the coast. These materials can be transported by truck (Interstate 84), barge (Columbia River), or railroad. In recent months, plans to construct six new coal export facilities in Oregon and Washington threaten to increase rail traffic along the Gorge, specifically to transport coal from Wyoming's Powder River Basin. Proposed plans could see a significant increase in hazardous materials traffic of up to 30 trains every day. This poses an increased fire and health hazard.

Structural fire agencies use data supplied by the OSFM Office to pre-plan in the event of a fire.

Chapter 8
The Active Citizen:
Home Protection and Defensible Space



The Active Citizen: Home Protection and Defensible Space

A proactive citizenry can significantly reduce the risk and hazard of wildfires in the wildland/urban interface. Creating defensible space—the reduction of hazardous fuels around homes and structures—has proven effective to slow and/or reduce the spread of fire towards the structure. Defensible space additionally allows fire personnel to safely and effectively protect a home in the event that a wildfire does strike. Defensible space also limits the possibility of a structural fire jumping from the home to the forest or adjacent building.

Homeowners and residents living with the WUI can take a variety of steps to reduce their risks to wildfire at little or no cost. The following describes some of these actions and provides some graphic examples of defensible space and fire hazards that may exist around a home. As the Oakland Firestorm of 1991 which destroyed almost 3,800 dwellings proved, even relatively small wildfires in urban areas can prove disastrous. The smallest actions taken to mitigate wildfires can have tremendous impacts.

CREATE DEFENSIBLE SPACE

Defensible space is the area immediately surrounding the home or accessory structure that has been altered to reduce the impact of fire hazard. This does not mean that it is necessary to create an area of 'scorched earth' around your home; there are numerous native plants that are resistant to fire that can be planted that need minimal maintenance, make the home aesthetically appealing, and significantly reduce fire spread compared to many typical home landscapes (see Chapter 12). To create an area of defensible space, homeowners can reduce natural and manmade fuels around the home through limbing, thinning, and other treatments to reduce the spread of fire. Treatments are recommended in three zones around the home, each one strengthening your homes ability to withstand a wildfire. Remember, in the wildland/urban interface of Hood River, it is not *if* a wildfire will start, but *when.*

Defensible space around the home doesn't just help the home—it protects firefighters. In the event of wildland fire, firefighters are often dispatched to protect individual homes. This means that firefighters—typically local volunteers—are putting their lives on the line to protect private citizen homes. Creating defensible safe allows firefighters to do their job safely. Using a process called 'structural triage,' firefighters determine if a home is safe to protect in the event of a fire. Defensible space is a critical element in determining a home's defensibility.

Defensible Space Management Zones

The three zones that need to be addressed when creating a defensible space are:

- Zone 1—this is the area nearest the home (15-30 feet away) that requires the most hazardous fuels reduction.
- Zone 2—this is a transitional area of fuels reduction around the home, typically 30-100 feet.
- Zone 3—this area extends more than 100 feet from the home to property boundaries and requires the lightest fuels management.

Figure 16: The three zones of defensible space.

Zone 1:

This zone is the most important of the three defensible space zones. It should extend from 15-30 around the perimeter of the home. On steeper slopes, the width should be increased to reduce preheating and improve your structures survivability. In this zone, most of the flammable vegetation should be removed. This doesn't mean that the area should be barren: there are many fire resistant plants that grow in the Northwest that are appropriate for this zone.

Keep Your Home Clear

Keeping your home free and clear of hazardous fuels is one of the simplest ways to increase the safety of your home. Remember, the wildland/urban interface default definition is any forested vegetation that is within 1.5 miles of a Community at Risk. This threshold is considered a reasonable distance that a firebrand can travel and ignite the roof or deck of a home. Based on this, 70 percent of the Hood River population is at risk of a fire threatening their home, even if they live in the middle of an orchard or residential area. Consider this: the Government Flats Complex of 2013 deposited burnt maple leaves as far away as the Hood River County Library, even though the nearest the fire reached was well over ten miles. Wildfires burning dense timber can create thermal plumes, sending smoke as high as 5,000 meters high. Given the fuel source and weather conditions, these thermal plumes can carry burning debris an extraordinary distance.

Living in the northwest, most homeowners are accustomed to the fall and winter deposits of leaves, pine needles, and cones on home roofs and gutters (Figure 17). Homeowners can reduce the risk of ignition by removing this buildup every spring.

Branches that overhang onto the roof or deck pose another significant threat to your home (Figure 18). While they may provide some degree of shade in the summer months, these overhanging branches can act as wicks, extending the extent that your home can catch fire from. Removing overhanging branches from your home has the added benefit of reducing the amount of debris that falls on your roof in the fall months, as well as reducing the impact of snow and ice to your home during the winter months.

buildup every spring should be a chore that all homeowners complete. Not only does it significantly reduce the threat to your home, but it can reduce the wear on your home's roof, gutters, and flashing. Keeping this in mind, fire prevention shouldn't only be limited to the summer months when wildfires are on the mind, but should be a year round chore.

Figure 17: *Don't* allow a buildup of debris to accumulate on your roof or deck—an ember from a fire miles away can still pose a threat to your home.

Figure 18: *Don't* allow limbs and branches to overhang onto your roof or deck—not only is this bad for your home, but it significantly increases the risk to your home and may classify your home as 'undefensible'.

Plants in Zone 1 should be pruned and maintained to prevent excessive growth. Both live and dead branches should be trimmed up the trunks of trees 5-10 feet. These 'ladder fuels' can quickly take a ground fire to the canopy of the trees, where the fire poses a much more grave threat to your home. Grasses and other ground vegetation should be irrigated and mowed during the growing season to a height of 6 inches or less.

Firewood and other flammable materials should be stored away from your house. Remember, anything that touches your home can act as a wick or point for ignition. Living in rural Oregon often means using propane, pellets, or firewood for winter heating. Keep these fuels at least 30 feet away and on the uphill slope.

Figure 19: Good defensible space around a home. Note the cleared field immediately behind the home.

Zone 2:

This is the transitional area of fuels reduction and is designed to diminish the intensity of wildfire as it approaches the home. The distance of this zone should be between 30-100 feet from the edges of the home (eave, deck, fence). In this zone, many of the same concepts of fuels reduction apply as in Zone 1.

Thinning and pruning are a key fuels management technique here. All diseased, stressed, or dead and dying trees should be removed to reduce the amount of vegetation available to fuel a fire. Removal of these trees works concurrently to reduce fuel loading and allow for a healthy forest. Homes in the WUI are often surrounded by dense forests or woodlands. After decades of fire exclusion and suppression, these woodlands can be out of ecological balance. The comparison of Figure 20 and 21 illustrate an overgrown forest and a managed 'healthy' forest. The latter can significantly reduce the chance of fire ignition and spread.

Shrubs can be left in Zone 2, however care should be taken to break up the continuity between shrubs. Shrubs in patches can lower the intensity of a wildfire when compared to continuous vegetation. The Colorado State Forest Service suggests that clumps of shrubs be at least 2½ times the mature height apart, and the patches of shrubs are no more than 2 times the mature height of a shrub. For example, a 6 foot oceanspray should be in a patch of no more than 12 feet wide, with the nearest cluster at least 15 feet away.

Driveways should be treated like Zone 2. All trees along the driveway should be thinned out at least 30 feet from the center point of your driveway on both sides. A guiding principle is to clear trees so that there is 10 foot spacing between tree crowns—if done properly, you should be able to see plenty of sky through the canopy of the trees.

Figure 20: Dense, overgrown forestland creates an extreme fire hazard.

Figure 21: A properly thinned and pruned forest allows for the healthy growth of native vegetation and lowers the intensity of a wildfire.

Zone 3:

Zone 3 is considered anything that is beyond 100 feet from the edge of the home. This zone should transition gradually from Zone 2. While Zone 3 homes can be found anywhere within the WUI, they tend to be concentrated in the more rural areas where homes are in the interface of the forest. Management techniques here are based on forest management objectives. Below are some considerations for forest management in Zone 3 however consultation of local and state forestry experts to properly manage this zone is suggested.

- A healthy forest is far more likely to survive in the event of a fire. Plants and trees from multiple species, different ages, and sizes are characterisitcs of a healthy forest.

- Ladder fuels are still a persistent problem in Zone 3—remember, these fuels (low branches, shrubs adjacent to branches) allow a fire to spread from the ground to the canopy of the forest.

- Snags—standing dead trees with no foliage—present a significant hazard in the event of a wildfire. These should be kept to two to three per acre to provide habitat for wildlife. Clear any snag that is within 100 feet of a powerlines, roads, or structures.

Figure 22: Ladder fuels on these trees in Zone 3 have been removed—further Zone 3 management may include increased ladder fuels removal and slash burning.

SENATE BILL 360

Passed in 1997, Senate Bill 360 (also known as the Oregon Forestland-Urban Interface Fire Protection Act) enlists homeowners in the task of making their property more resistant to wildfires and increasing the safety of fire personnel that may be dispatched in the event of a wildfire. The law was created in response to escalating wildfires and damage to homes, firefighters placing their lives at risk during conflagrations, and rising costs in fire suppression.

SB360 applies to lands protected by the Oregon Department of Forestry and does not apply to other properties outside of ODF protection. The act is administered by ODF—residents in counties where SB360 has been implemented receive serf-certification and prescriptive information. With the certification package, landowners are given two years to certify that their lands meet the standards decided by the Department of Forestry. Suggestions for prescription are roughly the same as creating defensible space zones. For those who have not received SB360 certification guides, it can be found at: http://www.oregon.gov/odf.

Oregon Forestland-Urban Interface Fire Protection Act

"The act [Senate Bill 360] provides four important steps that lead toward an effective protection system by establishing legislative policy regarding forestland-urban interface fire protection; defining forestland-urban interface areas in Oregon, and establishing a process and system for classifying fire risk in these areas; establishing standards for forestland-urban interface property owners so they can manage or minimize fire hazards and risks; and providing the means for establishing adequate, integrated fire protection systems in forestland-urban interface areas."
~Oregon Department of Forestry

Homeowners that do not comply with SB360 standards and do not complete self-certification can be held liable for up to $100,000 for the costs associated with fires that start on their property. For more information, visit the Oregon Department of Forestry website.

The process to implement SB 360 in Hood River County began as part of the 2004 CWPP. In 2009 the entire county was 'classified' as fire prone and SB 360 was adopted countywide. Self-certification guides were sent to homeowners by ODF and Hood River County with funding from USDA Title III grants. Certification for property owners is repeated in five-year intervals and will be repeated in 2014.

Create an Emergency Communication Plan

For those living in the wildland/urban interface, there is a high probability of a wildfire striking within their lifetime. Defensible space zones and fire-safe building construction can only help to mitigate the impacts of a wildfire—they cannot protect your home completely. Creating an *Emergency Communication Plan* is a final step to wildfire preparation.
A sample emergency communication plan is provided in Appendix B, and should include:

- An evacuation meeting place—this should detail where household members should meet in the event that a Level 2 or 3 evacuation notice is issued. Evacuation meeting places should be in a location where the event of a fire is unlikely.

- The phone, address, and email of an out of area contact—having a third party to contact in the event of a fire allows a point person to know who has evacuated and can inform others of your safety.
- A map or sketch of emergency evacuation routes—in the event of an evacuation, knowing several available evacuation routes is a safe idea. A fire may block one or more routes out of the threatened area; knowing that there are alternate routes can reduce stress levels and improve your safety while leaving.
- The location of an emergency survival kit—leaving quickly and safely depends on quality preparation. Don't leave gathering essential items until the last minute.

Typically evacuation notices are issued in three phases: Level 1 (Ready!), Level 2 (Set!), and Level 3 (Go!). There are no set distances from a fire when an evacuation notice is issued. Based on current and expected weather, fire behavior, fuel sources, and topography, fire managers jointly issue these notices.

Level 1: Be Ready!—At this level there is a fire in the area. Evacuations are voluntary at this time, but those who may need more time to evacuate (elderly or ill) and those with a respiratory illness who may be impacted by heavy smoke should consider leaving. Pets and livestock should be moved out of area, and residents should prepare their things for a full evacuation. Be sure that you have a 72-hour emergency survival kit. It should include:

- A list of the 5P's—People, Pets, Pills, Photos, and Important Papers
- Flashlight and extra batteries
- First aid kit and necessary medications
- Water (1 gallon per person, per day) and non-perishable food items
- Sleeping bag and clothing
- Important documents—insurance policies, identification, wills, and deeds

Level 2: Get Set!—Evacuations at this level are mandatory. Entry to these areas can be denied. Residents should leave as quickly as possible, gathering only the personal belongings which cannot be replaced and can be gathered quickly. Preparation should include:

- Face your car forward and close all windows
- Load emergency kit and essentials into the car
- Wear heavy cotton or wool clothing and have a wet bandana and goggles handy to protect you from sparks, embers, and smoke
- Leave a notice of your evacuation—a white sheet or pillow case at the end of the driveway works well

Level 3: Go!—If you receive as Level 3 evacuation, there is imminent danger in your area and you should leave immediately. Taking time to gather belongings is discouraged and may jeopardize the safety of your family and emergency personnel.

- Closely follow local news stations
- Obey orders of law enforcement and fire personnel
- Drive with your headlights on
- Do not block access to roadways or abandon your vehicle on the roadway

- Drive calmly and obey the standard rules of the road

Chapter 9
Identification and Prioritization of Fuels Management Areas

Identification and Prioritization of Fuels Management Areas

Regular wildfires are a natural process in the Pacific Northwest. While it is impossible to eliminate this risk, communities can plan and prepare for this natural disaster. Planning can occur on many levels, however one planning method that has proven successful is the reduction of hazardous fuels in areas of increased risk of an uncontrollable wildfire. The HRCCWPP identifies areas within fire protection districts that have an increased risk of catastrophic fire ignition as Fuels Management Areas (FMA). Prioritization of FMAs and possible hazardous fuels reductions projects is a key aspect of the Healthy Forest Restoration Act. The following Chapter identifies and details the FMAs located within Hood River County.

Hazardous Fuels Reductions Projects

According to the National Interagency Fire Center, a hazardous fuel is any kind of vegetation—dead or alive—that is flammable. These fuels can be brush, grasses, live or dead trees, and under canopy ground cover. In the Pacific Northwest, hazardous fuels are found in forests or woodlands that have an unnatural buildup of flammable material due to past management strategies and fire exclusion (Fule, et al 2001). Removal of hazardous fuels has become a nationally accepted management standard to help lower the intensity of fires and return forests to a more ecologically balanced state (Kalabokidis and Omi, 1998). This is one of the key principles of the National Fire Plan (2001).

Hazardous Fuels

Hazardous fuel is any kind of vegetation—dead or alive—that is flammable. Reducing hazardous fuels in isolated FMAs has proven to significantly change fire behavior, making a fire easier to control and reducing tree mortality.

Hazardous fuels reduction can come in many different forms, from logging to hand trimming of tree branches in a stand of trees. There is no one size fits all fuels management method for Hood River County, thus forest managers choose what management method is best given each stand's specific context. Different forests have different fuels that come in all shapes and sizes, and what fuels are considered hazardous largely determines the management technique. These fuels include litter, twigs and branches, live fuels, dead fuels, shrubs, grasses, ladder fuels (small trees), and canopy fuels (large trees). Reduction of these fuels typically utilizes one of three modes: prescribed fires, mechanical treatments, and biological controls. Regardless of the method chosen, the goal is to create a fire resilient forest in areas where the forest composition has been significantly altered from the historic condition.

"Successful fire exclusion in the 20th century has created severe fire problems across the West. Not every forest is at risk of uncharacteristically severe wildfire, but drier forests are in need of active management to mitigate fire hazard."
~Agee and Skinner, 2005

Four main principles have been suggested by Agee (2002) and Hessburg and Agee (2003) for fire resistant forests. These principles seek to alter fire behavior by reducing tree torching (the

process of a fire growing from the ground to the crown of the tree), reduce flame length, and decrease tree mortality.

Table 6: Principles of fire resistant forests (as adapted from Agee, 2005; Agee, 2002; and Hessburg and Agee (2003).

Principle	**Effect**	**Advantage**	**Disadvantage**
Reduction of surface fuels	Reduction in potential flame length	Reduced torching and easier fire control	Surface disturbance less with fire than other techniques
Increase height to live crown fuels	Torching requires longer flame length	Reduced torching	An open understory may increase surface wind potential
Decrease crown density	Reduces running crown fire	Reduces crown fire potential	May increase surface wind and increase surface fuel drying
Retain legacy fire resistant trees	Less tree mortality for same fire intensity	Restores historic forest structure	Less economical

Prescribed fire is the deliberate burning of wildland fuels that are in a natural or modified state (Fernandes and Botelho, 2003). This method of fuels reductions is the oldest management technique in the west and dates back to pre-European settlement (Hessburg and Agee, 2003). The Forest Service identifies four types of burns used in the east Cascades. Underburns and maintenance burns are low intensity fires that mimic wildfire to remove duff, litter, needles, and downed woody debris. Pile burning consists of removing piles of woody debris left-over from thinning and limbing—pile fires are contained to single piles. These two techniques are the most common prescribed fire burning methods in Hood River County. Jackpot burning—the burning of highly concentrated downed woody debris that is not piled, and broadcast burning—high intensity burns used to reduce noxious species such as Juniper, are common prescribed fires in drier climates.

Mechanical treatments are used in forests where high concentrations of fuels make prescribed fires difficult to control. Mechanical treatments may include chipping, mowing, crushing, logging, mechanical piling, and mastication. These fuels treatments are often utilized in forests that are significantly deviated from their historical conditions and are used before a prescribed fire can be utilized. These forests tend to be dense, often containing smaller trees and heavy brush. In Hood River County, these forest conditions are dominant in many parts of the Mt. Hood National Forest. Figure 23 illustrates a forest stand slated for mechanical piling as part of the proposed Pollalie-Cooper Fuels Reduction Project.

Figure 23: Discussing mechanical piling in the Mt. Hood National Forest as part of the Polallie-Cooper Fuels Reduction Project.

Biological controls are the use of herbicides or grazing to remove hazardous fuels. Biological controls require site specific environmental assessments and tend to be reserved for invasive or noxious plant species, including blackberry and juniper.

Identification of FMAs in Hood River

Identification and prioritization of FMAs must be collaborative and inclusionary. By this nature, the identification of hazard areas can be highly subjective. Identification of FMAs initially took place on a district level. Fire Chiefs for all districts were approached to locate where in their individual districts they perceived to exist extreme conditions for the ignition of a catastrophic wildfire. Using a printed aerial map containing the fire district and WUI boundaries, fire Chiefs were asked to circle where they believed high risk to exist. Initially, Chiefs were asked to categorize these 4-8 FMAs in order based on their own knowledge of the area; however this was excluded in latter FMA identification as it became overly subjective.

To provide an objective perspective, a ranking system was applied to each hazard area with fire districts. Following the risk assessment schema from Chapter 7, each hazard area that was identified by local fire personnel was rated Low, Moderate, High, or Extreme based on a score from 12-90 points. The criteria and ranking system applied are consistent with other CWPPs and attempt to account for as many factors as possible in determining risk, hazard, and protection capability.

WY' EAST FIRE DISTRICT

Priority 1: Shute Road—High

Location: The Shute Road Hazard Area is located in the Wy'East Community at Risk in T2N-R10E Sec: 29. It extends northeast from the intersection of Highway 281 and the Wy'East RFPD boundary along Highway 281 until Summit Drive, then east on Summit Drive until the intersection of Shute Road; Shute Road south to Gilhouley Road; south until even with the Wy'East district boundary and west to the starting point.

Community at Risk: Odell

Adjacency: County

Biophysical Setting and Fire Regime: The two dominant Fire Regime Groups are III (<= 35 year return interval, low and mixed severity) and V (>200 year return interval, any severity). The BPS consists of Douglas Fir, Grand Fir, and Western Hemlock, with small patches of Devil's Club and White Alder in isolated drainages.

Hazard: The Shute Road HA is located on the eastern flanks of Middle Mountain. West facing slopes range from 25-45 degrees and have extreme direct solar insulation. Gilhouley Road and Shute Road are the primary access points from the east—these connect to a series of logging and county roads. Access from the west is limited. Heavy fuels and steep slopes give Shute Road a hazard score of 27 points.

Risk: Due to the slope and aspect, fuels in this HA tend to be dry, even 1000 hour fuels drying out more rapidly than in other parts of the county. Bordering Highway 281 and the Mt. Hood Scenic Railroad, it is at high risk of fire starts from passing cars or trains. Additionally, logging operations in the area and equipment use put the area at risk to fire brands. Historic causes include lightening, arson, and debris burning. Middle Mountain is used by recreationists (ATVs) further putting it at risk of wildfire. Proximity to a busy highway (OR 281), powerlines, and population give the area a risk score of 32 points.

Protection Capability: Twenty-six homes are located in the 617 acre hazard area, the majority of which are found along the Highway 281 corridor, with the remaining intermixed off of Shute Road. Limited water sources make structural protection a challenge. Much of the land in the area belongs to Hood River County Forestry—any fire jeopardizes public land which is a large source of revenue for the County of Hood River. A fire in the area would also threaten to shut down Highway 281, one of the two north-south roads used to access the upper-lower valley. Protection capability was assessed at 19 points.

Project Description: Work with homeowners to comply with WUI and SB 360 defensible space standards; minimize fire hazards and fuel loading around homes located off of HWY 281 and Shute Road. Limbing, thinning, and hand pile burning as a recommended option. Fuels reduction in logged areas should focus on slash pile removal.

Priority 2: Microwave Ridge—High

Location: Located in the Wy'East Community at Risk (formerly Pine Grove) at roughly T3N-R11E Sec: 31 and T2N-R11E Sec: 6. The Microwave Ridge Fuels Management Area (FMA) is generally location south of the Historic Columbia River Highway to the Old Dalles Road. East of Eastside Road, including Highline, Hidden Oaks, Lichen, and Oak Ridge. The eastern portion follows Microwave Ridge to the Columbia River Highway.

Community at Risk: Pine Grove

Land Adjacency: State, Federal, County

Biophysical Setting and Fire Regime: Fire Regime Group I (<= 35 year return interval, low and mixed severity) and Group III (35-200 year return interval, low and mixed severity) dominate the landscape. BPS in Group I is comprised of a story of Oregon White Oak, with fescue and oatgrass on the canopy floor; BPS in Group III is predominantly Oregon White Oak, Ponderosa Pine, and Doug Fir.

Hazard: The Microwave Ridge area is about 1,198 acres. According to ODF records since the mid 1960's, 22 fires have occurred within this region, burning 1500 acres of land. It is protected in part by Columbia Gorge National Scenic Area, Oregon Department of Forestry, and Wy'East Rural Fire Protection District. South and West facing slopes receive extremely high amounts of solar radiation. MR can be characterized as steep, with slopes upwards of 35 degrees common. Located on the eastern edge of the county, it receives relatively roughly half the precipitation of its western counterparts and is impacted by strong winds, often up to 40 mph. Based on the physical characteristics of the area (including steep slopes, south and west exposure, and dense fuels), Microwave Ridge received a hazard rating of 25 points.

Risk: BPA transmission lines (115kV) intersect this area. Several microwave towers/cell towers are located at the top of the ridge. Both the BFMA lines and communication towers have been known causes of fire vectors in the past. The area is severely impacted by the Mountain Pine Beetle, causing severe rates of Ponderosa Pine mortality. Human use is an additional hazard to the area: recreationalists (mountain bikers and ATV riders) frequently use land just south of Microwave Ridge, increasing the risk of human caused vectors. Based on the proximity to power lines, railroad, interstate highway, population density, and public use, Microwave Ridge was assessed a score of 35 points for risk.

Protection Capability: While high in aspects of hazard, the Microwave Ridge area is additionally high for consequence—steep terrain with few defensible breaks, limited access/egress, and limited availability of water will (and have) made fires here historically difficult to fight. Geographically, there are few areas between Microwave Ridge and the community of Mosier in neighboring Wasco County to effectively defend against a fire pushing to the east. Most recent data indicates that 93 planned or existing homes are found in the area. Two of the newest developments (Oak Ridge and Hidden Oaks) are located in steep terrain, with heavy fuel loading below them, increasing their risk of fire. Several fuels reduction projects have already been carried out along Oak Ridge and the Old Dalles Road. Based on the average response time to the

area of twelve minutes and proximity to fire hydrants, Microwave Ridge was assessed a score of 14 points in terms of protection capability.

Project Description: Fuels reduction treatments should be focused around structures to the north of the BFMA transmission lines and east of Highline Drive to the Columbia River Highway State Trailhead. Treatment should include the removal of ladder fuels, thinning, and hand piling to minimize fuel loading. Projects should be collaborative, working with homeowners to comply with WUI and SB 360 defensible space standards.

Priority 3: Highway 281—High

Location: The HWY 281 HA is found in T2N-R10E Sec: 29. It part of the Wy'East Community at Risk and can roughly be described as the area from the intersection of Summit Drive and HWY 281, southwest along the corridor of HWY 281 to Milepost 9; North and east along the boundary of the Wy'East Fire District until parallel with Summit Drive.

Community at Risk: Odell

Adjacency: County

Biophysical Setting and Fire Regime: FRG III (35-200 year return interval, low and mixed severity) dominate the area, interspersed with FRG V (>200 year return interval, any severity) along the riparian corridor of the West Fork Hood River. The BPS is predominantly Douglas Fir-Western Hemlock mix, with patches of Black Cottonwood, Western Redcedar, and Bigleaf Maple within the riparian area.

Hazard: The HWY 281 HA is located between the West Fork of the Hood River and HWY 281. Slopes are moderate. A western aspect decreases the moisture content of fuels during the summer months. The hazard score is assessed at 29 points.
Risk: Access is limited to several private driveways off of HWY 281. Past fire vectors in the area have been caused by public utilities (powerlines). Due to limited ingress and egress, a fire of any size in this HA could rapidly spread through the densely vegetated riparian area. Risk is assessed at 16 points.

Protection Capability: Three homes are found within the HWY 281 HA and seven additional home are directly adjacent on the agricultural lands to the east. A fire would put all seven homes at risk. Structural protection of the homes within the HA is limited due to access and one way egress. A fire in the HA would threaten to interrupt traffic on HWY 281, a major thoroughfare between the north end of the valley and the south. Powerlines found in the area would be subject to damage if a fire were to occur. Protection capability is assessed at 24 points.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

Priority 4: Endow Road—Moderate

Location: The Endow Road Hazard Area is located in T1N-R10E Sec: 3. The area is formed from a 1/4 mile buffer to the south of Endow Road and a 1/8 mile buffer to the north of Endow Road.

Community at Risk: Odell

Adjacency: County

Biophysical Setting and Fire Regime: Fire Regime Group is dominated by FRG III (35-200 year return interval, low and mixed severity), interspersed with patches of FRG I (<= 35 year return interval, low and mixed severity). Dominant BPS species include Doug and Grand Fir, with patches of Ponderosa Pine.

Hazard: The Endow Road HA is located to the west flank of Highway 35, with a northwest aspect. Several steep ravines are found to the south of the four residences in the area. Access is off of Highway 35. Endow Road is steep and narrow. Endow road has steep slopes with heavy fuels, giving the area a hazard score of 33 points.

Risk: County forestry land is adjacent to the south. The steep nature of the area creates a chimney effect; fires in this area would spread rapidly. Jackstrawed trees from the 2012 ice storm are a fuel source that would increase the chances of an uncontrollable fire. Risk was assessed at 6 points due to proximity to Highway 35.

Protection Capability: Four residences are found within the HA. A fire in the Endow Road area would spread rapidly and threaten to shut-down Highway 35, one of two major routes from the northern Hood River Valley to the southern Hood River Valley. Dense vegetation on the east side of HWY 35 could easily ignite should a fire start on the west side of HWY 35. Loss of timber revenue is probable if a wildfire were to burn into County lands. Average response time to Endow Road was low (six minutes) and hydrant access limited; the area received a protection capability score of 21 points.

Project Description: Projects in the 86 acre Endow Road HA should focus on working with homeowners to comply with WUI and SB 360 defensible space standards. Removal of fuels (jackstrawed trees) is a priority around homes and should include biomass removal and hand pile burning. Trees removed could be used to supply firewood for low income residents of the area.

Priority 5: Fir Mountain Loop—Moderate

Location: Fir Mountain Loop is located in the Wy'East Community at Risk in T2N-R11E Sec: 30. It is defined by a ¼ mile buffer around Fire Mountain Loop Road.

Community at Risk: Pine Grove

Land Adjacency: County

Biophysical Setting and Fire Regime: FRG I (<= 35 return interval, low and mixed severity) and FRG III (35-200 return interval, low and mixed severity) regimes dominate the Fir Mountain Loop ecoregion. The BPS is dominated by a mix of Douglas and Grand Fir, interspersed with Ponderosa Pine.

Hazard: The Fir Mountain Loop HA is located on the eastern portion of Hood River County. It is characterized by steep, densely vegetated terrain. Vegetation in the drainages below the hazard area are vegetated exceptionally dense. Fir Mountain Road is the only access to the loop, which is narrow and steep itself. It is protected by Wy'East Rural Fire Protection District. The hazard score for Fir Mountain Loop was 33 points.

Risk: Fire danger in the Fir Mountain Loop area is high as a result of dense vegetation and steep slopes. Historical records show few fires nearby, however an increase in human activity in the area puts the area at a high risk for fire starts from debris burning or recreationalists. During the ice storm in the winter of 2012, the area suffered high tree loss, resulting in a jackstraw of trees in the forests nearby. Downed trees provide heavy fuel loading and put the remaining trees at risk to infestation by the California fivespined pine ips. Overall risk score is 5 points.

Protection Capability: Sixteen homes are located within the Fir Mountain Loop area, and can be characterized as a suburban population density. The high number of residences puts the consequence of fire in this area as high. Fire suppression and structural protection is difficult due to limited access and egress, as well as minimal water sources. One fire hydrant is 1/3 mile below the loop, further making structural protection and suppression difficult. Protection capability is 21 points.

Project Description: Fuels reduction treatments should focus on creating defensible space around homes and clearing jackstrawed trees and thick brush to the west of the homes. Limbing and thinning combined with hand pile burning are options well suited for the area. Two fuels reduction projects by the Oregon Department of Forestry have already been completed in this area. Treatments will minimize fire hazard and fuel loading and assist in returning to its historic condition class. Efforts should be collaborative with homeowners, helping residents to comply with WUI and SB 360 defensible space standards.

Priority 5: Maggie Lane—Moderate

Location: Located in the Wy'East Community at Risk in T2N-R11E Sec: 20. Maggie Lane can be roughly characterized to be east of Wells Drive to Elder road. The north boundary is 1/3 mile north of Maggie Lane, and south until parallel with the intersection of Fir Mountain Road and Wells Drive.

Community at Risk: Pine Grove

Land Adjacency: County

Biophysical Settings and Fire Regime: Maggie Lane is comprised of two fire regime groups. FRG I (<=35 year return interval, low and mixed severity) and FRG III (35-200 year return interval, low and mixed severity). The biophysical setting of Maggie Lane is a mix of fir

(douglas and grand) on northern slopes, and Oregon White Oak and Ponderosa Pine on the drier south facing slopes.

Hazard: Maggie Lane covers roughly 477 acres on the western slopes of Hood River Mountain. The area can be characterized as steep, with slopes between 30 and 45 degrees. Southwest aspects receive high solar isolation. Combined with high winds, fuels tend to dry out rapidly in the early summer months. Access to the Maggie Lane area is minimal. Maggie Lane is the only access on the western portion of the area, which is a steep dead end. Eastern access is off of Elder Road, which can only be accessed from the community of Mosier or off of the Old Dalles Road. Response time to the eastern portion of the Maggie Lane HA is over 30 minutes. Protection is provided by Wy'East Rural Fire Protection District on the western portion, and Oregon Department of Forestry on the eastern section. Severe pine beetle kill and thick underbrush increase the risk of fire intensity. Steep slopes and south and west aspects give the Maggie Lane FMA a hazard score of 26 points.

Risk: The eastern area of Maggie Lane is heavily used by recreationists, including mountain bikers, ATV riders, and hunters (the known cause of two fire starts in or nearby). SDS Lumber owns 6,000 acres on the eastern border, where equipment use and slash piles have the potential to increase fire risk. The risk score for Maggie Lane was 7 points.

Protection Capability: Seven houses are found in the Maggie Lane hazard area, with an additional house planned in the lower portion. Even with adequate defensible space, these homes would be difficult to protect in the event of a fire: steep, narrow roads with no egress make access with structural engines difficult. Access to water is also limited (one hydrant on Wells Drive). Protection capability was assessed a score of 21 points.

Project Description: Fuels reduction projects should be focused on the homes off of Maggie Lane and the homes at the top of the ridge off of Elder Road. Fuels reduction treatments should include limbing and thinning to reduce fuel loading and minimize fire hazards. Hand pile burning is recommended due to the steep terrain. Projects should be collaborative with homeowners to comply with WUI and SB 360 defensible space standards. Thinning would encourage the return of Ponderosa Pine and Oregon White Oak tree species, fire resistant species that have been overcrowded by the dominant Douglas Fir.

Priority 6: Riverside Drive—Low

Location: The Riverside Drive HA is located in the Wy'East Community at Risk (formerly Odell) at T2N-R10E Sec: 15 and T2N-R10E Sec: 21. Its extent runs from the southwestern section of Riverside Drive, north and east to the northern boundary of Tucker Park; north from Highway 281 to the Hood River.

Community at Risk: Odell

Land Adjacency: County

Biophysical Setting and Fire Regime: Fire Regime Group I (<= 35 year return interval, low and mixed severity) dominates the area, with patches of FRG V (> 200 year return, any severity). The BPS is predominantly Douglas Fir-Western Hemlock mix, with patches of Black Cottonwood, Western Redcedar, and Bigleaf Maple within the riparian area.

Hazard: The Riverside Drive HA is 89 acres between Highway 281 and the West Fork of the Hood River. It is protected by Wy'East Rural Fire Protection District. It is adjacent to Parkdale RFPD to the south and West Side RFPD to the west. The majority of the area is low angle with high solar insulation, causing fuels to dry rapidly. Access is found off of Highway 281 in two places: Riverside Drive, which is a dead end road to going north to the river; a county road that is used to access camping and recreation in Tucker Park. Hazard was assessed at 13 points.

Risk: The Riverside Drive HA is considered a priority for three main reasons. It includes Tucker Park (a Hood River County Park) that is used heavily by recreationists for camping and river access (90 campsites). High human traffic increases the risk of a fire vector. The dry fuels along the river are exceptionally prone to ignition. Homes along the river are difficult to access with minimal ingress and egress. Risk was assessed at 12 points.

Protection Capability: Thirteen residences are found within the Riverside HA. While two new fire hydrants were recently installed near the river, structural protection of homes would be difficult without putting fire personnel at risk. A fire in this area would additionally threaten to shut down Highway 281, a high use state highway that is one of two roads used between Hood River and Parkdale. A fire in Tucker Park would limit recreation areas in the area, having negative impacts on County Parks and Recreation budgets, as well as those industries associated with outdoor recreation. Protection capability was assessed a score of 24 points.

Project Description: Projects in the area should focus on two main areas: the homes off of Riverside Drive near the Hood River, and the land surrounding Tucker Park. Treatments near Riverside Drive should prioritize fire breaks, defensible space, and homeowner awareness. Removal of ladder fuels is a recommended treatment option. Near Tucker Park, removal of ladder fuels is suggested, as well as public outreach and education.

PARKDALE FIRE DISTRICT

Priority 1: Wild Dogwood—High

Location: Wild Dogwood is located in the Parkdale Community at Risk in T1N-R10E, Sections 14 and 22. Highway 35 and Miller Road form the western edge of the area and Wild Dogwood Road forms the northern edge. Eastern and southern edges are formed by the Parkdale Fire District.

Community at Risk: Parkdale

Land Adjacency: State, County

Biophysical Setting and Fire Regime: The FRG for Wild Dogwood is a majority Group III (35-200 year fire return interval, low and mixed severity) with small patches of FRG I (<=35 year

return interval, low and mixed severity). Consistent with the East Cascades, the BPS is dominated by Doug Fir-Grand Fir East Cascades Mesic Montane Conifer forests, with North Pacific Maritime Dry-Mesic Douglas Fir and Western Hemlock in the lower elevations. Mosaics of Ponderosa Pine and Oregon White Oak are also found in Wild Dogwood.

Hazard: The Wild Dogwood FMA is 582 acres to the east of Highway 35 on the forested slopes off of Pine Mont Road. The area received a hazard rating of 32 points out of 40. The score assessed factored in fuels, aspect, slope, and elevation. Fuels off of Wild Dogwood are considered mature timber with patches of light and medium slash throughout. Northern aspects in the area tend to have denser fuels due to higher moisture contents and lower temperatures, yielding longer fuel curing times. Slopes are considered low to moderate (mostly <25°).

Risk: Wild Dogwood received a risk score of 26 points of 35. Historic fire occurrence is high, with 11 fires reported according to ODF data. Risk factors include a high number of houses in the area (42) and its proximity to Highway 35. Additional fire risks that were not included in the assessment include logging operations and high traffic from motorists travelling through the area to nearby recreation areas.

Protection Capability: Protection capability was assessed at 16 out of 24 points. Structural fire protection for the 42 homes that fall within the boundaries of Wild Dogwood is provided by Parkdale RFPD. Hydrant access is provided by 1 hydrant in the zone, and 2 within 800 feet. Response time to the Wild Dogwood is between 5 and 10 minutes.

Project Description:

Priority 2: Highway 281 South—High

Location: Highway 281 South is located in the Parkdale Community at Risk (formerly Dee). The FMA stretches from T1N-R10E, Section 18, north to T1NR10E, Section 31 and is roughly a ¼ mile on both sides of Highway 281, including parts of the Hood River.

Community at Risk: Dee

Land Adjacency: Federal, State, County

Biophysical Setting and Fire Regime: Highway 281 South is uncharacteristically classified as FRG V throughout (>200 year return interval, any severity). Consistent with the low lying regions of Mt. Hood, the BPS is dominated by, Doug Fir-Western Hemlock Dry Mesic Forests, with spots of Red Alder, Bigleaf and Vine Maple Woodlands in the riparian corridor near the river.

Hazard: The Highway 281 FMA consists of 754 acres along the Hood River. Slopes are low with a dominant western aspect. Fuels consist of timber (FM 10) with areas of intermediate brush (FM 6). Jackstrawed trees as a result of ice damage from the 2011 ice storm put this FMA at a higher hazard than classified solely from LANDFIRE data. The area received a hazard score of 26 points.

Risk: Highway 281 South received a risk score of 32 points of 35. Historic fire occurrence is high, with 13 fires reported according to ODF data. Risk factors include adjacency to Highway 281, powerlines, and railroad. There are a moderate number of houses in the area (36). Additional risk factors that were not included in the assessment include use by recreationists.

Protection Capability: Protection capability was assessed at 11 out of 24 points. Structural fire protection for the 36 homes that fall within the boundaries is provided by Parkdale RFPD. Hydrant access is provided by 9 hydrants in the zone. Response time is moderate, at 5-10 minutes.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

Priority 3: Powerlines to Aubert—High

Location: Powerlines to Aubert is located in the Parkdale Community at Risk in T1N-R10E, Sections 27 and 34. The southern edge is formed by the Big Eddy-Chemawa BFMA transmission lines. From the powerlines, it runs north along the edge of Parkdale Fire District until perpendicular to Miller Road, then south along the forest-orchard interface until the starting point.

Community at Risk: Parkdale

Land Adjacency: Federal, County

Biophysical Setting and Fire Regime: The FRG for Aubert is a majority Group III (35-200 year fire return interval, low and mixed severity) with slight interspersals of FRG I (<= 35 year return interval, low and mixed severity). Consistent with the East Cascades, the BPS is dominated by Doug Fir-Hemlock North Pacific Maritime Dry Mesic Forests and Doug Fir-Grand Fir East Cascades Mesic Montane Confier Forests.

Hazard: This FMA consists of 606 acres on the lower west slopes of Bald Butte. The area has been assessed a hazard rating of 34 out of 40. Slopes are moderate to steep, especially in the hard to reach upper stretches of the FMA (20 percent >25°<40°). The Anderson Fuel Model is dominated by mature timber (FM 10), although patches of trees have been removed through logging, low brush (FM 5). Western aspects decrease fuel moisture content early in the season, increase the risk of ignition.

Risk: Powerlines-Aubert received a risk score of 16 points of 35. Historic fire occurrence is moderate, with 4 fires reported according to ODF data. Risk factors include a moderate number of houses in the area (20), proximity to high-voltage power lines, and Highway 35. Additional fire risks that were not included in the assessment recreationists, agricultural use, and lightening.
Protection Capability: Protection capability was assessed at 18 out of 24 points. Structural fire protection for the 20 homes that fall within the boundaries of Aubert is provided by Parkdale

RFPD. Hydrant access is low, with three hydrants within ½ mile. Response time is under 6 minutes.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

Priority 4: Baldwin Creek—Hillcrest—Moderate

Location: The Baldwin Creek—Hillcrest hazard area is located in the Parkdale Community At Risk in T1N-R10E, Sections 15 and 16. The southern boundary follows Baldwin Creek Road east until Highway 35, then north; from Highway 35 north to the end of Hillcrest Road. Western and northern boundaries are formed by the Parkdale Fire District.

Community at Risk: Parkdale

Land Adjacency: State, County

Biophysical Setting and Fire Regime: Two main BPS are found in the Baldwin Creek FMA: North Pacific Maritime Dry-Mesic Doug Fir-Western Hemlock (eastern portion), and East Cascades Mesic Montane Mixed Conifer Forest (western portion). The FRG for Baldwin Creek is a majority Group III (35-200 year fire return interval, low and mixed severity), with FRG V (>200 year return interval, any severity) and FRG I (<=35 year return interval, low and mixed severity) found in small patches.

Hazard: The Baldwin Creek FMA is 988 acres on the south and east sides of Middle Mountain (Gilhouley). The area received a hazard rating of 28 points out of 40. The score assessed factored in fuels, aspect, slope, and elevation. Fuels off of Baldwin Creek and Hillcrest consists of timber (FM 10) and light and medium logging slash or red slash (FMs 11/12). Fuels here experience early drying in the summer months, increasing the risk of ignition. Slopes are moderate to steep (20-35°), with higher slopes in the urban interface to the south.
Risk: Baldwin Creek received a risk score of 26 points of 35. Historic fire occurrence is high, with 11 fires reported according to ODF data. Risk factors include a high number of houses in the area (122) and its proximity to Highway 35. Additional fire risks that were not included in the assessment include logging operations and recreational use by motorists.

Protection Capability: Structural fire protection for the 122 homes that fall within the boundaries of the Baldwin Creek is provided by Parkdale RFPD. Hydrant access is provided by 18 hydrants. Response time to the Baldwin Creek Area is between 5 and 10 minutes. Protection capability was assessed at 11 out of 24 points.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

Priority 5: Smullen Road—Moderate

Location: Smullen Road is located in the Parkdale Community at Risk in T1S-R10E, Section 4. The western edge is defined by Smullern Road and the eastern edge is defined by Parkdale RFPD. Southern and northern edges are roughly defined by the section lines of T1S-R10E.

Community at Risk: Parkdale

Land Adjacency: Federal, State, County

Biophysical Setting and Fire Regime: The FRG for Smullen Road is a majority Group III (35-200 year fire return interval, low and mixed severity). Consistent with the East Cascades, the BPS is dominated by North Pacific Maritime Dry-Mesic Douglas Fir and Western Hemlock.

Hazard: The FMA consists of 528 acres on the western slopes off of Oak Ridge. Slopes are moderate to steep in the upper reaches. During the summer months, the area receives s a high amount of solar radiation, decreasing the time that it takes fuels to dry out. The FMA received a hazard score of 32 out of 40. Patches of agriculture are surrounded by mature/overmature timber and understory (FM 10) in the lower elevations and mature timber is found in higher elevations.

Risk: Smullen Road received a risk score of 10 points of 35. Historic fire occurrence is low, with 2 wildfire ignitions reported according to ODF data. Housing density is low (5 housing units in the area) and it is adjacent to Highway 35. Other risk factors include agriculturalists.

Protection Capability: Protection capability was assessed at 21 out of 24 points. Structural fire protection for the 5 homes that fall within the boundaries is provided by Parkdale RFPD. Hydrant access is low and provided by 3 hydrants between ½ and ¾ mile from the area. Response time to the Smullen is between 5 and 10 minutes.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

Priority 6: Laurence Lake—Moderate

Location: The Laurence Lake FMA is located in the Parkdale Community at Risk in Section 18 of T1S-10E and Section 24 of T1S-9E. It follows Laurence Lake Road south and west from the intersection of Clear Creek Road for approximately 1 mile, then north along fire roads through County forest land until agricultural land south of MacIntosh Road. The eastern edge is defined by the interface between agriculture and forest lands.

Community at Risk: Parkdale

Land Adjacency: Federal and County

Biophysical Setting and Fire Regime: The FRG for Laurence Lake is a entirely Group III (35-200 year fire return interval, low and mixed severity), which is consistent with the East Cascades. The BPS is dominated by North Pacific Maritime Dry-Mesic Douglas Fir and Western Hemlock , with a patchwork of Doug Fir-Grand Fir East Cascades Mesic Montane Conifer forests in middle elevations, and White Alder and Devils Club along the riparian corridor.

Hazard: The FMA consists of 519 acres on the east facing, low angle slopes between Laurence Lake and Parkdale. Fuels are dense, predominantly consisting of mature timber (FM 10), with large patches of medium logging slash (FM 12) and intermediate brush (FM 6) and closed timber litter in riparian areas (FM 8). Laurence Lake received a hazard score of 30 points, largely due to heavy fuels and dense tree spacing in re-forested lands.

Risk: Laurence Lake received a risk score of 10 points of 35. Historic fire occurrence is low to moderate, with 3 fires reported according to ODF data. Risk factors that were included are a moderate number of houses in the area (21). Additional fire risks that were not included in the assessment include use by motorists and lightening.

Protection Capability: Protection capability was assessed at 19 out of 24 points. Structural fire protection for the 21 homes that fall within the boundaries is provided by Parkdale RFPD. Hydrant access is provided by 1 hydrant in the zone, and 2 within 800 feet. Response time is between 5 and 10 minutes.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

Priority 7: Lost Lake Road—Moderate

Location: The Lost Lake Road FMA is located in the Parkdale (formerly Dee) Community at Risk in Sections 13 and 23 of T1N-R9E. Alder road defines the western edge, Lost Lake Road and Carson Hill Road define the northern edge, and the forest road off of the intersection of Collins and Alder define the southern boundary.

Community at Risk: Dee

Land Adjacency: Federal, County

Biophysical Setting and Fire Regime: The FRG for Lost Lake Road is a majority Group III (35-200 year fire return interval, low and mixed severity) interspersed with FRG V (>200 year return interval, any severity). Consistent with the low lying regions of Mt. Hood, the BPS is dominated by, Doug Fir-Western Hemlock Dry Mesic Forests, with spots of Black Cottonwood, Bigleaf Maple, and Western Redcedar Woodlands in the riparian areas.

Hazard: The Lost Lake Road FMA consists of 358 acres eastern slopes of the Mt. Hood Forest. Slopes low (<25°) in most of the hazard zone. The FMA received a hazard score of 25 out of 40.

Patches of agriculture are surrounded by mature/overmature timber and understory (FM 10), with intermediate brush (FM 6) and cured slash in areas that have been logged in recent years.

Risk: Lost Lake received a risk score of 6 points of 35. Historic fire occurrence low; no fires were reported according to ODF data. Risk factors include a moderate number of houses in the area (22). Other risk factors include lightening, which is prevalent in the area.

Protection Capability: Protection capability was assessed at 16 out of 24 points. Structural fire protection for the 22 homes that fall within the boundaries is provided by Parkdale RFPD. Hydrant access is provided by 1 hydrant in the zone, and 2 within 800 feet. Response time is between 5 and 15 minutes.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

Priority 8: Berry Drive—Low

Location: The Berry Drive FMA is located in the Parkdale (formerly Dee) Community at Risk in Section 24 of T1N-R9E. The eastern border is defined by Berry Drive and the western edge is defined by the Hood River. The northern and southern edges are defined by the section lines of Section 24.

Community at Risk: Dee

Land Adjacency: County

Biophysical Setting and Fire Regime: The FRG for Lost Lake Road is a majority Group III (35-200 year fire return interval, low and mixed severity) interspersed with FRG V (>200 year return interval, any severity). Consistent with the low lying regions of Mt. Hood, the BPS is dominated by, Doug Fir-Western Hemlock Dry Mesic Forests, with spots of Black Cottonwood, Bigleaf Maple, and Western Redcedar Woodlands in the riparian areas.

Hazard: The Berry Drive FMA consists of 143 acres of low slopes to the east of the Hood River. The most recent LANDFIRE (2008) data indicate that the area is predominantly timber and closed timber litter (FM 10 and 8), however recent logging has changed the fuel loading to fit with FM 11 (light logging slash). In the summer months, the area receives s a high amount of solar radiation, decreasing fuel curing times. The FMA received a hazard score of 19 out of 40.
Risk: Berry Drive received a risk score of 3 points of 35. Historic fire occurrence low; no fires were reported according to ODF data. Risk factors include a low number of houses in the area (6).

Protection Capability: Protection capability was assessed at 19 out of 24 points. Structural fire protection for the 6 homes that fall within the boundaries is provided by Parkdale RFPD. Hydrant access is provided by 1 hydrant. Average response time is between around five minutes.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

WEST SIDE FIRE DISTRICT

Priority 1: Mitchell Point—High

Location: The Mitchell Point Fuels Management Area is in the West Side Community at Risk. Lands within the Mitchell Point Fuels Management Area are located within T3N-R10E, Sections 31 and 32. Interstate 84 is identified as the northern boundary, and BFMA Hood River Mainline to the south; it begins (west) at the entrance for the Mitchell Point Overlook off of I-84 and ends ¼ mile to the east of the BFMA/BLM access road adjacent to Post Canyon.

Community at Risk: West Side

Land Adjacency: Federal (1.25 mile adjacency), State, County

Biophysical Setting and Fire Regime: Doug Fir and Grand Fir dominate the BPS, especially on the steeper slopes, with Oregon White Oak and fescue on the lower more exposed slopes. The Fire Regime Group is consistent with low elevation Columbia River Gorge Fire Regimes: FRG III dominates (35-200 year fire return interval, low and mixed severity) interspersed with patches of FRG 1 (<= 35 year return interval, low and mixed severity).

Hazard: The Mitchell Point FMA encompasses an area of 352 acres. According to a combination of ODF and USFS data, 13 fires have been reported within the FMA since the 1960's, reportedly burning under 10 total acres (although other fires are possible but were not reported). Slopes near Mitchell Point are steep (upwards of 35° is common). The majority of fuels in the area is classified as mature or overmature timber and understory (Fuel Model 10) and pose a high risk of crowing in the event of a fire, especially with the high winds that are common. Significant icefall from the 2012 ice-storm is present on the forest floor. Patches of young brush can be found near Mitchell point as well. Considering fuels, aspect, elevation, and slope, the Mitchell Point FMA received 32 points out of 40 for hazard.

Risk: Risk in the Mitchell Point FMA is high, receiving 29 out of 35 points. Mitchell Point has a history fire occurrence in the area. Fires and fire potential are the result of a variety of factors: 115 volt BFMA transmission lines intersect the area to the south; a high volume of traffic travels through the corridor on Interstate 84 (an estimated 21,300 AADT); the viewpoint at Mitchell Point has become a popular area for recreationists. Population density in the area is low (<10 dwellings per 40 acres).

Protection Capability: Fire protection falls within the jurisdictions of ODF (to the west) and West Side Fire (to the east), as well as the CRGNSA, although the 8 homes found in the Mitchell Point FMA are under structural protection from West Side. Fire protection is difficult due to high

response times and limited water sources directly available. Access is limited from the freeway, which requires moving apparatus through a narrow tunnel underneath the freeway. Response times to the center of the zone are typically >11 minutes. The nearest hydrant access is roughly 1 mile away, and access is further complicated by the divided highway (drive time to and from the nearest hydrant for tender operations is > 13 minutes. The area received a total fire protection capability rating of 24 out of 24 points.

Project Description: Fuels reductions projects should be focused around the structures in the area, especially those off of steep driveways in the densely forested timber zone. Removing of ladder fuels and downed/dead fuels on the forest floor would significantly reduce the risk to houses nearby. Other fuels reduction measures should focus on clearing light fuels near the highly trafficked Mitchell Point overlook. Fuels reduction projects should be collaborative with homeowners, and help compliance with SB 360 guidelines.

Priority 2: Indian Creek—High

Location: Indian Creek is located within both the West Side and Hood River Community at Risk in T3N-R10E, Section 36. The eastern boundary follows the Hood River north from the rough intersection of Eliot Drive until the Indian Creek Trail off of May and 2nd Street. From the Indian Creek Trail, it turns west, following the Hood River Fire Department boundary and into the Indian Creek Drainage between Marian Street and Betty Lou Avenue, then south along the Hood River Fire Department Boundary until its starting point.

Community at Risk: West Side

Land Adjacency: City

Biophysical Setting and Fire Regime: Doug Fir and Western Hemlock dominate the BPS, especially on the steeper slopes away from the riparian area, with White Alder and Devil's Club in the moister area near the river and creek. The Fire Regime Group is consistent with low elevation Columbia River Gorge Fire and Western Hood River Fire Regimes: FRG III dominates (35-200 year fire return interval, low and mixed severity) predominates FRG coverage.

Hazard: The FMA consists of 94 acres in the Indian Creek Drainage to the Hood River. Largely based on its steep slope (over 50 percent >35°) and its dense fuels, the FMA received a hazard score of 34 out of 40. The drainage itself can be considered a mature/overmature timber and understory (FM 10) according to LANDFIRE data. Grass with timber/shrub overstory (FM 2) is also found here, with large amounts of Scotch Broom and Himilayan Blackberry. Dense timber abutting light fuels and Scotch Broom give the fuels hazard of the area a score of 30 out of 30.

Risk: Risk in and near the Indian Creek FMA is high, receiving 35 out of 35 points. Indian Creek has a history fire occurrence in the area, receiving 9 fire starts according to ODF records. Fires and fire potential are the result of a variety of factors: Power transmission lines intersect the area to the south; the Indian Creek Trail receives a high volume of traffic, both by recreationists and the homeless, who often camp near the Hood River at the bottom of the drainage. The housing density of the Indian Creek FMA is considered dense, with greater than 25 dwellings per 40 acres in and surrounding the FMA.

Protection Capability: Fire protection falls within the jurisdictions of Hood River Fire and EMS and West Side RFPD. While only 3 homes are found within the Fuels Management Area, it is surrounded by high population density on the north side (May Street) and the south side (Sieverkrop Development). In terms of response time and hydrant availability, the Indian Creek FMA is highly defensible in the result of a fire. Response time is < 5 minutes, and there are many hydrants in the area to aid in suppression. As a result the Indian Creek FMA received a low score of 8 of 24 points. While fire protection capability is high in this area, homes within or immediately adjacent to the FMA are at a high risk of loss or damage due to the nature of heavy fuels in the area.

Project Description: Work with homeowners to comply with WUI and SB 360 defensible space standards; minimize fire hazards and fuel loading around homes located to the north of Betty Lou Avenue, which should include the removal of Fire Model 6 shrubs near homes (blackberries and scotch broom) and limbing low hanging branches within 100 yards of homes. Fuels reduction in the interior of the zone should include limbing, thinning, and chipping. Biomass could be utilized by local residents for landscaping and garden mulch. Public education should accompany fuels reduction projects.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

Priority 2: Riordan Hill—High

Location: The Riordan Hill FMA is located in T2N-R10E, Section 5 in the West Side Community at Risk. The area can roughly be described as a 1/3 mile buffer on either side of Riordan Hill Road. It encompasses portions of Post Canyon Drive and the Bonneville—Hood River Power Transmission Line.

Community at Risk: West Side

Land Adjacency: Federal, State, County

Biophysical Setting and Fire Regime: FRG in the Riordan Hill FMA is split equally between FRG V (>200 return interval, any severity) and FRG III (35-200 year fire return interval, low and mixed severity), with small patches of FRG I (<= 35 year return interval, low and mixed severity). Areas with FRG III and V are found in the damp riparian areas of Post Canyon, consisting of a Western Hemlock-Douglas Fir BPS or Black Cottonwood-Bigleaf Maple-Western Redcedar BPS. Patches of FRG I consist of Ponderosa Pine, Fescue, and Oregon White Oak.

Hazard: The FMA consists of 190 acres in the Indian on the south and east slopes of Riordan Hill. Largely based on its steep slope (over 20 percent >35°), aspect, and its dense fuels, the FMA received a hazard score of 34 out of 40. It can be considered to be a part of FM 10

(mature/overmature timber and understory) according to LANDFIRE data. Intermediate Brush (FM 6) is found in areas where clear-cutting has removed the canopy in several places. Patches of agricultural land nearby create possible fire breaks if a fire were to begin on the western edge of this FMA.

Risk: Risk in and near the Riordan Hill FMA is considered low, receiving 9 out of 35 points. Riordan has a low fire occurrence in the area, receiving 1 reported fire start according to ODF records. Potential fire vectors are low on Riordan Hill—powerlines intersect the northern portion of the FMA and a number of recreationists use the area for ATVs and Mountain Bikes, however these numbers are low in the summer months during regulated closures. The housing density of the FMA is considered scattered, with between 1 and 10 dwellings per 40 acres.

Protection Capability: Structural fire protection for the four homes within the Riordan Hill FMA is provided by West Side RFPD. Due to a > 11 minute transit time to homes within the zone and the lack of fire hydrants nearby, the Riordan FMA was assessed a protection capability of 24 of 24 points. Protection is further hampered by one way access and steep or narrow driveways.

Project Description: Work with homeowners to comply with WUI and SB 360 defensible space standards; minimize fire hazards and fuel loading around homes located in the forested areas off of Riordan Hill and Post Canyon Drive. Reductions projects should include the removal of ladder fuels and limbing low hanging branches within 100 yards of homes. Other fuels reduction projects should focus on creating fire breaks to the west.

Priority 3: Ruthton Point—High

Location: The Ruthton Fuels Management Area is part of the West Side Community at Risk and is located in T3N-R10E, Section 28. It and comprises the Ruthton Point, which juts north of Interstate 84 into the Columbia River.

Community at Risk: West Side

Land Adjacency: State

Biophysical Setting and Fire Regime: The BPS of Ruthton Point consists predominantly of Doug Fir-Grand Fir, interspersed with a mosaic of Ponderosa Pine and Oregon White Oak-Fescue. This low elevation area is dominated by FRG III (35-200 year fire return interval, low and mixed severity) with patches of FRG I (<= 35 year fire return interval, low and mixed severity).

Hazard: The FMA consists of 88 acres to the north of the Columbia River Highway to the Columbia River. Steep slopes with dense forested vegetation abut the northern edge of the freeway (>35°). The FMA received a hazard score of 32 out of 40. While much of the point is agricultural, the slopes along the freeway are considered mature/overmature timber and understory (FM 10) and closed, short needle timber litter (FM 8), according to the most recent LANDFIRE data (2008 Refresh). Young Brush (FM 5) is also found here, with large amounts of Scotch Broom and Himilayan Blackberry. Dense timber abutting light fuels and Scotch Broom give the fuels hazard of the area a score of 30 out of 30.

Risk: Risk in and near the Ruthton Point FMA is considered low, receiving 11 out of 35 possible points. Riordan has a low fire occurrence in the area, receiving 3 reported fire starts according to ODF records, although possible fire vectors are moderate near Ruthton—the Columbia River Highway passes to the south of the Point, creating a high risk of fire from passing vehicles. To the north, the Union Pacific Railroad causes another possible fire vector. The housing density of the FMA is considered scattered, with between 1 and 10 dwellings per 40 acres.

Protection Capability: Structural fire protection for the 7 homes that fall within the boundaries of the Ruthton FMA is provided by West Side RFPD. Hydrant access is unavailable; structural protection would necessitate the use of tender relays, transportation time of which is > 15 minutes roundtrip (minus water transfer). As Ruthton is along the freeway, response time is > 11 minutes. Ruthton was assessed a Protection Capability score of 24 out of 24 points. Access and protection capabilities are further complicated one way ingress and egress to the homes within the area, as well as steep and narrow driveways.

Project Description: Work with homeowners to comply with WUI and SB 360 defensible space standards; minimize fire hazards and fuel loading around homes located in the forested areas off of Morton Road. Reductions projects should include the removal of ladder fuels and limbing low hanging branches within 100 yards of homes. Other fuels reduction projects should focus on reducing the fuel loading along the Columbia River Highway—this could include thinning and the removal of ladder fuels.

Priority 4: York Hill Road—Moderate

Location: The York Hill Road FMA is located in Section 8 of T2N-R10E. It is part of the West Side Community at Risk. The area is identified as a 1/3 mile buffer around York Hill Road, to the west of the Country Club Golf Course.

Community at Risk: West Side

Land Adjacency: County

Biophysical Setting and Fire Regime: The FRG for York Hill Road is a majority Group III (35-200 year fire return interval, low and mixed severity) on the eastern side, with FRG V (>200 year return interval, any severity) dominating the western edge or the FMA. Consistent with the Western Gorge, the BPS is dominated by Doug Fir-Western Hemlock Wet Mesic Forests, with few spots of Black Cottonwood-Narowleaf Willow-Madrone-Arroyo Willow and White Alder-Devil's Club near riparian corridors.

Hazard: This FMA consists of 355 acres on the south and east slopes of York Hill. The area has been assessed a hazard rating of 32 out of 40. Slopes are moderate to steep in places, but the majority of the zone is relatively low angle. The Anderson Fuel Model is dominated by mature timber (FM 10), although patches of trees have been removed through logging, leaving intermediate brush (FM 6). The south and east aspects increase fuel aridity during the summer months.

Risk: The York Hill Road FMA received a score of 8 points out of 35 for the risk assessment. has a moderate historical fire occurrence in the area, receiving 5 reported fire starts according to ODF records. Potential fire vectors are from agricultural or recreational use, however these were not included in the risk assessment. The housing density of the FMA is considered low, with between 1-10 dwellings per 40 acres.

Protection Capability: Structural fire protection for the 22 homes that fall within the boundaries of the York Hill FMA is provided by West Side RFPD. Hydrant access is provided by three hydrants on the western edge of the FMA. Response time to the York Hill FMA is estimated to be between 5 and 10 minutes, however is complicated by steep roads with limited ingress and egress options. Protection capability was assessed at 11 out of 24 points.

Project Description: Work with homeowners to comply with WUI and SB 360 defensible space standards. Reductions projects should include the removal of ladder fuels, thinning and limbing low hanging branches within 100 yards of homes on the north and west sides of York Hill Road. Fuels reduction projects should focus on creating defensible space and fire breaks to the west of the FMA. Options could include thinning, limbing, and hand piling.

Priority 5: Frazier Road—Moderate

Location: The Frazier Road FMA is intersected by Sections 4 and 5 of T2N-R10E within the West Side Community at Risk. The area comprises a ¼ mile buffer on the north and south side of Frazier Road.

Community at Risk: West Side

Land Adjacency: State (1/4 mile), County (1/2 mile)

Biophysical Setting and Fire Regime: The FRG for Frazier Road is a majority Group III (35-200 year fire return interval, low and mixed severity) with slight interspersals of FRG I (<= 35 year return interval, low and mixed severity) and FRG V (>200 year fire return interval, any severity). Consistent with the Western Columbia River Gorge, the BPS is dominated by Doug Fir-Grand Fir North Pacific Montane Riparian Woodlands with spots of Oregon White Oak-Romers-Fescue, and Ponderosa Pine. Small areas of White Alder and Devil's Club would be found in the low-lying riparian areas nearby.

Hazard: The FMA consists of 160 acres on the western hills of Hood River. Slopes are moderate to steep in many places. During the summer months, the area receives s a high amount of solar radiation, decreasing the time that it takes fuels to dry out. The FMA received a hazard score of 36 out of 40. Patches of agriculture are surrounded by mature/overmature timber and understory (FM 10) according to the most recent LANDFIRE data (2008 Refresh). Intermediate Brush (FM 6) and cured slash is also found in the Frazier Road FMA.

Risk: Risk in and near the Frazier Hill FMA is considered low, receiving 6 out of 35 points. Frazier has a low fire occurrence in the area—ODF records indicate that no substantial fires of record. Potential fire vectors are low—hunters and recreationists use the area, however these

numbers are low in the summer months during regulated closures. The housing density of the FMA is considered scattered, with between 1 and 10 dwellings per 40 acres.

Protection Capability: Structural fire protection for the 15 homes that fall within the boundaries of the Frazier Road FMA is provided by West Side RFPD. Hydrant access is unavailable; structural protection would necessitate the use of tender relays. Response time to Frazier Road homes is estimated to be between 5 and 10 minutes. Response is complicated by steep roads with limited ingress and egress options. Protection capability was assessed at 21 out of 24 points.

Project Description: Work with homeowners to comply with WUI and SB 360 defensible space standards. Reductions projects should include the removal of ladder fuels and limbing low hanging branches within 100 yards of homes, along Frazier Road and Riordan Hill Road, and creating fire breaks on the western edge of the FMA.

Priority 6: Phelps Creek—Moderate

Location: The Phelps Creek FMA is located in T3N-R10E, Section 33 in the West Side Community at Risk. The area is located to the South from Interstate 84 to Phelps Creek Road. The eastern boundary is identified by Country Club Road and includes all of West Ridge Drive.

Community at Risk: West Side

Land Adjacency: State

Biophysical Setting and Fire Regime: The FRG for Phelps Creek is a majority Group III (35-200 year fire return interval, low and mixed severity) interspersed with FRG I (<= 35 year return interval, low and mixed severity). Consistent with the Western Columbia River Gorge, the BPS is dominated by Doug Fir-Grand Fir North Pacific Montane Riparian Woodlands, Doug Fir-Western Hemlock Dry Mesic Forest, with spots of Oregon White Oak-Romers-Fescue, and Ponderosa Pine. Small areas of Black Cottonwood and Arroyo Willow would be found in the low-lying riparian areas nearby.

Hazard: The FMA consists of 183 acres to the south of the Columbia River Highway to Phelps Creek. The hazard rating received is 34 out of 40. Based on the steep slopes near the Interstate (>35°), southern aspect (which receives high solar radiation), and mature/overmature timber (FM 10), the hazard rating of Phelps Creek is high. Additionally, tall grasses intermingle with low-lying tree branches, creating an environment for fast moving fires that could easily spread to tree crowns.

Risk: Risk in and near the Phelps Creek FMA is considered moderate, receiving 14 out of 35 points. Phelps Creek has a moderate historical fire occurrence in the area, receiving 3 reported fire starts according to ODF records. Potential fire vectors include: the Columbia River Highway, which passes to the north; the Union Pacific Railroad which passes through the adjacent FMA of Ruthton. The housing density of the FMA is considered moderate, with between 10-25 dwellings per 40 acres.

Protection Capability: Structural fire protection for the 21 homes that fall within the boundaries of the Phelps Creek FMA is provided by West Side RFPD. Hydrant access is ample, with two hydrants found on Phelps Creek Road; response time to homes within the Phelps Creek FMA is > 11 minutes, and structural protection would necessitate the use of tender relays. Protection capability is further complicated by steep roads with limited ingress and egress options. Protection capability was assessed at 14 out of 24 points.

Project Description: Work with homeowners to comply with WUI and SB 360 defensible space standards. Reductions projects should include the removal of ladder fuels and limbing low hanging branches within 100 yards of homes, along Phelps Creek Road and West Ridge Road, and creating fire breaks on the western edge of the FMA.

Priority 7: Reed Road—Moderate

Location: The Reed Road FMA is located in T2N-R10E, Sections 20 and 30. It is part of the West Side Community at Risk. The area is identified as south and east of Reed Road to the Hood River.

Community at Risk: West Side

Land Adjacency: State, County

Biophysical Setting and Fire Regime: The FRG for Reed Road is a majority Group III (35-200 year fire return interval, low and mixed severity) with slight interspersals of FRG V (>200 year return interval, any severity). Consistent with the low lying regions of Mt. Hood, the BPS is dominated by, Doug Fir-Western Hemlock Dry Mesic Forests, with spots of Black Cottonwood, Narowleaf Willow, Madrone, and Arroyo Willow. Small areas of Oregon White Oak-Romers-Fescue are also found.

Hazard: The FMA consists of 278 acres between the Hood River and Reed Road. Largely based on its steep slopes to the south of the zone (over 35 percent >35°), solar heating based on its southern aspect, and its dense fuels, the FMA received a hazard score of 34 out of 40. It can be considered to be a part of FM 10 (mature/overmature timber and understory) according to the most recent LANDFIRE data. Grass with shrub overstory (FM 2) is found in areas where clear-cutting has removed the canopy in several places. Patches of agricultural land nearby create possible fire breaks if a fire were to begin in this FMA.

Risk: Reed Road is considered a low risk area, receiving 11 of 35 points. Although Reed Road has received no reported fires directly within the Fuels Management Area, three fires reported by ODF adjacent to the FMA were counted. While the hazard score is high, Reed Road has few potential fire vectors (human) as the road is mainly used for home access. Potential fire vectors include power transmission lines that intersect the area. The housing density of the FMA is considered scattered, with between 1-10 dwellings per 40 acres.

Protection Capability: Structural fire protection for the 12 homes that fall within the boundaries of the Reed Road FMA is provided by West Side RFPD. Hydrant access is limited to one hydrant on Reed Road; structural protection at the end of the FMA would necessitate the use of

tender relays. Response time from West Side RFPD is > 11 minutes. Reed Road is narrow and a dead end—structural protection would be highly limited in the event of a fire due to these factors. Protection capability was assessed at 19 out of 24 points.

Project Description: Work with homeowners to comply with WUI and SB 360 defensible space standards. Reductions projects should include the removal of ladder fuels and limbing low hanging branches within 100 yards of homes and along the Reed Road right of way.

Priority 8: Post Canyon—Low

Location: The Post Canyon FMA is located in Section 33 of T2N-R10E. It is part of the West Side Community at Risk. The FMA is identified as the section of Post Canyon Road immediately to the west of Snowberry Drive until roughly parallel with Flying Trout Drive.

Community at Risk: West Side

Land Adjacency: State (1/4 mile)

Biophysical Setting and Fire Regime: Two main BPS are found in the Post Canyon FMA: North Pacific Maritime Dry-Mesic Doug Fir-Western Hemlock, and North Pacific Lowland Riparian Forest and Shrubland consisting of Black Cottonwood-Bigleaf Maple-Western Redcedar. The FRG for Post Canyon is a majority Group III (35-200 year fire return interval, low and mixed severity) on the eastern side, with FRG V (>200 year return interval, any severity) found in patches in the riparian corridor.

Hazard: The Post Canyon FMA is 34 acres in the low riparian area off of Post Canyon Drive. The area received a hazard rating of 6 points out of 40. The low score assessed was due to the patchwork nature of the fuels, which consist of agriculture, mature timber (FM 10), and closed short needle timber-litter (FM 8). Slopes in this FMA are low (<25°). Post Canyon also receives relatively little solar insulation during the summer months.

Risk: Post Canyon received a risk assessment score of 6 points. The small area has had no fire starts reported by ODF (although several adjacent fires have been reported). Potential fire vectors are limited to residents and passing traffic en route to the popular recreation area, Post Canyon. The housing density of the FMA is considered moderate, with between 10-25 dwellings per 40 acres.

Protection Capability: Structural fire protection for the 19 homes that fall within the boundaries of the Post Canyon Road FMA is provided by West Side RFPD. Hydrant access is limited to two hydrants on the corners of Country Club and Snowberry, and Country Club and Post Canyon (both within 100 yards of the FMA). Response to homes is estimated to be between 5 and 10 minutes. Protection capability was assessed at 16 out of 24 points.

Project Description: Work with homeowners to comply with WUI and SB 360 defensible space standards. Reductions projects should include the removal of ladder fuels and limbing low hanging branches within 100 yards of homes.

HOOD RIVER FIRE DEPARTMENT

Priority 1: Wasco Street—High

Location: Wasco Street is in the Hood River Community at Risk in T3N-R10 E, Section 26. The FMA runs parallel to the Columbia River Highway from Wasco Loop, east until parallel with 13th Street. To the south it is defined by Wasco and Hope Streets.

Community at Risk: Hood River

Land Adjacency: State, County

Biophysical Setting and Fire Regime: The FRG for Wasco is a majority Group I (<=35 year return interval, low and mixed severity) with areas of Group III (35-200 year fire return interval, low and mixed severity). The BPS consists of Oregon White Oak, Romer's Fescue, and Oatgrass.

Hazard: Wasco Street received a hazard rating of 13 points. The area has low slopes with high solar radiation, decreasing fuel curing times. Fuels along Interstate 84 are predominantly grasses, interspersed with dense Himalayan Blackberry stands and Ponderosa Pine. Pine trees have severe mortality rates from a California Fivespined Ips outbreak in 2012-2013, increasing the overall hazard in the area. FBFM consists predominantly of grass with shrub overstory (FM 2) and young brush (FM 5).

Risk: Wasco Street received a risk score of 17 points of 35. Historic fire occurrence within the HA is low, however several fires along the ODOT I-84 corridor threatened several apartment complexes in recent years. Risk factors include adjacency to Interstate 84, Morrison and Jaymar Park, and the Union Pacific Railroad. Population density in the area is extremely high, 47 housing units per 10 acres (17 acre area). Adjacency to Interstate 84 and high use from residents remains the biggest risk factors to the Wasco Street FMA.

Protection Capability: Protection capability was assessed at 8 out of 24 points. Structural fire protection for the 55 buildings that fall within the boundaries is provided by Hood River Fire and EMS. Hydrant access is provided by 16 hydrants in or within 400 feet of the zone. Response time is less than 10 minutes.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

Priority 2: 30th and Rand—High

Location: The 30th and Rand FMA is located in the Hood River Community at Risk in Sections 26, 27, 34, and 35 of T3N-R10E. It covers residential and urban forest areas between Frankton Road (west) and Rand Road (east). The northern edge is defined by Country Club and Cascade Avenue, and the southern edge is defined by May Street.

Community at Risk: Hood River

Land Adjacency: County

Biophysical Setting and Fire Regime: The FRG for Rand and 30th is a majority Group I (<=35 year return interval, low and mixed severity) with areas of Group III (35-200 year fire return interval, low and mixed severity). The BPS consists of Oregon White Oak, Romers Fescue, and Oatgrass. Patches of Douglas Fir and Ponderosa Pine are also present.

Hazard: 30th and Rand received a hazard rating of 18 points. The area has low slopes, but receives high solar radiation—fuel drying time is minimal. Houses are intermixed with fuels consisting of medium brush (FM 6) and mature timber (FM 10) which consists predominantly of Ponderosa Pine, White Oak, and Douglas Fir. Dense patches of Himilayan Blackberry are also found. Pine trees have severe mortality rates from a California Fivespined Ips outbreak in 2012-2013, increasing the overall hazard in the area.
Risk: Rand Road is 161 acres. It received a risk score of 11 points of 35. Historic fire occurrence within the HA is low according to ODF records, however fires have been reported by Hood River Fire. Direct risk factors include adjacency to Interstate 84. Population density in the area is high, with 17 houses per ten acres.

Protection Capability: Protection capability was assessed at 8 out of 24 points. Structural fire protection for the 121 homes that fall within the boundaries is provided by Hood River Fire and EMS. Hydrant access is provided by 15 hydrants in the zone. Response time is less than five minutes.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

Priority 3: East Hazel—Moderate

Location: The East Hazel FMA is located in the Hood River Community at Risk in Section 36 of T3N-R10E. The area identified covers the urban interface from 2nd Street (west) to the edge of the Hood River (east). North and south borders are defined by Sherman Street and the Indian Creek Drainage, respectively.

Community at Risk: Hood River

Land Adjacency: N/A

Biophysical Setting and Fire Regime: The FRG for East Hazel is a majority Group III (35-200 year fire return interval, low and mixed severity) with patches of Group I (<=35 year return interval, low and mixed severity). The BPS consists of Oregon White Oak, Romers Fescue, and Oatgrass where FRG I dominates, and Doug Fir-Western Hemlock North Pacific Maritime Forests around FRG III.

Hazard: East Hazel received a hazard rating of 13 points. The area has low slopes in the urban area with high solar radiation. High slopes along the Hood River receive intense summer sun, decreasing fuel curing times. Fuels along Interstate 84 are predominantly grasses, interspersed with dense Himilayan Blackberry stands and Ponderosa Pine. Pine trees have severe mortality rates from a California Fivespined Ips outbreak in 2012-2013, increasing the overall hazard in the area. FBFM consists predominantly of grass with shrub overstory (FM 2) and young brush (FM 5).

Risk: East Hazel received a risk score of 12 points of 35. Historic fire occurrence within the HA is low according to ODF records, with one fire reported. East Hazel's main risk factors are from adjacency to the Mt. Hood Scenic Railroad and the steep slopes to the north of the Hood River. Other risks are use by recreationists on the Indian Creek Trail. Direct risk factors include adjacency to Interstate 84. Population density in the area is high, with 30 houses per ten acres.

Protection Capability: Protection capability was assessed at 8 out of 24 points. Structural fire protection for the 110 structures that fall within the boundaries is provided by Hood River Fire and EMS. Hydrant access is provided by 12 hydrants in the zone. Response time is less than five minutes.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

Priority 4: Columbia Gorge Community College—Low

Location: The CGCC FMA is located in the Hood River Community at Risk in T3N-R10E, Section 35. The area includes the undeveloped drainage of Indian Creek between the Columbia Gorge Community College (South) and Nix Road (north).

Community at Risk: Hood River

Land Adjacency: N/A

Biophysical Setting and Fire Regime: The FRG for the CGCC FMA is dominated by FRG V (>200 return interval, any severity) along the riparian corridor where Black Cottonwood-Bigleaf Maple forests and shrublands exist. The peripheries of the riparian corridor are FRG III (35-200 year return interval, low and mixed severity) and consist of a Black Cottonwood-Arroyo Willow BPS.

Hazard: Wasco Street received a hazard rating of 12 points. The area has low overall slope, with both northwest and southeast aspects within the Indian Creek Drainage. Fuels in the drainage consist of Ponderosa Pine and medium brush (FM 6). There is a high rate of tree mortality caused by the Fivespined Ips (40 percent) which significantly increases the hazard.

Risk: CGCC is 26 acres. It received a risk score of 9 points of 35. Historic fire occurrence within the HA is low according to ODF records. Direct risk factors include adjacency to Highway 281 and use by recreationists along the Indian Creek Trail. Population density in the area is low, with less than 3 houses per ten acres. High population densities are found off of Avalon on the western edge of CGCC.

Protection Capability: Protection capability was assessed at 8 out of 24 points. Structural fire protection for the 7 homes and Community College that fall within the boundaries is provided by Hood River Fire and EMS. Hydrant access is provided by 2 hydrants in the zone and 9 within 400 feet. Response is time less than five minutes.

Project Description: Fuels treatment around homes in the HA should be a priority. Limbing, reduction of ladder fuels, and thinning are recommended to reduce fuel loading. Work should be collaborative with property owners to assist in compliance with WUI and SB 360 defensible space standards.

CITY OF CASCADE LOCKS

McQuinn Point

Location: McQuinn Point FMA is located in the Community at Risk of Cascade Locks in T2N-R8E, Section 5. The area is adjacent to the McQuinn Cemetery and protrudes into the Columbia River.

Community at Risk: Hood River

Land Adjacency: Federal (located on the spit to the West of the FMA)

Biophysical Setting and Fire Regime: The FRG for McQuinn Point is dominated by FRG V (>200 return interval, any severity). The BPS is Douglas Fir and Western Hemlock and is considered a North Pacific Maritime Mesic environment.

Hazard: McQuinn Point received a hazard rating of 31 points. The FMA has low slope and elevation, however as it lies in a riparian area it has high fuel. Fuel Models 8 (closed timber and litter) and 3 (tall grass) contribute to the high hazard rating.

Risk: McQuinn point FMA is 21 acres and received a risk score of 6 points. There are no structures within the FMA. The area is heavily used publicly for river access—ODF fire ignitions reported are low, however Cascade Locks Fire reports that the area receives numerous fire starts throughout the fire season that are not reported. McQuinn Point is subject to high east winds during the summer months, increasing the risk factor.

Protection Capability: There is one hydrant located within 500 meters of the FMA and response time is less than 10 minutes. The FMA received protection capability score of 16 points.

Project Description: Fuels reductions projects should be coordinated with ODF to remove fuels in the high use area. Public education programs should focus on the risk of fire to the area.

Shahala/Windsong

Location: The Shahala/Windsong FMA is located in the Community at Risk of Cascade Locks in T2N-R8E, Sections 5 and 6. The FMA is bordered to the north by Forest Road and to the south by the Columbia River Highway. East and west boundaries are just east of Sheridan Road and east of the Windsong cul-de-sac, respectively.

Community at Risk: Hood River

Land Adjacency: Federal and State

Biophysical Setting and Fire Regime: The FRG for McQuinn Point is dominated by FRG V (>200 return interval, any severity). The BPS is Douglas Fir and Western Hemlock and is considered a North Pacific Maritime Mesic environment; low-lying areas have a BPS of Black Cottonwood, Big Leaf Maple, and Western Redcedar.

Hazard: The Shahala FMA received a hazard rating of 18 points of 40 possible. The unfinished bank-owned development has been largely cleared of dead material; as of fall 2013, slash piles were slated for burning by March 2014. The area receives constant sun during the summer months and thus fast fuel drying times. The area is dominated by Anderson's FM 6 (hardwood shrubs/brush) and tall grass (FM 3). Slope is below 25°.

Risk: The Shahala FMA is 48 acres. It received a risk score of 19 points. Housing density in the FMA is high, with 102 structures in or near the area. Proximity to the railroad and Columbia Highway increase risk factors. Shahala is adjacent to the Bear Mountain Wood Products facility, which contains high quantities of flammable and toxic liquids and gases.

Protection Capability: The protection capability of Shahala FMA is high. Response time is low (less than five minutes) and water sources are abundant (11 fire hydrants). Cul-de-sacs in the FMA have ample room for apparatus turnaround.

Project Description: Coordinated clearing of fuels along the railroad and freeway right of ways should be completed annually in partnership with Santa Fe Railroad and ODOT. Emergency evacuation plans should be coordinated with residents in the event of a wildfire near the Bear Mountain Forest Products facility.

Mt. View

Location: The Mountain View FMA is located in the Community at Risk of Cascade Locks in T2N-R8E, Sections 7. The FMA is bordered to the north by Hilltop Road and to the south by the Columbia River Highway. East and west boundaries are Sheridan Road and Gravel Pit, respectively.

Community at Risk: Hood River

Land Adjacency: Federal and State (small ownership with near adjacency)

Biophysical Setting and Fire Regime: The FRG for McQuinn Point is dominated by FRG V (>200 return interval, any severity). The BPS is Douglas Fir and Western Hemlock and is considered a North Pacific Maritime Mesic environment; low-lying areas have a BPS of Black Cottonwood, Big Leaf Maple, and Western Redcedar.

Hazard: The Mt. View FMA received a hazard score of 22 points. The moderate hazard is a result of heavy fuels surrounding homes and proximate to Interstate 84. These patches of fuels consists predominantly of Anderson's FM 8,9, and 10 (timber with litter, and timber with litter and understory). Light fuels along Interstate 84 receive rapid drying during the summer months due to long spans of sun exposure. Slope is less than 25°.

Risk: The FMA is 15 acres and received a risk factor of 12 points. Housing density is high, with 1.5 structures per acre. Additional risk factors for the area are its proximity to the Columbia River Highway and relative adjacency to the Bear Mountain Wood Products facility.

Protection Capability: Protection capability is high (8 points). Response time is less than 5 minutes and there are 3 hydrants within 500 meters. The area is accessible by fire apparatus from the west and east—however driveways within the area remain narrow.

Project Description: Annual removal of woody debris along the freeway should be coordinated by CRGNSA and ODOT to reduce the risk of fire ignition by passing traffic. Narrow driveways should be cleared to allow easy access by fire apparatus.

Bear Mountain Industrial Area

Location: The Bear Mountain Industrial Area FMA is located in the Community at Risk of Cascade Locks in T2N-R8E, Section 5. The FMA encompasses the entire Bear Mountain Forest Products Company and Industrial Park with a 400 foot buffer. The southern boundary is the Columbia River Highway, while the eastern boundary is Campbell Road.

Community at Risk: Hood River

Land Adjacency: Federal and State

Biophysical Setting and Fire Regime: The FRG for McQuinn Point is dominated by FRG V (>200 return interval, any severity). The BPS is Douglas Fir and Western Hemlock and is considered a North Pacific Maritime Mesic environment; riparian areas near the Columbia River contain small numbers of Big Leaf Maple and Western Redcedar.

Hazard: The Bear Mountain Industrial Area received an aggregate hazard score of 30 points. The western-most edge of the area has tall grass and hardwood shrubs (FM 3 and 6). The dominant fuel source in the area can be attributed to the Bear Mountain Wood Products facility along Interstate 84, where a high volume of wood products are processed. These abundant fuels are exposed to intense sun in the summer months and see rapid drying.

Risk: The FMA is 54 acres and received a risk score of 13 points. There are no dwellings in the FMA. Adjacency to the freeway and railroad increase risk factors. The highest risk comes from the Bear Mountain Forest Products facility—numerous fire ignitions were reported by Cascade Locks Fire. The Bear Mountain facility has high quantities of combustible gases and liquids, in addition to non-flammable toxins.

Protection Capability: Response time to Bear Mountain is less than 5 minutes and there are 4 hydrants within 500 meters. Protection capability was assessed at 8 points. While response time is adequate, a large pool of resources would be needed in the event of a fire in the FMA.

Project Description: Fuels removal is of low concern—fire pre-plans should be evaluated by Cascade Locks, ODF, CRGNSA, and county jurisdictions that may respond through mutual aid. Evacuation procedures should be evaluated by all emergency personnel including sheriff and state police.

Rudolph Creek

Location: The Rudolph Creek FMA is located in the Community at Risk of Cascade Locks in T2N-R7E, Section 12. The FMA is bordered to the east by the railroad and to the west by the Columbia River and encompasses the InLoo fish access area.

Community at Risk: Hood River

Land Adjacency: Federal

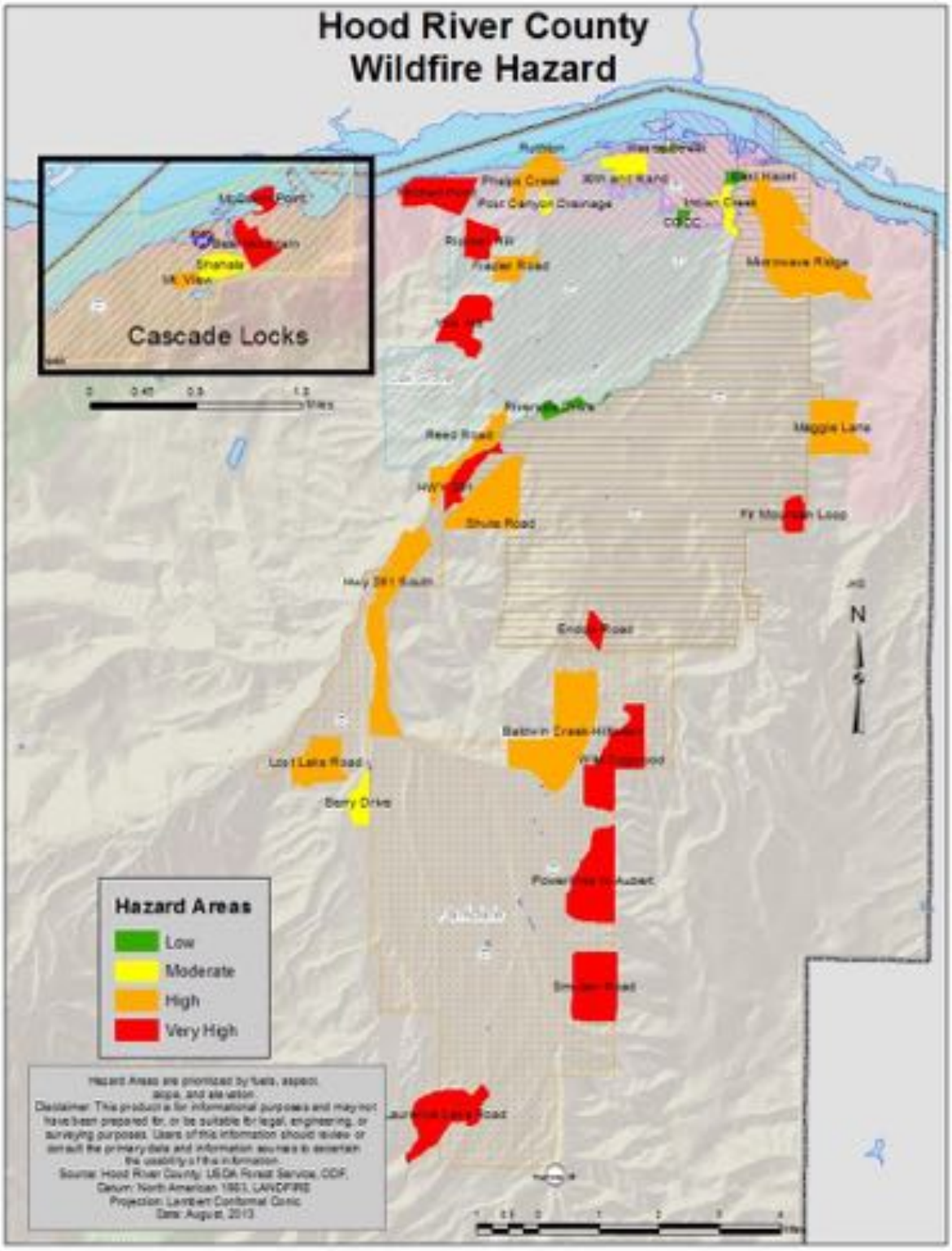
Biophysical Setting and Fire Regime: The FRG for McQuinn Point is dominated by FRG V (>200 return interval, any severity). The BPS is Douglas Fir and Western Hemlock and is considered a North Pacific Maritime Mesic environment. Fuel density in the FMA is low.

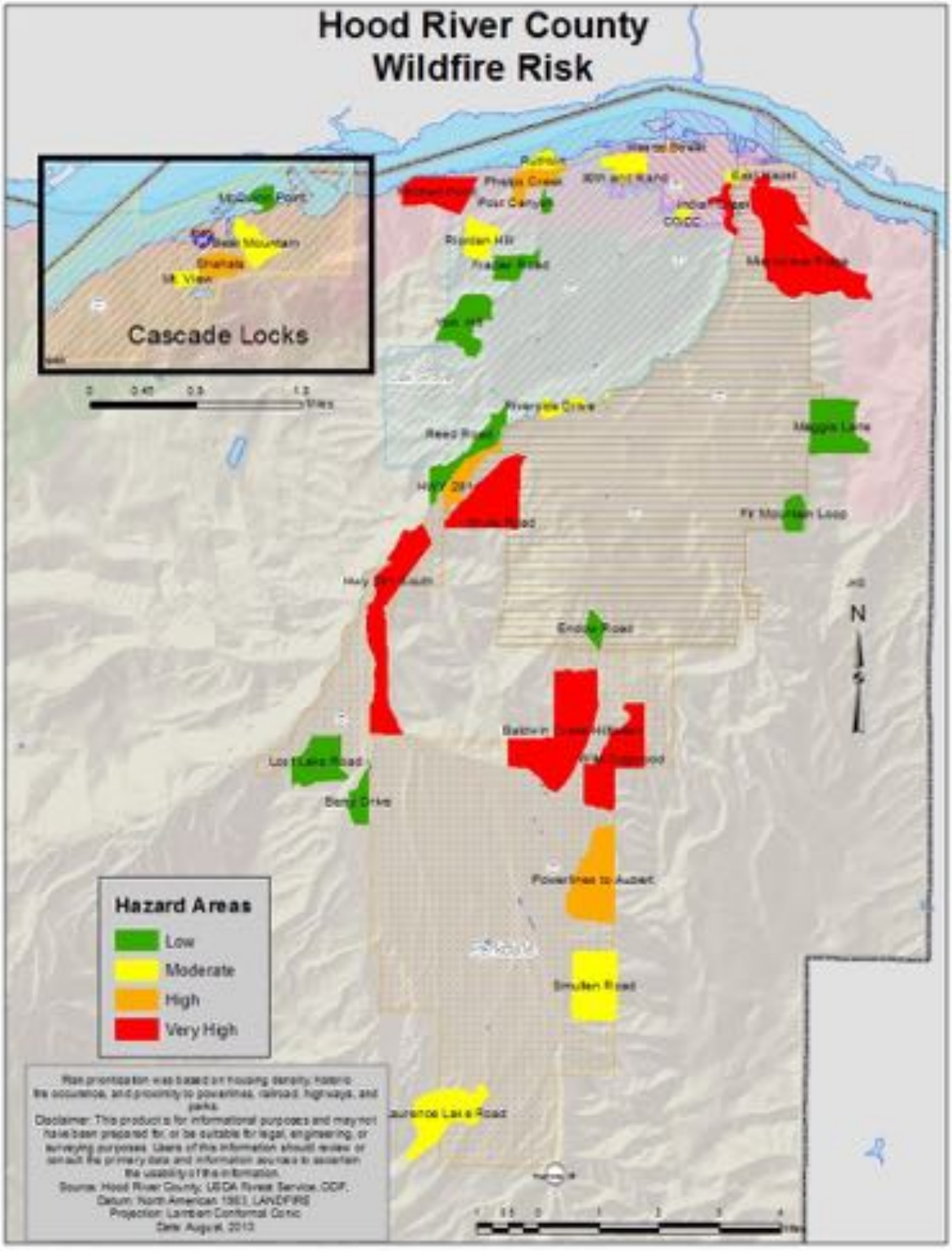
Hazard: The Rudolph Creek area along the Columbia River has a low hazard rating of 17 points. Light brush on the western perimeter sees high sun exposure. Slope is less than 25°.

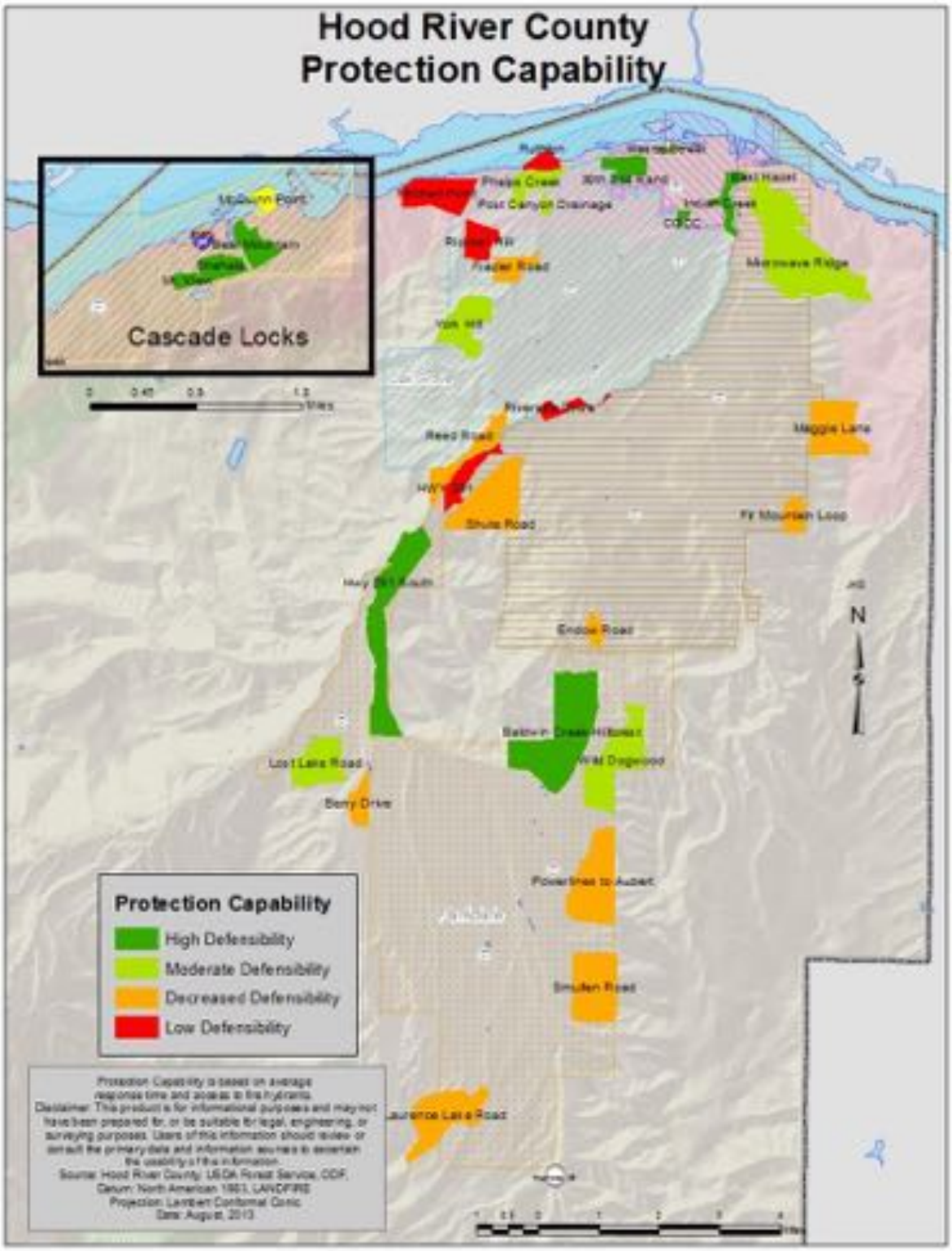
Risk: The FMA is 4 acres and received a risk score of 9 points. There are four structures in the FMA (density at 1 structure per acre). Risk factors are increased by use as a park and adjacency to the railroad. Rudolph Creek is heavily used during the summer fishing months and a high rate of fire ignitions were reported by Cascade Locks Fire.

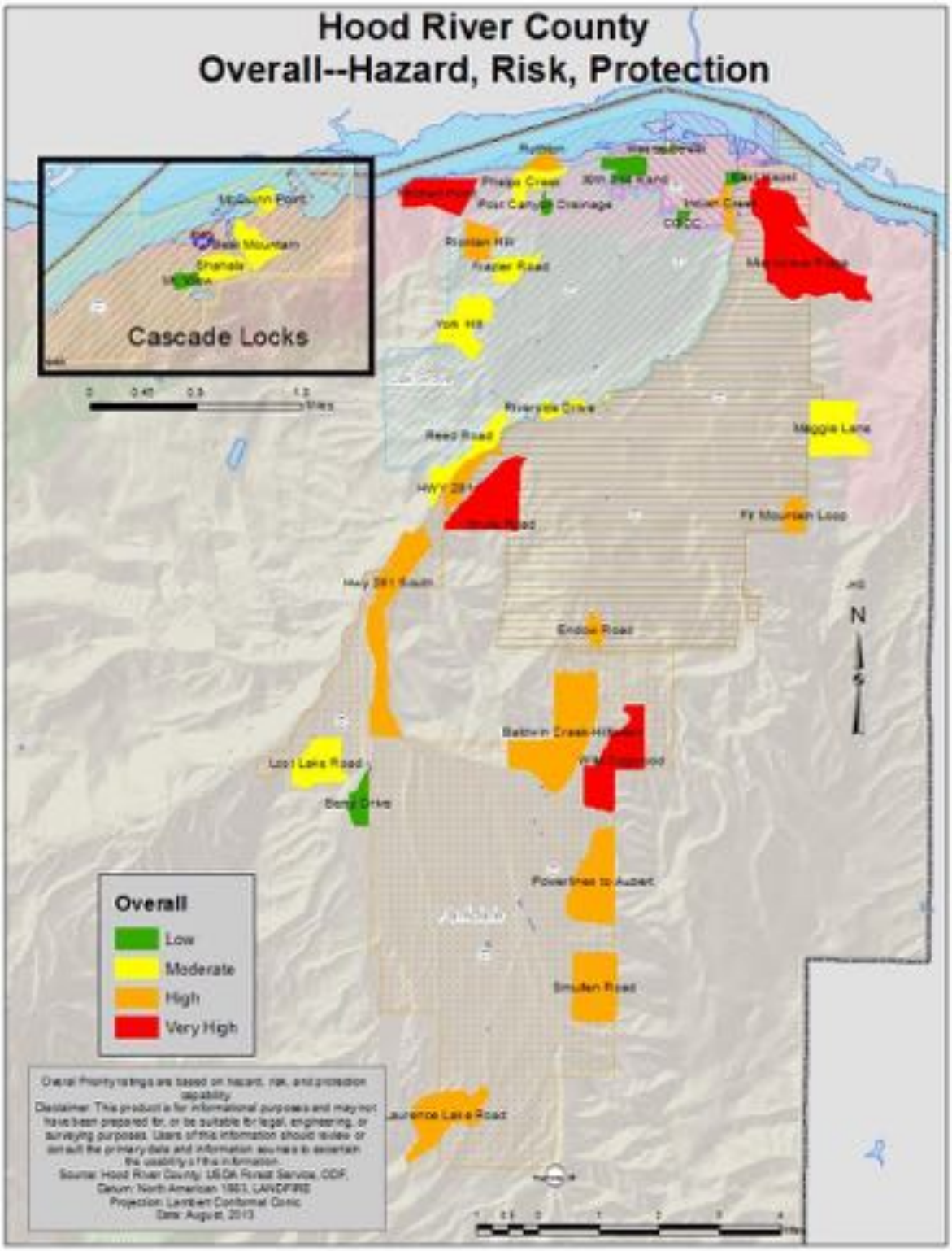
Protection Capability: The protection capability is high (8 points).

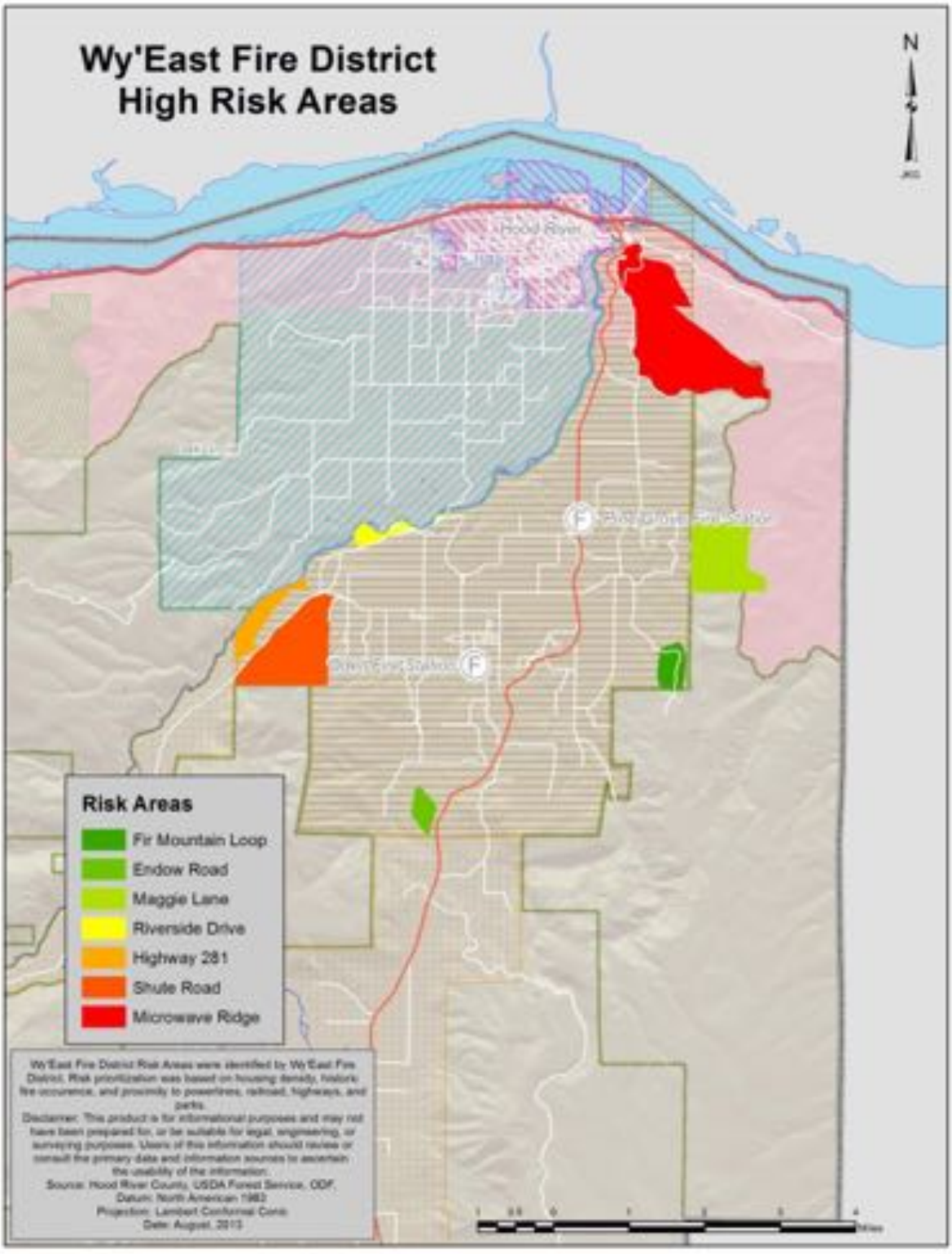
Project Description: Fire prevention and education should be targeted to the dominant use groups of the FMA.

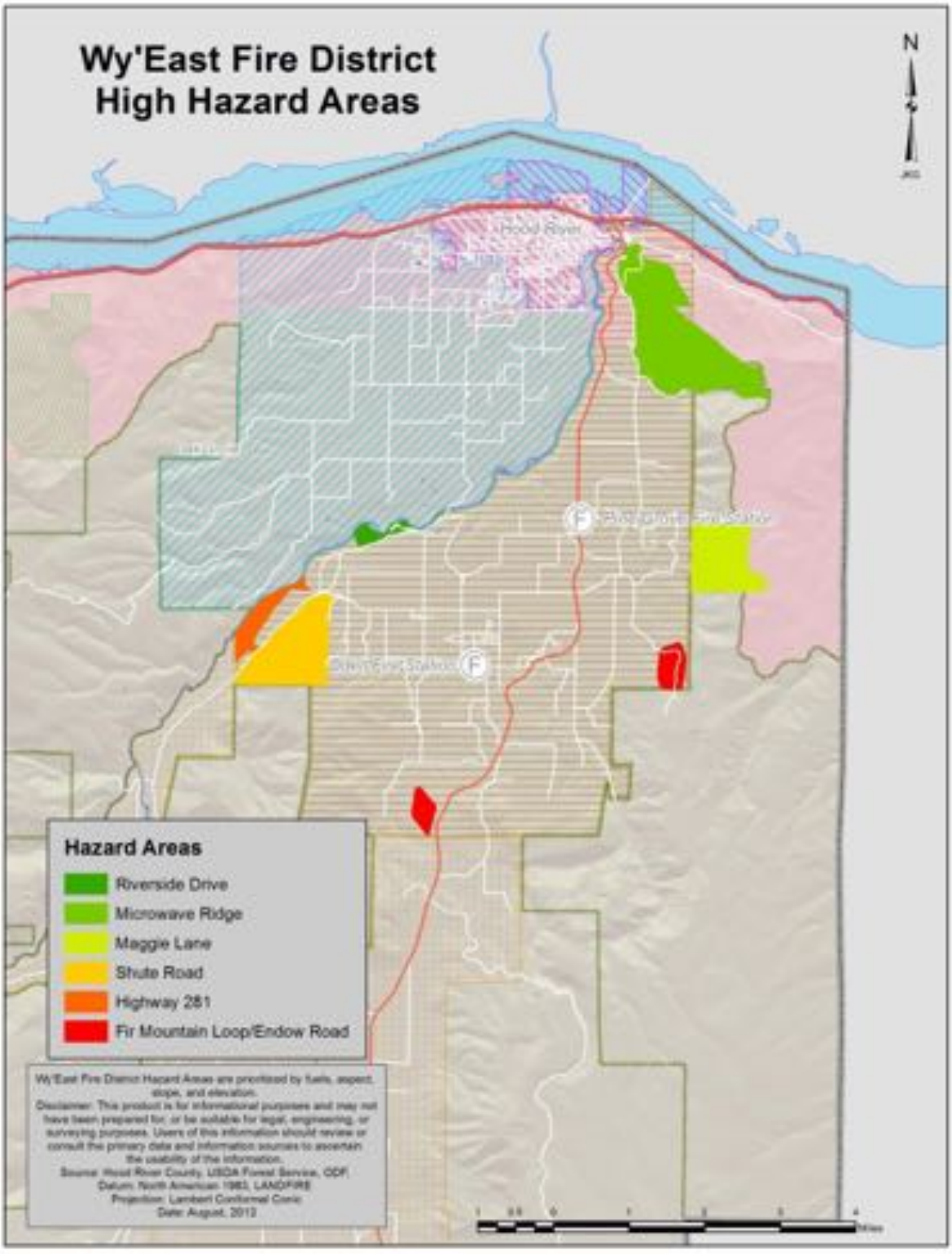

Hood River County
Wildfire Hazard
Cascade Locks
Reed Road
Shute Road
Lost Lake Road
Berry Drive
Maggie Lane
Merriman Ridge
Hazard Areas
Low
Moderate
High
Very High
N

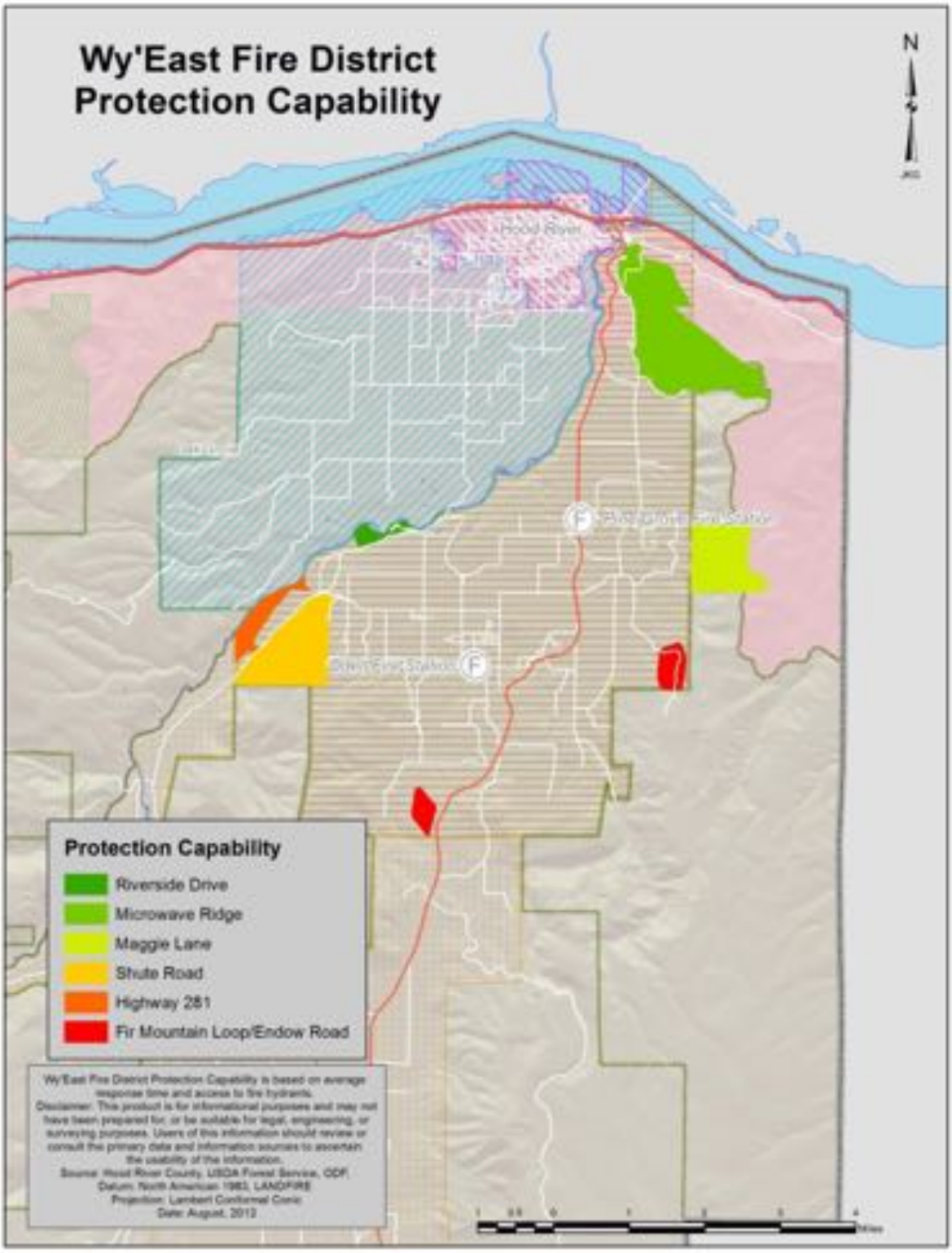

Hood River County
Wildfire Risk
Cascade Locks
Hazard Areas
Low
Moderate
High
Very High
N

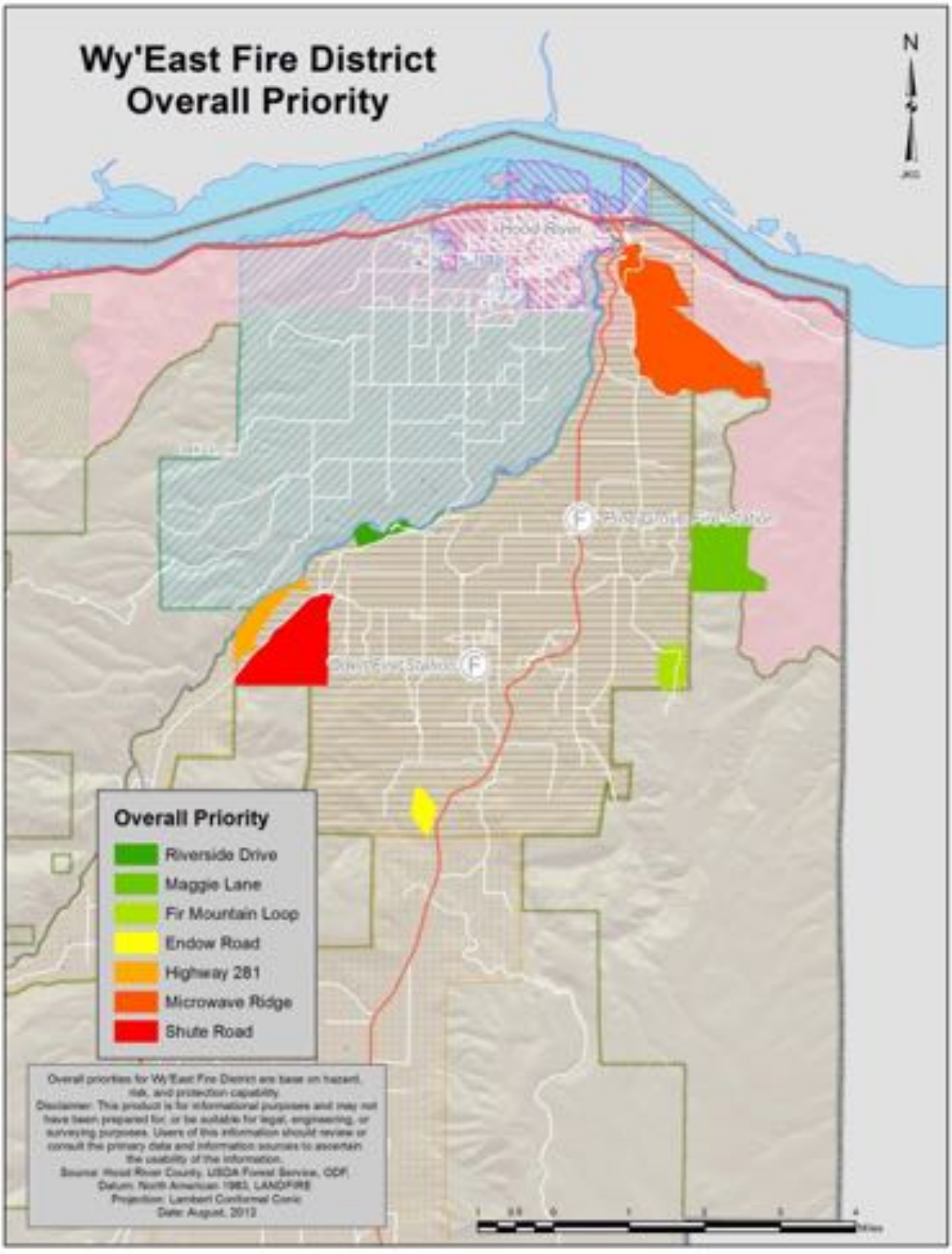

Hood River County
Protection Capability
Cascade Locks
Protection Capability
High Defensibility
Moderate Defensibility
Decreased Defensibility
Low Defensibility
Reed Road
Shute Road
Meadow Road
Lost Lake Road
Berry Drive
Smullen Road
Laurence Lake Road
Maggie Lane
Fir Mountain Loop
Merriman Ridge
Wild Dogwood
Powerline to Aubert
Prosser Creek
Post Canyon Drainage
Indian Creek
Frazier Road
N
S

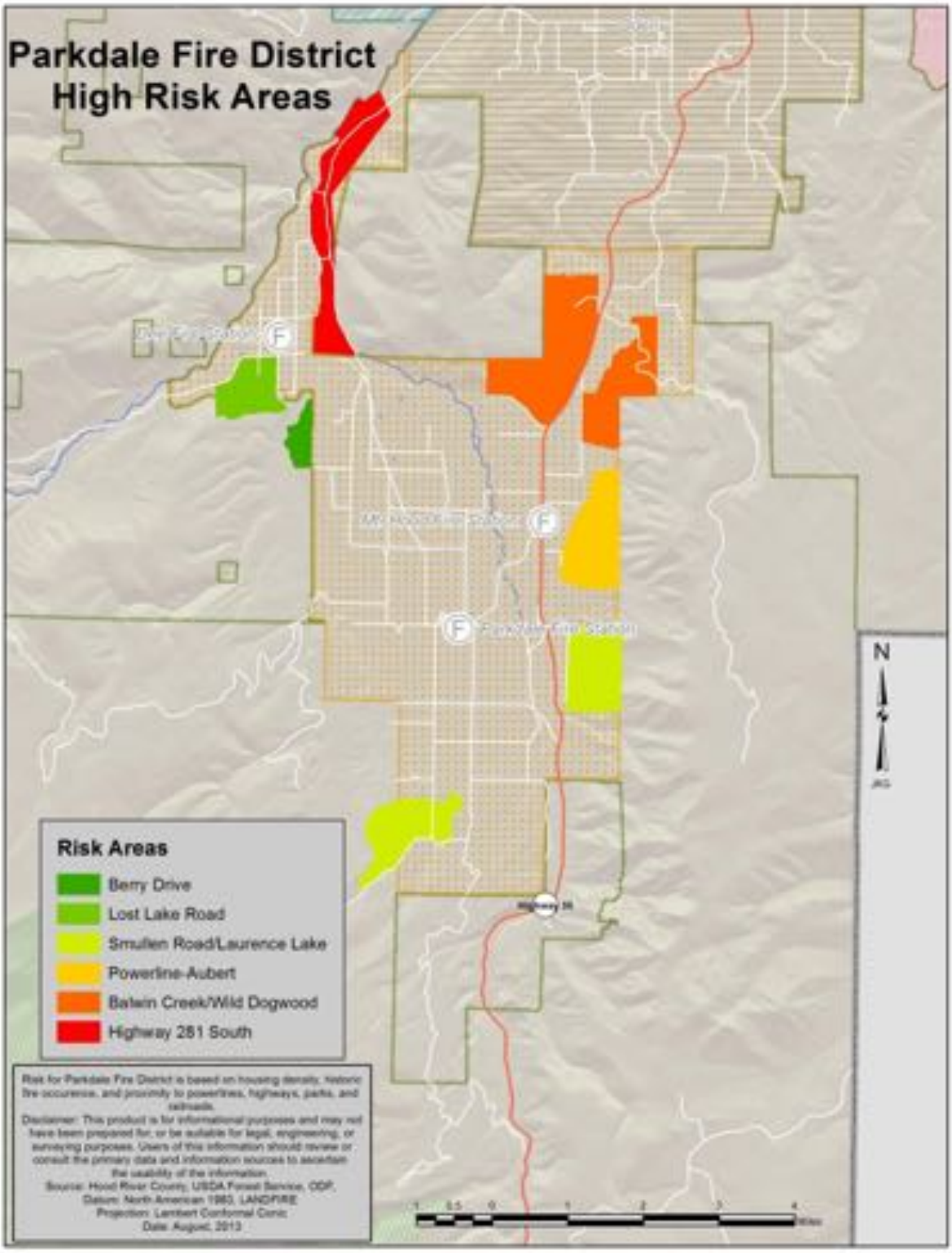

Hood River County
Overall--Hazard, Risk, Protection
Cascade Locks
Reed Road
Riverside Drive
Maggie Lane
Fir Mountain Loop
Endow Road
Lost Lake Road
Smullen Road
Laurence Lake Road
N
Overall
Low
Moderate
High
Very High

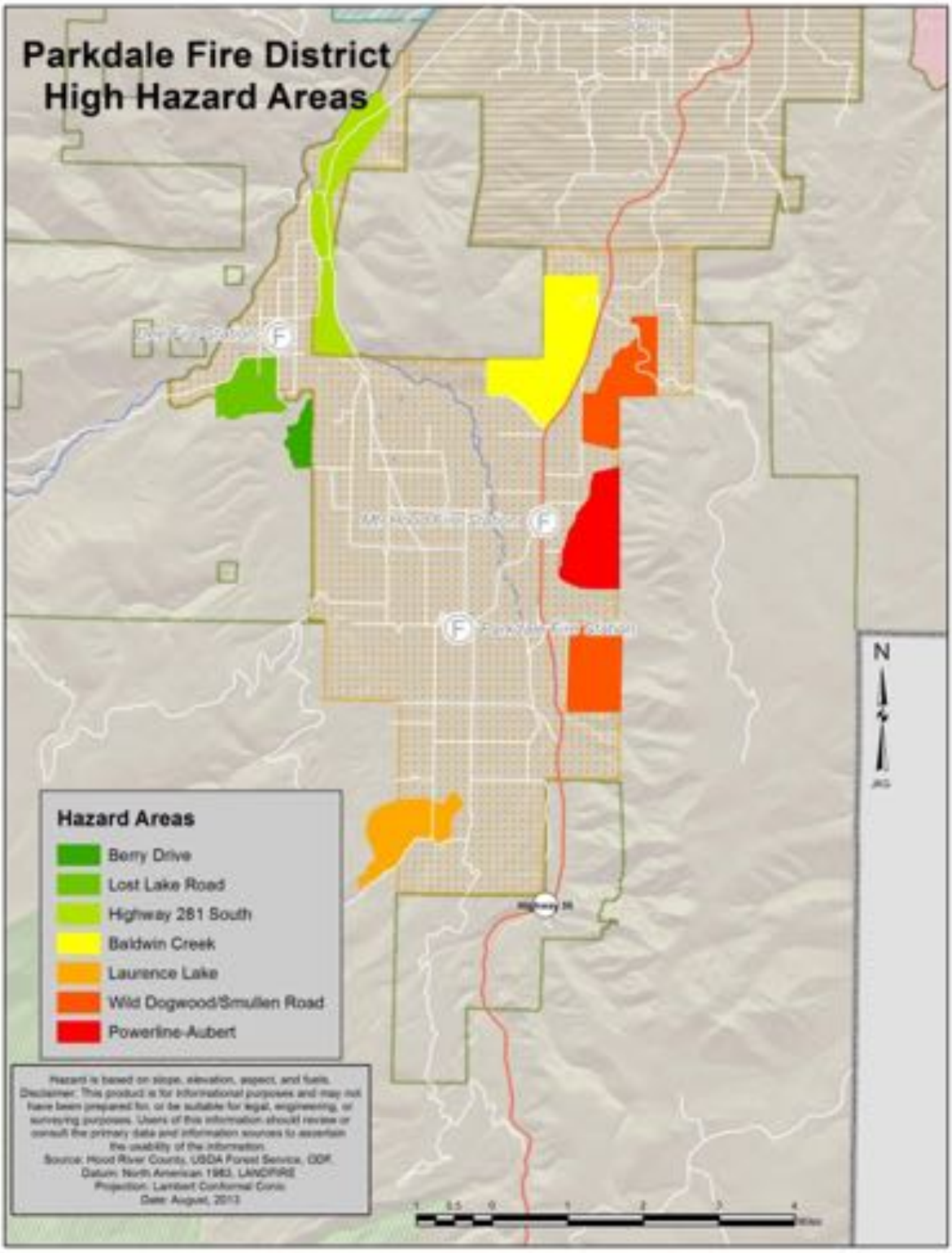

Wy'East Fire District
High Risk Areas
N
Hood River
Risk Areas
Fir Mountain Loop
Endow Road
Maggie Lane
Riverside Drive
Highway 281
Shute Road
Microwave Ridge
Wy'East Fire District Risk Areas were identified by Wy'East Fire District. Risk prioritization was based on housing density, historic fire occurrence, and proximity to powerlines, railroad, highways, and parks.
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF
Datum: North American 1983
Projection: Lambert Conformal Conic
Date: August, 2013

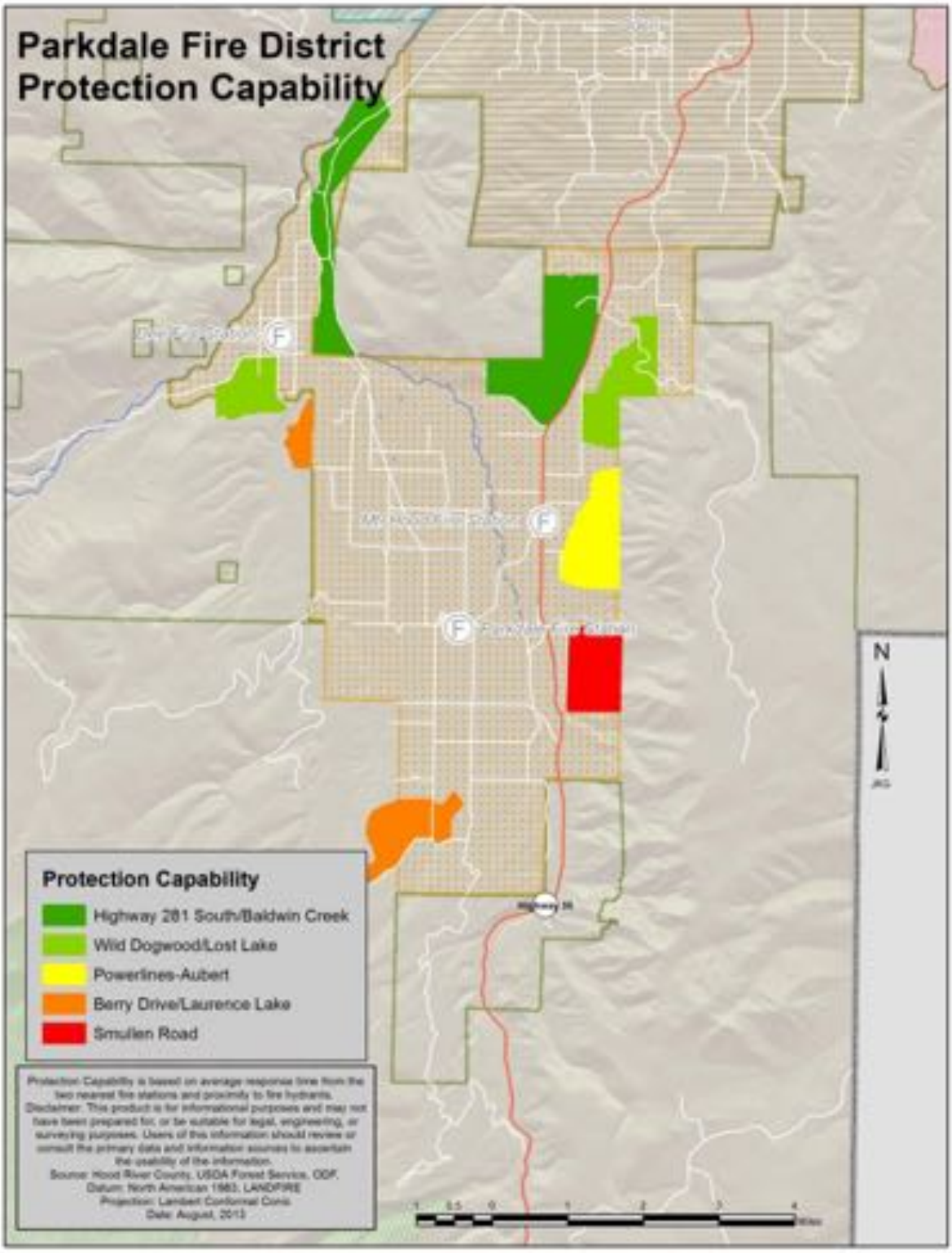

Wy'East Fire District
High Hazard Areas
N
Hood River
Hazard Areas
Riverside Drive
Microwave Ridge
Maggie Lane
Shute Road
Highway 281
Fir Mountain Loop/Endow Road

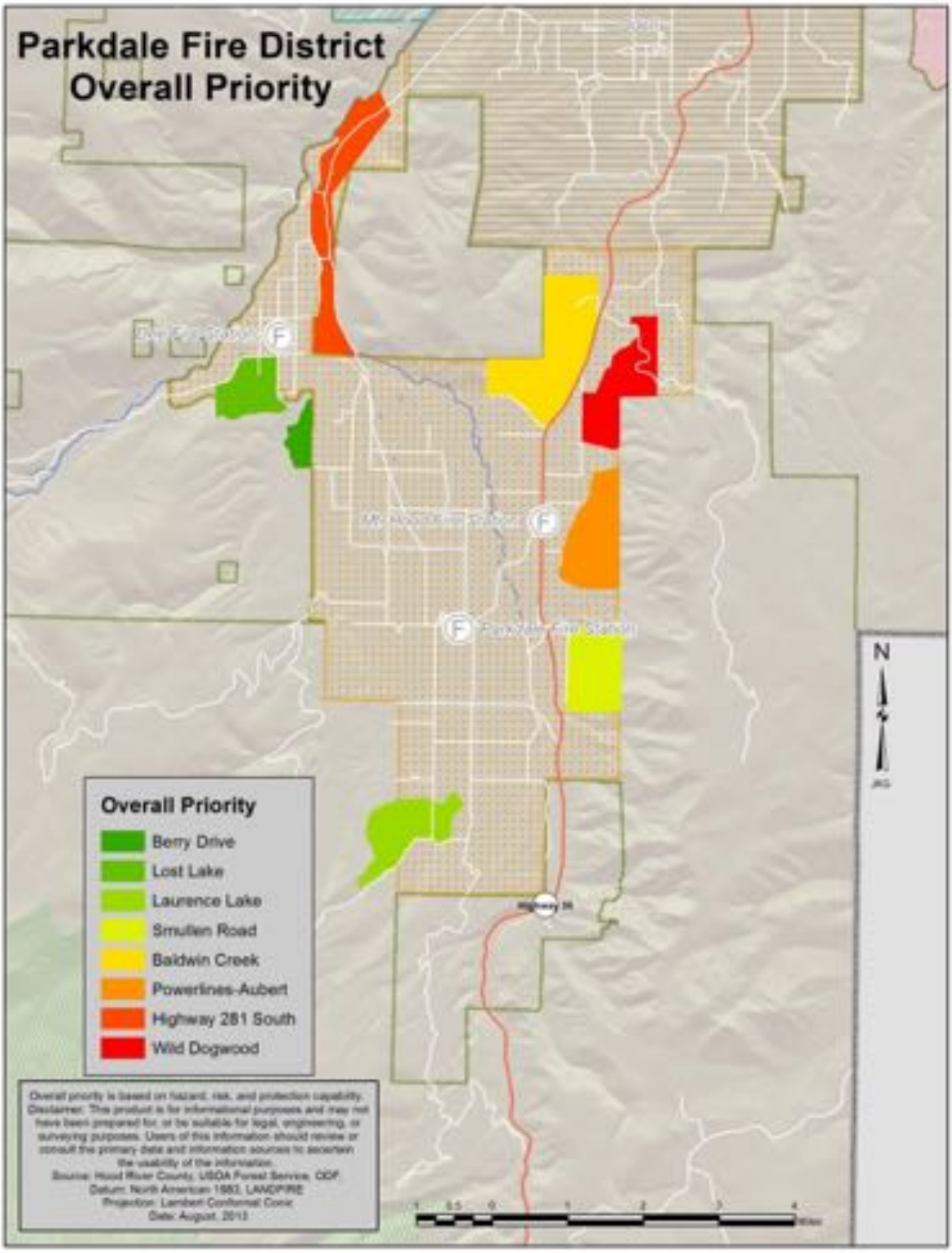

Wy'East Fire District
Protection Capability
N
Protection Capability
Riverside Drive
Microwave Ridge
Maggie Lane
Shute Road
Highway 281
Fir Mountain Loop/Endow Road

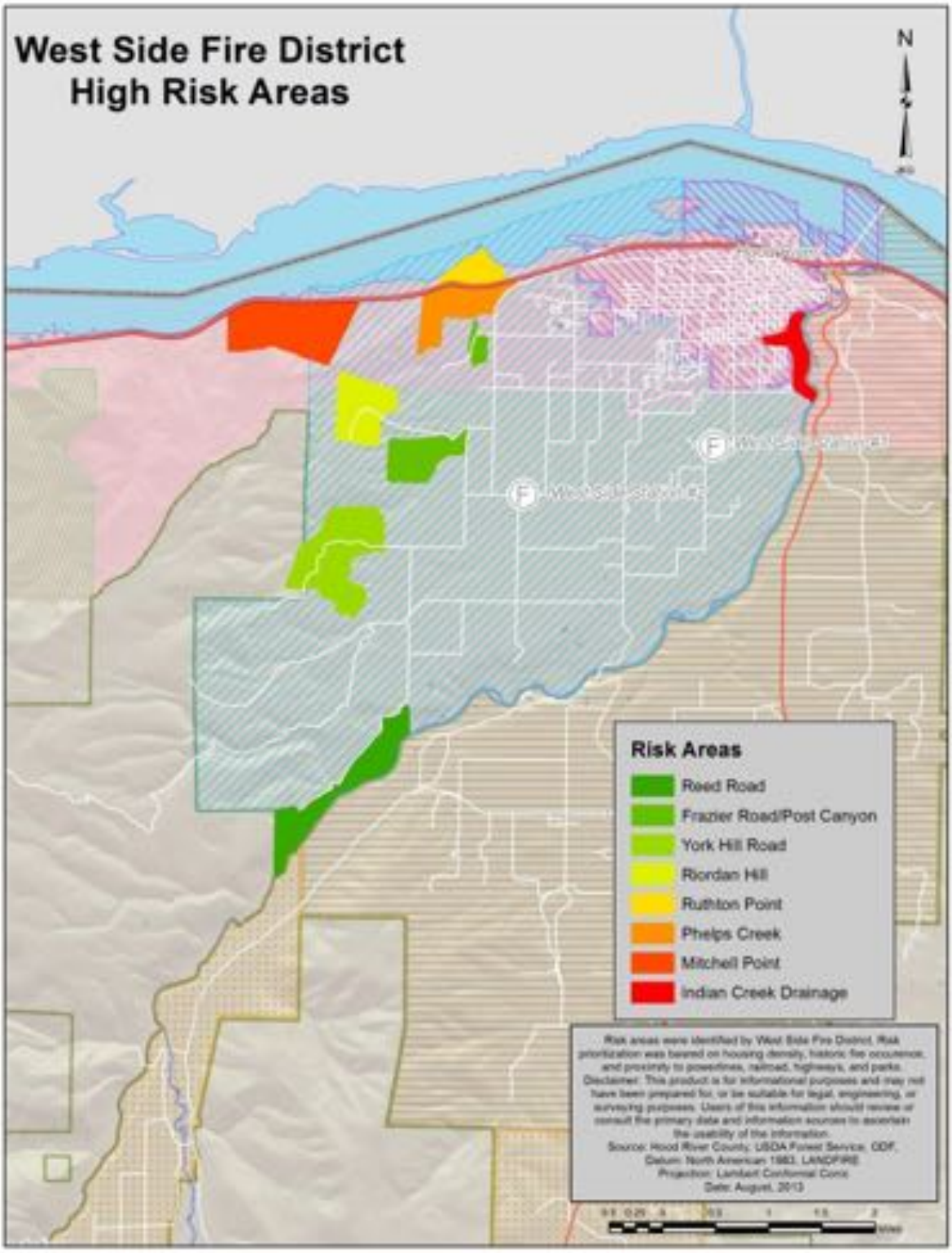

Wy'East Fire District
Overall Priority
N
Hood River
Overall Priority
Riverside Drive
Maggie Lane
Fir Mountain Loop
Endow Road
Highway 281
Microwave Ridge
Shute Road
Overall priorities for Wy'East Fire District are base on hazard, risk, and protection capability
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF
Datum: North American 1983, LANDFIRE
Projection: Lambert Conformal Conic
Date: August, 2012


Parkdale Fire District
High Risk Areas
Risk Areas
Berry Drive
Lost Lake Road
Smullen Road/Laurence Lake
Powerline-Aubert
Balsm Creek/Wild Dogwood
Highway 281 South
N


Parkdale Fire District
High Hazard Areas
Hazard Areas
Berry Drive
Lost Lake Road
Highway 281 South
Baldwin Creek
Laurence Lake
Wild Dogwood/Smullen Road
Powerline-Aubert
N


Parkdale Fire District
Protection Capability
N
Protection Capability
Highway 281 South/Baldwin Creek
Wild Dogwood/Lost Lake
Powerlines-Aubert
Berry Drive/Laurence Lake
Smullen Road
Protection Capability is based on average response time from the two nearest fire stations and proximity to fire hydrants.
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF.
Datum: North American 1983, LANDFIRE
Projection: Lambert Conformal Conic
Date: August, 2013


Parkdale Fire District
Overall Priority
Overall Priority
Berry Drive
Lost Lake
Laurence Lake
Smullen Road
Baldwin Creek
Powerlines-Aubert
Highway 281 South
Wild Dogwood
N


West Side Fire District
High Risk Areas
N
Risk Areas
Reed Road
Frazier Road/Post Canyon
York Hill Road
Riordan Hill
Ruthton Point
Phelps Creek
Mitchell Point
Indian Creek Drainage
Risk areas were identified by West Side Fire District. Risk prioritization was based on housing density, historic fire occurence, and proximity to powerlines, railroad, highways, and parks.
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF.
Datum: North American 1983, LANDFIRE
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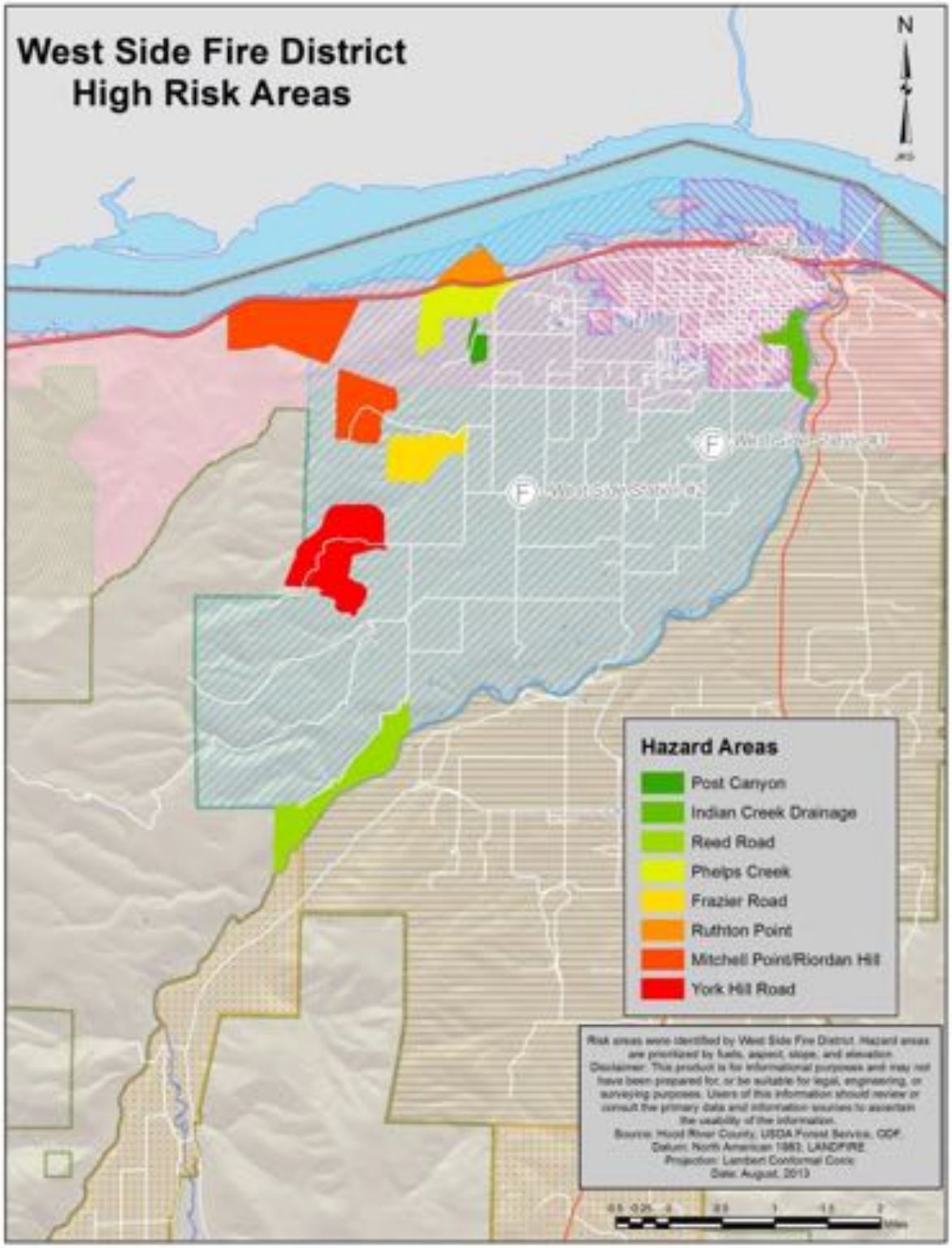
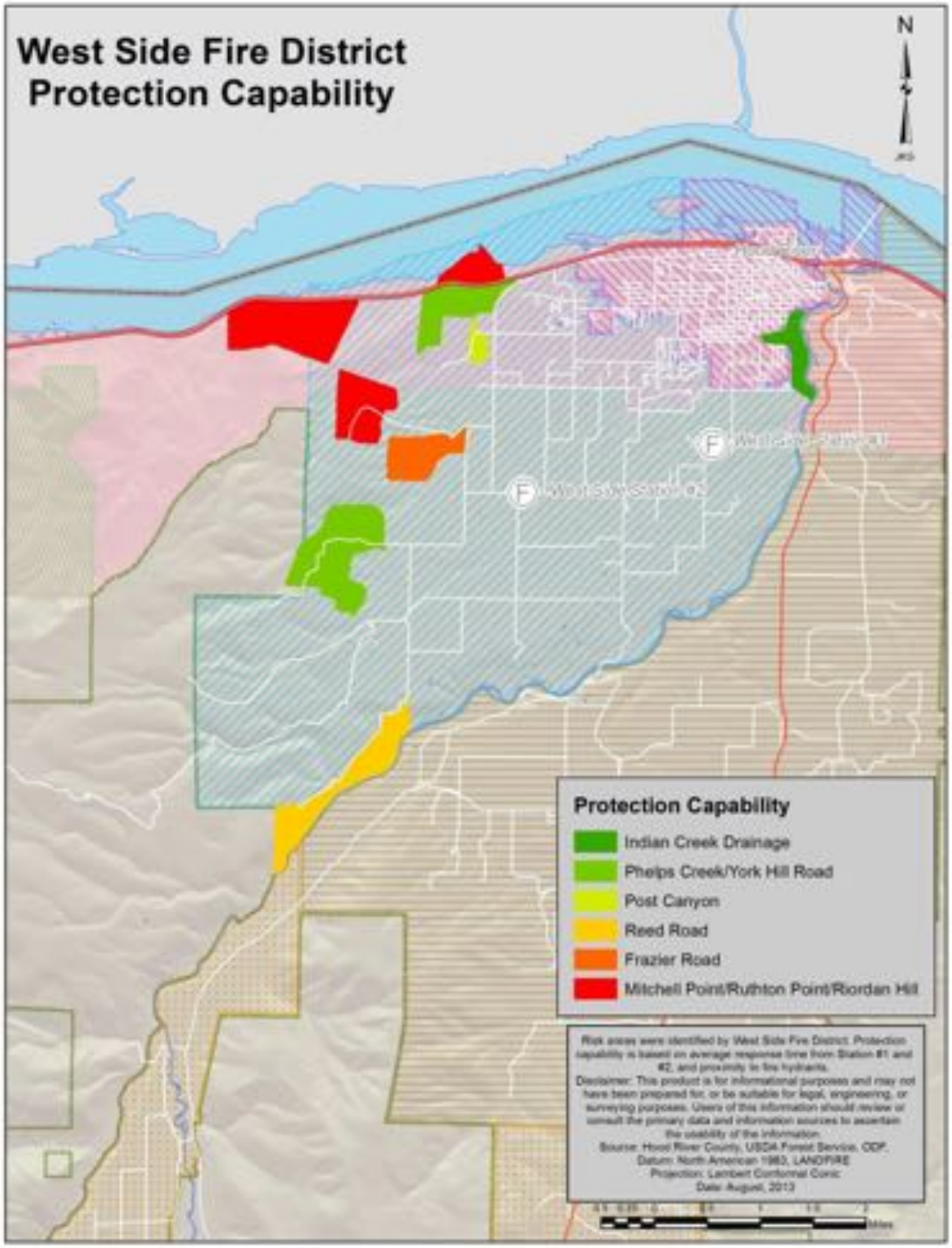
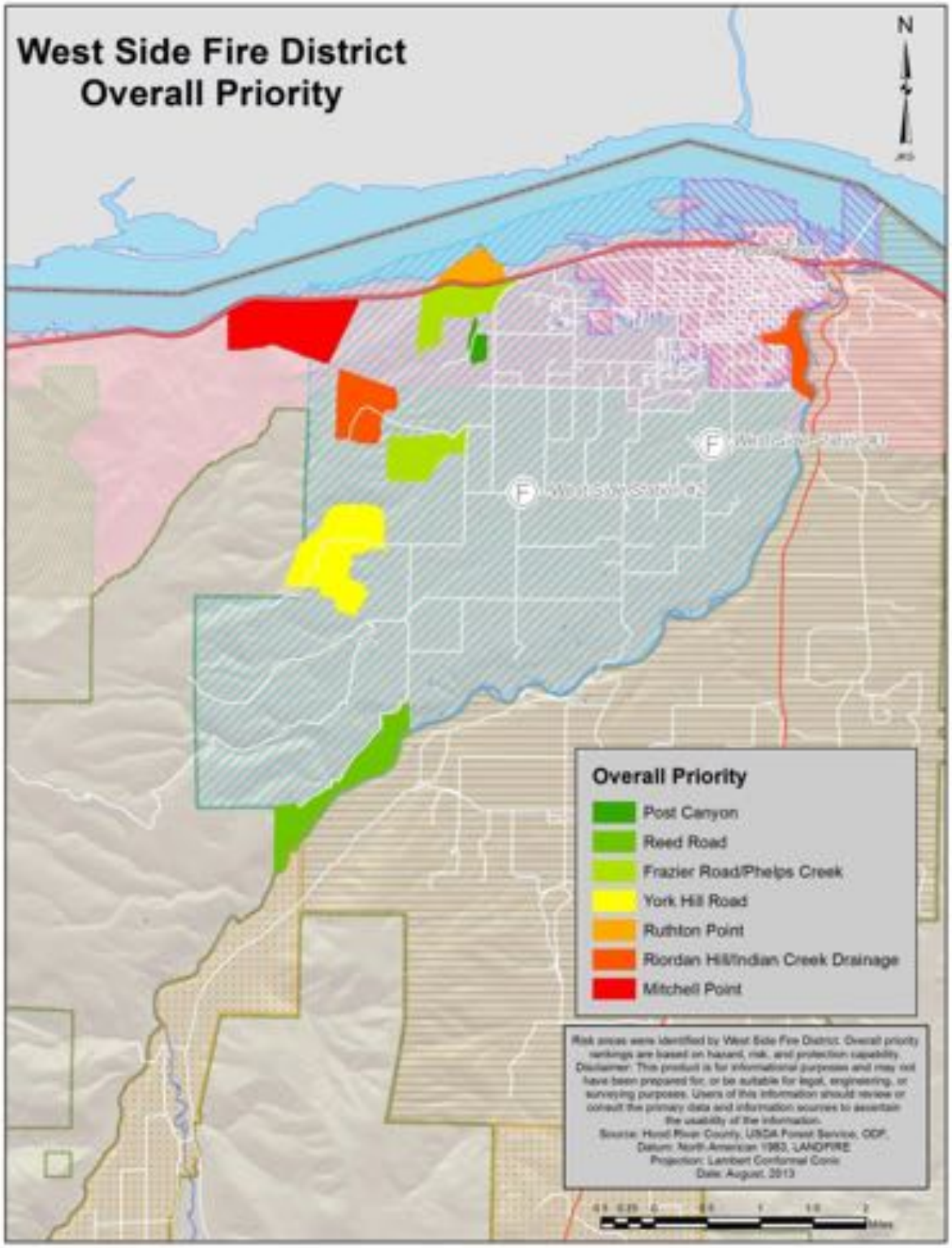
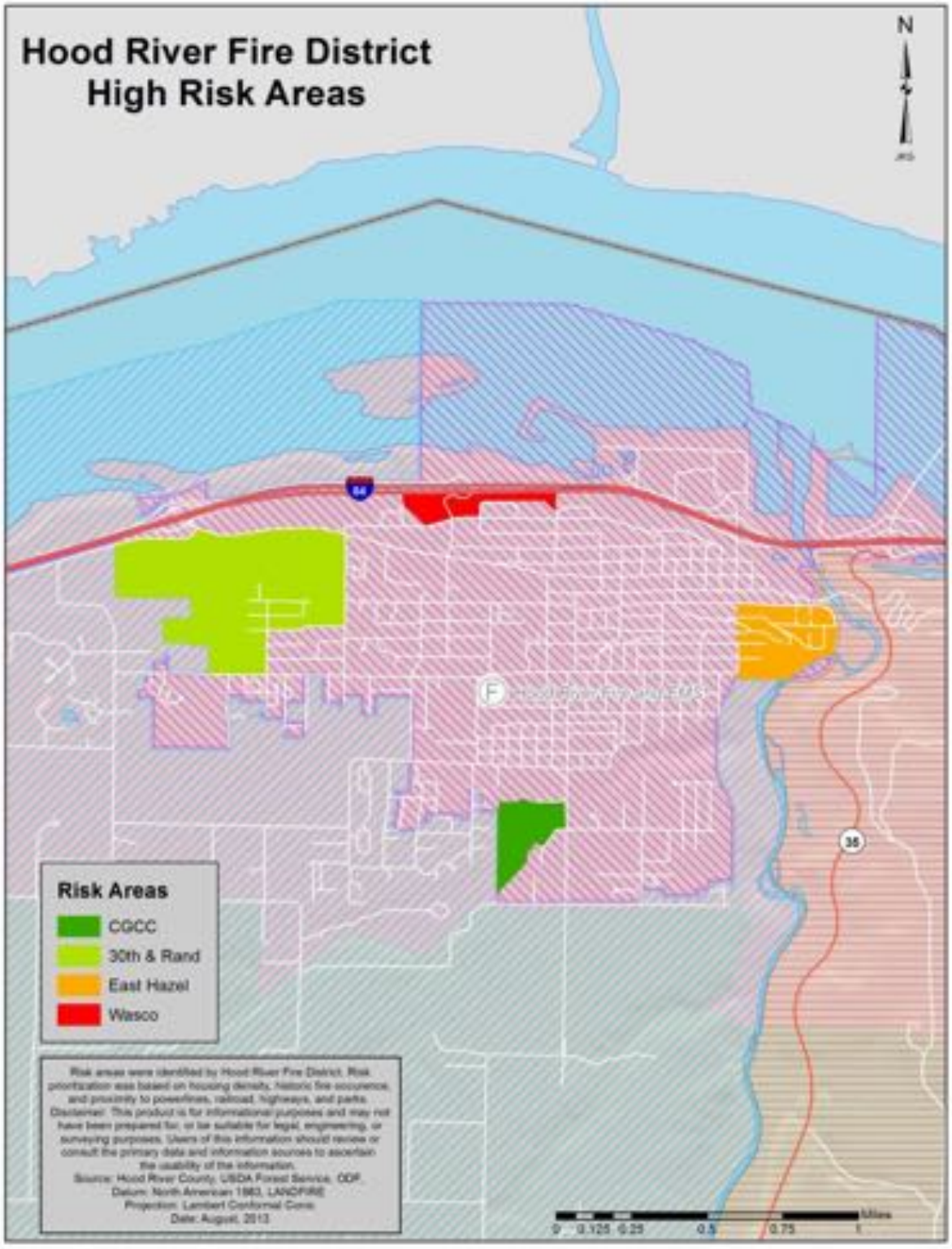
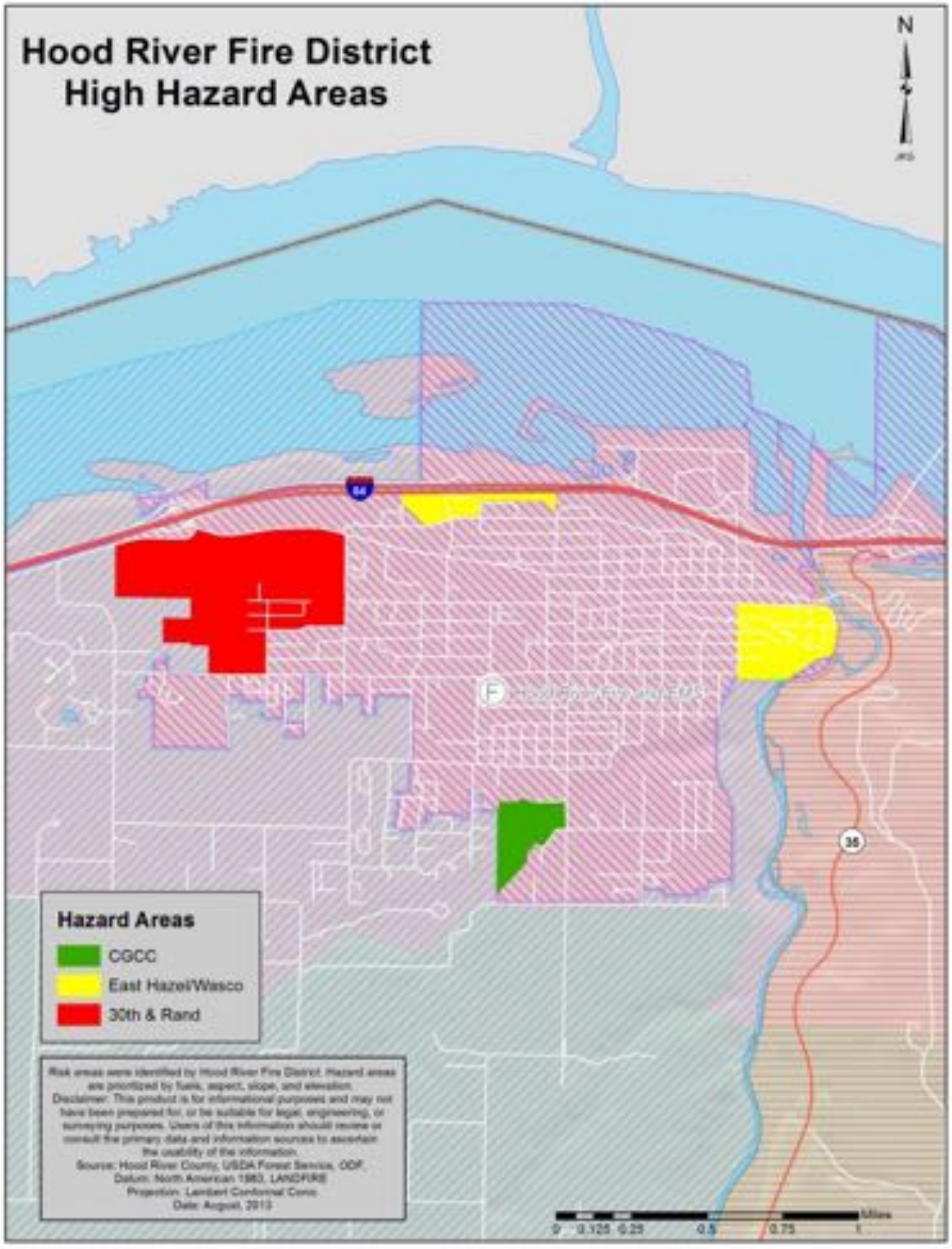
Date: August, 2013

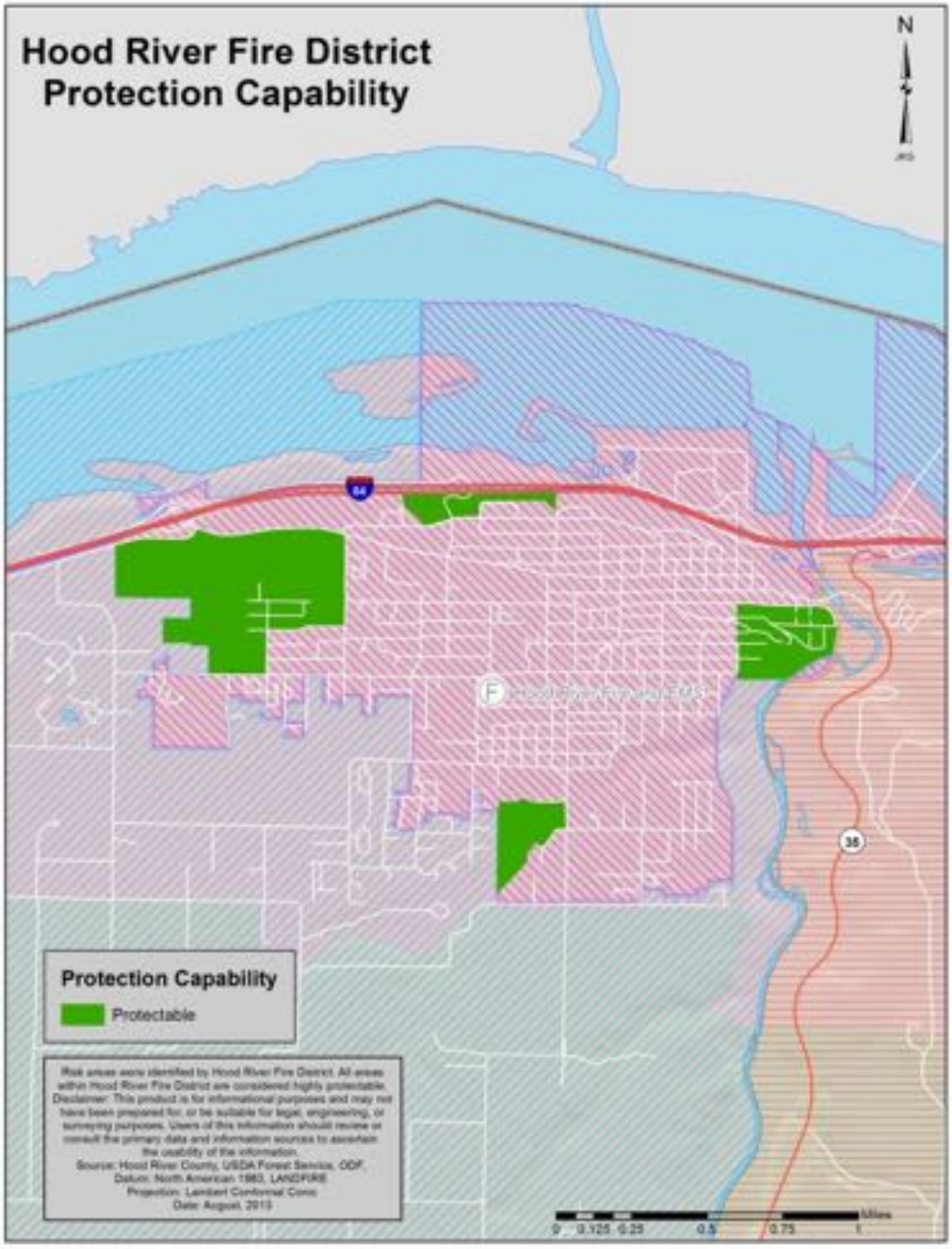

West Side Fire District
High Risk Areas
N
Hazard Areas
Post Canyon
Indian Creek Drainage
Reed Road
Phelps Creek
Frazier Road
Ruthton Point
Mitchell Point/Riordan Hill
York Hill Road
Risk areas were identified by West Side Fire District. Hazard areas are prioritized by fuels, aspect, slope, and elevation.
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF
Datum: North American 1983, LANDFIRE
Projection: Lambert Conformal Conic
Date: August, 2013

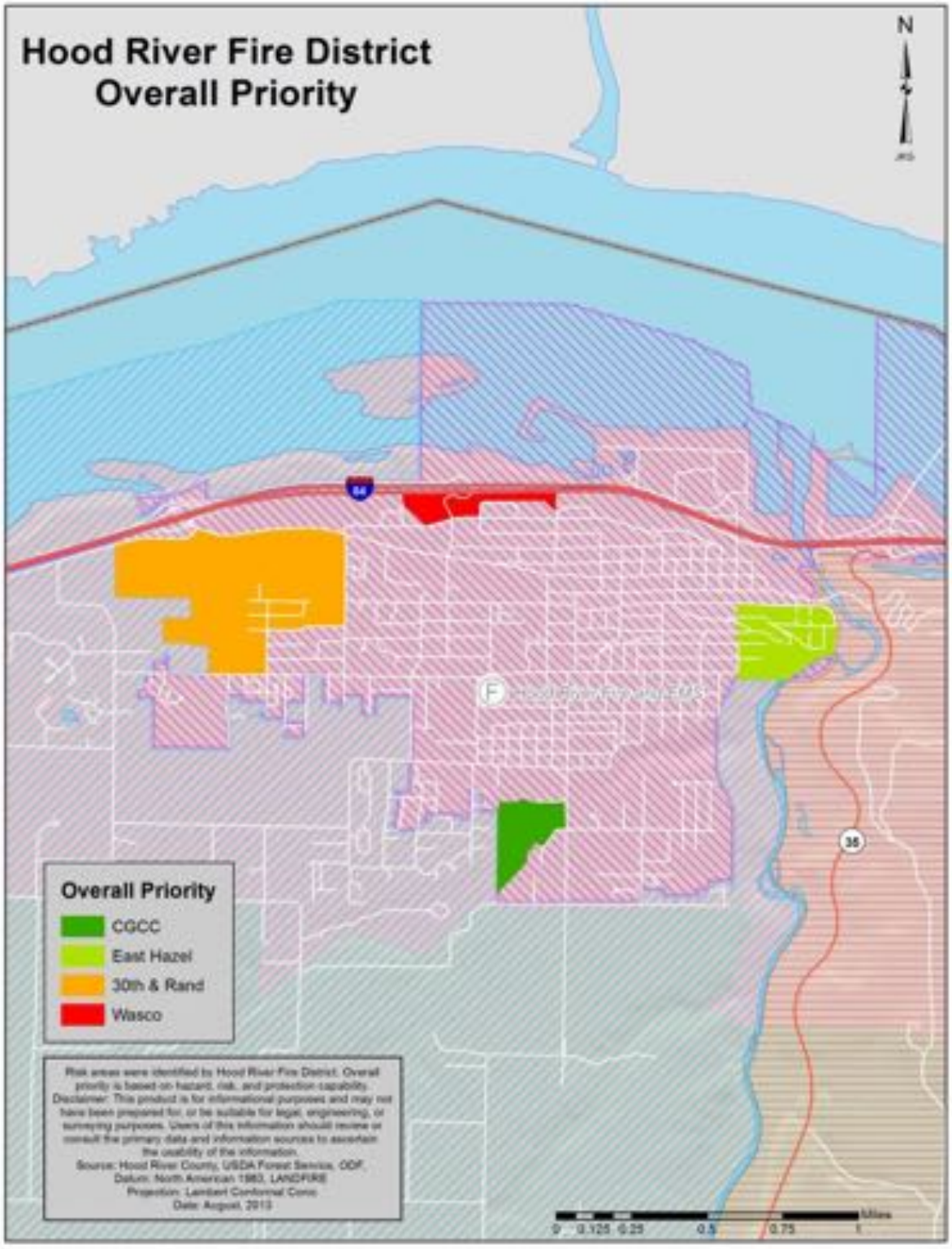

West Side Fire District
Protection Capability
N
Protection Capability
Indian Creek Drainage
Phelps Creek/York Hill Road
Post Canyon
Reed Road
Frazier Road
Mitchell Point/Ruthton Point/Riordan Hill
Risk areas were identified by West Side Fire District. Protection capability is based on average response time from Station #1 and #2, and proximity to fire hydrants.
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF.
Datum: North American 1983, LANDFIRE
Projection: Lambert Conformal Conic
Date: August, 2013
Miles

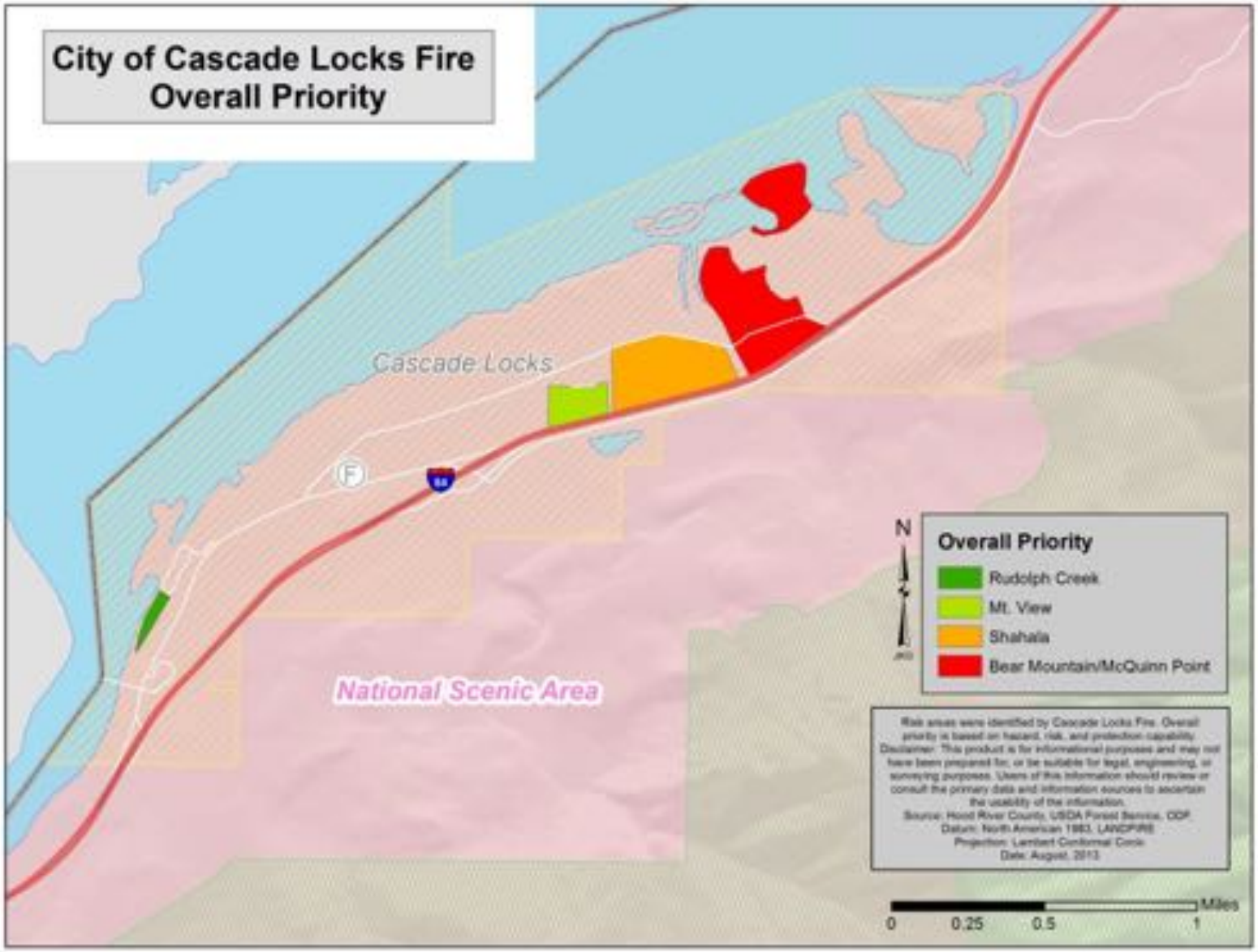

West Side Fire District
Overall Priority
N
Overall Priority
Post Canyon
Reed Road
Frazier Road/Phelps Creek
York Hill Road
Ruthton Point
Riordan Hill/Indian Creek Drainage
Mitchell Point
Risk areas were identified by West Side Fire District. Overall priority rankings are based on hazard, risk, and protection capability.
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF.
Datum: North American 1983, LANDFIRE
Projection: Lambert Conformal Conic
Date: August, 2013
Miles

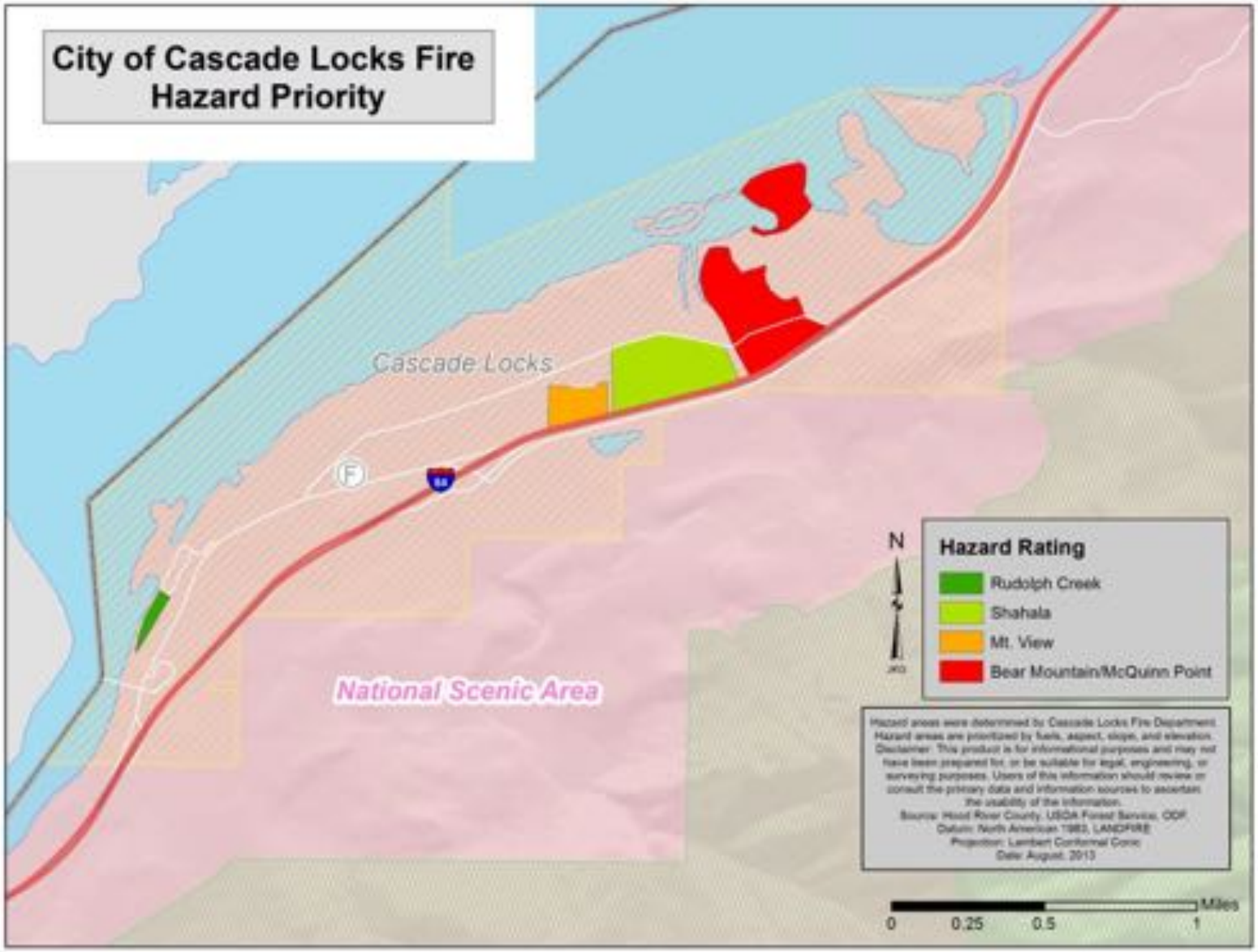

Hood River Fire District
High Risk Areas
N
Risk Areas
CGCC
30th & Rand
East Hazel
Wasco
Risk areas were identified by Hood River Fire District. Risk prioritization was based on housing density, historic fire occurence, and proximity to powerlines, railroad, highways, and parks.
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF
Datum: North American 1983, LANDFIRE
Projection: Lambert Conformal Conic
Date: August, 2013
84
35
0 0.125 0.25 0.5 0.75 1
Miles

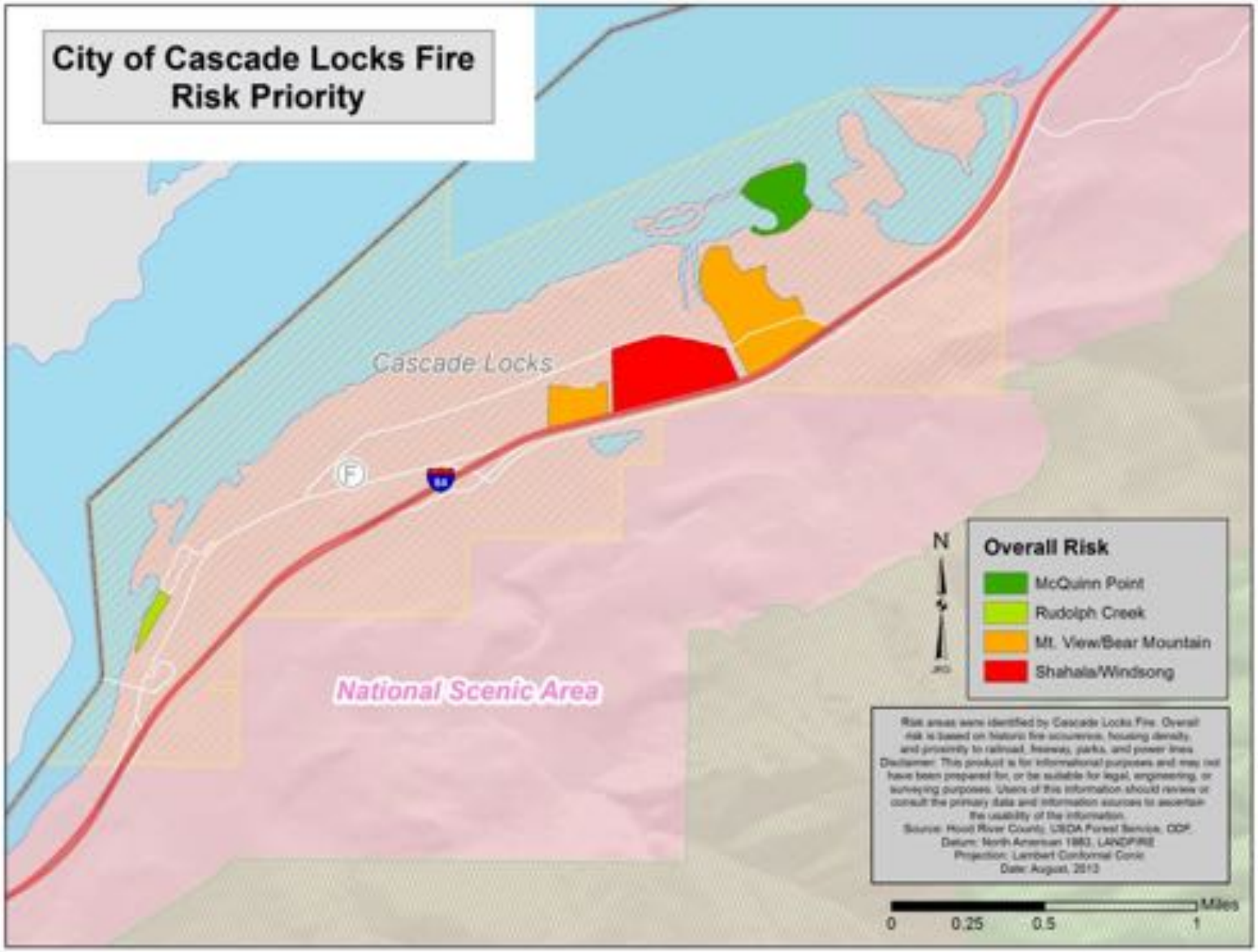

Hood River Fire District
High Hazard Areas
N
84
35
Hazard Areas
CGCC
East Hazel/Wasco
30th & Rand
Risk areas were identified by Hood River Fire District. Hazard areas are prioritized by fuels, aspect, slope, and elevation.
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF
Datum: North American 1983, LANDFIRE
Projection: Lambert Conformal Conic
Date: August, 2013
0 0.125 0.25 0.5 0.75 1
Miles


Hood River Fire District
Protection Capability
N
84
35
Protection Capability
Protectable
Risk areas were identified by Hood River Fire District. All areas within Hood River Fire District are considered highly protectable.
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF
Datum: North American 1983, LANDFIRE
Projection: Lambert Conformal Conic
Date: August, 2013
0 0.125 0.25 0.5 0.75 1
Miles


Hood River Fire District
Overall Priority
N
84
35
Overall Priority
CGCC
East Hazel
30th & Rand
Wasco
Risk areas were identified by Hood River Fire District. Overall priority is based on hazard, risk, and protection capability.
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF
Datum: North American 1983, LANDFIRE
Projection: Lambert Conformal Conic
Date: August, 2013
Miles
0 0.125 0.25 0.5 0.75 1


City of Cascade Locks Fire
Overall Priority
Cascade Locks
National Scenic Area
N
Overall Priority
Rudolph Creek
Mt. View
Shahala
Bear Mountain/McQuinn Point
Miles
0
0.25
0.5
1


City of Cascade Locks Fire Hazard Priority
Cascade Locks
National Scenic Area
N
Hazard Rating
Rudolph Creek
Shahala
Mt. View
Bear Mountain/McQuinn Point
Hazard areas were determined by Cascade Locks Fire Department. Hazard areas are prioritized by fuels, aspect, slope, and elevation.
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF
Datum: North American 1983, LANDFIRE
Projection: Lambert Conformal Conic
Date: August, 2013
Miles
0
0.25
0.5
1


City of Cascade Locks Fire Risk Priority
Cascade Locks
National Scenic Area
N
Overall Risk
McQuinn Point
Rudolph Creek
Mt. View/Bear Mountain
Shahala/Windsong
Miles
0
0.25
0.5
1

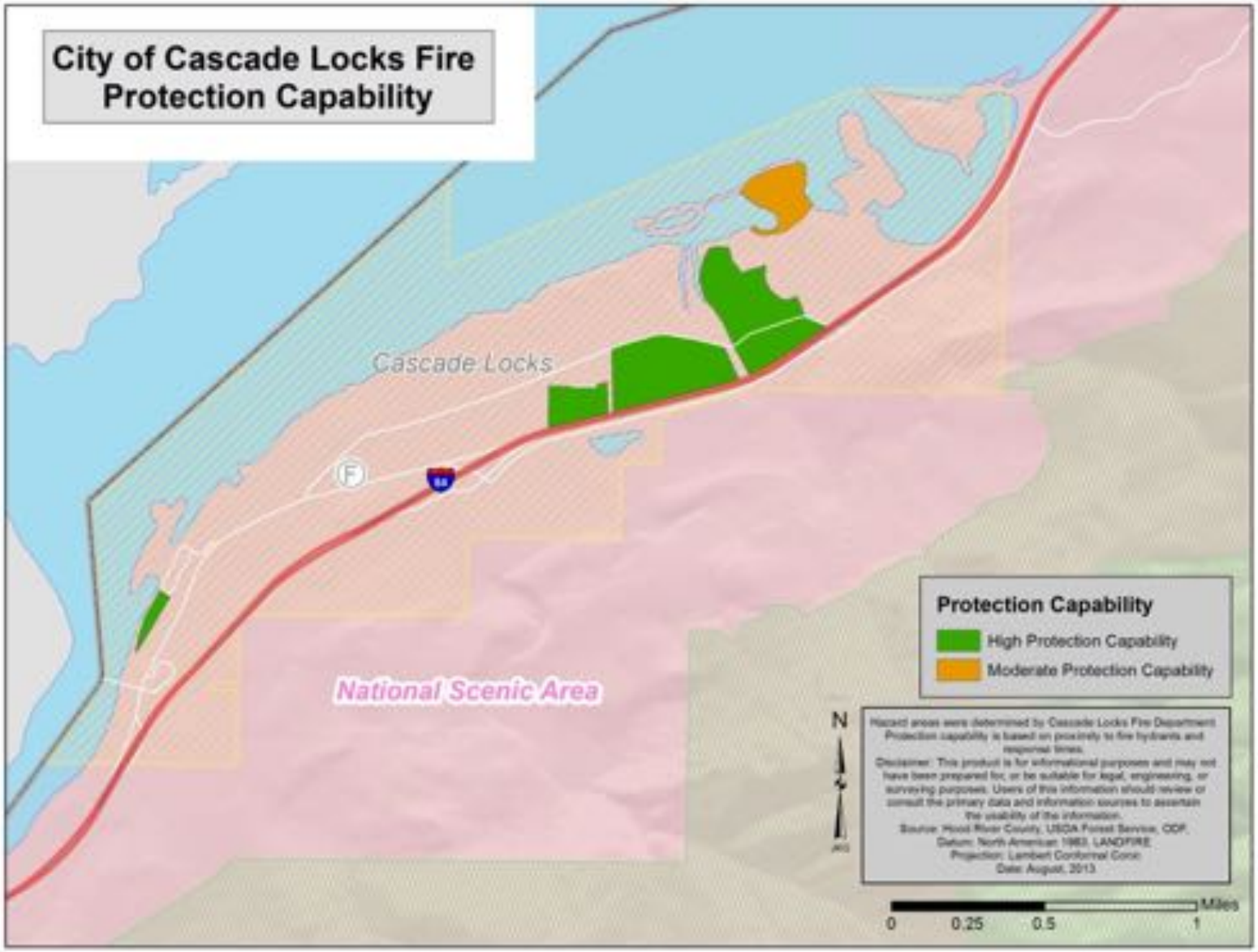

City of Cascade Locks Fire Protection Capability
Cascade Locks
National Scenic Area
Protection Capability
High Protection Capability
Moderate Protection Capability
N
Hazard areas were determined by Cascade Locks Fire Department. Protection capability is based on proximity to fire hydrants and response times.
Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Source: Hood River County, USDA Forest Service, ODF.
Datum: North American 1983, LANDFIRE
Projection: Lambert Conformal Conic
Date: August, 2013
Miles
0
0.25
0.5
1

Table 7: Prioritized project areas in Hood River County.

Name	District	CAR	Hazard	Risk	Protection	Overall	Priority	Page
Mitchell Point	West Side	West Side	32	29	24	85	Very High	113
Shute Road	Wy'East	Odell	27	32	19	78	Very High	100
Microwave Ridge	Wy'East	Pine Grove	25	35	14	74	Very High	101
Wild Dogwood	Parkdale	Parkdale	32	26	16	74	Very High	107
Indian Creek	Hood River	Hood River	30	35	8	73	Very High	114
Highway 281	Wy'East	Odell	29	16	24	69	High	102
Highway 281 South	Parkdale	Parkdale	26	32	11	69	High	107
Powerline-Aubert	Parkdale	Parkdale	34	16	18	68	High	108
Riordan Hill	West Side	West Side	34	9	24	67	High	115
Ruthton Point	West Side	West Side	32	11	24	67	High	116
Baldwin Creek-Hillcrest	Parkdale	Parkdale	28	26	11	65	High	109
Reed Road	West Side	West Side	34	11	19	64	High	120
Frazier Road	West Side	West Side	36	6	21	63	High	118
Smullen Road	Parkdale	Parkdale	32	10	21	63	High	110
Phelps Creek	West Side	West Side	34	14	14	62	High	119
Endow Road	Wy'East	Odell	33	6	21	60	High	103
Fir Mountain Loop	Wy'East	Pine Grove	33	5	21	59	High	104
Laurence Lake	Parkdale	Parkdale	30	10	19	59	High	105
Maggie Lane	Wy'East	Pine Grove	26	7	21	54	Moderate	110
McQuinn Point	Cascade Locks	Cascade Locks	31	6	16	53	Moderate	126
Bear Mountain	Cascade Locks	Cascade Locks	30	13	8	51	Moderate	128
York Hill Road	West Side	West Side	32	8	11	51	Moderate	117
Riverside Drive	Wy'East	Odell	13	12	24	49	Moderate	105
Lost Lake Road	Parkdale	Parkdale	25	6	16	47	Moderate	111

Shahala/Windsong	Cascade Locks	Cascade Locks	18	19	8	45	Moderate	126
Mt. View	Cascade Locks	Cascade Locks	22	15	8	45	Moderate	127
Berry Drive	Parkdale	Parkdale	19	3	19	41	Low	112
Wasco Street	Hood River	Hood River	13	17	8	38	Low	122
30th and Rand	Hood River	Hood River	18	11	8	37	Low	123
Rudolph Creek	Cascade Locks	Cascade Locks	17	9	8	34	Low	129
East Hazel	Hood River	Hood River	13	12	8	33	Low	123
CGCC	Hood River	Hood River	12	9	8	29	Low	124
Post Canyon	West Side	West Side	6	6	16	28	Low	121

Chapter 10
Emergency Response Operations

Emergency Response Operations

The Hood River County Fire Chiefs Association (HRCFCA) oversees and coordinates emergency response throughout lands within protected fire districts in Hood River County. Participating fire districts in the HRCFCA include the City of Hood River Fire and EMS, City of Cascade Locks Fire, Parkdale Rural Fire Protection District, Wy'East Rural Fire Protection District, and West Side Rural Fire Protection District. Fire Chiefs from participating districts meet monthly (with the exception of peak fire season) and discuss county wide fire/emergency response operations. The HRCFCA additionally works with federal and state fire agencies in determining local burn ban implementation dates.

FIRE DEPARTMENTS/DISTRICTS

Hood River County has five structural/wildland fire districts, two of which are municipalities (City of Cascade Locks and the City of Hood River). Other fire resources are Oregon Department of Forestry (ODF) and the US Forest Service (USFS.) ODF provides fire protection to all private and non-federal forest lands in Hood River County, which includes forested lands within all fire districts except the city of Hood River. The USFS provides suppression and protection services to federal lands and is composed of two distinct administrative units: Mt. Hood Ranger District and Columbia Gorge National Scenic Area.

Hood River County structural fire and EMS services are mostly staffed with volunteer personnel that are on call 24 hours per day, seven days a week. Responses are initiated via the 911 center with alarms communicated to the volunteer crews via tone activated pagers that are issued to all personnel. A new 911 operations system (Active 911) is currently being adopted to function with Hood River's existing CAD system. Active 911 hopes to improve response time and increase volunteer response by alerting volunteer and paid personnel through a variety of media devices, including iPhone, Android, Blackberry, tablet, and digital cell phones.

Hood River Fire and EMS is the only department that is staffed full time. They provide fire and EMS response to those living within the city limits, as well as Advanced Life Support to those districts without an ambulance service. The City of Cascade Locks and Parkdale Fire additionally have Advanced and Basic Life Support ambulance service, while Wy'East and West Side Fire rely predominantly on Hood River Fire and EMS. West Side, Wy'East, Cascade Locks, and Parkdale all are staffed during regular daytime hours by the fire chief and lieutenant.

AUTOMATIC AND MUTUAL AID AGREEMENTS

Automatic, [3] mutual aid[4] and immediate need[5] agreements currently in place enhance timely responses of equipment and personnel either as initial or supplement resources. Automatic and mutual aid agreements allow for comprehensive coverage and quick initial attack on fire starts.

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[3] Automatic Aid is an interdepartmental agreement where specific apparatus and personnel respond automatically into an adjoining district.

[4] Mutual Aid is an interdepartmental agreement where specific apparatus and personnel may be requested case by case to respond into an adjoining district.

Each of the fire districts has predetermined agreements to supply to one another equipment and/or manpower to assist in mitigating emergency operations. Aid may be activated to overcome a shortfall in personnel during the day when some volunteers may not be able to respond from work or equipment may be out of service or in use at another emergency. Shortfalls of personnel may also be seasonal (i.e. elk/deer hunting season, fruit harvest).

Hood River County Fire districts also place personnel and equipment at the Oregon State Fire Marshal's disposal to assist in the implementation of the State's Conflagration Act. The act is invoked when there is a fire in any one county that overwhelms the local and mutual aid resources of that county. The County Fire Defense Chief will request through the Governor that additional resources be assigned to fight fire and manage the conflagration. Strike Teams and Task Forces will be assigned from other fire districts in neighboring counties to assist.

Conflagration and Immediate Needs are two circumstances where apparatus and personnel from Hood River County will leave the county. These teams will be sent as a Task Force or a Strike Team. A Task Force is typically requested when a variety of equipment is needed for fire protection and suppression—in Hood River County, a Task Force will typically send two structural engines, three boosters (wildland fire apparatus), and one tender (water truck), all from different districts. A Strike Team typically consists of one tender and five engines. In both Immediate Needs and Conflagration Acts, apparatus and personnel are taken from throughout the county as to minimize depletion of resources from any single fire district.

FIRE DEPARTMENT CAPACITY

Each fire department has resources and man power to provide fire protection to its residents every day of the year. Personnel available for response may vary considerably depending on the time of day, hence the need for mutual and automatic aid agreements. It is unlikely that there will be two or more structure fires burning at the same time across the county that would come close to depleting manpower resources. In the advent of a large wildland fire, the initial response crews may be under staffed and under equipped for a short period of time until federal, state, and immediate needs crews respond.

The mergers between Parkdale and Dee Fire to form Parkdale RFPD, and between Pine Grove and Odell Fire to form Wy'East RFPD has significantly increased available personnel for fire suppression and emergency response. Merging resources and personnel has increased the response time and capability of both fire protection districts.

ROAD SYSTEMS

Critical to a functioning community is the ability to freely and safely navigate the roads and driveways. The road system starts where you park your car at your house. Here, at the driveway, fire personnel often find their main challenges in protecting and suppressing a fire at a home. A large semi-truck and trailer is not required to access all homes, but a Type 1 fire engine, eight and one half feet wide, weighing 35,000 pounds, should be able park at your front door and turn

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[5] Immediate Need is an interdepartmental agreement where predetermined apparatus and personnel will respond from many departments to assist an adjoining district or county.

around with ease if you are more than 150 feet from a road. For new construction, this is addressed in current codes; however, for older dwellings, access may not accommodate fire engines. To ensure that a home is safely defendable in the WUI, access from driveways and private roads should follow the below criteria:

- Driveways must be a minimum of 20 feet wide
- Driveways (especially with bridges or culverts) shall be able to support 65,000 pounds
- Provide an adequate turnaround for Type I fire apparatus if the driveway is longer than 300 feet
- Provide a vertical clearance of 13 feet 6 inches
- Driveways and street numbers should also be clearly identified and visible from the roadway
- On driveways with numerous spurs, spur driveways should be clearly marked with address number and road.

Driveways that do not meet current fire access standards pose a significant safety risk for fire fighters and residents whether it is in terms of access or egress. Safety can be further compromised by poorly maintained road surfaces and excessive overhanging or encroaching vegetation. On driveways and private roads, it is up to the property owner to ensure that fire personnel can safely access homes. Responding personnel may choose not to offer protection for houses at the end of theses dead end roads if responding will trap or compromise firefighter safety.

During times of emergency, it is the duty of law enforcement to maintain an orderly flow of traffic on the roads. Public works and fire department personnel may be called on to assist in traffic management. In times of conflagration, responding fire apparatus share the road with evacuating residents. During this time, it is preferable that a series of one way traffic routes be established with check valves to guide the motoring public.

Reference points such as address numbers should be visible at all driveways, at the road side and at junctions on shared driveways. While the local fire personnel may have a good idea of where residences are, out of district personnel may struggle without adequate street and address signs, especially if they are further hampered by smoke.

WATER SUPPLY

Water systems that supply an adequate volume and pressure for a sufficient duration of time are essential to sustain firefighting efforts for both structural and wildland protection. District water systems for the county originate well beyond the final delivery points. Reservoirs, pumping stations, water mains and hydrants along with the watershed are part of the county's vital infrastructure.

Water will come in two basic ways for initial fire response either directly through hoses via a fire hydrant or delivered to the fire via fire apparatus such as tenders carrying thousands of gallons of water. The structures further into the WUI are more remote; consequently, tender operations are more prevalent.

Tender operations require more personnel to manage and will generally require more than one tender, sometimes up to four or more depending on the fire flow needed and the distance to the

filling site. When minutes count, an additional engine may be used to fill tenders to help shorten the delivery turnaround time. To mitigate longer turnaround times, fire operations will utilize other sources of water, such as swimming pools, private ponds, creeks, rivers and irrigation canals.

The insurance industry is becoming more aware of the issues surrounding structures in the WUI. The Insurance Service Organization (ISO) already places an emphasis on fire protection at the fire district level by assigning a district rating dependent on water, personnel, apparatus availability and response times.

DEPARTMENT PERSONNEL AND ROUTINE TRAINING

There are five agencies that provide structural and wildland fire suppression duties in addition to protection services rendered by ODF and USFS. All of the five agencies are maintained by assessed funds. Cascade Locks and Hood River fire departments are city based while Wy'East, Parkdale, and Westside are Rural Fire Protection Districts overseen by a board of directors.

The fire districts are structured in a command system consisting of chiefs, assistant chiefs, captains, lieutenants, engineers and firefighters or a combination of those listed. Some also have staffing that consists of support personnel. All of these individuals are required to work together to suppress a fire or protect a home in the event of an emergency. As a result, mandatory standardized training is required for fire personnel.

Training and departmental duties occur weekly to address equipment readiness and business concerns. Much of the training that is mandated such as first aid, CPR, blood borne pathogens, hazmat, fit testing (for SCBA - air packs), and fitness testing. Guidelines come from Occupational Safety Hazard Association (OSHA) and Oregon State Fire Marshal (OSFM.) Volunteers are asked to commit one night per week to the fire department to ensure that training is current and that the volunteer can safely operate equipment. Continuous training is recognized as a key component in the successful performance of any volunteer fire department.

Of the issues that face the Hood River County fire service, volunteer recruitment and retention is the most challenging. Many younger volunteers welcome the education and training that the fire service provides and will use that experience to seek out jobs in the fire service elsewhere. Historically, the volunteer base has relied on neighbor helping neighbor with personnel living and working within their respective districts, performing duties as firemen. Departments tended to be very close knit and social. Today there are a declining number of fire calls and an increasing amount of traffic and medical response situations. Changing emergency patterns combined with a significant increase in mandatory training have contributed significantly to the decline in volunteers throughout Hood River County. The decline in structure fires is mostly related to improved building codes, better construction materials and public education.

Today the county fire service is learning the virtues of acquiring equipment that enhances interoperability. For example, six of the seven departments now have identical Self Contained Breathing Apparatus (SCBA). With more automatic and mutual aid agreements in place, the value associated with interoperable equipment and training will is realized. To streamline this

process, many districts and departments nation-wide have coordinated and consolidated training and administrative efforts to form unified districts.

RESIDENTIAL FIRE PROTECTION

Fire districts, through an Insurance Service Organization (ISO[6]) rating system are assigned a value that is dependent on the ability to provide water, equipment and personnel to protect residents and structures. The insurance industry looks at the rating system and will assign premiums accordingly. The system rates fire districts on according to class scale, where Class 10 equals no fire protection and Class 1 represents well developed protection and response capabilities.

Most people are familiar with the "are you within 1000 feet of a fire hydrant?" question. While this is a basic question for many insurance companies there are other mitigating solutions that offer the equivalent water resources. An example of a water resource equivalent is a water tender shuttles that can maintain a 250 gallon per minute water supply for a 2 hour period of time that are available to supply an engine at 250 gallons per minute at 125 pounds per square inch within 5 minutes of the engine's arrival. To receive an ISO rating, each district submits to regular inspections.

[6] www.isomitigation.com

Chapter 11
Community Wildfire Prevention Resources and Outreach

Community Wildfire Prevention Resources and Outreach

The involvement of the community is one of the best ways to reduce the risk and consequence associated with wildfire. For one, it is members of the community that are on the front lines for reporting fires and fire hazards. An educated and aware citizenry can significantly reduce the chance of a fire ignition. They can also reduce the chance of fire spread through property and home maintenance. The following chapter briefly outlines community outreach programs for wildfire awareness and prevention.

Ready, Set, Go!

Ready, Set, Go! (RSG) is a wildfire education and prevention program managed by the International Association of Fire Chiefs (IAFC). It is designed with the purposed of improving the communication between fire departments and the general public. In 2013, Hood River County Fire Services joined RSG in an effort to become part of the national dialogue in fire prevention and community outreach. As an RSG participant, Hood River County Fire Services has gained access to various implementation guides and planning documents; Spanish and English wildfire prevention and awareness materials; and interaction with other fire prone counties across the country. RSG also allows Hood River County to maintain a database of hours spent on public education and outreach in comparison to other departments around the country. Community resources can be accessed freely at www.wildlandfirersg.org.

Mid-Columbia Fire Prevention Coop

The Mid-Columbia Fire Prevention Coop provides fire awareness throughout the Mid-Columbia River Gorge. Members include Hood River Fire and EMS, Parkdale RFPD, Wy'East RFPD, West Side RFPD, Mid-Columbia Fire and Rescue, Underwood Conservation District, Mosier Fire, U.S. Forest Service, Washington Department of Natural Resources, Bureau of Land Management, Warm Springs Tribes, Oregon State Fire Marshal's Office, and Oregon Department of Forestry. The coop meets on a quarterly basis to discuss community events, PSAs, and public wildfire outreach. The Mid-Columbia Fire Prevention Coop website acts as a public resource for structural protection and wildfire prevention. Residents can stay current on NW fires at http://www.stopgorgefires.org.

Hood River County Fair

The Hood River County Fair has traditionally been a resource for community outreach in Hood River County. Held the last weekend in July, the County Fair is in the middle of wildfire season and acts as an opportunity to reach out to families and youth interested in fire prevention. The county fair is staffed daily by personnel from various fire departments who provide educational materials and answer questions on wildfire prevention.

Radio, News, and Big Screen PSAs

Three main venues for public outreach have been identified for Public Service Announcements. They are The Hood River News, Gorge Radio, and Hood River Cinemas. PSAs are submit to the Hood River News by the Wildfire Prevention Coordinator and other fire management personnel

to alert the public of upcoming fire season changes. Typically, Hood River News PSAs occur at the beginning of fire season to notify about changes to burning regulations, and at the end of the fire season. Periodically PSAs are issued regarding tree management methods during times of drought or Pine Beetle Outbreak. During fire season, Gorge Radio plays a 30 second announcement detailing simple wildfire preparation tasks around the home. Hood River Cinemas—in partnership with Mid-Columbia Fire Prevention Coop and Big Screen Advertising—play wildfire PSAs at the beginning of films detailing some of the dangers of fires in the Hood River Valley. All of the PSAs are designed to target a different audience in Hood River County.

Columbia Gorge Community College

The Columbia Gorge Community College has been a venue for wildfire prevention. At the beginning of fire season in 2013, CGCC hosted a free wildfire prevention and education seminar taught by the Hood River County Wildfire Prevention Coordinator. The seminar provided a brief history on the background of wildfires in the Northwest, and illustrated inexpensive techniques to reduce the intensity of a fire around the home. This included defensible space standards that are consistent with SB 360 and the National Fire Plan. The seminar also provided a venue for concerned citizens to ask questions about their homes in an open and friendly manner.

Hazard Area Mailings

Wildfire prevention and awareness mailers have been provided to those living within hazard areas of Hood River County. The mailers (see Appendix B) were created to encourage homeowners to create defensible space around their homes and prepare for wildfires. In 2013, 1,700 flyers were mailed to residents living in homes that were considered in extreme high risk areas. These areas were identified using current satellite imagery and local empirical knowledge of terrain, fuels, and potential ignition sources.

Wildfire Prevention Hotline

During the 2013 fire season, Hood River Fire and EMS hosted a Wildfire Prevention Hotline. The hotline provided a single phone line for interested citizens to call and have their wildfire questions answered. It also served as a go-to point for On-Call Hazardous Fuels Review. On-Call Hazardous Fuels Review allowed the assessment of fuels of individual homeowners based on digital information (acquired through a GIS and including terrain, fuels, ignition points) and a site specific assessment. Homeowners that received this assessment were given suggestions on how to improve their property's defensibility in the event of a wildland fire.

Wildfire Resistant Plants Distribution

The adage 'lean, mean, and green for 30 feet' was once an easy way to refer to defensible space around the home. While an affective motto, it does not take into consideration hazardous fuels such as blackberry, scotch broom, and hedges, which are green but remain extreme fire hazards. In an effort to combat this misconception, the Hood River County Fire Chiefs Association distributed a brochure on fire safe plants that can be planted around the home (*Fire-Resistant Plants for Home Landscapes*), a publication created by Oregon State University that focuses on native plants that can be planted near the home and still help maintain a level of resistance against fire. Brochures were distributed free of charge at local fire departments and nurseries.

Past Projects Completed

- Establish County-wide Wildfire Protection Group—Complete—The Hood River Fire Chief's Association serves as the coordinated wildfire protection group, meeting monthly to discuss county conditions and action items.
- Establish Demonstration Sites—Ongoing—Sites around the county have benefited from hazardous fuels reduction projects.
- Improve Residential Fire Protection Capability—Ongoing—Residential fire protection capacity has been improved through county land-use process for homes within the WUI.
- Hazardous Fuel Reduction—Ongoing—Hazardous fuels reduction projects have continued throughout Hood River County (see map on following page).
- GIS Infrastructure—Ongoing—Hood River County Fire services will continue to update GIS infrastructure through Title III Funding.
- Uniform Application of SB 360—Complete/Ongoing—Hood River County has adopted SB 360 county-wide with the help of Oregon Department of Forestry. The five year review cycle will begin over in 2014/2015.

Chapter 12
Structural Ignitability

"Safeguards to prevent the occurrence of fires and to provide adequate fire protection facilities to control the spread of fire in wildland-urban interface areas are provided in a tiered manner commensurate with the relative level of hazard present"

~International Wildland-Urban Interface Code

Structural Ignitability

Structural Ignitability refers to the home itself and the surroundings in immediate proximity to the home (the Home Ignition Zone or Zones 1 and 2 in Defensible Space, Chapter 6). There are three factors that influence structural ignitability:

- The structure—where the structure is built on the terrain (setback from slopes), building materials, roofing material, and roofing assembly all impact the ignitability of a home.
- Defensible space—as detailed in Chapter 6, defensible space is the area from the edge of the home up to 100 feet; defensible space suggests reduced fuels and well maintained trees.
- Fire access—a home can only be protected from fire by fire personnel if there is appropriate access from the road or driveway.

This portion of the CWPP considers the levels of responsibility and planning that are included in structural ignitability—namely, the players involved in helping to reduce the ignitability of homes in the WUI. Considering fire access and defensible space standards have been discussed in previous chapters, this portion of the CWPP focuses on structures themselves—what materials and standards should be used for homes within the WUI. It also provides suggestions for Hood River County to adopt a county-wide building code for any home within the WUI.

Individual Responsibility

When it comes to reducing the ignitability of a home, the homeowner comes first. Considering that older homes built in the wildland-urban interface are not subject to some of the newer regulations that have been imposed on structures near forests, the homeowner must be responsible for home improvement. Many of these homes have cedar siding or roofing, do not have sufficient water supply systems, and have narrow or steep driveways that inhibit firefighter access. While improvements to these homes may require additional fire prevention measures, many are currently difficult to protect in the event of a fire. Due to the difficulty of assessing each individual home and providing suggestions, it is up to individual fire districts to know the areas where older home construction may reduce the home's defendability.

In the construction of newer homes, homeowners have the unique responsibility of demanding that the most fire resistant materials are used—this includes roofing, decking, siding, and ensuring that all vents are closed with mesh no bigger than ¼ inch. For homeowners with questions regarding the most up-to-date fire safe information, see the Oregon Department of Forestry Senate Bill 360.

Fire Response

Reducing structural ignitability in the wildland-urban interface is also the responsibility of local fire jurisdictions. In Hood River County, it is up to the five individual fire protection districts to

ensure that homes in the WUI can be safely defended. This includes inspecting driveways for safe access, egress, and turn around; working with homeowners to be sure that driveways, spur roads, and addresses are clearly marked; having a working knowledge of the location of fire hydrants and other water sources available to protect homes. Fire response personnel should maintain adequate training in apparatus use, water hauling, and home protection.

Regulatory Framework

Perhaps the most important aspect of reducing structural ignitability, is creating a county wide regulatory framework for houses being built in the WUI. This includes both zoning regulations as well as building codes.

Hood River County has adopted the Oregon State Building Code. These codes are the minimum requirements for homes being built within Hood River County. The City of Hood River have added to these building codes, by adopting the *International Wildland-Urban Interface Code* of the International Code Council. These codes are designed for homes being built within the WUI and specify what measures should be taken when building a home in the WUI based on risk and hazard. Current county codes define home construction based on reducing structural fires and not the risk of ignition from outside the home.

Zoning regulations in Hood River County vary greatly depending on the zone established. For homes that are adjacent to forested lands, houses are required to have an 80 foot setback from the property line. No requirements are legislated for firewise landscaping or water access.

Action Items

- The county-wide adoption of the *International Wildland-Urban Interface Code*. Adopting these codes will ensure that new homes and reconstruction of homes in the WUI use building materials and styles that reduce the risk of fire ignition externally.
- Review county zoning regulations for houses built in the WUI. Reviewing zoning regulations in Hood River County can place regulations on landscaping requirements for new structures being built in the WUI.
- Home and driveway inspections by fire jurisdictions. Homes within the WUI should be inspected for defensible space and adequate driveway access on an ongoing basis. This is the responsibility of individual fire jurisdictions.

Chapter 13
Sustaining Efforts

"We who are privileged to be in these chambers today can view the challenges we face as opportunities, not as reasons for despair. We can do this only if we blend our independent spirits in terms of reverence for the life and respect for nature. Each of you might suggest different words, but our goal is certainly the same: a better Oregon."

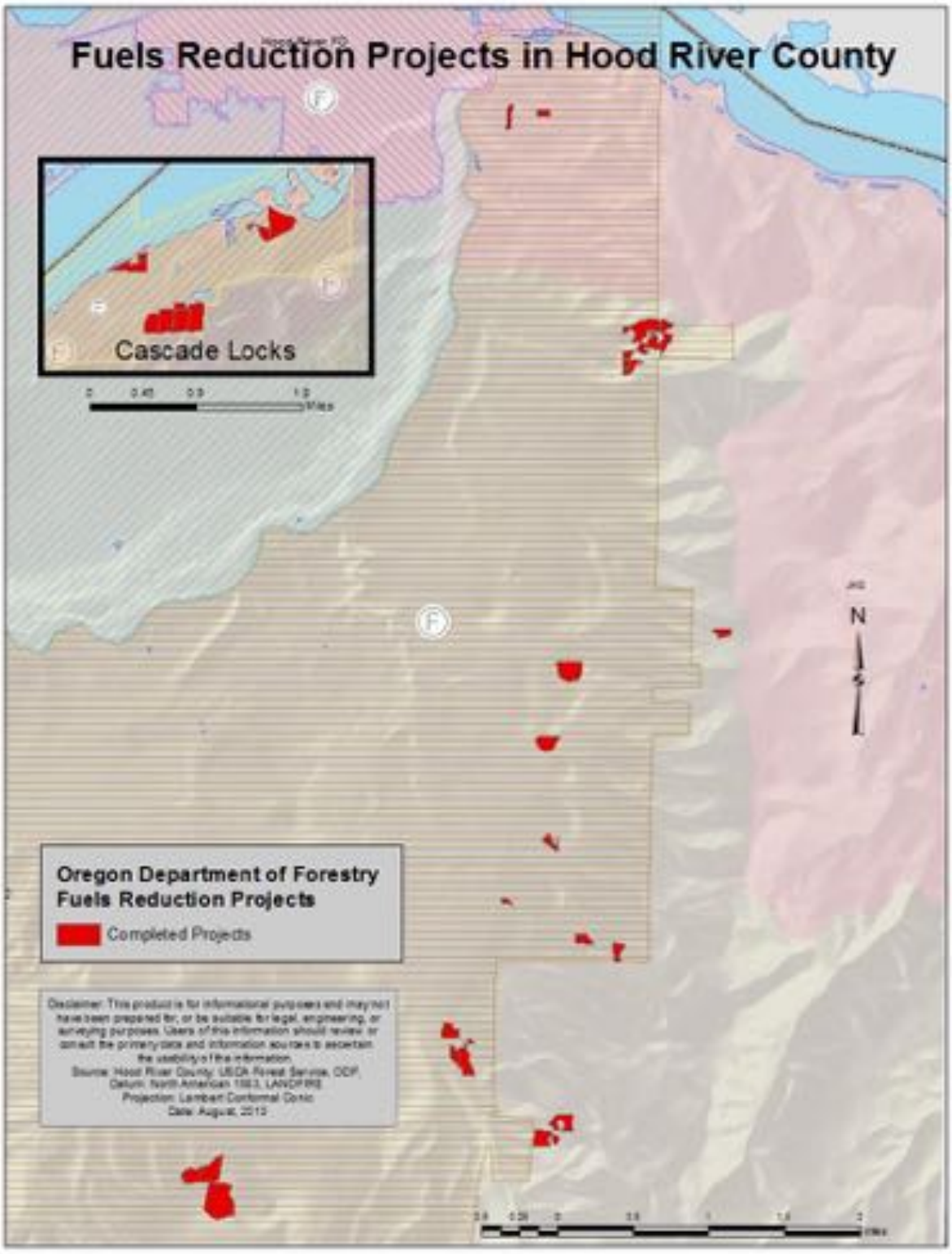
~Tom McCall, 1971

Sustaining Efforts

Planning for the future of wildfires in Hood River County is a key element to the CWPP. Hood River is a dynamic county that is constantly changing. Even since the original CWPP was written in 2005, Hood River County has experienced drastic changes in demographics, forest structure, and available fire suppression resources. Demographic changes have increased the use of forested land for tourism. This includes hiking, camping, mountain biking, equestrian users, and dirt biking. In the past six years, the forest structure has additionally changed: large stand replacing fires such as the Dollar Lake Fire have had an impact on forest structure, as has logging, and the outbreak of the fivespined ips, which has infested a significant percent of Ponderosa Pine trees in the county. Further changes have been seen in infrastructure. More businesses have opened in the county, increasing the pressure on the WUI, transportation infrastructure, while in some cases increasing the hazardous materials present in the county.

Sustaining efforts can be organized at many different scales. Citizens can actively plan on the small scale, from family to neighborhood. These efforts are largely grass roots, however can be supported by the five fire districts within the county. On a larger scale, each fire district is in a constant cycle of training, planning, and preparing for the event of a wildfire. Volunteer firefighters spend hours each month maintaining equipment, identifying hazards, and practicing fire suppression techniques. Due to the multi-scalar nature of fire planning and prevention, it is difficult to identify sustaining efforts on all scales. Below are some sustaining efforts that are in motion at the county level.

- Knowing the locations of fire hydrants and other water sources within the county can significantly increase fire suppression capabilities. Current updates to the hydrant master list have been submit by each fire protection district. An efficient way to share this information can be through the creation of cloud-based document folders. Free options include *Dropbox* and *Google Drive*.
- Continued updates of fire hydrants can also be achieved through mapping applications on smartphones. *EpiCollect* is an application that allows multi-user tracking and updating of data, such as fire hydrants.
- Hood River County is comprised of five fire protection districts, one state fire agency, and two federal fire agencies. Annual meetings should be coordinated to increase collaboration between these organizations.
- Fuels reductions projects are coordinated by the Oregon Department of Forestry. ODF representative and fire personnel should be in dialogue with each other to identify where fuels projects should be completed and when/if they have been completed.


Fuels Reduction Projects in Hood River County
Cascade Locks
N
Oregon Department of Forestry
Fuels Reduction Projects
Completed Projects

Acronyms

The following acronyms are used in the CWPP:

AADT	Annual Average Daily Traffic
CAR	Community at Risk
CFI	California Fivespined Ips
CRGNSA	Columbia River Gorge National Scenic Area
CWPP	Community Wildfire Protection Plan
EMS	Emergency Management System
FMA	Fuels Management Area
FRCC	Fire Regime Car Condition Class
FRG	Fire Regime Group
GIS	Geographic Information System
HA	Hazard Area
HFI	Healthy Forest Initiative
HFRA	Healthy Forest Restoration Act
HRCFCA	Hood River County Fire Chiefs Association
HRCCWPP	Hood River County Community Wildfire Protection Plan
HRSWCD	Hood River Soil and Water Conservation District
HRWG	Hood River Watershed Group
IAFC	International Association of Fire Chiefs
ISO	Insurance Service Organization
MHNF	Mt. Hood National Forest
NASF	National Association of State Foresters
NFP	National Fire Plan
ODF	Oregon Department of Forestry
ODOT	Oregon Department of Transportation
OSFMO	Oregon State Fire Marshal Office
OSHA	Occupational Safety and Hazard Association
PLA	Public Land Assessment
PSA	Public Service Announcement

RFPD	Rural Fire Protection District
ROW	Right of Way
RSG	Ready, Set, Go!
SB360	Senate Bill 360 (also known as Oregon Forestland-Urban Interface Fire Protection Act of 1997)
SCBA	Self-contained Breathing Apparatus
TRT	Transient Room Tax
USDA	Unite States Department of Agriculture
VCC	Vegetation Condition Class
WSA	Wildfire Service Area
WUI	Wildland Urban Interface

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