Grant County, Washington

County Wildfire Protection Plan

2015

FINAL DRAFT

For PUBLIC REVIEW

V6 – 9/15/15

Pending Approval by the

Grant County Commissioners and State Forester

2015

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Acknowledgements

This Community Wildfire Protection Plan represents the efforts and cooperation of a number of organizations and agencies working together to improve preparedness for wildfire events while reducing factors of risk.

USDI Bureau of Land Management

Grant County Fire Protection District # 5

Grant County Fire Protection District #8

Grant County Fire Protection District #13

To obtain copies of this plan contact:

Grant County Emergency Management
3953 Airway Drive NE Building #2
Moses Lake, Washington 98837
509-762-1462

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Foreword

The process of developing a Community Wildfire Protection Plan (CWPP) can help a community clarify and refine its priorities for the protection of life, property, and critical infrastructure in the wildland–urban interface on both public and private land. It also can lead community members through valuable discussions regarding management options and implications for the surrounding land base. Local fire service organizations help define issues that may place the county, communities, and/or individual homes at risk. Through the collaboration process, the CWPP steering committee discusses potential solutions, funding opportunities, and regulatory concerns and documents their resulting recommendations in the CWPP. The CWPP planning process also incorporates an element for public outreach. Public involvement in the development of the document not only facilitates public input and recommendations, but also provides an educational opportunity through interaction of local wildfire specialists and an interested public.

The idea for community-based wildland fire planning and prioritization is neither novel nor new. However, the incentive for communities to engage in comprehensive forest planning and prioritization was given new and unprecedented impetus with the enactment of the Healthy Forests Restoration Act (HFRA) in 2003. This landmark legislation includes the first meaningful statutory incentives for the US Forest Service (USFS) and the Bureau of Land Management (BLM) to give consideration to the priorities of local communities as they develop and implement forest management and hazardous fuel reduction projects. In order for a community to take full advantage of this new opportunity, it must first prepare a Community Wildfire Protection Plan (CWPP).

A countywide CWPP steering committee generally makes project recommendations based on the issue causing the wildfire risk, rather than focusing on individual landowners or organizations. Thus, projects are mapped and evaluated without regard for property boundaries, ownership, or current management. Once the CWPP is approved by the Grant County Commissioner's and the State Forester, the steering committee will begin further refining proposed project boundaries, feasibility, and public outreach as well as seeking funding opportunities.

*The **Grant County Community Wildfire Protection** Plan expands on the wildfire chapter of the Grant County Hazard Mitigation Plan updated in 2013. This project was funded by Grant County Emergency Management and the Bureau of Land Management.*

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Signature Pages

This Grant County Community Wildfire Protection Plan has been developed in cooperation and collaboration with representatives of the following organizations and agencies.

Grant County Commissioners

This Grant County Community Wildfire Protection Plan has been developed in cooperation and collaboration with representatives of the following organizations and agencies.

Grant County Commissioners

Richard Stevens Grant County Commissioner District #1	Date
Carolann Swartz Grant County Commissioner District #2	Date
Cindy Carter Grant County Commissioner District #3	Date

Signatures of Participation by Grant County Fire Protection Districts and Departments

This Community Wildfire Protection Plan and all of its components identified herein were developed in close cooperation with the participating entities listed. These members of the CWPP steering committee formally recommended that this document be adopted by the Grant County Commissioners.

Don Rushton, Chief Coulee City Fire Department	Date
Mark Payne, Chief Electric City Fire Department	Date
Jeremy Burns, Chief Ephrata Fire Department	Date
Richard Paris, Chief Grand Coulee Volunteer Fire Department	Date
Jim Stephens, Chief Hartline Volunteer Fire Department	Date
Tom Taylor, Chief Moses Lake Fire Department	Date

Mike Gray, Chief
Soap Lake Fire Department

Don Fortier, Chief
Grant County F. P. D. #3

Randy Wiggins, Chief
Grant County F. P. D. #4

Dan Smith, Chief
Grant County F. P. D. #5

Daryl Dormaier, Chief
Grant County F. P. D. #6

Kirk Sheppard, Chief
Grant County F. P. D. #7

Dave Patterson, Chief
Grant County F. P. D. #8

Eric Linn, Chief
Grant County F. P. D. #10 & #11

Scott Mortimer, Chief
Grant County F. P. D. #12

James Stucky, Chief
Grant County F. P. D. #13

Signatures of Participation by other Grant County CWPP Steering Committee Entities

This Community Wildfire Protection Plan and all of its components identified herein were developed in close cooperation with the participating entities listed. These members of the CWPP steering committee formally recommended that this document be approved by the Grant County Commissioners.

Robert Schneider, Director Grant County Emergency Management	Date
Aaron Everett, Deputy Supervisor, Forest Practices and Federal Relations, State Forester, Washington State Department of Natural Resources	Date
Linda Coates-Markle, Wenatchee Field Manager Spokane District Bureau of Land Management	Date

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Chapter 1

Overview of this Plan and its Development

In 2014, the Bureau of Land Management contracted with Northwest Management Inc. to conduct an in-depth risk assessment for the hazards of wildland fire. Wildfire events occur almost annually in Grant County; thus, programs and projects that mitigate the impacts of this hazard is a benefit to the local residents, property, infrastructure, and the economy. In January of 2015, the Bureau of Land Management met with the newly formed Steering Committee to introduce their plans in developing a wildland fire risk assessment and the opportunity to meld that plan into a Community Wildfire Protection Plan.

This Community Wildfire Protection Plan (CWPP) for Grant County, Washington, is the result of analyses, professional collaboration, and assessments of wildfire risks and other factors focused on reducing wildfire threats to people, structures, infrastructure, and unique ecosystems in Grant County. Agencies and organizations that participated in the planning process included:

- Grant County Department of Emergency Management
- Washington Department of Fish and Wildlife
- Washington Department of Natural Resources
- Moses Lake School District
- U.S. Bureau of Reclamation
- Bureau of Land Management
- U.S. Fish and Wildlife Service
- Grant County Fire Protection District #3
- Grant County Fire Protection District #4
- Grant County Fire Protection District #5
- Grant County Fire Protection District #6
- Grant County Fire Protection District #7
- Grant County Fire Protection District #8
- Grant County Fire Protection District #10
- Grant County Fire Protection District #11
- Grant County Fire Protection District #12
- Grant County Fire Protection District #13
- Grant County Fire Protection District #14

- Grant County Fire Marshal Office
- Grant County GIS
- Ephrata Fire Department
- Coulee City Fire Department
- Electric City Fire Department
- Grand Coulee Fire Department
- Moses Lake Fire Department
- Grant County Board of County Commissioners Office
- Desert Aire Owners Association

Northwest Management, Inc. of Moscow, Idaho was selected to assist the steering committee by facilitating meetings, leading the assessments, and authoring the document. The project manager from Northwest Management, Inc. was Brad Tucker.

Goals and Guiding Principles

Planning Philosophy and Goals

The goals of the planning process include integration with the National Fire Plan, the Healthy Forests Restoration Act, and the Disaster Mitigation Act. The plan utilizes the best and most appropriate science from all partners as well as local and regional knowledge about wildfire risks and fire behavior while meeting the needs of local citizens and recognizing the significance wildfire can have to the regional economy.

Vision Statement

To provide for the protection of people, structures, infrastructure, livestock, agriculture, state and federally listed species, and unique ecosystems that contribute to our way of life and the growth and sustainability of the local and regional economy through education, training, support, and planning.

Mission Statement

To prepare and make Grant County residents, communities, state agencies, local, and federal governments, and the local economy less vulnerable to the negative effects of wildland fires through the effective administration of wildfire hazard mitigation grant programs, hazard risk assessments, Firewise, and efficient fuels treatments, and to provide a coordinated approach to mitigation policy through federal, state, regional, and local planning effects while providing a plan that will not diminish the private property rights of land/asset owners within Grant County.

Goals

1. Educate citizens about the unique risks and challenges of wildfire preparedness and reclamation in Grant County through education programs.

2. Determine areas at risk of wildfire and establish/prioritize mitigation projects without regard to ownership, and recommend both conventional and alternative treatment methods to protect people, homes, infrastructure, state and federal listed species, and natural resources throughout Grant County.
3. Identify and map Wildland Urban Interface Boundaries.
4. Improve county and local fire agency eligibility for funding assistance (National Fire Plan, Health Forest Restoration Act, FEMA, and other sources) to reduce wildfire hazards, prepare residents for wildfire situations, and enhance fire agency response capabilities.
5. Improve emergency response times through enhanced radio communications, and greater road addressing and signage throughout Grant County.
6. Improve the ability of the County Fire Protection Agencies to provide fire protection for the residents of Grant County through improved resources, recruitment and retention of volunteers, and training.
7. Develop regulatory measures such as building codes and road standards specifically targeted to reduce the wildland fire potential and reduce the potential for loss of life and property.

United States Government Accountability Office (GAO)

Since 1984, wildland fires have burned an average of more than 850 homes each year in the United States and, because more people are moving into fire-prone areas bordering wildlands, the number of homes at risk is likely to grow. The primary responsibility for ensuring that preventative steps are taken to protect homes lies with homeowners. Between 2003 and 2013, seven of the ten years have produced the largest direct property loss wildland fires in the United States, with five of the fires costing more than $400 million in damage.[1]

GAO was asked to assess, among other issues, (1) measures that can help protect structures from wildland fires, (2) factors affecting use of protective measures, and (3) the role technology plays in improving firefighting agencies' ability to communicate during wildland fires.

The two most effective measures for protecting structures from wildland fires are: (1) creating and maintaining a buffer, called defensible space, from 30 to 100 feet wide around a structure, where flammable vegetation and other objects are reduced; and (2) using fire-resistant roofs and vents. In addition to roofs and vents, other technologies – such as fire-resistant windows and building materials, surface treatments, sprinklers, and geographic information systems mapping can help in protecting structures and communities, but they play a secondary role.

Although protective measures are available, many property owners have not adopted them because of the time or expense involved, competing concerns such as aesthetics or privacy, misperceptions about wildland fire risks, and lack of awareness of their shared responsibility for fire protection. Federal, state, and local governments, as well as other organizations, are

[1]National Fire Protection Association Fire Analysis and Research Division. Large-Loss Fires in the United States 2013. NFPA No. LLS10. November 2014.

attempting to increase property owners' use of protective measures through education, direct monetary assistance, and laws requiring such measures. In addition, some insurance companies have begun to direct property owners in high risk areas to take protective steps[2].

State and Federal CWPP Guidelines

This Community Wildfire Protection Plan includes compatibility with FEMA requirements for a Hazard Mitigation Plan, while also adhering to the guidelines proposed in the National Fire Plan, and the Healthy Forests Restoration Act (2003). This Community Wildfire Protection Plan has been prepared in compliance with:

- The National Fire Plan: A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan (December 2006).
- The Integrated Rangeland Fire Management Strategy (2015).
- Healthy Forests Restoration Act (2003).
- National Cohesive Wildland Fire Management Strategy (March 2011).
- The Federal Emergency Management Agency's Region 10 guidelines for a Local Hazard Mitigation Plan as defined in 44 CFR parts 201 and 206, and as related to a fire mitigation plan chapter of a Multi-Hazard Mitigation Plan.
- National Association of State Foresters – guidance on identification and prioritizing of treatments between communities (2003).

The objective of combining these complementary guidelines is to facilitate an integrated wildland fire risk assessment, identify pre-hazard mitigation activities, and prioritize activities and efforts to achieve the protection of people, structures, the environment, and significant infrastructure in Grant County while facilitating new opportunities for pre-disaster mitigation funding and cooperation.

Additional information detailing the state and federal guidelines used in the development of the Grant County Community Wildfire Protection Plan is included in Appendix 6.

Integration with other Local Planning Documents

During development of this Community Wildfire Protection Plan, several planning and management documents were reviewed in order to avoid conflicting goals and objectives. Existing programs and policies were reviewed in order to identify those that may weaken or enhance the mitigation objectives outlined in this document. The following sections identify and briefly describe some of the existing Grant County planning documents and ordinances considered during development of this plan.

Grant County Hazard Mitigation Plan 2013

[2] United States Government Accountability Office. Technology Assessment – Protecting Structures and Improving Communications during Wildland Fires. Report to Congressional Requesters. GAO-05-380. April 2005.

The federal Disaster Mitigation Act of 2000 (Public Law 106-390) require state and local governments to develop hazard mitigation plans as a condition for to receive federal disaster grant assistance and funding for hazard mitigation projects. To fulfill this requirement, Grant County and the cities and towns of Ephrata, Moses Lake, Warden, and Quincy, and Fires Districts 3, 10, and 12 have developed and maintain an up-to-date local hazard mitigation plan. The jointly updated Grant County Hazard Mitigation Plan was approved by FEMA in 2013. The Federal Government requires that Hazard mitigation plans be updated every five years.

Grant County Comprehensive Emergency Management Plan 2012

The Grant County Comprehensive Emergency Management Plan or CEMP is the plan which addresses the functional categories of managing emergencies or disasters in Grant County. The Basic Plan and Emergency Support Functions (ESFs) are currently being updated and revised to include changes consistent with the National Response Plan, 2012 revision and to include the National Incident Management System (NIMS) concepts.

The CEMP includes comprehensive guidance for what the response agencies may provide and conduct before, during and after an emergency or disaster in Grant County. Among the Emergency Management field, an emergency is an event involving shortages of time and resources that require a response beyond routine resources. A disaster is an event in which a community's available resources are expended and the community undergoes danger including losses such that the social or economic structure is disrupted and some or all of the community's essential functions are prevented. The Grant County Comprehensive Emergency Management Plan may be initiated for both situations. The local agencies/organizations will endeavor to make every reasonable effort to respond in the event of an emergency or disaster. However, local resources and operations may be overwhelmed. The responsibilities and tenets outlined in these plans will be fulfilled only if the situation, information exchange, extent of actual agency capabilities and resources are available. There is no guarantee implied by this plan that a perfect response to emergency or disaster incidents will be practical or possible.

Grant County Comprehensive Plan 2006

The Countywide Comprehensive Plan is the guiding document that establishes the vision for growth and development in the County. The goals and policies of the plan create the framework for designating properties into comprehensive plan map designations and their correlating zoning districts.

This CWPP will "dove-tail" with the County's Comprehensive Plan during its development and implementation to ensure that the goals and objectives of each are integrated. This planning effort is intended to be compatible with the goals and objectives of the County's Comprehensive Plan.

Grant County Shoreline Master Program September 2014

The Grant County Shoreline Master Program (SMP) is a guiding document that intends to implement the requirements of the Washington State Shoreline Management Act (SMA) (Revised Code of Washington (RCW. 90.58). The SMA requires cities and counties to adopt a Shoreline Master Program to regulate shoreline development and accommodate "all reasonable and appropriate uses" consistent with "protection against adverse effects to the public health, the land and its vegetation and wildlife, and the waters of the state and their aquatic life… and public

rights of navigation." Grant County adopted its Shoreline Master Program in 1975. The Department of Ecology adopted the 2003 Shoreline Management Act Guidelines (Chapter 173-26 Washington Administrative Code (WAC) (Guidelines) which require local government review and updates of Shoreline Master Programs. The updated version of the Grant County Shoreline Master Program provides goals, policies, and regulations for the development of Grant County shorelines. Shoreline Coalition cities and towns include: Coulee City, Electric City, Grand Coulee, Krupp, Soap Lake, and Wilson Creek. Grant County's SMP encompasses shoreline along five rivers and stream, and 80 lakes.

Chapter 2

Documenting the Planning Process

Documentation of the planning process, including public involvement, is necessary to meet FEMA's DMA 2000 requirements (44CFR§201.4(c)(1) and §201.6(c)(1)). This section includes a description of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how all of the involved agencies participated.

Description of the Planning Process

The Grant County Community Wildfire Protection Plan was developed through a collaborative process involving all of the organizations and agencies detailed in Chapter 1 of this document. The planning process included five distinct phases which were in some cases sequential (step 1 then step 2) and in some cases intermixed (step 4 completed throughout the process):

1. **Collection of Data** about the extent and periodicity of the wildfire hazard in and around Grant County.
2. **Field Observations and Estimations** about risks, location of structures and infrastructure relative to risk areas, access, and potential treatments.
3. **Mapping** of data relevant to pre-wildfire mitigation and treatments, structures, resource values, infrastructure, risk assessments, and related data.
4. **Facilitation of Public Involvement** from the formation of the steering committee to news releases, public meetings, public review of draft documents, and acknowledgement of the final plan by the signatory representatives.
5. **Analysis and Drafting of the Report** to integrate the results of the planning process, provide ample review and integration of committee and public input, and signing of the final document.

The Planning Team

Northwest Management facilitated the Community Wildfire Protection Plan meetings. Stakeholders involved in the meetings included representatives from local communities, Grant County Department of Emergency Management, Fire Protection Districts, federal and state agencies, and local organizations with an interest in the county's fire safety.

The planning philosophy employed in this project included the open and free sharing of information with interested parties. Information from federal, state, and local agencies was integrated into the database of knowledge used in this project. Meetings with the committee were held throughout the planning process to facilitate a sharing of information between participants. When the public meetings were held, many of the committee members were in attendance and shared their support and experiences and their interpretations of the results.

Multi-Jurisdictional Participation

44 CFR §201.6(a)(3) calls for multi-jurisdictional planning in the development of Hazard Mitigation Plans which impact multiple jurisdictions. In addition to the participation of federal agencies and other organizations, the following local jurisdictions were actively involved in the development of this Community Wildfire Protection Plan:

- City of Moses Lake
- City of Ephrata
- City of Coulee City
- Grant County Fire District #3
- Grant County Fire District #4
- Grant County Fire District #5
- Grant County Fire District #6
- Grant County Fire District #7
- Grant County Fire District #8
- Grant County Fire District #10
- Grant County Fire District #11
- Grant County Fire District #13

These jurisdictions were represented on the steering committee and in public meetings either directly or through their servicing fire department or district. They participated in the development of hazard profiles, risk assessments, and mitigation measures. The steering committee meetings were the primary venue for authenticating the planning record. However, additional input was gathered from each jurisdiction in the following ways:

- Steering committee leadership visits to local group meetings where planning updates were provided and information was exchanged.
- One-on-one visits between the steering committee leadership and representatives of the participating jurisdictions (e.g. meetings with Grant County Board of County Commissioners, city councilors and mayor, fire district commissioners, and community leaders).
- Written correspondence between the steering committee leadership and each jurisdiction updating the participating representatives on the planning process, making requests for information, and facilitating feedback.

Like other areas of Washington and the United States, Grant County's human resources have many demands placed on them in terms of time and availability. In Grant County, elected officials (county and town councilors and mayor) do not serve in a full-time capacity; some of them have other employment and serve the community through a convention of public service. Recognizing this and other time constraints, many of the jurisdictions decided to identify a representative to cooperate on the steering committee and then report back to the remainder of their organization on the process and serve as a conduit between the steering committee and the jurisdiction.

Steering Committee Meetings

The following people participated in steering committee meetings, volunteered time, or responded to elements of the Grant County Community Wildfire Protection Plan's preparation.

NAME	ORGANIZATION
David A. Nelson	Grant County Fire Marshal
Don Fortier	Grant County Fire District #3
Randy Wiggins	Grant County Fire District #4
Dan Smith	Grant County Fire District #5
Jack Zeilenga	Grant County Fire District #5
Rick Wentworth	Grant County Fire District #5
Daryl Dormaier	Grant County Fire District #6
Kirk Sheppard	Grant County Fire District #7
David Patterson	Grant County Fire District #8
Rick Kummer	Grant County Fire District #8
Rand Brixby	Grant County Fire District #8
Robert D. Weber	Grant County Fire District #10
Dwight VanderVorste	Grant County Fire District #10
Brian Evans	Grant County Fire District #10/11
Scott Mortimer	Grant County Fire District #12
Jim Stucky	Grant County Fire District #13
Shane Heston	Grant County Fire District #13
Todd Huffman	Grant County Fire District #13
Richard Paris	Grand Coulee Volunteer Fire Department
Jeremy Burns	Ephrata Fire Department
Pete Kunjara	Moses Lake Fire Department
Michelle Price	Moses Lake School District
Becky Stokoe	Multi Agency Communications Center
Jackie Jones	Multi Agency Communications Center
Don Rushton	Coulee City, Fire Department
David A. Nelson	Grant County Fire Marshal
Bruce Gribble	Grant County Fire Marshal
Igor Shaporda	Grant County Public Utility District
Sheryl Dotson	Grant County Public Utility District
Cindy Carter	Grant County Commissioner
Carolann Swartz	Grant County Commissioner
Richard Stevens	Grant County Commissioner

- Ron Bunday .....Desert Aire Homeowners Association
- Nick Bechtold .....WA Department of Fish and Wildlife
- Eric Pentico.....Washington Department of Fish and Wildlife
- John Janak.....U.S. Fish and Wildlife Service
- Timothy J. Cawley-Murphree U.S. Fish and Wildlife Service
- Jon Ness .....Grant County Health District
- Robert Schneider.....Grant County Department of Emergency Management
- Sandi Duffey .....Grant County Department of Emergency Management
- Michele Haughton.....Grant County Department of Emergency Management
- Elisabeth Lauver .....Grant County Planning Department (GIS)
- Mike Solheim.....Bureau of Land Management
- Jonathan Brooks.....Bureau of Reclamantion
- Brad Tucker .....Northwest Management, Inc.
- Tera King .....Northwest Management, Inc.
- Meghan McEldery .....Northwest Management, Inc.
- Tiana Luke .....Northwest Management, Inc.

Committee Meeting Minutes

Committee meetings were scheduled and held from January, 2015 through June, 2015. These meetings served to facilitate the sharing of information and to lay the groundwork for the Grant County CWPP. Northwest Management, Inc. as well as other planning committee leadership attended the meetings to provide the group with regular updates on the progress of the document and gather any additional information needed to complete the Plan.

Steering committee meeting minutes are included in Appendix 2.

Public Involvement

Public involvement was made a priority from the inception of the project. There were a number of ways that public involvement was sought and facilitated. The idea is to allow members of the public to provide information and seek an active role in protecting their own homes and businesses, and in some cases it may lead to the public becoming more aware of the process without becoming directly involved in the planning.

News Releases

Print Media	Other Media
Columbia Basin Herald iFiber One News	Local Fire Protection Districts

Under the auspices of the steering committee, periodic press releases were submitted to the various print and online news outlets that serve Grant County. Informative flyers were also distributed around town and to local offices within the communities by the committee members.

Figure 2.1 News Article from iFiber One News.

Plan to combat wildland fires being developed for Grant County

By Joe Utter | Posted: Friday, January 30, 2015 2:52 pm

MOSES LAKE - Grant County is working to develop a plan to better protect communities from wildfires and prevent future fires.

Wildland fire

The Grant County Department of Emergency Management is working with the Bureau of Land Management and Northwest Management, Inc. to develop a Community Wildfire Protection Plan, according to Emergency Management Generalist Michele Haughton.

The plan will include risk analyses to determine where fires are likely to ignite and how they may impact communities and the environment.

Wildfires burned more than 400,000 acres in Washington last year, including more than 250,000 acres in nearby Okanogan County, according the Northwest Interagency Coordination Center.

The project will assess fire risks in the county and make recommendations that will not only help prevent wildfires, but will also help create a more "fire-resistant" Grant County and provide public wildfire education, according to Haughton.

"Some of the goals of this project are to improve awareness of wildland fire issues locally, identify high fire risk areas and develop strategies to reduce this risk, and improve accessibility of funding assistance to achieve these goals," Haughton stated.

A planning committee was formed and meets on Feb. 12 at 1:30 p.m. at the Grant County Fairgrounds 4-H Building. The meeting is open to the public.

The committee includes representatives from local fire districts, Grant County, Department of Natural Resources and the Bureau of Land Management.

For more information or for anyone interested in participating in the planning committee, contact Brad Tucker with Northwest Management, Inc. at 208-883-4488 ext. 117.

Figure 2.2. Press Release, February 2015.

Grant County
EMERGENCY MANAGEMENT

Public Safety. Public Trust

NEWS RELEASE

DATE/TIME	**Jan 30, 2015**
New Release	1
CONTACT	Michele Haughton
Direct	*509-762-1462*
Email	mhaughton@grantcountywa.gov
Office	509-762-1461 3953 Airway Drive NE, #2, Moses Lake, WA 98837

FOR IMMEDIATE RELEASE

Moses Lake - Grant County plans to develop a Community Wildfire Protection Plan working in conjunction with the Bureau of Land Management (BLM) and Northwest Management, Inc., Grant County has launched the process of developing the county-level Community Wildfire Protection Plan (CWPP). Local agencies and organizations in Grant County have initiated a planning committee to complete CWPP as part of the National Fire Plan, National Cohesive Wildland Fire Management Strategy, and Healthy Forests Restoration Act as authorized by Congress and the White House. The Grant County CWPP will include risk analyses with predictive models indicating where fires are likely to ignite and how they may impact local communities and the environment. The second meeting is scheduled for February 12th, 2015 at 1:30 pm and will be the second of several monthly meetings. Anyone is welcome to attend these meetings. This meeting will be held in the 4-H building located at the Grant County fairgrounds, 3953 Airway DR NE, Moses Lake WA.

Northwest Management, Inc. has been retained by Grant County and the BLM to facilitate meetings, conduct field inspections and interviews, develop vulnerability assessments, and collaborate with the committee to delineate mitigation projects. The planning committee includes representatives from local fire districts, Grant County, DNR, BLM, and others.

The intention of the project is to conduct an assessment of wildland fire risk in Grant County and the local communities, then make mitigation recommendations that will not only help prevent wildfire ignitions from occurring, but will also guide decision-makers towards creating a more fire-resistant Grant County and provide for public wildfire education. Some of the goals of this project are to improve awareness of wildland fire issues locally, identify high fire risk areas and develop strategies to reduce this risk, and improve accessibility of funding assistance to achieve these goals.

The planning committee will be conducting public meetings to discuss preliminary findings and to seek public involvement during the planning process during late spring or early summer of 2015. A notice of the dates and locations of these meetings will be posted in local news outlets. For more information on the Grant County CWPP or if you're interested in participating on the planning committee, please contact Brad Tucker, Northwest Management, Inc., at 208-883-4488 ext. 117.

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GRANT COUNTY DEPARTMENT OF EMERGENCY MANAGEMENT NEWS RELEASE
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Version 1. 1/2015

Public Meetings

Public meetings were scheduled in strategic locations during the wildfire risk assessment phase of the planning process to share information on the Plan, obtain input on the details of the wildfire risk assessments, and discuss potential mitigation treatments. Attendees at the public meetings were asked to give their impressions of the accuracy of the information generated and provide their opinions of potential treatments.

The schedule of public presentation meetings in Grant County included three locations: Ephrata, Coulee City, and Royal City. The first public meeting was attended by thirteen individuals on the committee and one from the general public. The second meeting was attended by three individuals on the committee. The third meeting was attended by a few members of the committee and eight citizens. The public meeting announcement was sent to the local newspapers and committee members were asked to post the flyer shown in Figure 2.3 around their communities.

Figure 2.3. Public Meeting Flyer March 19th, 2015

Grant County Community Wildfire Protection Plan

Public Meeting Announcement

NORTHWEST MANAGEMENT, INC.

May 11, 2015	May 12, 2015	May 13, 2015
Ephrata Fire Dept	Coulee City Location	Royal City Location
800 A Street SE	317 W Main ST	336 Camelia ST NE
Ephrata, WA	Coulee City WA	Royal City WA
6:00 PM	**6:00 PM**	**5:30 PM**

These public meetings will address the Community Wildfire Protection Plan being updated for Grant County. Public input is being sought to better understand the vulnerability of County residents, businesses, and resources to wildfire. The purpose of this plan is to promote awareness of the countywide wildland fire hazard and propose workable solutions to reduce the wildfire risk.

The planning committee is working on:

- **Mapping the Wildland Urban Interface in Grant County.**
- **Improving public awareness and educating the public about wildfire risk.**
- **Evaluating strategies for landowners to lessen wildfire potential.**
- **Addressing areas of inadequate fire protection.**
- **Recommending risk mitigation projects.**

These meetings are open to the public and will include slideshow presentation by wildfire specialists and local personnel working to develop this plan.

Learn about the assessments of wildfire risk and the wildland urban interface of Grant County. Discuss *YOUR* priorities for how our community can best mitigate these risks.

Documented Review Process

The opportunity to review and comment on this plan has been provided through a number of avenues for the committee members as well as the members of the general public.

During regularly scheduled committee meetings in the late winter and spring of 2015, the committee met to discuss findings, review mapping and analysis, and provide written comments on draft sections of the document. During the public meetings, attendees observed map analyses and photographic collections, discussed general findings from the community assessments, and made recommendations on potential project areas.

The first draft of the document was prepared after the public meetings and presented to the committee in June for a full committee review. The committee was given two months to provide comments to the plan.

Public Comment Period

A public comment period was conducted from September25th, 2015 to October 23rd, 2015 to allow members of the general public an opportunity to view the full draft plan and submit comments and any other input to the committee for consideration. A press release was submitted to the local newspapers on September 16th, 2015 announcing the comment period, the locations of the Plan for review, and instructions on how to submit comments. Hardcopy drafts were printed and made available at public libraries in Quincy, Moses Lake, Coulee City, Grand Coulee, Royal City, Warden, Soap Lake and Ephrata. Hardcopies were also made available at the following fire departments/districts: Fire District #3, Fire District #4, Fire District #5, Fire District #6, Fire District #7, Fire District #8, Fire District #9, Fire District #10/11, Fire District #12, Fire District #13, Coulee City Fire Department, Ephrata Fire Department, Grand Coulee Fire Department, Moses Lake Fire Department, and Soap Lake Fire Department. An electronic version of the plan was made available online at www.grantcountywa.gov . Provide a summary of comments here.

Figure 2.4. Press Release #3 – Public Comment Period

Grant County
EMERGENCY MANAGEMENT
Public Safety, Public Trust

NEWS RELEASE

DATE/TIME	**16 Sep 2015 12:44 PM**
New Release	1
CONTACT	Robert Schneider
Direct	*509.762-1462*
Email	ecc@grantcountywa.gov
Office	509-762-1462 3953 Airway Drive NE, #2, Moses Lake, WA 98837

Grant County Community Wildfire Protection Plan Available for Public Review

The Grant County Community Wildfire Protection Plan has been completed in draft form and is available to the public for review and comment at the locations listed below. Electronic copies may be viewed in pdf format at www.grantcountywa.gov The public review phase of the planning process will be open from September 25th, 2015 thru October 23rd, 2015.

Public Library Locations

Coulee City
Ephrata
Grand Coulee
Moses Lake
Quincy
Royal City
Soap Lake
Warden

Fire Department and Districts

Fire District # 3
Fire District # 4
Fire District # 5
Fire District # 6
Fire District # 7
Fire District # 8
Fire District # 9
Fire District # 10/11
Fire District # 12
Fire District # 13

Coulee City Fire Department
Ephrata Fire Department
Grand Coulee Fire Department
Moses Lake Fire Department
Soap Lake Fire Department

The purpose of the Grant County Community Wildfire Protection Plan (CWPP) is to reduce the impact of wildfire on Grant County residents, landowners, businesses, communities, local governments, and state and federal agencies while maintaining appropriate emergency response capabilities and sustainable natural resource management policies. The CWPP identifies high-risk areas as well as recommend specific projects that may help prevent wildland fires from occurring altogether or, at the least, lessen their impact on residents and property. The CWPP is being developed by a committee of city and county elected officials, departments, local and state emergency response representatives, land managers, and others.

The Grant County CWPP includes a risk analysis at the community level with predictive models for where disasters are likely to occur. This Plan will enable Grant County and its communities to be eligible for grant dollars to implement the projects and mitigation actions identified by the committee. Although not regulatory, the CWPP will provide valuable information as we plan for the future.

Comments on the CWPP must be submitted to the attention of Brad Tucker at tucker@nmi2.com or PO Box 9748, Moscow, Idaho 83843 by close of business on October 23rd, 2015.

Continued Public Involvement

Grant County is dedicated to involving the public directly in review and updates of the Community Wildfire Protection Plan and Wildfire Risk Assessment. Grant County Emergency Management, working with the CWPP steering committee, are responsible for review and update of the Plan as recommended in chapter 6 of this document.

The public will have the opportunity to provide feedback annually on the anniversary of the adoption of this plan, at an open meeting of the steering committee. Copies of the Grant County Wildfire Protection Plan will be catalogued and kept at all of the appropriate agencies in the county. The Plan also includes the address and phone number of Grant County Emergency Management, who is responsible for keeping track of public comments on the Plan.

A public meeting will also be held as part of each annual evaluation or when deemed necessary by the steering committee. The meetings will provide the public a forum for which they can express its concerns, opinions, or ideas about the Plan. The County Department of Emergency Management will be responsible for using county resources to publicize the annual public meetings and maintain public involvement through the webpage and various print and online media outlets.

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Chapter 3

Grant County Characteristics

Grant County was formally created on February 24, 1909 out of a portion of Douglas County and was named after U.S. President Ulysses S. Grant. Grant County is centrally located in the Washington and bounded by 8 counties: Douglas County, Okanogan County, Lincoln County, Adams County, Franklin County, Benton County, Yakima County, and Kittitas County.

With an area of 2,679.51 square miles, Grant County ranks as the 4th largest county of Washington's 39 counties and the 13th most populous county in the state. Grant County has fourteen incorporated communities including Coulee City, Electric City, Ephrata, George, Grand Coulee, Hartline, Krupp/Marlin, Mattawa, Moses Lake, Quincy, Royal City, Soap Lake, Warden, and Wilson Creek; Ephrata is the County Seat. The largest incorporated jurisdiction is the City of Moses Lake with a population of 21,250. Ephrata is the next largest city with 7,959 residents.[3] Of the 91,800 residents 40,956 residents live in unincorporated portions of the county.

Geography and Climate

The Columbia River flows in a deep valley along the west and southwestern boundary of the county. Grant County lies within the channeled scablands of the Columbia Basin, a region formed by ice age flooding and wind blown volcanic ash. The terrain varies from steep and rocky to rolling hills and tabletop plateaus. The northern part of the county is characterized by loess mantled hills that have been dissected by the channeled scablands. The county transitions at Babcock Ridge and the Beesley Hills to the southward sloping, deeply dissected plains of the southern half of the County that are broken up by the Saddle Mountains and Frenchman Hills, which create a distinct valley called Royal Slope and on reverse slope area called the Wahluke Slope. Elevation ranges from 380 feet above sea level along the Columbia River to 2,882 feet above sea level at Monument Hill near Quincy.

Grant County lies within the state's Central Basin climatological region. The climate in Grant County is influenced heavily by the Cascade Range. Grant County lies in the rainshadow of the Cascade Mountains is one of the driest counties in Washington with an average annual precipitation of 8 inches. Winters are cold; summers are warm. The average annual temperature is 52° F. Temperatures in January average about 26° F; temperatures in July average about 74° F. Temperatures in July range from an average low of about 62° F to an average high of about 89° F. The growing season averages 150 days, with the last freeze late in April and the first frost occurring in early October. Average annual snowfall is about 18 inches. On average, eleven to fourteen days have at least one inch of snow on the ground, but this varies greatly from year to year. [4]

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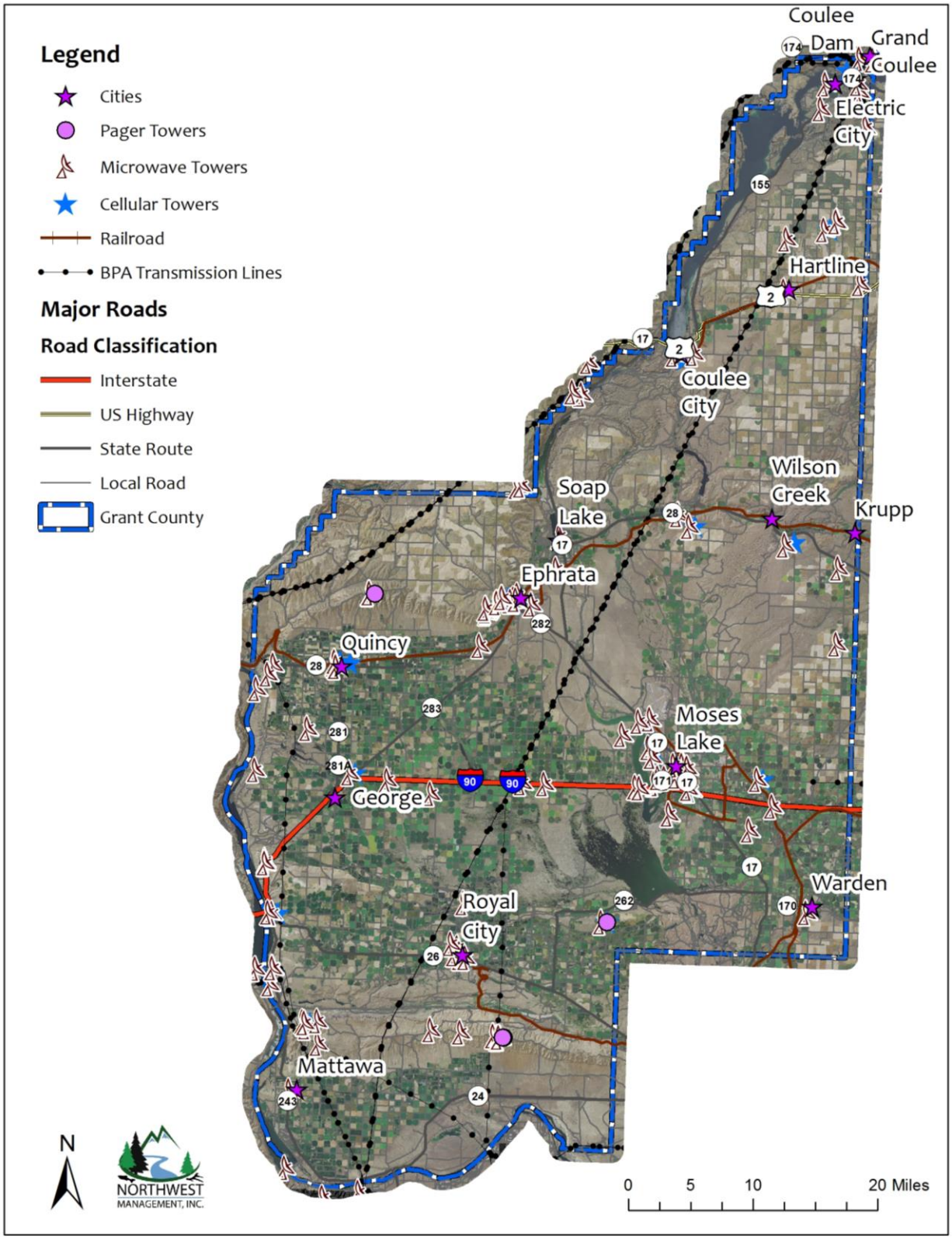
[3] Moses Lake, Washington U.S. Census Bureau Quick Facts. Available online at http://quickfacts.census.gov/qfd/states/53/5347245.html. Accessed February 2015.

[4] Grant County Comprehensive Plan. Available online at http://www.grantcountywa.gov/Planning/. Accessed February, 2015.

Figure 3.1. Grant County Aerial Map.



Population and Demographics

The 2010 Census established the Grant County population at 89,120, which shows an increase from a population of 74,698 in 2000. The estimated 2013 population is 91,878 providing a population density of 34.3 persons per square mile. Since 1890, Grant County has been steadily growing with the exception of a nearly 10% decrease in the 1960's. Since the 1960's the county's population has grown, on average by nearly 24%. Table 3.1 shows historical changes in population in Grant County.

Table 3.1. Historical and Current Population

1960	1970	1980	1990	2000	2010
46,477	41,881	48,522	54,758	74,698	89,120

Table 3.2. 2013 U.S. Census Bureau Population Estimate by Community

Coulee City	570	Mattawa	4,476
Electric City	1,006	Moses Lake	21,360
Ephrata	7,959	Quincy	7,242
George	501	Royal City	2,177
Grand Coulee	1,038	Soap Lake	1,574
Hartline	156	Warden	2,729
Krupp	49	Wilson Creek	211

The 2010 Census reported that ethnicity in Grant County is comprised of 72.8% white, 38.3% Hispanic or Latino, 1.1% Black, 1.2% American Indian or Alaskan Native, and 09% is Asian, Native Hawaiian, or Other Pacific Islander, and 3.5% reporting two or more races. Approximately 49% of the residents are female. There are 35,083 housing units (62.7% homeownership rate) in Grant County.[5] From 2009-2013 there were an estimated 2.96 persons per household in Grant County with a median household income of $45,949.[6]

Land Ownership

The majority of ownership within Grant County is private. Federal ownerships account for less than 15% of the land base with the Fish and Wildlife Service contributing the largest federal portion with over 89,619 acres. Approximately 7% of Gant County is State owned land.

[5] Grant County Profile of General Population and Housing Characteristics: 2010 Demographic Profile. Available at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk. Accessed March, 2015.
[6] U.S. Census Bureau. State & QuickFacts. http://quickfacts.census.gov/qfd/states/53/53025.html. Accessed February, 2015.

Table 3.3. Land Ownership Categories in Grant County		
Entity	**Acres**	**Percent of Total Area**
Private	1,273,580	71%
Bureau of Reclamation	212,000	12%
State	96,133.9	5%
FWS	89,619	5%
BLM	53,307	3%
State Fish & Wildlife	42,314.9	2%
State Parks	8,279.6	<1%
Water	7,198.8	<1%
DOD	2,814.7	<1%
Undetermined	1,405.7	<1%
Total	**1,786,655**	**100%**

The data used to develop this table was provided by the 2015 BLM database. Local government property (i.e. County) is likely under the Private ownership category. There may be more accurate information but this table shows general trends, which is sufficient for the purpose of this plan.

Development Trends

Grant County's rural, wide expanses of open lands, diverse farmlands, and arid foothills is one of its most attractive features. The fifteen incorporated cities and surrounding areas make up the urban growth areas that contains half of Grant County's population. Outside the urban areas is a significant amount of land comprising the natural resource base of Grant County's economy and the remainder of the population. Mixed within these lands is tracts of land not suited for agriculture or urban development and make up the rural land base of Grant County. The County recognized the need to maintain and protect the County's rural character and existing land use patterns.[7]

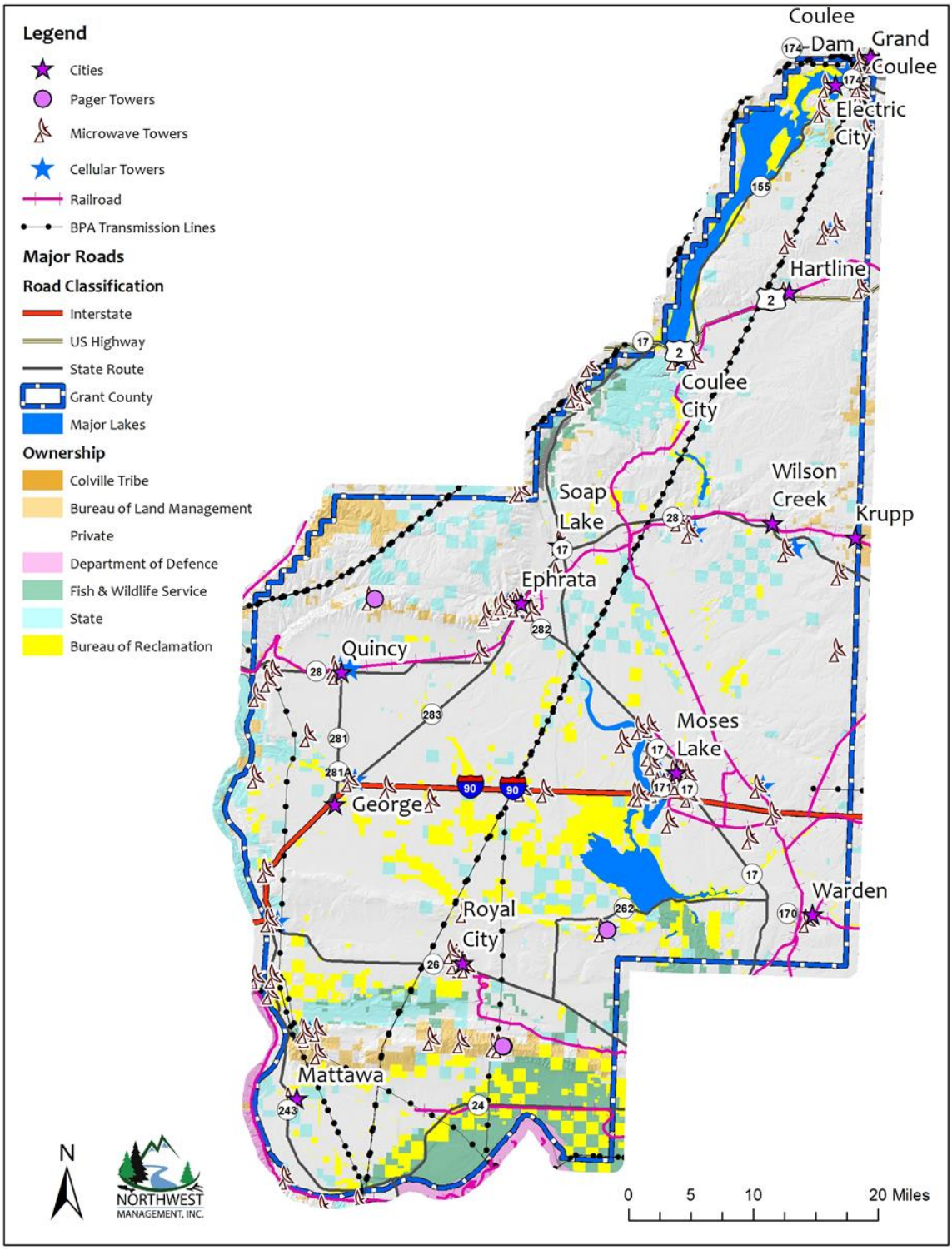
Agriculture

The predominant land use in Grant County is agriculture, in the form of dryland grain crops (including some in CRP), rangeland livestock grazing and irrigated orchard farming. Irrigated agriculture activities are located in the Moses Coulee area, and along the Columbia River corridor. Dryland wheat, other grain crops, and livestock production are primarily located on the plateau area. The 2012 Agriculture Census ranked Grant County as having the highest volume of agriculture sales, $1.7 billion, in Washington. Grant County is a top producer in Washington and the U.S. of wheat, corn, hay, potatoes, fruit, and livestock.

Grant County has 1,552 farms covering 963,784 acres with the average farm size of 621 acres per farm.[8]

[7] Grant County Comprehensive Plan. Available online at http://www.grantcountywa.gov/Planning/. Accessed February, 2015.
[8] U.S. Department of Agriculture's National Statistics Service 2012 Census of Agriculture: Washington State and County Data. Available online at: http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Washington/wav1.pdf. Accessed March, 2015.

Figure 3.2. Grant County Ownership



Natural Resources

Grant County is a diverse ecosystem with a complex array of vegetation, wildlife, and fisheries that have developed with, and adapted to fire as a natural/man-induced disturbance process. Integrating natural resources and fire management objectives, and more effectively using science can help identify, conserve, and create resilient and resistant landscapes for the long term. In addition, better use of technology to communicate key information quickly and simply to resource managers and wildland firefighting personnel, such as the location of previously identified high priority habitats, can improve the efficacy of firefighting and restoration efforts. Natural resource advisors and fire managers, at all levels, should coordinate and work collaboratively to identify priority habitats before a wildfire season to improve fire response and protection of priority habitat.

Nearly a century of wildland fire suppression coupled with past land-use practices (primarily agriculture and grazing) has altered plant community succession and has resulted in dramatic shifts in the fire regimes and species composition. As a result, some areas of Grant County have become more susceptible to large-scale, high-intensity fires posing a threat to life, property, and natural resources including wildlife and plant populations. High-intensity, stand-replacing fires have the potential to seriously damage soils, native vegetation, and fish and wildlife populations. In addition, an increase in the number of large, high-intensity fires throughout the nation's forest and rangelands has resulted in significant safety risks to firefighters and higher costs for fire suppression.

Fish and Wildlife

There are many species of wildlife that inhabit the shrub / steppe region of central Washington. Some of the species present even rely on this type of ecosystem to survive. Sage grouse, Columbian sharp tailed grouse, and Columbian pygmy rabbit once heavily populated this region of Washington, however due to habitat loss; these populations have been drastically reduced in numbers and largely been genetically isolated from other populations. There has been a significant effort by federal, state, and private landowners in recent years to increase the available preferred habitat through Conservation Reserve Program and incorporating higher grazing standards throughout the region.[9]

Pygmy Rabbit

The pygmy rabbit is the smallest rabbit in North America and its historical range includes portions of Washington and are typically found in areas of tall, dense sagebrush cover, and are highly dependent on sagebrush to provide both food and shelter throughout the year. The pygmy rabbit was state listed as a threatened species in Washington in 1990 because of population and distribution declines due to habitat changes. It was reclassified as state endangered in 1993 as declines contiuned, except for a distinct population segement in the Sagebrush Flats Wildlife Area in Douglas County, it was considered near extinct by 2001. The distinct population segment of the species known as the Columbia Basin pygmy rabbit was listed in 2003 as an endangered

[9] Washington Department of Fish and Wildlife website. http://wdfw.wa.gov/ Accessed April, 2013.

species under the federal Endagered Species Act. Threats to the pygmy rabbit include: habitat loss and fragementaiton caused by habitat conversion and wildfire freqency in some areas.

Greater Sage-Grouse

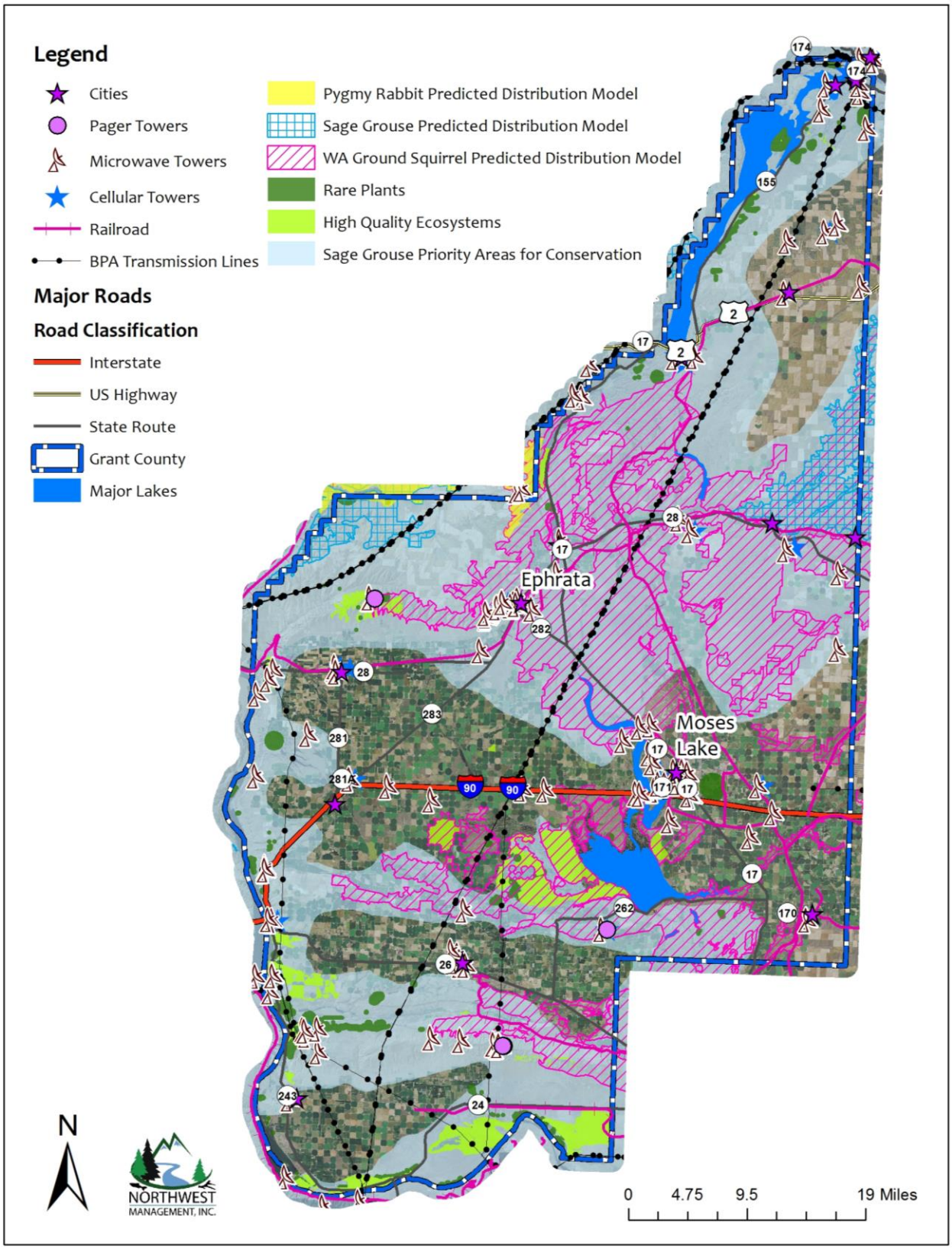
Greater sage-grouse historically occurred throughout the shrubsteepe and meadow-steppe communities of eastern Washington. Currently, the state has two relatively isolated breed populations in Douglas-Grant Counties and in Kittitas-Yakima Counties. Greater sage-grouse were listed as a threatened species by the state of Washington in 1998. In 2001, the Washington population of greater sage-grouse also became a Candidate for listing under the federal Endangered Species Act.[10]

Washington Ground Squirrels

Washington ground squirrels occupy shrub-steppe and native grassland habitats in the Columbia Basin Region of eastern Washington. The Washington ground squirrels were listed as a Candidate by the state of Washington in 1997 and also became a Candidate for listing under the federal Endangered Species act in 1999.

[10] Stinson, C. M., and M. A. Schroeder. 2014. Sage-grouse conservation in Washington: 2013. Wildlife Program, Washington Department of Fish and Wildlife, Olympia, Washington.

Figure 3.3. Grant County Sensitive Species



Vegetation

The Columbia Basin supports a complex landscape of native steppe and shrubsteppe vegetation composed of; scattered shrubs, typically sagebrush species or bitterbrush with a bunchgrass cover, usually bluebunch wheatgrass, Idaho fescue or needlegrasses, scablands (shallow rocky soils) that support specialized vegetation dominated by stiff sagebrush, one of several bushy buckwheats, and short bunchgrasses, and land largely converted to agricultural use or rangeland dominated by exotic plants or native vegetation tolerant of persistent land use.[11]

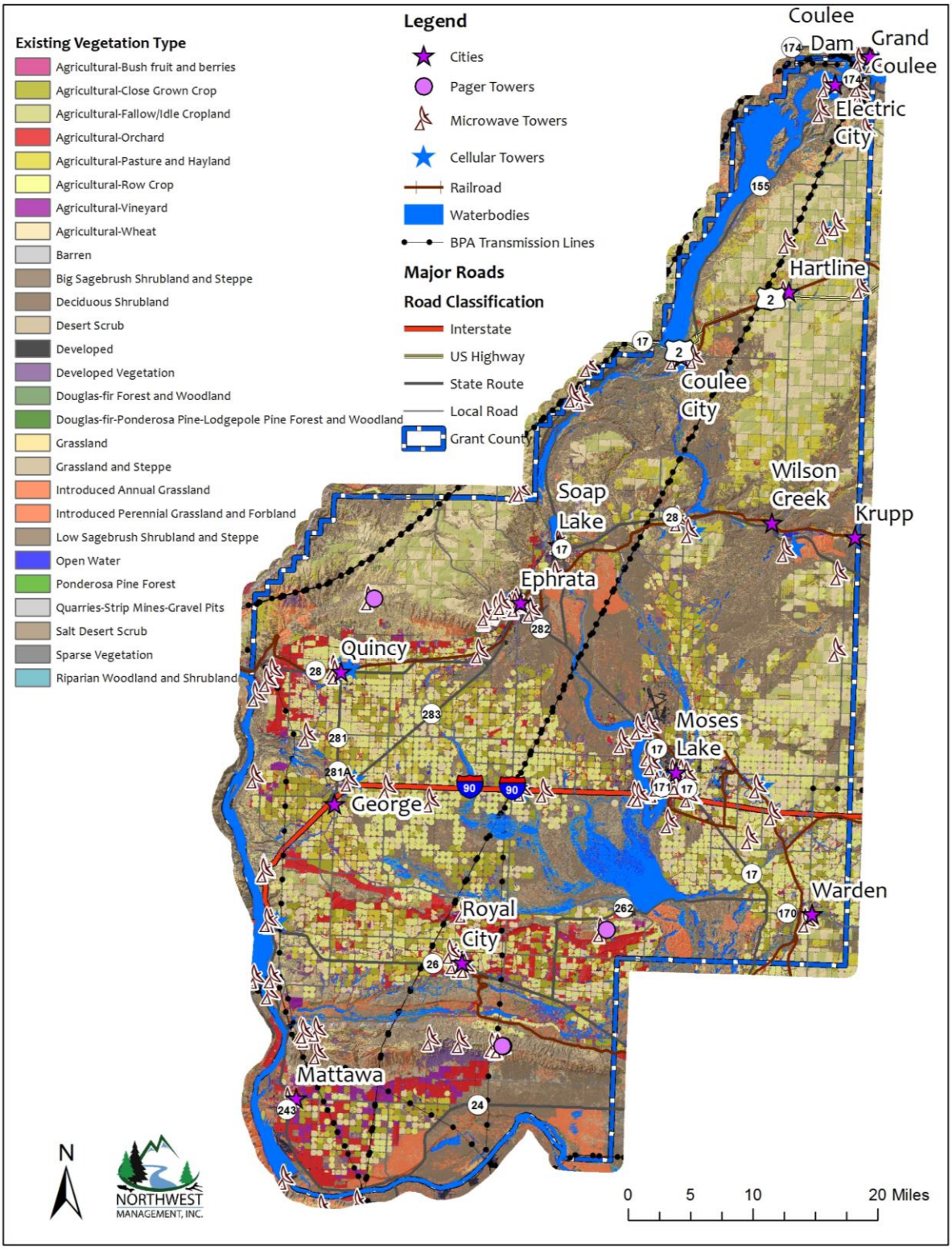
Table 3.4. Vegetative Cover Types in Grant County.

Land Cover	Acres	Percent of Total Area
Barren	1,735.5	< 1%
Sparsely Vegetated	19,488.3	1%
Riparian	20,299.9	1%
Conifer	25,614.3	1%
Grassland	59,610.1	3%
Exotic Herbaceous	83,195.4	5%
Open Water	83,698.5	5%
Developed	139739.2	7.8%
Shrubland	583,224.6	33%
Agricultural	770,049.4	43%
Total	**1,786,655**	**100%**

Vegetation in Grant County is a mix of shrubland, grassland, agricultural, and some riparian ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the vegetation of the area. The most represented vegetated cover type is agriculture followed by shrubland then grassland areas.

[11] A Riparian Vegetation Classification of the Columbia Basin, Washington. http://www1.dnr.wa.gov/nhp/refdesk/pubs/columbiarip.pdf Accessed May, 2013

Figure 3.4. Grant County Vegetation Types.



Hydrology

The Washington Department of Ecology & Water Resources Program is charged with the development of the Washington State Water Plan. Included in the State Water Plan are the statewide water policy plan and component basin and water body plans, which cover specific geographic areas of the state (WDOE 2005). The Washington Department of Ecology has prepared general lithologies of the major ground water flow systems in Washington.

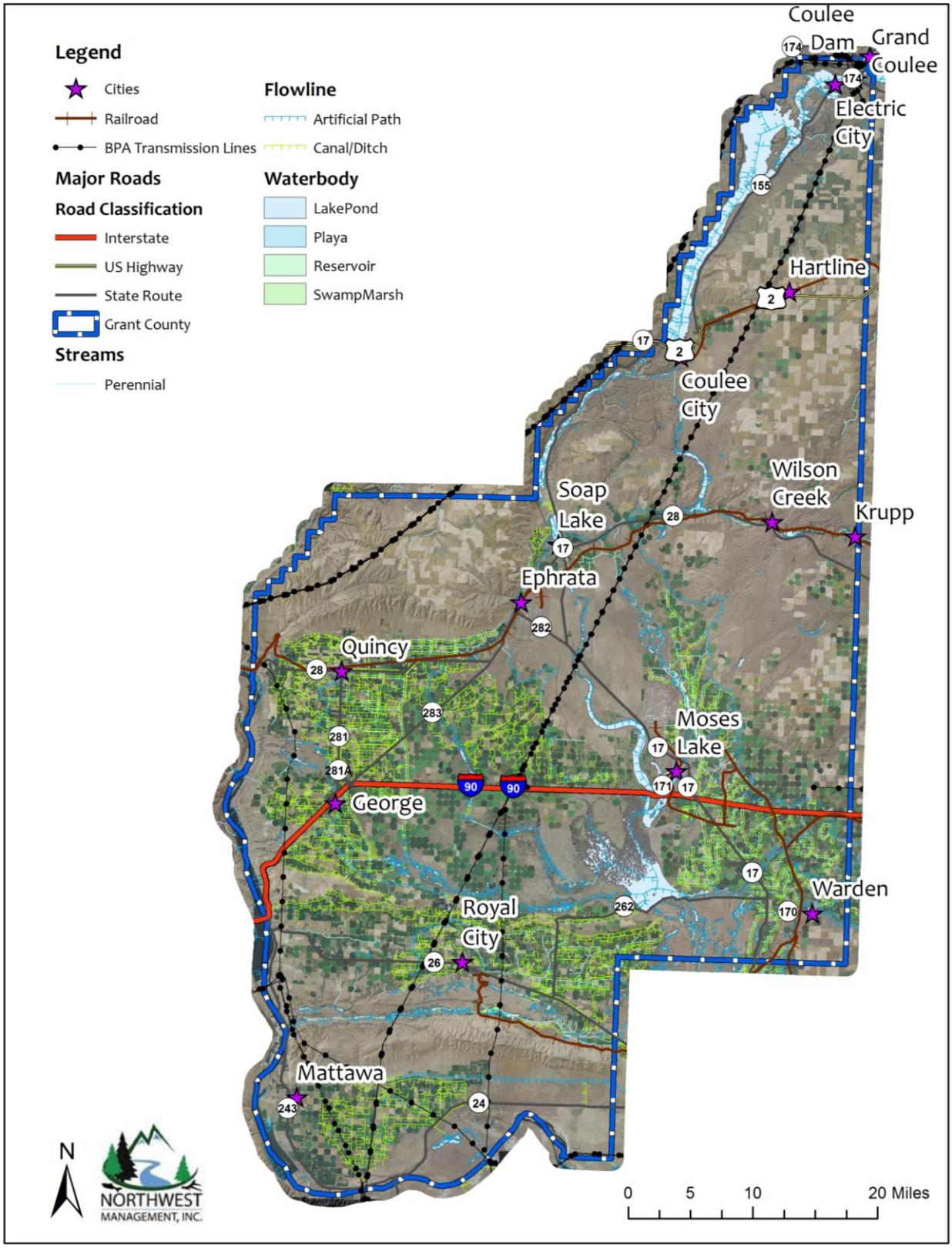
The state may assign or designate beneficial uses for particular Washington water bodies to support. These beneficial uses are identified in section WAC 173-201A-200 of the Washington Surface Water Quality Standards (WQS). These uses include:

- **Aquatic Life Uses:** char; salmonid and trout spawning, rearing, and migration; nonanadromous interior redband trout, and indigenous warm water species
- **Recreational Uses:** primary (swimming) and secondary (boating) contact recreation
- **Water Supply Uses:** domestic, agricultural, and industrial; and stock watering

While there may be competing beneficial uses in streams, federal law requires protection of the most sensitive of these beneficial uses.

A correlation to mass wasting due to the removal of vegetation caused by high intensity wildland fire has been documented. Burned vegetation can result in changes in soil moisture and loss of rooting strength that can result in slope instability, especially on slopes greater than 30%. The greatest watershed impacts from increased sediment will be in the lower gradient, depositional stream reaches.

Figure 3.5. Grant County Water Resources.



Air Quality

The primary means by which the protection and enhancement of air quality is accomplished is through implementation of National Ambient Air Quality Standards (NAAQS). These standards address six pollutants known to harm human health including ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxides.[12]

The Clean Air Act, passed in 1963 and amended in 1977, is the primary legal authority of the U.S. Environmental Protection Agency. The Clean Air Act provides the principal framework for national, state, and local efforts to protect air quality. Under the Clean Air Act, the Organization for Air Quality Protection Standards (OAQPS) is responsible for setting the NAAQS standards for pollutants which are considered harmful to people and the environment. OAQPS is also responsible for ensuring these air quality standards are met, or attained (in cooperation with state, Tribal, and local governments) through national standards and strategies to control pollutant emissions from automobiles, factories, and other sources.[13]

Smoke emissions from fires potentially affect an area and the airsheds that surround it. Climatic conditions affecting air quality in Washington are governed by a combination of factors. Large-scale influences include latitude, altitude, prevailing hemispheric wind patterns, and mountain barriers. At a smaller scale, topography and vegetation cover also affect air movement patterns. Locally adverse conditions can result from occasional wildland fires in the summer and fall, and prescribed fire and agricultural burning in the spring and fall.

Due principally to local wind patterns, air quality in Grant County is generally good to excellent, rarely falling below Washington Department of Ecology pollution standards.

Washington Department of Ecology

The Washington Department of Ecology Air Quality Program protects public health and the environment from pollutants caused by vehicles, outdoor and indoor burning, and industry. The DOE oversees permitting for non-forested (i.e. agriculture and rangeland) burning. Grant County falls under the jurisdiction of the Eastern Regional Office (ERO). The ERO can be reached at: 509-329-3400.

Washington State Smoke Management Plan

The Department of Natural Resources (DNR), Department of Ecology (DOE), U.S. Forest Service (USDA), National Park Service (NPS), Bureau of Land Management (BLM), U.S Fish and Wildlife Service (USDI), participating Indian nations, military installations (DOD), and small and large forest landowners have worked together to deal with the effect of outdoor burning on air.

Protection of public health and preservation of the natural attractions of the state are high priorities and can be accomplished along with a limited, but necessary, outdoor burning program. Public health, public safety, and forest health can all be served through the application of the

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[12] USDA-Forest Service (United States Department of Agriculture, Forest Service). 2000. Incorporating Air Quality Effects of Wildland Fire Management into Forest Plan Revisions – A Desk Guide. April 2000. – Draft.

[13] Louks, B. 2001. Air Quality PM 10 Air Quality Monitoring Point Source Emissions; Point site locations of DEQ/EPA Air monitoring locations with Monitoring type and Pollutant. Idaho Department of Environmental Quality. Feb. 2001. As GIS Data set. Boise, Idaho.

provisions of Washington State law and this plan, and with the willingness of those who do outdoor burning on forest lands to further reduce the negative effects of their burning.

The Washington State Smoke Management Plan pertains to DNR-regulated silvicultural outdoor burning only and does not include agricultural outdoor burning or outdoor burning that occurs on improved property. Although the portion of total outdoor burning covered by this plan is less than 10 percent of the total air pollution in Washington, it remains a significant and visible source.

The purpose of the Washington State Smoke Management Plan is to coordinate and facilitate the statewide regulation of prescribed outdoor burning on lands protected by the DNR and on unimproved, federally-managed forest lands and participating tribal lands. The plan is designed to meet the requirements of the Washington Clean Air Act.

The plan provides regulatory direction, operating procedures, and advisory information regarding the management of smoke and fuels on the forest lands of Washington State. It applies to all persons, landowners, companies, state and federal land management agencies, and others who do outdoor burning in Washington State on lands where the DNR provides fire protection, or where such burning occurs on federally-managed, unimproved forest lands and tribal lands of participating Indian nations in the state.

The Smoke Management Plan does not apply to agricultural outdoor burning and open burning as defined by Washington Administrative Code (WAC) 173-425-030 (1) and (2), nor to burning done "by rule" under WAC 332-24 or on non-forested wildlands (e.g., range lands).

Chapter 4

Risk and Preparedness Assessments

Wildland Fire Characteristics

An informed discussion of fire mitigation is not complete until basic concepts that govern fire behavior are understood. In the broadest sense, wildland fire behavior describes how fires burn; the manner in which fuels ignite, how flames develop and how fire spreads across the landscape. The three major physical components that determine fire behavior are the fuels supporting the fire, the topography in which the fire is burning, and the weather and atmospheric conditions during a fire event. At the landscape level, both topography and weather are beyond our control. We are powerless to control winds, temperature, relative humidity, atmospheric instability, slope, aspect, elevation, and landforms. It is beyond our control to alter these conditions, and thus impossible to alter fire behavior through their manipulation. When we attempt to alter how fires burn, we are left with manipulating the third component of the fire environment; fuels which support the fire. By altering fuel loading and fuel continuity across the landscape, we have the best opportunity to control or affect how fires burn.

A brief description of each of the fire environment elements follows in order to illustrate their effect on fire behavior.

Weather

Weather conditions contribute significantly to determining fire behavior. Wind, moisture, temperature, and relative humidity ultimately determine the rates at which fuels dry and vegetation cures, and whether fuel conditions become dry enough to sustain an ignition[14]. Once conditions are capable of sustaining a fire, atmospheric stability and wind speed and direction can have a significant effect on fire behavior. Winds fan fires with oxygen, increasing the rate at which fire spreads across the landscape. Weather is the most unpredictable component governing fire behavior, constantly changing in time and across the landscape.

Topography

Fires burning in similar fuel types, will burn differently under varying topographic conditions. Topography alters heat transfer and localized weather conditions, which in turn influences vegetative growth and resulting fuels. Changes in slope and aspect can have significant influences on how fires burn. Generally speaking, north slopes tend to be cooler, wetter, more productive sites. This can lead to heavy fuel accumulations, with high fuel moistures, later curing of fuels, and lower rates of spread. In contrast, south and west slopes tend to receive more direct sun, and thus have the highest temperatures, lowest soil and fuel moistures, and lightest fuels. The combination of light fuels and dry sites leads to fires that typically display the highest rates of spread. These slopes also tend to be on the windward side of mountains. Thus, these slopes tend to be "available to burn" a greater portion of the year.

[14]NOAA website http://www.nws.noaa.gov/om/wfire.shtml. Accessed on July 30, 2012.

Slope also plays a significant role in fire spread, by allowing preheating of fuels upslope of the burning fire. As slope increases, rate of spread and flame lengths tend to increase. Therefore, we can expect the fastest rates of spread on steep, warm south and west slopes with fuels that are exposed to the wind.[15]

Fuels

Fuel is any material that can ignite and burn. Fuels describe any organic material, dead or alive, found in the fire environment. Grasses, brush, branches, down woody material, forest floor litter, conifer needles, and buildings are all examples. The physical properties and characteristics of fuels govern how fires burn. Fuel loading, size and shape, moisture content, and continuity and arrangement all have an effect on fire behavior. Generally speaking, the smaller and finer the fuels, the faster the potential rate of fire spread. Small fuels such as grass, needle litter and other fuels less than a quarter inch in diameter are most responsible for fire spread. In fact, "fine" fuels, with high surface to volume ratios, are considered the primary carriers of surface fire. This is apparent to anyone who has ever witnessed the speed at which grass fires burn. As fuel size increases, the rate of spread tends to decrease due to a decrease in the surface to volume ratio. Fires in large fuels generally burn at a slower rate, but release much more energy and burn with much greater intensity. This increased energy release, or intensity, makes these fires more difficult to control. Thus, it is much easier to control a fire burning in grass than to control a fire burning in timber.[16]

When burning under a forest canopy, the increased intensities can lead to torching (single trees becoming completely involved) and potential development of crown fires. That is, they release much more energy. Fuels are found in combinations of types, amounts, sizes, shapes, and arrangements. It is the unique combination of these factors, along with the topography and weather, which determines how fires will burn.

The study of fire behavior recognizes the dramatic and often-unexpected effect small changes in any single component have on how fires burn. It is impossible to speak in specific terms when predicting how a fire will burn under any given set of conditions. However, through countless observations and repeated research, some of the principles that govern fire behavior have been identified and are recognized.

Wildfire Hazards

In the 1930s, wildfires consumed an average of 40 to 50 million acres per year in the contiguous United States, according to US Forest Service estimates. By the 1970s, the average acreage burned had been reduced to about 5 million acres per year. Over this time period, fire suppression efforts were dramatically increased and firefighting tactics and equipment became more sophisticated and effective. For the 11 western states, the average acreage burned per year since 1970 has remained relatively constant at about 3.5 million acres per year. The 2014 wildfire season set a new record for 31 days at Preparedness Level (PL) 5 and had one of the

[15] Auburn University website https://fp.auburn.edu/fire/topos_effect.htm. Accessed on July 30,2012.
[16] Gorte, R. 2009. Congressional Research Service, Wildfire Fuels and Fuel Reduction.

largest wildfires in Washington History, the Carlton Complex at 256,108 acres. There were a total of 425,136 acres consumed in the state of Washington.[17]

The severity of a fire season can usually be determined in the spring by how much precipitation is received, which in turn determines how much fine fuel growth there is and how long it takes this growth to dry. These factors, combined with annual wind events can drastically increase the chance a fire start will grow and resist suppression activities. Furthermore, recreational activities are typically occurring throughout the months of July, August, and September. Occasionally, these types of human activities cause an ignition that could spread into populated areas and wildlands.

This map shows both state and federally reported fires (1970-2012) as well as a majority of the wildfires that the local Fire Protection Districts responded to (2002-2013). The federal fires (indicated by yellow triangles) appear to be located primarily on BLM property and are likely human caused ignitions resulting from the high amount of recreation that occurs in those areas. It should be noted that fire data within the County is not standardized across local and federal agencies. Fires that are responded to by the local Fire Protection Districts are not always reported and therefore the above map could be misleading by showing that most wildfires occur on federal ownership while in fact a large majority of wildland fires occur on private land.

Fire History

Fire was once an integral function within the majority of ecosystems in Washington. The seasonal cycling of fire across most landscapes was as regular as the July, August and September lightning storms plying across western Washington. Depending on the plant community composition, structural configuration, and buildup of plant biomass, fire resulted from ignitions with varying intensities and extent across the landscape. Shorter return intervals between fire events often resulted in less dramatic changes in plant composition.[18] These fires burned from 1 to 47 years apart, with most at 5- to 20-year intervals.[19] With infrequent return intervals, plant communities tended to burn more severely and be replaced by vegetation different in composition, structure, and age.[20] Native plant communities in this region developed under the influence of fire, and adaptations to fire are evident at the species, community, and ecosystem levels.

Historic Fire history data for Grant County is largely unknown. Local knowledge suggests that Native Americans did frequently burn which played an important role in shaping the vegetation throughout County. The Bureau of Land Management is helping to fund future research targeted at identifying the fire history in central Washington through fire scars and charcoal deposits. Although this data is not available for the development of this document, it should be available for the five year update of this plan.

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[17] http://www.nwccinfo.blogspot.com. Accessed March 17, 2015.
[18] Johnson, C.G. 1998. Vegetation Response after Wildfires in National Forests of Northeastern Oregon. 128 pp.
[19] Barrett, J.W. 1979. Silviculture of ponderosa pine in the Pacific Northwest: the state of our knowledge. USDA Forest Service, General Technical Report PNW-97. Pacific Northwest Forest and Range Experiment Station, Portland, OR. 106 p.
[20] Johnson, C.G.; Clausnitzer, R.R.; Mehringer, P.J.; Oliver, C.D. 1994. Biotic and Abiotic Processes of Eastside Ecosytems: the Effects of Management on Plant and Community Ecology, and on Stand and Landscape Vegetation Dynamics. Gen. Tech. Report PNW-GTR-322. USDA-Forest Service. PNW Research Station. Portland, Oregon. 722pp.

Figure 4.1. Ignition History in Grant County from 1970-2012.

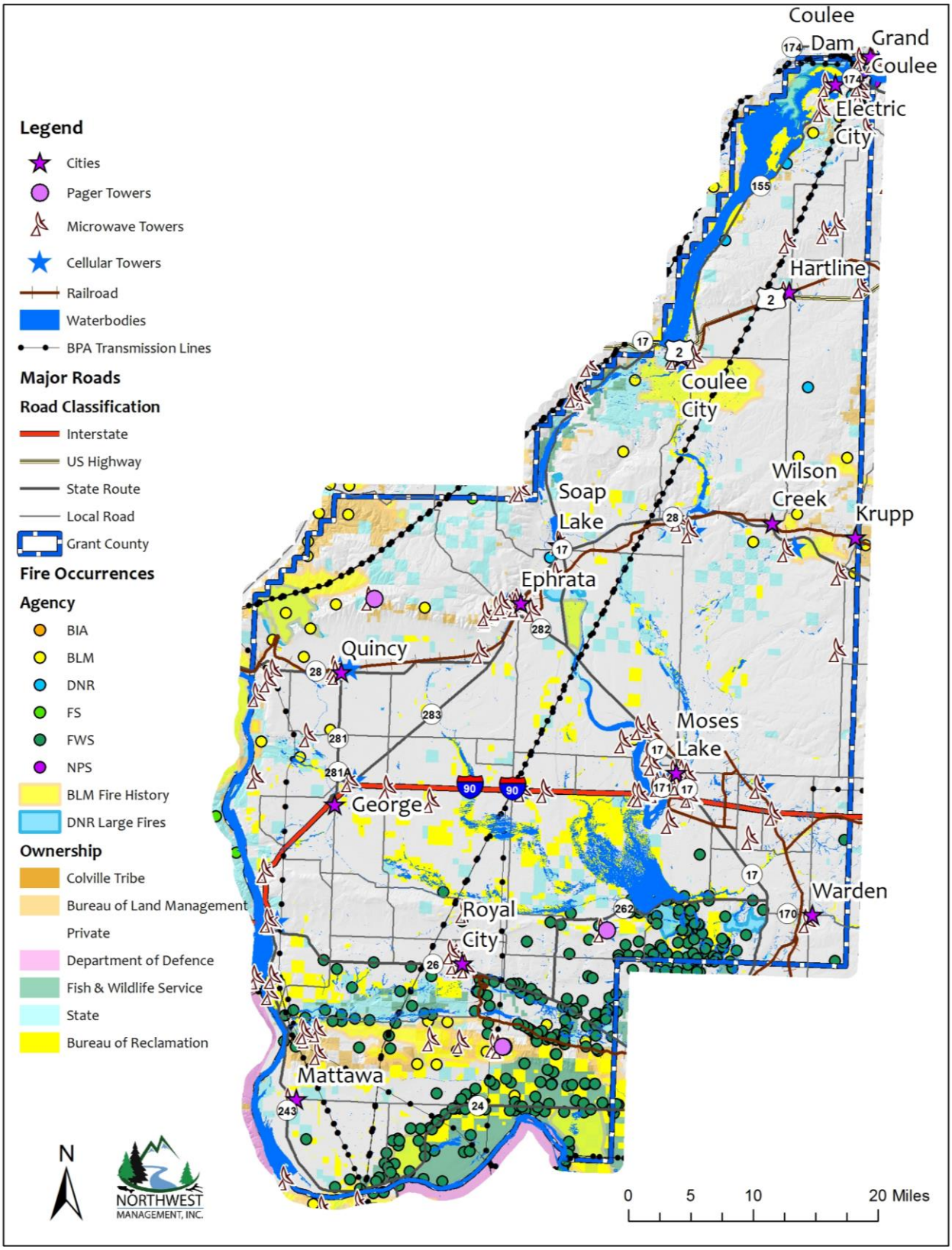

Figure 4.2. Recent wildfire - July, 2015. iFIBER One News.[21]

Posted: Monday, July 20, 2015 1:39 pm.

By Joe Utter

GEORGE - A wildland fire burning near George spread through 500 acres and is growing.

It was between 30 and 40 percent contained on Monday, but the fire expanded and was moving toward George, jumped Interstate 90 and triggered more evacuations.

Firefighters from Grant County and the Bureau of Land Management have crews fighting the fire near I-90 and Silica Road. The fire began Sunday afternoon.

Fire District 3 Chief Don Fortier said no structures were damaged and no injuries were reported.

Campers at the Old Vantage Highway were forced to evacuate Sunday afternoon.

Residents in the Quincy Lakes area were evacuated on Monday afternoon. Deputies and law enforcement went door to door to ask people to leave.

Residents in the areas near Silica Road, Road 5.5 Southwest, Road S Southwest, Road T.5 Southwest and Road U Southwest, according to the sheriff's office.

The wind-driven fire blew heavy smoke across I-90, forcing police to close the westbound lanes and backing up traffic for several miles. The highway was closed again on Monday as the fire spread across the lands. Traffic sitting on I-90 was told to turn around and leave.

Fortier said firefighters from Grant County fire districts 5, 8, 10, 11, 13 and the Ephrata Fire Department provided mutual aid along with two helicopters from federal resources.

Grant County is under a red flag warning until Monday evening, with high winds and low humidity causing potential for wildfires to grow.

[21] iFIBER One News website available at: http://www.ifiberone.com/news/george-fire-spreads-toward-town-triggers-more-evacuations-i-/article_64dd1f00-2f1f-11e5-9dff-07c42e4e7763.html. Accessed July, 2015.

Figure 4.3. Hills Fire - July, 2015. iFIBER One News.[22]

Posted: Sunday, July 5, 2015 12:50 am.

By Joe Utter

QUINCY - People near Baird Springs Road were told to evacuate early Sunday morning due to a wildfire burning northwest of Quincy.

About 15 homes were evacuated after the Hills fire sparked about three miles northwest of Quincy.

Between 5,000 and 10,000 acres of sage brush and grass burned in the wind-driven fire, according to the Grant County Sheriff's Office.

The state fire marshal's office approved mobilizing fire departments across the state early Sunday morning to help fight the fire.

No structures were damaged.

People were allowed to return home late Sunday morning.

Figure 4.4. Saddle Lake Fire – June, 2015. iFIBER One News.[23]

Posted: Tuesday, June 30, 2015 5:26 pm.

By Joe Utter

MATTAWA – The Saddle Lake wildfire grew to about 15,000 acres near Mattawa.

The initial estimated size of the fire along state Route 24 was about 3,000 acres but firefighters say strong winds caused the fire to spread during the day Monday, according to Grant County Fire District 8.

The fire is about 95 percent contained and was turned over to the state for mop up and flare-up protection.

Air support was used Monday to dump water and chemical retardant along the fire line.

Between 70 and 120 firefighter were expected to remain on scene throughout Tuesday.

The fire stretches from SR 24 to the Columbia River, about seven miles long and four to five miles at its widest point, according to officials.

The fire sparked Sunday night near the Vernita Bridge and is believed to have been caused by lightning.

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[22] iFIBER One News website available at: http://www.ifiberone.com/news/at-least-acres-burning-in-wildfire-near-quincy/article_7ef64b14-22ea-11e5-8fca-473fe2cb4bfc.html. Accessed July, 2015.

[23] iFIBER One News website available at: http://www.ifiberone.com/news/saddle-lake-fire-grew-to-acres-now-percent-contained/article_d6512886-1f87-11e5-838c-6724554efeeb.html. Accessed July, 2015.

Figure 4.5. I-90 fire – July 20, 2015. KOMOnews.com.[24]

A stubborn brush fire burning in Central Washington flared back up again Monday afternoon, shutting down a portion of Interstate 90 overnight. The freeway remained closed early Tuesday morning and was scheduled to reopen at 10 a.m.

The wind-driven fire has already burned an estimated 900 acres near Silica Road, according to the Washington State Patrol.

Kyle Foreman with the Grant County sheriff's office said the wind -- which gusted at 25 miles per hour on Monday -- will play a large role in how the fire is fought.

"That continues to be a risk," he said. "If we have any areas that don't get put out, they stand the chance of getting fired back up again so firefighters are going to work real hard to make sure everything is out and cold around here"

The residents of 50 homes have been told to prepare to leave if the fire comes their way. The homes were briefly evacuated Monday afternoon.

The fire started Sunday afternoon and flared up again Monday as winds grew heavier, prompting the state to authorize the Washington State Fire Services Resource Mobilization.

"Mobilization specialists from the Fire Protection Bureau have ordered four strike teams, two helicopters, and a Type 3 Incident Management Team to supplement the resources already fighting the fire," WSP officials wrote in a Monday evening news release.

The Grant County sheriff's office received a report about a hay-filled trailer on fire on Frontage Road next to I-90. The tractor was not damaged and nobody was injured, according to the sheriff's office.

No other homes or vehicles have damaged in the fire.

Roughly 200 firefighters were battling the fire on Monday afternoon, according to the sheriff's office.

All lanes of I-90 were closed overnight between Vantage and George due to heavy smoke and fire across the freeway, the state patrol said. The freeway was set to reopen at 10 a.m. Tuesday, but could be closed again if conditions become worse.

Wildfire Ignition Profile

Detailed records of wildfire ignitions and extents from the Washington Department of Natural Resources (DNR) and Bureau of Land Management (BLM) have been analyzed. In interpreting these data, it is important to keep in mind that the information represents only the lands protected by the agency specified and may not include all fires in areas covered only by local fire departments or other agencies.

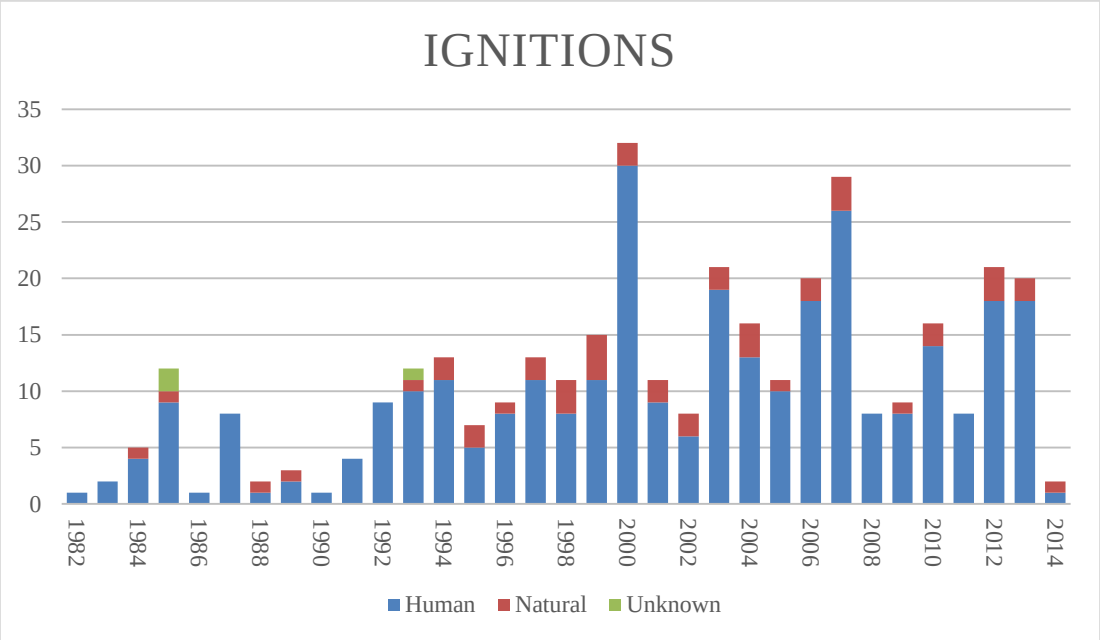
The Federal fire point data for all agencies (1980-2013), WA DNR (1970-2015) and BLM (1980-2015) database of wildfire ignitions used in this analysis includes ignition and extent data within their jurisdictions. During this period, the agencies recorded an average of 11 wildfire ignition per year resulting in an average total burn area of 4,107 acres per year. According to this dataset, the vast majority of fires occurring in Grant County are human caused; however, naturally ignited/unknown caused fires do occur.

[24] KOMOnews.com website available at: http://www.komonews.com/news/local/Dozens-of-homes-evacuated-as-brush-fire-swells-in-Central-Washington-317628761.html. Accessed September 14, 2015.

Table 4.1. Summary of Cause from State and BLM databases 1982-2014.				
General Cause	**Number of Ignitions**	**Percent of Total Ignitions**	**Acres Burned**	**Percent of Total Acres**
Human-Caused	313	87%	100,439	76%
Natural Ignition	45	12%	30,962	24%
Unknown	3	<1%	30	<1%
Total	**361**	**100%**	**131,431**	**100%**

Based on the agencies' combined datasets specific to Grant County, there is an upward trend in both the number of ignitions and acres burned per year since 1970. The upward trends could be attributed to a higher amount of people moving to more rural areas of Grant County. Another contributing factor could be the spread of invasive species. It should be noted that a majority of the wildland fires occurring in Grant County are not reported at the State or Federal level, therefore a separate analysis of fire history at the Fire District level is warranted.

Figure 4.6. Summary of Grant County State and Federal Ignitions by Cause



The data reviewed above provides a general picture regarding the level of wildland-urban interface fire risk within Grant County. There are several reasons why the fire risk may be even higher than suggested above, especially in developing wildland-urban interface areas.

1) Large fires may occur infrequently, but statistically they will occur. One large fire could significantly change the statistics. In other words, 40 years of historical data may be too short to capture large, infrequent wildland fire events.

2) The level of fire hazard depends profoundly on weather patterns. A several year drought period would substantially increase the probability of large wildland fires in Grant County. For smaller vegetation areas, with grass, brush and small trees, a much shorter drought period of a few months or less would substantially increase the fire hazard.

3) The level of fire hazard in wildland-urban interface areas is likely significantly higher than for wildland areas as a whole due to the greater risk to life and property. The probability of fires starting in interface areas is much higher than in wildland areas because of the higher population density and increased activities. Many fires in the wildland urban interface are not recorded in agency datasets because the local fire department responded and successfully suppressed the ignition without mutual aid assistance from the state or federal agencies.

Wildfire Extent Profile

Across the west, wildfires have been increasing in extent and cost of control. Data summaries for 2003 through 2014 are provided and demonstrate the variability of the frequency and extent of wildfires nationally.

Table 4.2. Statistical Highlights of Wildfires from 2004 -2014 Nationally.

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Fires	77,534	66,753	96,385	85,705	78,979	78,792	71,971	74,126	67,774	47,579	63,212
10-year Average ending with indicated year	100,466	89,859	87,788	80,125	79,918	78,549	76,521	80,465	74,912	74,560	73,128
Acres Burned (million acres)	6.8	8.7	9.9	9.3	5.3	5.9	3.4	8.7	9.2	4.3	3.6
10-year Average ending with indicated year (million acres)	4.9	6.1	6.5	7.0	6.9	6.9	6.5	7.0	7.3	7.2	6.8
Structures Destroyed	1,095	--	--	--	--	--	788	5,246	4,244	2,135	1,953
Estimated Cost of Fire Suppression (Federal agencies only)	$1.0 billion	$9.8 million	$1.93 billion	$1.84 billion	$1.85 billion	$1.24 billion	$1.13 billion	$1.73 billion	$1.9 billion	$1.7 billion	$1.5 billion

The National Interagency Fire Center and the National Incident Coordination Center maintains records of fire costs, extent, and related data for the entire nation. Tables 4.2 and 4.3 summarize some of the relevant wildland fire data for the nation and some trends that are likely to continue into the future unless targeted fire mitigation efforts are implemented and maintained. According to these data, the total number of fires is trending downward while the total number of acres burned is trending upward. Since 1980 there has been a significant increase in the number of acres burned.[25] In 2014, Washington was second behind California for the highest structure loss per state, with 342 residences, one commercial and 175 outbuildings destroyed during the 2014 fire season.[26]

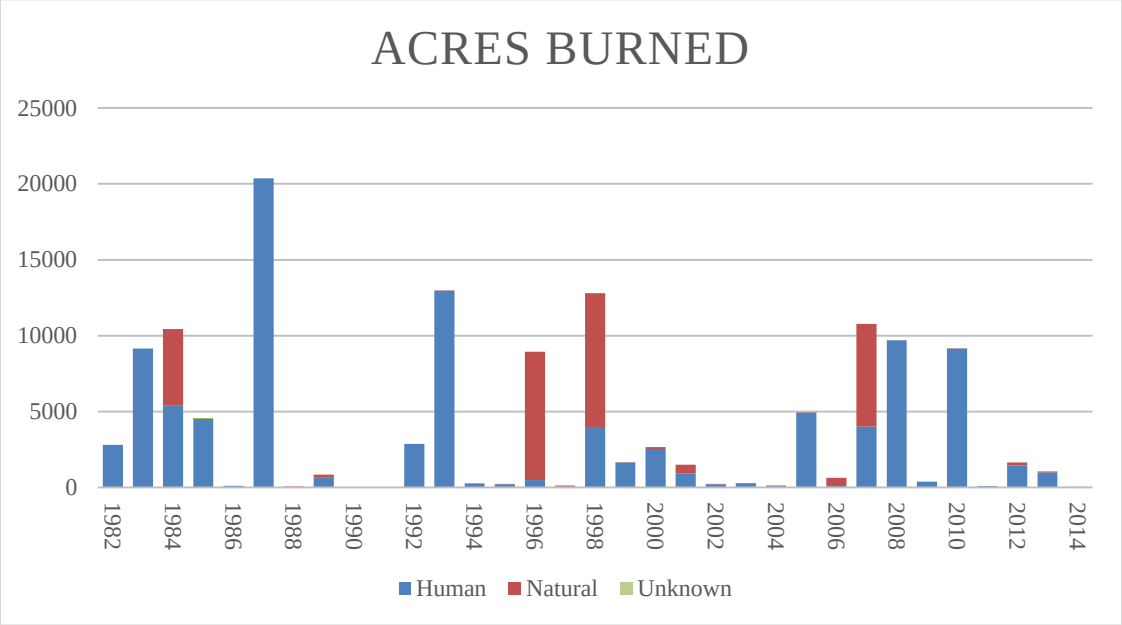
[25] National Interagency Fire Center. 2015. Available online at http://www.nifc.gov/.
[26] National Interagency Fire Center. Wildland Fire Summary and Statistics Annual Report 2014. Available online at http://www.predictiveservices.nifc.gov/intelligence/2014_Statssumm/annual_report_2014.pdf.

Table 4.3. Total Fires and Acres 1980 - 2014 Nationally.

Year	Fires	Acres	Year	Fires	Acres
2014	63,212	3,595,613	**1996**	115,025	6,701,390
2013	47,579	4,319,546	**1995**	130,019	2,315,730
2012	67,774	9,326,238	**1994**	114,049	4,724,014
2011	74,126	8,711,367	**1993**	97,031	2,310,420
2010	71,971	3,422,724	**1992**	103,830	2,457,665
2009	78,792	5,921,786	**1991**	116,953	2,237,714
2008	68,594	4,723,810	**1990**	122,763	5,452,874
2007	85,822	9,321,326	**1989**	121,714	3,261,732
2006	96,385	9,873,745	**1988**	154,573	7,398,889
2005	66,753	8,689,389	**1987**	143,877	4,152,575
2004	77,534	6,790,692	**1986**	139,980	3,308,133
2003	85,943	4,918,088	**1985**	133,840	4,434,748
2002	88,458	6,937,584	**1984**	118,636	2,266,134
2001	84,079	3,555,138	**1983**	161,649	5,080,553
2000	122,827	8,422,237	**1982**	174,755	2,382,036
1999	93,702	5,661,976	**1981**	249,370	4,814,206
1998	81,043	2,329,709	**1980**	234,892	5,260,825
1997	89,517	3,672,616			

These statistics are based on end-of-year reports compiled by all wildland fire agencies after each fire season. The agencies include: Bureau of Land Management, Bureau of Indian Affairs, National Park Service, US Fish and Wildlife Service, Forest Service, and all state agencies.

Figure 4.7. Summary of Grant County State and Federal Acres Burned by Cause.



The fire suppression agencies in Grant County respond to numerous wildland fires each year, but few of those fires grow to a significant size. According to national statistics, only 2% of all wildland fires escape initial attack. However, that 2% accounts for the majority of fire suppression expenditures and threatens lives, properties, and natural resources. These large fires are characterized by a size and complexity that require special management organizations

drawing suppression resources from across the nation. These fires create unique challenges to local communities by their quick development and the scale of their footprint.

Wildfire Hazard Assessment

Grant County was analyzed using a variety of models, managed on a Geographic Information System (GIS) system. Physical features of the region including roads, streams, soils, elevation, and remotely sensed images were represented by data layers. Field visits were conducted by specialists from Northwest Management, Inc. and others. Discussions with area residents and local fire suppression professionals augmented field visits and provided insights into forest health issues and treatment options. This information was analyzed and combined to develop an objective assessment of wildland fire risk in the region.

Historic Fire Regime

Historical variability in fire regime is a conservative indicator of ecosystem sustainability, and thus, understanding the natural role of fire in ecosystems is necessary for proper fire management. Fire is one of the dominant processes in terrestrial systems that constrain vegetation patterns, habitats, and ultimately, species composition. Land managers need to understand historical fire regimes, the fire return interval (frequency) and fire severity prior to settlement by Euro-Americans, to be able to define ecologically appropriate goals and objectives for an area. Moreover, managers need spatially explicit knowledge of how historical fire regimes vary across the landscape.

"Natural" fires in Grant County would have been disproportionately caused by Native Americans. Aboriginal peoples intentionally set fires throughout the region for the purposes of controlling tree and shrub expansion and for the cultivation of select plants. When we describe "natural" in the Range of Natural Variability we are including indigenous peoples as natural disturbance agents and contributors to perceptions of what is "natural".

A primary goal in ecological restoration is often to return an ecosystem to a previously existing condition that no longer is present at the site, under the assumption that the site's current condition is somehow degraded or less desirable than the previous condition and needs improvement

Land managers in Grant County must determine if the past, Native American influenced condition of the County was necessarily healthier, had a higher level of integrity, and was more sustainable than the current condition. In other words, is "restoration" an appropriate course of action? After a prolonged absence, if fire is reintroduced to these ecosystems the result could be damaging. Fuel loads throughout most of the County today are quite high and most of the County is inhabited by people, homes, and infrastructure. The ecosystem was adapted to fire in the past, but is no longer adapted today, especially in light of the human component.

In the absence of intensive Native American burning, a condition has developed where fire could/should not be reintroduced without some significant alteration of the current ecosystem structure. This would also require a significant assessment of social acceptance and financial contribution.

Many ecological assessments are enhanced by the characterization of the historical range of variability which helps managers understand: (1) how the driving ecosystem processes vary from site to site; (2) how these processes affected ecosystems in the past; and (3) how these processes might affect the ecosystems of today and the future. Historical fire regimes are a critical component for characterizing the historical range of variability in fire-adapted ecosystems. Furthermore, understanding ecosystem departures provides the necessary context for managing sustainable ecosystems. Land managers need to understand how ecosystem processes and functions have changed prior to developing strategies to maintain or restore sustainable systems. In addition, the concept of departure is a key factor for assessing risks to ecosystem components. For example, the departure from historical fire regimes may serve as a useful proxy for the potential of severe fire effects from an ecological perspective.

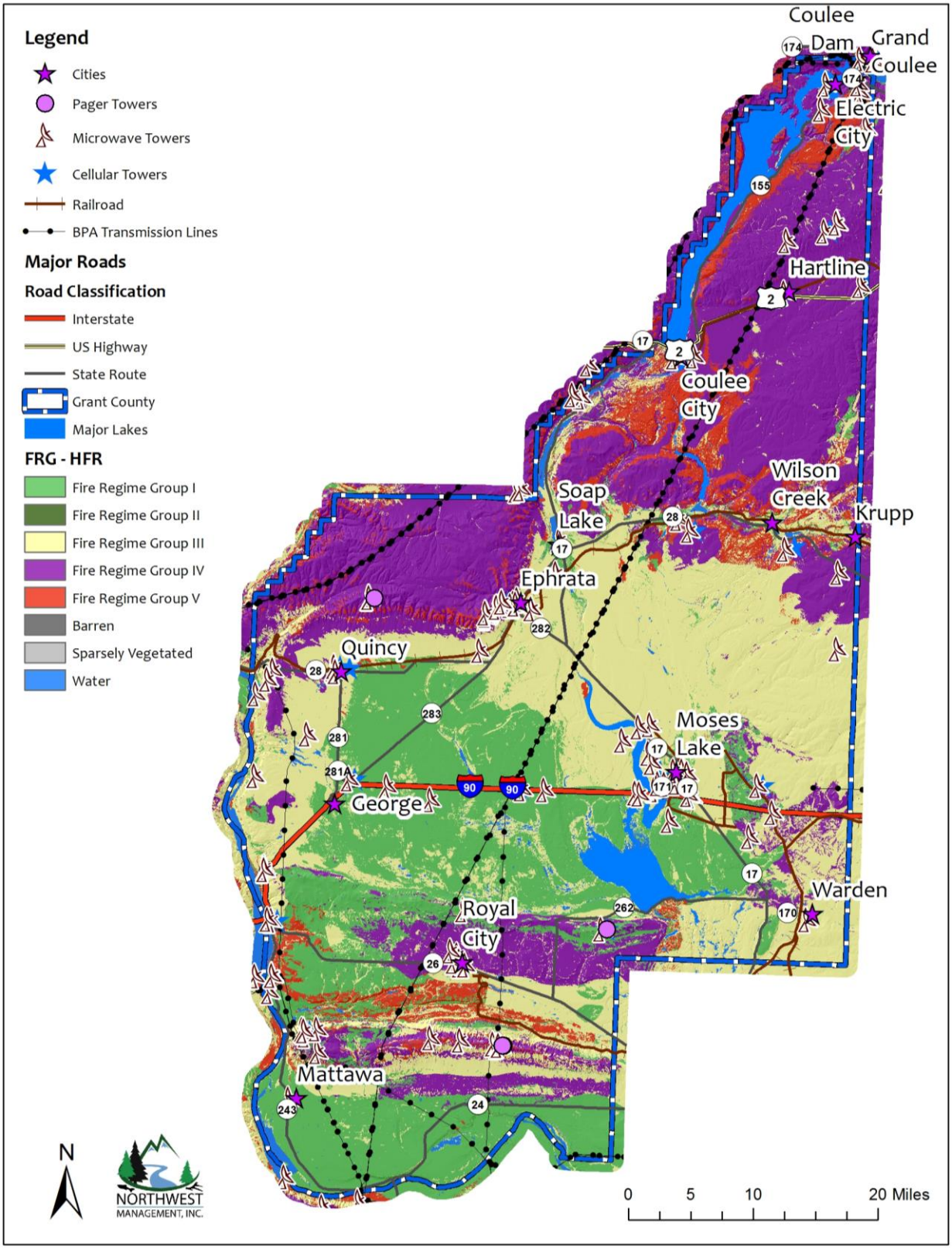
Table 4.4. Historic Fire Regimes in Grant County.

Historic Fire Regime	Description	Acres	Percent of Total
Fire Regime Group I	<= 35 Year Fire Return Interval, Low and Mixed Severity	445,963	25%
Fire Regime Group II	<= 35 Year Fire Return Interval, Replacement Severity	139	<1%
Fire Regime Group III	35 - 200 Year Fire Return Interval, Low and Mixed Severity	609,939	34%
Fire Regime Group IV	35 - 200 Year Fire Return Interval, Replacement Severity	521,783	29%
Fire Regime Group V	> 200 Year Fire Return Interval, Any Severity	126,474	7%
Water	Water	80,075	4%
Barren	Barren	2,000	<1%
Sparsely Vegetated	Sparsely Vegetated	283	<1%
	Total	**1,786,655**	**100%**

This model only uses the current vegetation types to determine the historic fire regime. Native Americans reportedly burned throughout the county on a regular basis. The vegetation types were much different pre Euro-American settlement than they are today and believed to be a more grassland dominated landscape.

A map depicting the historic fire regime as well as additional explanation of how the historic fire regime data was derived is included in Appendix 1 and 3.

Figure 4.8. Historic Fire Regime for Grant County.



Vegetation Condition Class

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning.[27, 28] Coarse scale definitions for historic fire regimes have been developed by Hardy et al[29] and Schmidt et al[30] and interpreted for fire and fuels management by Hann and Bunnell.

A vegetation condition class (VCC) is a classification of the amount of departure from the historic regime. [31] The three classes are based on low (VCC 1), moderate (VCC 2), and high (VCC 3) departure from the central tendency of the natural (historical) regime.[32,33] 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.

An analysis of Vegetation Condition Classes in Grant County shows that the majority land in the county that has not been converted to agriculture (34%) is considered highly departed (37%) from its historic fire regime and associated vegetation and fuel characteristics. Approximately 2% has a low departure and less than 20% is considered moderately departed.

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[27] Agee, J. K. Fire Ecology of the Pacific Northwest forests. Oregon: Island Press. 1993.

[28] Brown. J. K. "Fire regimes and their relevance to ecosystem management." *Proceedings of Society of American Foresters National Convention*. Society of American Foresters. Washington, D.C. 1995. Pp 171-178.

[29] Hardy, C. C., et al. *"Spatial data for national fire planning and fuel management."* International Journal of Wildland Fire. 2001. Pp 353-372.

[30] Schmidt, K. M., et al. *"Development of coarse scale spatial data for wildland fire and fuel management."* General Technical Report, RMRS-GTR-87. U.S. Department of Agriculture, Forest Service. Rocky Mountain Research Station. Fort Collins, Colorado. 2002.

[31] Hann, W. J. and D. L. Bunnell. "Fire and land management planning and implementation across multiple scales." International Journal of Wildland Fire. 2001. Pp 389-403.

[32] Hardy, C. C., et al. *"Spatial data for national fire planning and fuel management."* International Journal of Wildland Fire. 2001. Pp 353-372.

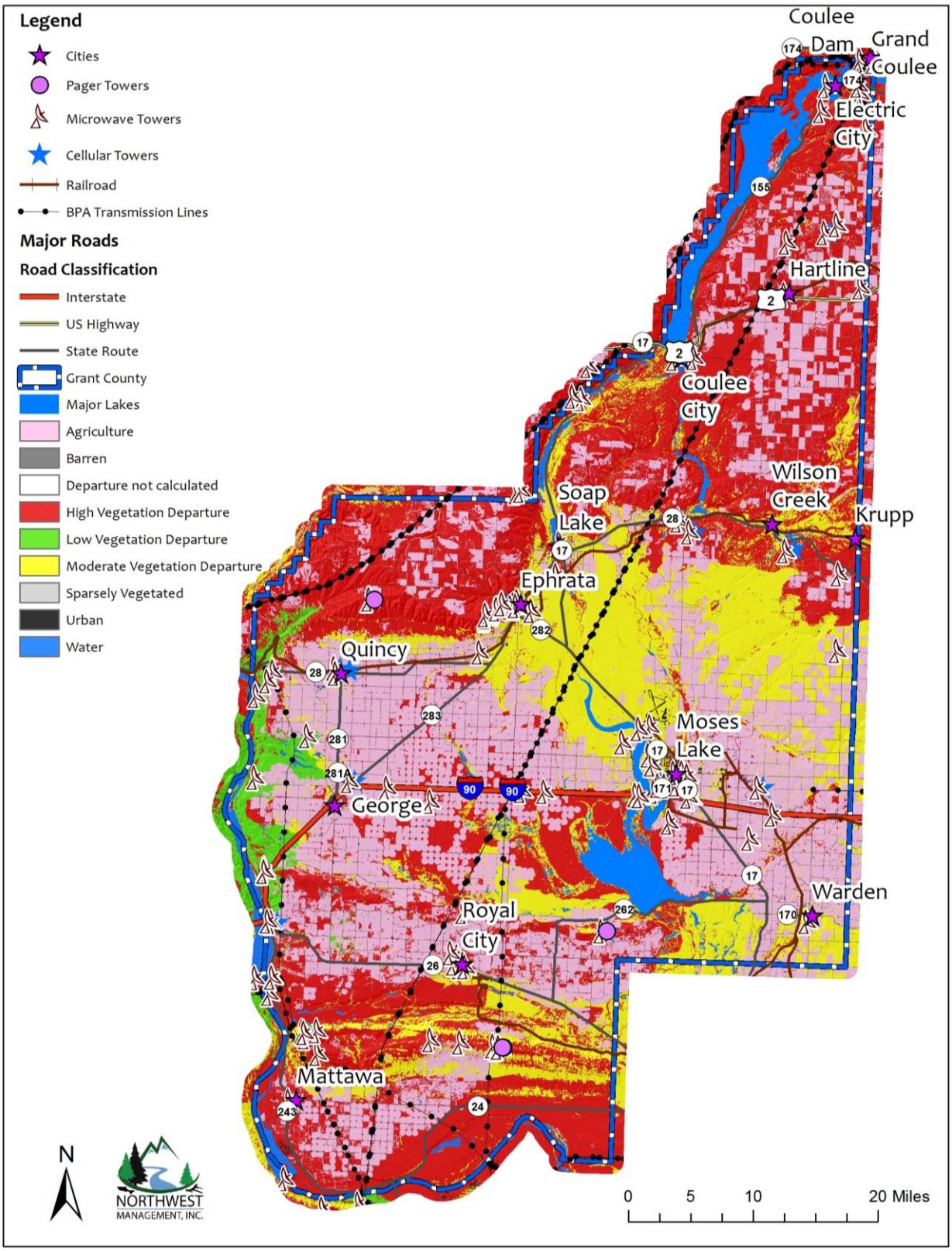
[33] Schmidt, K. M., et al. *"Development of coarse scale spatial data for wildland fire and fuel management."* General Technical Report, RMRS-GTR-87. U.S. Department of Agriculture, Forest Service. Rocky Mountain Research Station. Fort Collins, Colorado. 2002.

Table 4.5. Vegetation Condition Class in Grant County.			
Vegetation Condition Class	**Description**	**Acres**	**Percent of Total**
Vegetation Condition Class I	Low Vegetation Departure	31,764	2%
Vegetation Condition Class II	Moderate Vegetation Departure	353,902	20%
Vegetation Condition Class III	High Vegetation Departure	662,495	37%
Agriculture	Agriculture	618,568	35%
Water	Water	80,075	4%
Urban	Urban	37,219	2%
Barren	Barren	2,412	<1%
Sparsely Vegetated	Sparsely Vegetated	187	<1%
	Total	**1,786,665**	**100%**

The current Vegetation Condition Class model shows that much of Grant County is considered to be highly departed. A concentration of the highly departed vegetation appears to occur in the northeast corner of the county where vast amounts of Conservation Reserve Program land exists. In addition, a majority of the county is dominated by various shrub species with a grass understory consisting of bluebunch wheatgrass, Idaho fescue, and other grass species. The current structure and density of the shrublands in many areas makes it susceptible to health issues from competition, insects, and disease. The current fire severity model suggests that a higher severity fire than historical norms would be expected in these areas.

A map depicting Vegetation Condition Class as well as a more in-depth explanation of VCC is presented in Appendices 1 and 3.

Figure 4.9. Vegetation Condition Class.



Grant County's Wildland-Urban Interface

The wildland-urban interface (WUI) has gained attention through efforts targeted at wildfire mitigation; however, this analysis technique is also useful when considering other hazards because the concept looks at where people and structures are concentrated in any particular region.

A key component in meeting the underlying need for protection of people and structures is the protection and treatment of hazards in the wildland-urban interface. The wildland-urban interface refers to areas where wildland vegetation meets urban developments or where forest fuels meet urban fuels such as houses. The WUI encompasses not only the interface (areas immediately adjacent to urban development), but also the surrounding vegetation and topography. Reducing the hazard in the wildland-urban interface requires the efforts of federal, state, and local agencies and private individuals.[34] "The role of [most] federal agencies in the wildland-urban interface includes wildland firefighting, hazard fuels reduction, cooperative prevention and education, and technical experience. Structural fire protection [during a wildfire] in the wildland-urban interface is [largely] the responsibility of Tribal, state, and local governments".[35] The role of the federal agencies in Grant County is and will be much more limited. Property owners share a responsibility to protect their residences and businesses and minimize danger by creating defensible areas around them and taking other measures to minimize the risks to their structures.[36] With treatment, a wildland-urban interface can provide firefighters a defensible area from which to suppress wildland fires or defend communities against other hazard risks. In addition, a wildland-urban interface that is properly treated will be less likely to sustain a crown fire that enters or originates within it. [37]

By reducing hazardous fuel loads and creating new and reinforcing existing defensible space, landowners can protect the wildland-urban interface, the biological resources of the management area, and adjacent property owners by:

- Minimizing the potential of high-severity fires entering or leaving the area;
- Reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI. Research indicates that flying sparks and embers (firebrands) from a crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior;[38]
- Improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

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[34] Norton, P. Bear Valley National Wildlife Refuge Fire Hazard Reduction Project: Final Environmental Assessment. Fish and Wildlife Services, Bear Valley Wildlife Refuge. June 20, 2002.
[35] USFS. 2001. United States Department of Agriculture, Forest Service. Wildland Urban Interface. Web page. Date accessed: 25 September 2001. Accessed at: http://www.fs.fed.us/r3/sfe/fire/urbanint.html
[36] USFS. 2001. United States Department of Agriculture, Forest Service. Wildland Urban Interface. Web page. Date accessed: 25 September 2001. Accessed at: http://www.fs.fed.us/r3/sfe/fire/urbanint.html
[37] Norton, P. Bear Valley National Wildlife Refuge Fire Hazard Reduction Project: Final Environmental Assessment. Fish and Wildlife Services, Bear Valley Wildlife Refuge. June 20, 2002.
[38] McCoy, L. K., et all. Cerro Grand Fire Behavior Narrative. 2001.

Three wildland-urban interface conditions have been identified (Federal Register 66(3), January 4, 2001) for use in wildfire control efforts. These include the Interface Condition, Intermix Condition, and Occluded Condition. Descriptions of each are as follows:

- **Interface Condition** – a situation where structures abut wildland fuels. There is a clear line of demarcation between the structures and the wildland fuels along roads or back fences. The development density for an interface condition is usually 3+ structures per acre;
- **Intermix Condition** – a situation where structures are scattered throughout a wildland area. There is no clear line of demarcation; the wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres; and
- **Occluded Condition** – a situation, normally within a city, where structures abut an island of wildland fuels (park or open space). There is a clear line of demarcation between the structures and the wildland fuels along roads and fences. The development density for an occluded condition is usually similar to that found in the interface condition and the occluded area is usually less than 1,000 acres in size.

In addition to these classifications detailed in the Federal Register, Grant County has included three additional classifications to augment these categories:

- **Rural Condition** – a situation where the scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuels. There may be miles between these clusters.
- **High Density Urban Areas** – those areas generally identified by the population density consistent with the location of incorporated cities, however, the boundary is not necessarily set by the location of city boundaries or urban growth boundaries; it is set by very high population densities (more than 7-10 structures per acre).
- **Non-WUI Condition** – a situation where the above definitions do not apply because of a lack of structures in an area or the absence of critical infrastructure. This classification is not considered part of the wildland urban interface.

In summary, the designation of areas by the Grant County steering committee includes:

- Interface Condition: WUI
- Intermix Condition: WUI
- Occluded Condition: WUI
- Rural Condition: WUI
- High Density Urban Areas: WUI
- Non-WUI Condition: Not WUI, not present in Grant County

Grant County's wildland urban interface (WUI) is primarily based on population density. Relative population density across the county was estimated using a GIS based kernel density population model that uses object locations to produce, through statistical analysis, concentric rings or areas of consistent density. To graphically identify relative population density across the

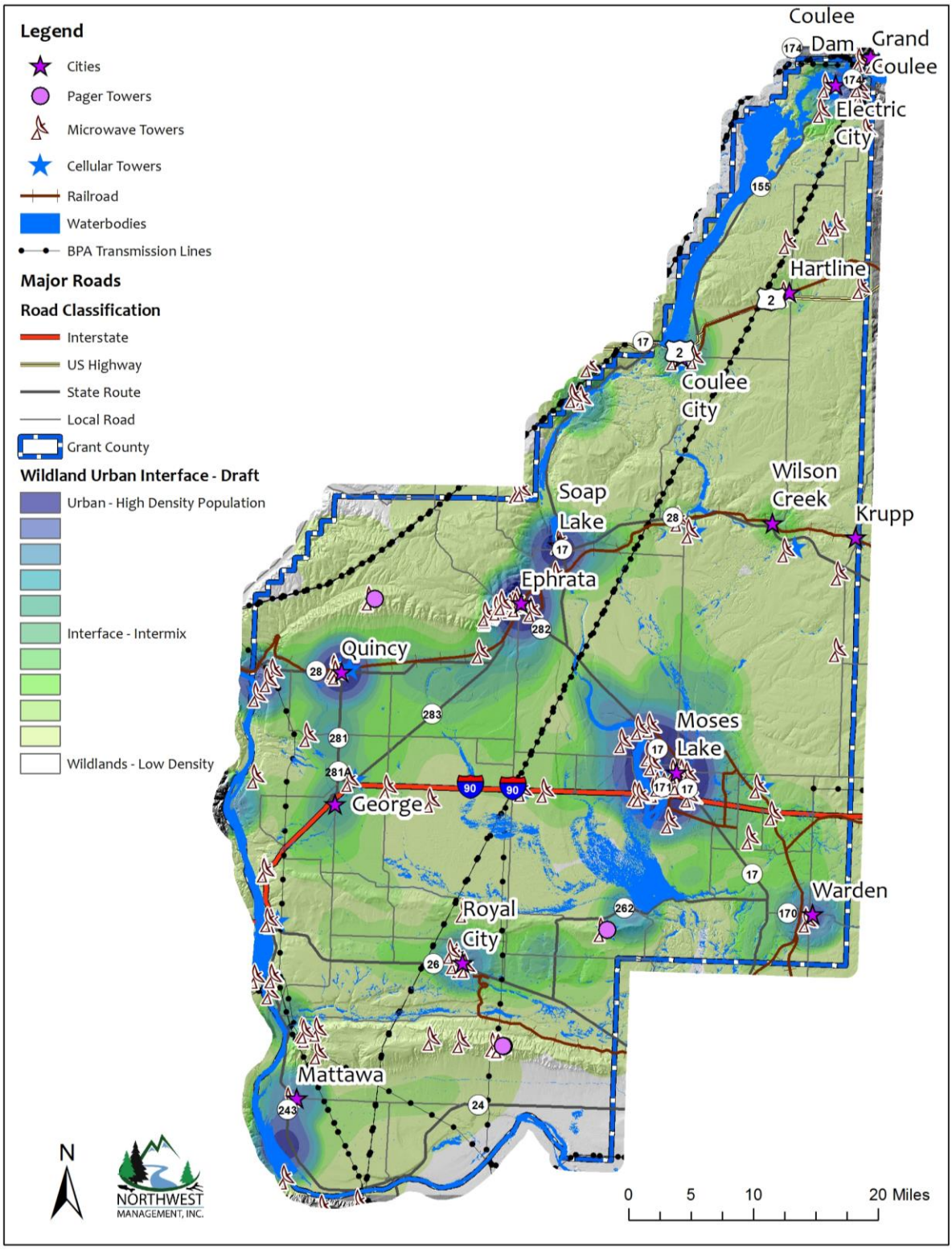
county, structure locations are used as an estimate of population density. 911 address points were used to identify structure locations in Grant County. The resulting output identified the extent and level of population density throughout the county.

By evaluating structure density in this way, WUI areas can be identified on maps by using mathematical formulae and population density indexes. The resulting population density indexes create concentric circles showing high density areas, interface, and intermix condition WUI, as well as rural condition WUI (as defined above). This portion of the analysis allows us to "see" where the highest concentrations of structures are located in reference to relatively high risk landscapes, limiting infrastructure, and other points of concern.

The WUI, as defined here, is unbiased and consistent and most importantly – it addresses all of the county, not just federally identified communities at risk. It is a planning tool showing where homes and businesses are located and the density of those structures leading to identified WUI categories. It can be determined again in the future, using the same criteria, to show how the WUI has changed in response to increasing population densities. It uses a repeatable and reliable analysis process that is unbiased.

The Healthy Forests Restoration Act makes a clear designation that the location of the WUI is at the determination of the county or reservation when a formal and adopted Community Wildfire Protection Plan is in place. It further states that the federal agencies are obligated to use this WUI designation for all Healthy Forests Restoration Act purposes. The Grant County Community Wildfire Protection Plan steering committee evaluated a variety of different approaches to determining the WUI for the county and selected this approach and has adopted it for these purposes. In addition to a formal WUI map for use with the federal agencies, it is hoped that it will serve as a planning tool for the county, state and federal agencies, and local Fire Protection Districts. A map depicting the Grant County WUI is included in Appendix 1.

Figure 4.10. Wildland Urban Interface in Grant County, Washington.



Potential WUI Treatments

The definition and mapping of the WUI is the creation of a planning tool to identify where structures, people, and infrastructure are located in reference to each other. This analysis tool does not include a component of fuels risk. There are a number of reasons to map and analyze these two components separately (population density vs. fire risk analysis). Primary among these reasons is the fact that population growth often occurs independent from changes in fire risk, fuel loading, and infrastructure development. Thus, making the definition of the WUI dependent on all of them would eliminate populated places with a perceived low level of fire risk today, which may in a year become an area at high risk due to forest health issues or other concerns.

By examining these two tools separately, the planner is able to evaluate these layers of information to see where the combination of population density overlays areas of high current relative fire risk and then take mitigation actions to reduce the fuels, improve readiness, directly address factors of structural ignitability, improve initial attack success, mitigate resistance to control factors, or (more often) a combination of many approaches.

It should not be assumed that just because an area is identified as being within the WUI, that it will therefore receive treatments because of this identification alone. Nor should it be implicit that all WUI treatments will be the application of the same prescription. Instead, each location targeted for treatments must be evaluated on its own merits: factors of structural ignitability, access, resistance to control, population density, resources and capabilities of firefighting personnel, and other site specific factors.

It should also not be assumed that WUI designation on national or state forest lands automatically equates to a treatment area. The Forest Service, Bureau of Land Management, and Washington Department of Natural Resources are still obligated to manage lands under their control according to the standards and guides listed in their respective forest or resource management plans (or other management plans). The adopted forest plan has legal precedence over the WUI designation until such a time as the forest plan is revised to reflect updated priorities.

Most treatments may begin with a home evaluation, and the implicit factors of structural ignitability (roofing, siding, deck materials) and vegetation within the treatment area of the structure. However, treatments in the low population areas of rural lands (mapped as yellow) may look closely at access (two ways in and out) and communications through means other than land-based telephones. On the other hand, a subdivision with densely packed homes (mapped as brown – interface areas) surrounded by forests and dense underbrush, may receive more time and effort implementing fuels treatments beyond the immediate home site to reduce the probability of a crown fire entering the subdivision.

Relative Threat Level Mapping

Grant County recognizes that certain regions of the County have unique risk factors that increase their vulnerability to wildland fire. In an effort to demonstrate these risk factors, the steering committee developed a threat level model analyzing various risk factors on a scale relative to Grant County specifically.

Risk Categories

Based on analysis of the various modeling tools, existing historical information, and local knowledge, a preliminary assessment of potentially high wildfire risk areas was completed. This assessment prioritized areas that may be at higher risk due to non-native or high fire risk vegetation, fire history profile, high risk fuel models, and/or limited suppression capabilities. This assessment also considered areas that had a high population or other valuable assets requiring protection from the impacts of wildland fires.

Non-native or High Fire Risk Vegetation

Fuel type, or vegetation, plays an important role in determining wildland fire danger. All fuel types can and will burn under the right conditions; however, some fuel types pose more danger than others due to the intensity at which they burn, the horizontal and vertical continuity of burnable material, and firefighters' ability to modify the fuel complex in front of an approaching wildfire. While rangeland or grass fires often spread rapidly, they burn quickly and at a lower intensity than forest fires. Additionally, local farmers and firefighters can often construct fuel breaks with dozers and other equipment relatively quickly. These tactics are not as effective in forested areas or on steep terrain.

Vegetation types that lead to increased wildfire intensity or severity were given a higher threat level rating.

High Risk Fire Behavior

Due to the heavy fuel loads in places, much of the County could experience extreme wildfire behavior characteristics that result in very intense, stand replacing severity fires. On the other hand, much of the agriculture/grassland area will likely experience rapid rates of spread, particularly under the influence of wind.

One of the factors contributing to potentially dangerous fire behavior is the preheating of fuels on steep slopes ahead of the actual flame front. Typically, fires spread very rapidly uphill, particularly in grass fuel types. Hot gases rise in front of the fire along the slope face preheating the upslope vegetation and moving a grass fire up to four times faster with flames twice as long as a fire on level ground. This preheating of fuels, or radiant heat, is capable of igniting combustible materials from distances of 100 feet or more.[39]

[39] "Wildfires and Schools". 2008. National Clearinghouse for Educational Facilities. National Institute of Building Sciences. Available online at http://www.ncef.org/pubs/wildfires.pdf.

Areas with a high potential for extreme fire behavior based on Fire Behavior Analysis Tool modeling and local knowledge were given a higher threat level rating. Based on local knowledge, the grass fuel model was given a higher intensity level than it normally would receive. Fires burning in this fuel type can spread rapidly. Grass fires can generally be controlled relatively easy assuming that response time is quick.

Suppression Capabilities

Fire protection in each district in Grant County is essentially the responsibility of the local fire district. The County has seven active Fire Protection Districts with resources available for fire suppression. However, each district is limited to the resources at hand until help from other districts or state or federal agencies can arrive.

Population Centers and Developing Areas

Due to the increased human activity within and surrounding Grant County communities, these areas are inherently at a higher risk of ignitions.

The perimeter and outskirts of population centers and known developing areas were given a higher threat level rating.

High Protection Value

There are several areas in Grant County that constitute protection due to their high conservation value such as tribal and other culturally or historically significant sites, recreational areas, and critical infrastructure. Communication towers, switchyards, and transmission lines are other examples of "High Protection Value" assets that were overlayed onto the final Relative Threat Level map to show where they occur in relation to "high" threat level areas within the County.

Field Assessments

Based on the preliminary review of the risk categories, high risk areas were identified and mapped. Field assessment of these areas were conducted in May and included tours of several of the communities in combination with interviews with local residents in identified high risk areas. Fire control and mitigation specialists conducted thorough field assessment to evaluate the accuracy of the models and other data, assess the extent of risk and hazardous fuels, and develop specific hazardous fuels treatment project plans. Additionally, experts from the local Fire Protection Districts, the Bureau of Land Management, and Grant County were consulted in order to address specific areas of concern and document local wildfire suppression operational tactics.

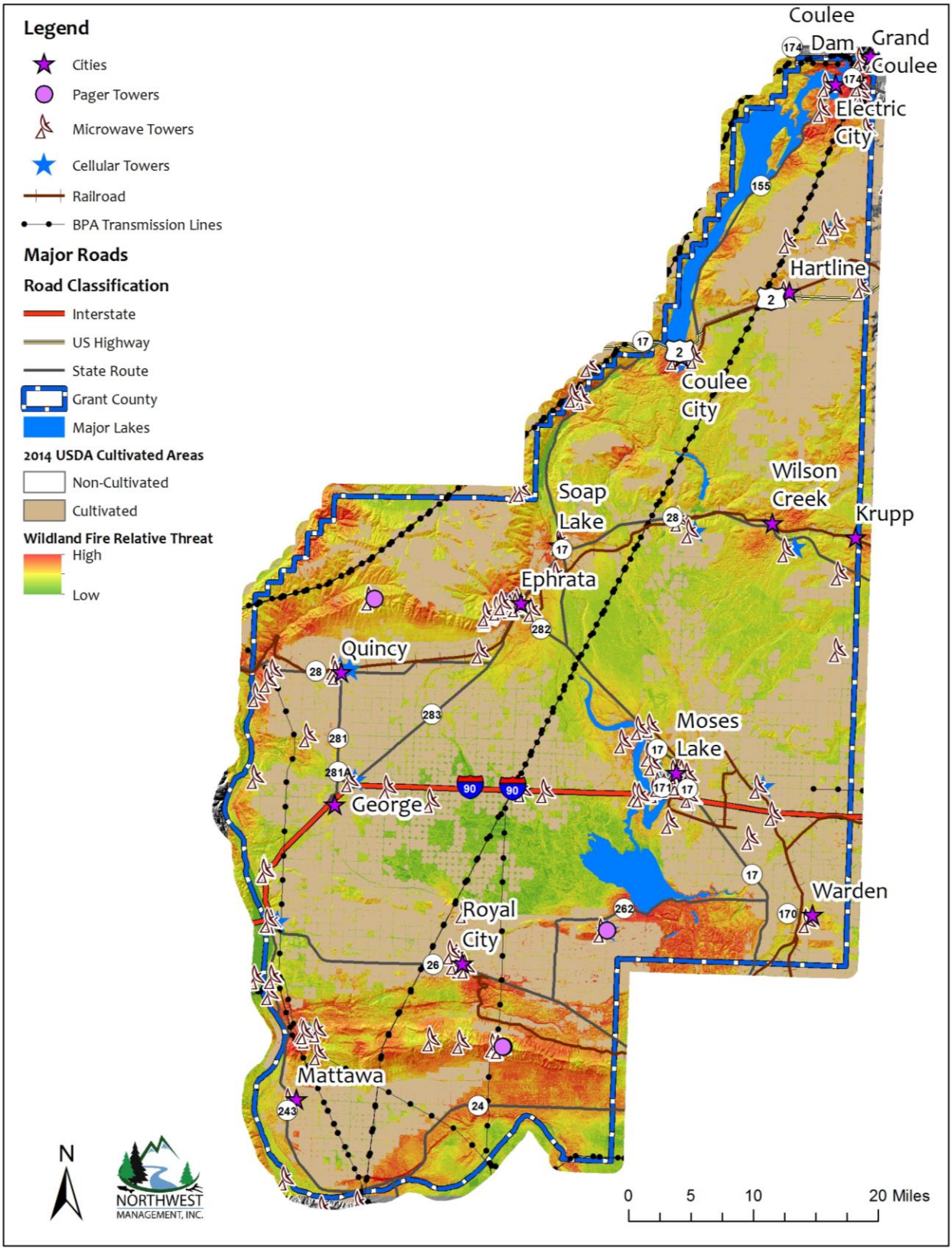
Determination of Relative Threat Level

Risk categories included in the final Relative Threat Level analysis were slope, aspect, precipitation, fuel models, fire intensity, and population density. The various categories, or layers, were ranked by the committee based on their significance pertaining to causal factors of high wildland fire risk conditions or protection significance. The ranked layers were then analyzed in a geographical information system to produce a cumulative effects map based on the ranking. Following is a brief explanation of the various categories used in the analysis and the general ranking scheme used for each.

- Environmental Factors – slope, aspect and precipitation all can have an enormous impact on the intensity of a wildfire. Therefore, areas with steep slopes, dry aspects, or lesser amounts of precipitation, relative to Grant County, were given higher threat rankings.
- Vegetation Cover Types – certain vegetation types are known to carry and produce more intense fires than other fuel types. For Grant County, shrub and grass fuel models were given the higher rankings followed by short grass / agriculture, and forest types (shrub understory) fuel models.
- Fire Behavior – areas identified by fire behavior modeling as having high rate of spread potential or high fire intensity were given a higher threat level ranking.
- Populated Areas – these areas were ranked higher due to the presence of human populations, structures, and infrastructure requiring protection from fire.
- Critical Infrastructure – areas or assets that cannot be replaced or afford special wildfire protection such as critical infrastructure, cultural or historic sites, and recreational areas were overlayed onto the Relative Threat Level Map to show those areas where critical infrastructure is most at risk. This allows land managers to focus mitigation efforts in those identified areas.

Each data layer was developed, ranked, and converted to a raster format using ArcGIS 10.1. The data layers were then analyzed in ArcGIS using the Spatial Analyst extension to calculate the cumulative effects of the various threats. This process sums the ranked overlaid values geographically to produce the final map layer. The ranked values were then color coded to show areas of highest threat (red) to lowest threat (green) relative to Grant County. A map showing the identified Grant County Relative Threat Level is included in Appendix 1.

Figure 4.11. Relative Threat Level Map for Grant County.



Overview of Fire Protection System

The DOI, United States Forest Service, state, tribes counties, and local governments maintain operational wildland fire organizations. These are supplemented by volunteer organizations such as volunteer fire departments and rangeland protection associations. In DOI, the operational fire organizations reside in Bureau of Land Management, National Park Service U.S. Fish and Wildlife Service, and Bureau of Indian Affairs. Other organizations such as US Fire Administration and U.S. Geological Survey have fire expertise that supports and partners with the operational fire organizations. The Office of Wildland Fire at DOI provides budget and policy coordination, leadership, and oversight for the operational programs within DOI. A number of chartered interagency groups exist to provide coordination and consistency among wildland fire organizations to ensure policy and operational consistency and interoperability.

The majority of the County has a local fire protection district that covers both structural and wildland fire response.

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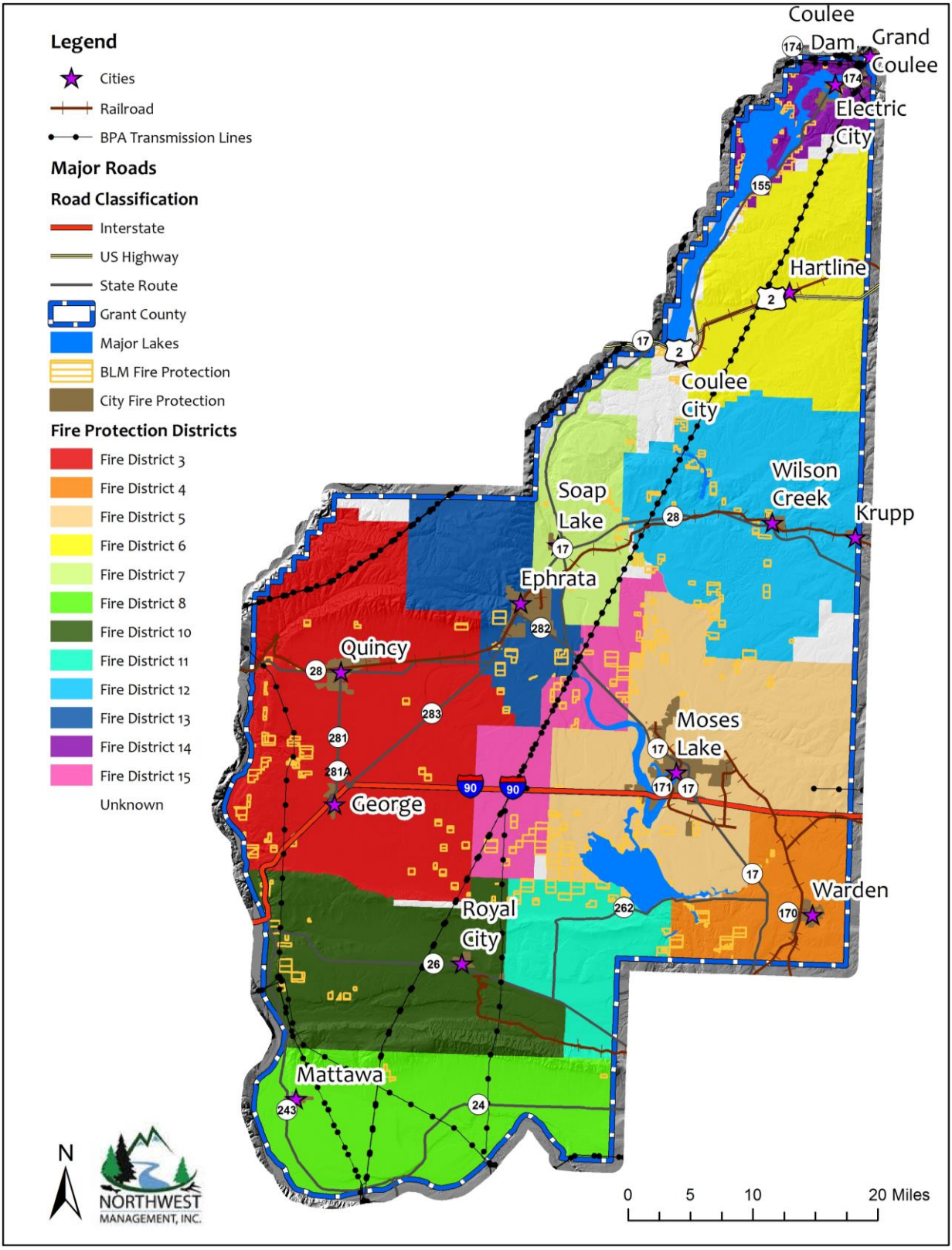
Figure 4.12. Wildfire Protection Responsibility Map.



Local Fire Department and District Summaries

The firefighting resources and capabilities information provided in this section is a summary of information provided by the fire chiefs or representatives of the wildland firefighting agencies listed. Each organization completed a survey with written responses. Their answers to a variety of questions are summarized here. These synopses indicate their perceptions and information summaries.

Appendix 4 contains contact information and a complete available resource list for each of the following fire service organizations.

Coulee City Fire Department

District Summary: No information available at time of plan development.

Electric City Fire Department

District Summary: No information available at time of plan development.

Ephrata Fire Department

Department Summary: The City of Ephrata is located near the center of Grant County and is the second largest city & economic center in the county. Our community sits in a valley surrounded by hills, agricultural industry and barren land. The city limits are comprised of county, state, and federal office buildings, Grant County PUD central operations, and commercial and residential areas. A class 1 rail corridor operated by Burlington Northern Santa Fe bisects the city and operating 24 freight trains and 2 Amtrak passenger trains/station daily. The Ephrata Port District operates the Ephrata Municipal Airport which is a destination place for recreational aircraft and for glider flights in the warm months of the year.

The Ephrata Fire Department is an ISO class 5 combination fire and EMS provider, with two career Chief Officers and 30 volunteer firefighters. The Ephrata Fire Department protects a population of 7,959 people in 10.5 square-mile city protection area.

The Ephrata Fire Department responds from one station, and runs approximately 400 calls a year, responding from emergency medical calls to commercial structure fires. The Department also provides automatic and mutual aid to five neighboring jurisdictions.

Issues of Concern:

Residential Growth: The continued residential growth in the city places more individuals and small subdivisions in undeveloped areas of the city. These locations place homes adjacent to flashy fuels which consist of native grasses and sage brush. Rapid fire growth in this type of fuel poses a high risk to residents.

Communications: The Ephrata Fire Departments communication support for MACC 911 center. Recently MACC has upgraded the radio communication system to 800 digital. This new system has provided more channels and clearer audio. The system has also created an

interruption in communication in certain locations in town. These issues can be addressed by selecting an appropriate channel.

Burn Permit Regulations: The City of Ephrata falls within an urban growth area. All rules and regulations set forth by the Department of Ecology on burning regulations in urban growth areas are enforced by The Ephrata Fire Department. These regulations can be found on the Department of Ecology website.

***Cooperative Agreements*:** The Ephrata Fire Department is a signing party to the Grant County Mutual Aid agreement and also participates in the statewide fire mobilization plan. Ephrata Fire Department works closely with our neighbor, Grant County Fire District #13, and has established an automatic mutual aid between the two departments for all major incidents.

Grand Coulee Volunteer Fire Department

District Summary: The City of Grand Coulee is located near the North end of Grant County and is adjacent to the largest Hydro-Power Generation facility in the country. Our community sits in a coulee surrounded by hills, lakes, recreation areas and barren land. The city limits are comprised of commercial and residential areas.

The Grand Coulee Volunteer Fire Department (GCVFD) is a combination fire and EMS provider, with an all-volunteer force of 30 volunteer firefighters and an additional 12 Emergency Medical Technicians.

The Grand Coulee Fire Department protects a year round population of 1500 people and a large visitor population during the summer, in approximately 15.5 square-mile jurisdictional protection area including the City of Grand Coulee and two fire districts. We provide under contract protection of Lincoln County Fire District #9, directly south and east of the City and a co-contract with Electric City for Grant County Fire District #14.

The Grand Coulee Fire Department responds from one station, and runs approximately 435 calls a year, responding from emergency medical calls, wildland fires to commercial structure fires. The Department also provides automatic and mutual aid to six neighboring jurisdictions in three counties.

Issues of Concern:

Residential Growth: The continued residential growth in the districts places more individuals and small subdivisions in undeveloped areas of the jurisdiction. These locations place homes adjacent to flashy fuels which consist of native grasses and sage brush. Rapid fire growth in this type of fuel poses a high risk to residents. Another issue on the District lands of ownership and coordination with federal Agencies who pay no support money affects our operations. There is a limited water system outside the city limits and we have few developed access points for drafting out of our vast lakes.

Communications: The GCVFD's communication is supported by MACC 911 center. Recently MACC has upgraded the radio communication system to 800 digital. This new system has provided more channels and clearer audio. The system has also created an interruption in

communication in certain locations in the jurisdiction because of geological and geographical features. These issues can be addressed by using different frequencies both analog and digital requiring numerous radios in all vehicles and stations.

Burn Permit Regulations: The City of Grand Coulee falls within an urban growth area. All rules and regulations set forth by the Department of Ecology on burning regulations in urban growth areas are referenced by The GCVFD.

***Cooperative Agreements*:** The Grand Coulee Volunteer Fire Department is a signing party to the Grant County Mutual Aid agreement and also participates in the statewide fire mobilization plan. Grand Coulee Fire Department works closely with our neighbors, Electric City Volunteer Fire Department, Coulee Dam Volunteer Fire Department, Okanogan Fire District #2, Douglas County Fire District #3, and US Bureau of Reclamation Fire Department, and has established an automatic mutual aid between the five departments for all major incidents.

Hartline Fire Department

District Summary: No information available at time of plan development.

Moses Lake Fire Department

District Summary: The City of Moses Lake is the largest population center in Grant County, and encompasses approximately 23 square miles of incorporated territory within the corporate limits. Our community is located in the heart of the Columbia Basin, and is situated around the various arms and horns of the lake from which the community name is derived.

Within the corporate limits are residential neighborhoods, commercial buildings, and two significant industrial zones. The city sits astride two highways of statewide importance, Interstate 90 and State Route 17. Immediately adjacent to the city limits is the Port of Moses Lake, operating one of the longest runways in the United States. Heavy U.S. Military and Boeing aircraft routinely make use of the Port facilities and the skies over the City.

The Moses Lake Fire Department operates from two stations, and responds to approximately 4,000 calls for service per year from emergency medical calls to industrial fires. MLFD is an ISO Class 4 career agency with three Chief Officers, and 27 uniformed personnel. We protect a full time population of nearly 22,000, which can swell to a daily population of as much as 50,000 due to seasonal tourist influx**.**

Issues of Concern

***Annexations of unimproved land areas*:** As the city continues to expand borders primarily to the north and west of the current city limits, we are incorporating areas of flashy fuels into the city. In many cases these undeveloped land areas start to develop with residential subdivisions, commercial and industrial occupancies. Growth into previously unimproved land areas significantly expands the wildland-urban interface fire potential.

***Multiple Simultaneous Incidents*:** The Moses Lake Fire Department has witnessed a significant increase in the amount of simultaneous incidents (multiple incidents within a single 60 minute

window). In 2014 the Department had multiple incidents within a 60 minute window on 1,209 occasions. Multiple incidents within a short period of time begin to tax available staffing and can quickly escalate into zero level staffing.

***Communications*:** Communications within the corporate boundaries of the City of Moses Lake are provided by the MACC 911 Center. With the upgrade to 800 MHz digital recently the department has access to more channels, with clearer audio. However, the new system has created voids in certain areas of the municipality that can impede communications in isolated locations throughout the city.

***Burn Permit Regulations*:** The City of Moses Lake falls within an urban growth area. All rules and regulations set forth by the Washington State Department of Ecology (DOE) on burning regulations in urban growth areas are enforced by the Moses Lake Fire Department.

***Cooperative Agreements*:** The Moses Lake Fire Department is a signing party to the Grant County Mutual Aid agreement and also participates in the statewide fire mobilization plan. Our current participation in the statewide fire mobilization plan is restricted due to apparatus and personnel staffing issues. We are actively working through our budget to address issues that are currently restricting our ability to fully participate in the statewide fire mobilization plan.

City of Quincy Fire Department

District Summary: Quincy contract with Grant County Fire Protection District #3 for all services.

Grant County Fire District #3

District Summary: Grant County Fire District #3 (GCFD3), with its main station located in Quincy, covers 502 square miles in the center of Washington State. GCFD3 responds to a total of approximately 700 calls per year in the rural fire district as well as Sunland Estates, Crescent Bar, the City of George and the City of Quincy, which contracts for fire protection services from GCFD3. The District is staffed by 7 career firefighters, 80 dedicated volunteers and 12 support personnel operating out of 7 stations strategically located throughout the District. The District's population base grows annually with over 19,000 permanent residents and an influx of over 30,000 people seasonally during the summer months.

With only 2 % of the District protected by hydrant water supply, the potential for wildland fires to grow to thousands of acres becomes a reality all too often. Light flashy fuels as well as dense sagebrush are wind driven in the summer months with high temperatures and downslope winds from the Cascade Mountains are common.

Issues of Concern:

Residential and Commercial Growth: The annexation of rural lands surrounding the City of Quincy for industrial growth causes a potential increase in residential construction as well as construction of world class data centers and industry. This growth into the rural areas increases the District's wildland-urban interface fire potential exponentially.

Communications: Due to the topography of the land in GCFD3, radio communication and cell phone coverage is compromised in many locations. Additional repeaters which have been added in the recent past have aided in this problem, but there are still thousands of acres of land that have limited or no communication availability.

Burn Permit Regulations: Burning is regulated by the Washington State Department of Ecology. Permit burning is allowed on a day to day basis, weather dependent. Any agricultural burning or burning within the District has a requirement to notify the District when burning begins.

Cooperative Agreements: GCFD3 has mutual aid agreements with outside agencies in Grant, Chelan and Douglas Counties. It also has agreements with the Bureau of Land Management and the Department of Natural Resources for fire response.

District Needs/ Wish List:

There are four areas that are of major concern for the District's rural setting; (1) fixed water supplies in the rural areas to have points of fill for apparatus for fire suppression, (2) land access as many areas are inaccessible due to fencing/gates or underdeveloped roads structure, (3) need for additional repeaters for expanded communications in the rural areas, (4) address markers for residences in the rural areas as many are very difficult to find when needed.

Grant County Fire District #4

District Summary:

Grant County Fire District 4 is comprised of 140 square miles that sits in the southeast corner of the County and provides services to the City of Warden. Within the 140 square miles there are over 23,000 acres of public and private ground that is shrub/steppe and is a heavily used recreation area for hunting, fishing, camping, with over 50 seep lakes. This area is also economically valued for cattle range and does not have any structures. The rest of the District is irrigated farm ground with some of the ground used for dryland farming. The District has 4 fire stations that house 22 trucks including; 4 engines, 9 tenders, 3 Type III engines, 1 Type VI engine, 3 aid/rescue vehicles and 2 command vehicles. The District is comprised of one full time paid Chief and 30 volunteers. 20 volunteers are, or will be, red card certified by May 2015 and participate in State Fire Mobilization. The District has 8 EMT's and 4 First Responders. The District's annual average call volume over the last three years is 265.

Issues of Concern:

Residential Growth: Individual and small subdivision development continues to increase the number of occupied structures adjacent to wildland fuels. These buildings represent an increase upon the demand for services from the fire district, and pose an increased risk to the safety of the residents and fire suppression forces when fire conditions require resources to be deployed in the wild/and areas to protect structures and civilians. Out of District residential growth has an impact on our District as well. As use goes up on public land it is incremental to the amount of fire suppression that will be needed.

Communications: The topography in our wild/and areas creates numerous communication problems for emergency responders via radio with our communication center and private cell phone use. We also have to communicate with agencies outside of the county which is very cumbersome having different styles of frequencies.

Burn Permit Regulations: Outdoor burning is banned in all urban growth areas, including Warden. The Department of Ecology requires permits and fees for all types of Agricultural burning. No permit is required for the following agricultural burning: orchard prunings; organic debris along fence lines or irrigation or drainage ditches; or organic debris blown by the wind.

Other: Volunteers in the District are aging with 11 (over 113) members having more than 20 years of service. Willing and able volunteers may become an increasingly scarce resource.

***Cooperative Agreements*:** The District is entered into a Cooperative Fire Protection Agreement with the United States Department of Interior, United States Fish and Wildlife Service, Mid-Columbia River National Wildlife Refuge Complex. The District has interagency agreements with the State of Washington, Washington State Patrol for the State Fire Service Mobilization and a Volunteer Fire Assistance Agreement with the Washington State Department of Natural Resources. The District is party to the County wide Mutual Aid Agreement. The District has an lnterlocal Cooperation Agreement regarding services to areas adjoining Adams County District 2 (Lind). The District also has lnterlocal Agreements with Adams County Districts 1 (Ritzville) and District 5 (Othello).

District Needs/Wish List:

Provide public education in Defensible Space Planning and Implementation; and burning regulations. Meet the needs of the Pre-Disaster Mitigation Plan in the areas of hazard risks and vulnerability assessments. Find funding and implementation for water resource delivery that is usable by the District in small sub-division areas that are at risk .The District needs suppression water handling resources, such as portable tanks, pumps, hose and accessories. Any equipment and resources that would benefit the county in ways of mutual aid may be a need.

Grant County Fire Protection District #5

District Summary: No information available at time of plan development.

Grant County Fire Protection District #6

District Summary: No information available at time of plan development.

Grant County Fire Protection District #7

District Summary: Grant County Fire Protection District #7 is comprised of 152 square miles that sits in the center of Grant County. The terrain spans everything from gentle rolling hills to 300 foot cliffs. The District is made up of a variety of agricultural areas. In the western portion of the District consists of orchards and irrigated farms, while dryland and irrigated agriculture along with rangelands make up the eastern portion of the District. The District has

three main residential areas that constitutes nearly 70% of the District's 2,400 residents. Other residents live in small subdivisions or extreme rural areas. The District has a large recreational area which makes up the northwest corner of District #7 that includes multiple lakes and Sun Lakes State Park. There is one centrally located station and one remote station located in the northwest portion of the District. These stations house 20 vehicles made up of; 4 engines, 1 tender, 2 aid vehicles, 3 type III wild land, 4 type VI wild land engines, 1 tactical tender, 3 Command vehicles, 1 air trailer, and 1 support. The District maintains 17 volunteers.

Issues of Concern:

Residential Growth: As with other areas of the County, individual and small subdivision developments continue to increase the number of occupied structures in and around wildland areas. Land that was once farm ground or open range is now being filled with homes. This represents an increased demand for services from the District. Fifteen years ago, the department responded to 65 calls a year and now the District responds to 250 calls annually. There is a general lack of required home addressing system which adds to the District's ability to respond to calls.

Communications: The topography of the District creates areas with no radio or cell phone services for residents or emergency responders alike. The District is forced to use vehicles as repeaters to communicate with dispatch for safety which eliminates those vehicles from responding to an incident.

Burn Permit Regulations: Outdoor burning is banned in the urban growth areas. The District follows the State Department of Ecology burning rules which includes permits for agricultural. The District will enforce all County bans when in effect.

Cooperative Agreements: The District is entered into Cooperative Fire Protection Agreements with; Washington State Department of Natural Resources, US Fish and Wildlife Service, Washington State Fish and Wildlife, Washington State Park Service, and a County wide Mutual Aid Agreement.

District Needs/Wish List: The District is in need of a more robust rural water supply system (tanks and pumps) to reduce turnaround times to refill. The District would like to improve public education on defensible space planning and implementation. Recruitment and retention of volunteers. The District needs funds to properly address various structures.

Grant County Fire Protection District #8

District Summary: Grant County Fire Protection District #8(GCFD8) has a coverage area of 248 square miles and is at the most southern end of Grant County. GCFD8 contracts Fire and EMS services to the City of Mattawa, population of 4,500 year round residents with an influx of an additional 4000 in the summer months .The second most populated area would be the community of Desert Aire with a population of 2,000. GCFD8 is staffed by 4 career firefighters and 34 volunteers who respond to approximately 400 calls per year out of 3 stations. These stations house 19 apparatus made up of 3 engines, 4 tenders, 1 heavy rescue, 1 type 6, 5 type 3 wildland engines, 3 ambulances and 2 command vehicles. The District is made up of both agricultural and wildland, with wildlands making up more than 70%. Much of the wildland area is high terrain making access extremely challenging.

Issues of Concern:

Residential Growth: As more farmland is converted to orchards and vineyards, the need for a work force increases, which brings more people to the area. An increase in population puts an increasing demand on the District and its already limited resources.

Communications: Due to the topography of the district, radio communications and cell phone coverage is compromised in many areas. Communication between mutual aid partners is complicated by different radio frequencies.

Burn Permit Regulations: The District follows the State Department of Ecology burning regulation and all other State and County burn regulations.

Cooperative Agreements: The District has entered into a cooperative agreement with the Department of Energy, Washington State Department of Fish and Wildlife, Bureau of Land Management and Department of Land Management. The District also has inter-local agreements with Adam County Fire District #5, Yakima Fire District #5. The District is party to the County-wide Mutual Aid Agreement.

District Needs/Wish List: Increase number of volunteers and plan for attrition of aging/retiring volunteers in an environment where there is a lack of individuals willing to volunteer the necessary hours to become and remain properly trained. Improve fire education for the community. Develop a local disaster preparedness plan.

Grant County Fire Protection District #10

District Summary: No information available at time of plan development.

Grant County Fire Protection District #11

District Summary: No information available at time of plan development.

Grant County Fire Protection District #12

District Summary: No information available at time of plan development.

Grant County Fire Protection District #13

District Summary: Grant County Fire District #13 (GCFD#13). GCFD#13 is a rural fire district that covers the greater Ephrata and the Upper Columbia Basin area. The District consists of two stations and 26 volunteer firefighters. Our primary source of revenue is property taxes of which we collect approximately $129,000 per year, with a total annual operating budget of approximately $141,000. 95% of our operating budget is committed to fixed costs such as: utilities, fuel, insurance and maintenance/repair. This leaves just a very small portion of funds to make capital purchases. The fire district covers 126 square miles with a population of 2600. The district is comprised of mostly residential and farming/ranching homes. We provide mutual aid to 6-7 neighboring jurisdictions to include automatic mutual aid to the City of Ephrata. In addition, we provide crews and apparatus for State Contract Fires and Mobilization. We also have fire protection contracts with Department of Fish and Wildlife for the Pigmy rabbit and the sage grouse, which is on the endangered & threatened species list.

Issues of Concern:

Resource Availability: The continued large wildland fires that threaten critical habitat. In addition we are facing aging equipment and sometimes are lacking the volunteer fire firefighter's support during certain times of the day.

Communications: Grant County Fire District #13 communication system is handed through MACC Dispatch; they provide support for 911 calls and support our radio system.

Burn Permit Regulations: Non permitted burning is allowed subject to state and county burn requirements. Agriculture burns are managed through the department of ecology.

Cooperative Agreements: US Bureau of Land Management, US Department of Fish and Wildlife, Washington State Department of Natural Resources, Washington State Department of Fish and Wildlife.

We also are a party to the County Wide Mutual Aid Agreement, and provide automatic aid to the City of Ephrata Fire Department.

District Needs/Wish List: Replace aging equipment and recruitment/retention of volunteers.

Grant County Fire Protection District #14

District Summary: Grant County Fire Protection District co-contracts with Electric City Fire Department for fire protection.

Grant County Fire Protection District #15

District Summary: Grant County Fire Protection District #15 contracts with Grant County Fire Protection District #5 for all services.

Washington Department of Natural Resources

District Summary: The Washington Department of Natural Resources (DNR) is the largest on-call fire department in the State with 1,200 permanent and temporary employees that fight fire on more than 12 million acres of private and state-owned forest lands. The DNR's fire protection and safety equipment requirements help local Fire Protection Districts respond to wildfires. The DNR also works with the National Weather Service to provide the fire weather forecasts and fire precaution levels that firefighters, landowners, forest industry rely on.

The Washington DNR does not have resources directly assigned to Grant County. The DNR's Northwest Region has 8-10 Type 5 and 6 initial attack engines staffed and available during the fire season in addition to air resources. These resources as well as others statewide are available to Grant County as they are available.

Cooperative Agreements in Grant County:

****NOTE: Washington DNR does not respond to structure fires****

Bureau of Land Management

Spokane District Mission Statement: The mission of the Spokane District is to share our unique capability and interest in sustaining the full diversity of natural and cultural landscapes across Washington State and invite their discovery and use. This includes protecting the natural resources, such as water for fish and wildlife; preserving environmental and cultural values on the lands they manage; providing for multiple uses, that include some commercial activities; and enhancing opportunities for safe and enjoyable outdoor recreation. The Spokane District also assesses energy and mineral resources and works to ensure that their development is in the best interest of the public. Another major responsibility is to ensure consideration of Tribal interests and administration the Department of Interior's trust responsibilities for American Indian Reservation communities.

District Summary: Up through the 1970's, BLM's policy was to divest ownership of all federal public (BLM) lands in the state of Washington. But in 1980, at the height of the Sage Brush Rebellion (a social movement to give control over federal lands to the states and local authorities), Washington voted to have the public lands remain under federal ownership and management. In the 1980 general election, the state put a measure on the ballot asking voters if the state constitution should "be amended to provide that the state no longer disclaim all rights to unappropriated federal public lands." Approximately 60% of the people and the majority in every county voted no, signaling to BLM that there was strong support for continued federal management of the public lands in the state.

In response to this vote, the Director of BLM approved a proposal by the District to begin a process of consolidating the scattered BLM lands around the state. Today the Spokane District BLM manages over 425,000 acres across eastern Washington for multiple uses, providing wildfire protection, suppression, support, and training for the BLM managed lands and other federal/state/county agencies.

The Spokane District Fire Management Program currently consists of two type six wildland engines (300 gallons) with two full time Engine Captains, four engine crew members, one ten person hand crew, one Fuels Technician, Seasonal Dispatcher, Fire Operations Specialist (FOS), Assistant Fire Management Officer (AFMO), and a Fire Management Officer (FMO). The hand crew is stationed in Spokane at the District office and the two Type 6 engines are in Wenatchee at the field office. There are approximately 16 other specialist (staff) from across the district that assist the Fire Management Program in wildland and/or prescribed fire efforts. With the District's scattered ownership pattern, the engines are usually on scene after initial attack forces have arrived. Our engines and personnel are available for off District and out of state fire assignments that aide in support, training, and experience.

Cooperative Agreements: The Spokane District BLM has Coop agreements with the Colville National Forest, US Fish and Wildlife Service, WA DNR, Spokane County FDs #3, 4, 9, 10, Spokane Valley FD, Benton County FD #1, Chelan County FDs #1, 6, Douglas FDs #2, 4, 5, 15, Franklin County FD #5, Grant County FD #5, Lincoln County FDs #1, 7, and Yakima County FDs #4, 5.

Fire Protection Issues

The following sections provide a brief overview of the many difficult issues currently challenging Grant County in providing wildland fire safety to citizens. These issues were discussed at length both during the committee process and at several of the public meetings. In most cases, the committee has developed action items (Chapter 6) that are intended to begin the process of effectively mitigating these issues.

Address Signage

The ability to quickly locate a physical address is critical in providing services in any type of emergency response. Accurate road address and address signage is fundamental to ensuring the safety and security Grant County residents. All of the County owned and maintained roads within Grant County are properly signed per the MUTCD. There may be times when due to weather, vandalism or vehicular damage that signs are missing, down or not visible. Grant County Public Works strives to maintain its inventory to the highest standards.

Coordination with State and Federal Agencies

There is currently little to no communication between local fire districts, fire departments, and the federal agencies. This presents a problem when there is confusion on who has initial attack responsibilities on federal lands and what restrictions are imposed by the jurisdictional agency responsible for fire protection. Successful implementation of rangeland fire mitigation strategies at the landscape level requires a clear a sustained commitment to interdisciplinary and interagency collaboration, in all aspects of rangeland fire management.

Urban and Suburban Growth

One challenge Grant County faces is the large number of houses in the urban/rural fringe. Since the 1970s, a segment of Washington's growing population has expanded further into traditional forest or resource lands. The “interface” between urban and suburban areas and the resource lands created by this expansion has produced a significant increase in threats to life and property from fires and has pushed existing fire protection systems beyond original or current design or capability. Currently Grant County has no Firewise Communities and many property owners within the interface are not aware of the threats they face or resources available to them. Furthermore, human activities increase the incidence of fire ignition and potential damage.

It is one of the goals of the Grant County CWPP to help educate the public on the ramifications of living in the wildland-urban interface, including their responsibilities as landowners to reduce the fire risk on their property and to provide safe access to their property for all emergency personnel and equipment. Homeowners building in a high fire risk area must understand how to make their properties more fire resistant using proven firesafe construction and landscaping techniques and they must have a realistic understanding of the capability of local fire service organizations to defend their property.

Rural Fire Protection

People moving from mainland urban areas to the more rural parts of Grant County, frequently have high expectations for structural fire protection services. Often, new residents do not realize that the services provided are not the same as in an urban area. The diversity and amount of equipment and the number of personnel can be substantially limited in rural areas. Fire protection may rely more on the landowner's personal initiative to take measures to protect his or her property. Furthermore, subdivisions on steep slopes and the greater number of homes exceeding 3,000 square feet are also factors challenging fire service organizations. In the future, public education and awareness may play a greater role in rural or interface areas. Great improvements in fire protection techniques are being made to adapt to large, rapidly spreading fires that threaten large numbers of homes in interface areas.

Debris Burning

Local debris burning is highly regulated in Grant County. The Washington State Department of Ecology regulations do not allow residential and land clearing burning within the city limits or urban growth areas surrounding Moses Lake, Coulee City, Coulee Dam, Electric City, Ephrata, George, Grand Coulee, Hartline, Krupp, Mattawa, Quincy, Royal City, Soap Lake, Warden, and Wilson Creek. Permit burns in Grant County. Debris burning of garden and yard debris in piles no larger than 4 feet by 3 feet is allowed year round in rural areas, excluding times when a burn ban has been issued by either the Washington State Department of Ecology or the local fire department. Burning anything in burn barrels is illegal within the County. Agriculture burning, land clearing burning, or burning of piles larger than 4 feet by 3 feet require a burn permit through the Grant County Conservation District or Washington State Department of Ecology. Some people still burn outside of the designated time frame, and escaped debris fires impose a very high fire risk to neighboring properties and residents. It is likely that regulating this type of burning will always be a challenge for local authorities and fire departments; however, improved public education regarding the county's burning regulations and permit system as well as potential risk factors would be beneficial.

Pre-planning in High Risk Areas

Although conducting home, community, and road defensible space projects is a very effective way to reduce the fire risk to communities in Grant County, recommended projects cannot all occur immediately and many will take several years to complete. Thus, developing pre-planning guidelines specifying which and how local fire agencies and departments will respond to specific areas is very beneficial. These response plans should include assessments of the structures, topography, fuels, available evacuation routes, available resources, response times, communications, water resource availability, and any other factors specific to an area. Community-based CWPPs often contain pre-planning information useful to fire managers. All of these plans should be available to the local fire departments as well as dispatch personnel.

Protection of Natural Resources

Protection of native plant communities, especially those containing perennial native grasses and forbs essential to ecosystem integrity and diversity, is important to provide ecosystem services that sustain wildlife, such as the greater sage-grouse and native pollinators. One of the primary challenges to restoring the health of rangeland ecosystems is achieving effective long-term

restoration and post-fire recovery. Arid rangelands face many environmental and site conditions stresses exacerbated by drought, climate change, and spread of invasive species, leading to more frequent and catastrophic fires. While restoration can be successful at the small scale, achieving a landscape approach to effective and sustainable restoration of the sagebrush-steppe can be difficult. There is a need for natural resource advisors and fire managers, at all levels, to improve communication and continue to coordinate and work collaboratively to identify priority habitats before and throughout the wildfire season to improve fire response and protection of priority habitats. Where priority habitat exists, pre-position of firefighting assets to improve preparedness and suppression capability in the initial stages of a wildfire increases the chances of keeping fires small and limits loss of habitat.

Conservation Reserve Program Fields

Since the introduction of the CRP by the federal government, many formerly crop producing fields have been allowed to return to native grasses. CRP fields are creating a new fire concern all over the west. As thick grasses are allowed to grow naturally year after year, dense mats of dead plant material begin to buildup. Due to the availability of a continuous fuel bed, fires in CRP fields tend to burn very intensely with large flame lengths that often times jump roads or other barriers, particularly under the influence of wind. Many landowners and fire personnel are researching allowable management techniques to deal with this increasing problem.

Volunteer Firefighter Recruitment

The rural fire departments in Grant County are predominantly dependent on volunteer firefighters. The trend for several years, in many volunteer fire departments, is that membership has continued to decrease. This can be attributed to several reasons including the need for two wage earners in a house hold to support their family, lack of desire from today's generation, and the tremendous amount of time spent in training to satisfy the ever-increasing regulations from state and federal agencies. Whether it be job and family commitments combined with hobbies or competition with other volunteer organizations, it comes down to the fact there is very little time left for being a volunteer firefighter. This is exacerbated by the added stress of emergencies and inherent dangers of the job, not to mention that our society is generally less appreciative of the commitment and sacrifices made by volunteer firefighters.

Today's fire departments, career and volunteer, find themselves in a position where there is an increased demand for their services, but are confronted with increasing operational costs and overall less revenue. In the rural setting where revenue is limited and volunteers are limited, this can add up to a fire service that is stretched very thin. In particular, many departments have difficulty maintaining volunteers available during regular work day hours (8am to 5pm).

One of the goals of this CWPP is to assist local fire departments and districts with the recruitment of new volunteers and retention of trained firefighters. This is a very difficult task, particularly in small, rural communities that have a limited pool; however, providing departments with funding for training, safety equipment, advertising, and possibly incentive programs will help draw more local citizens into the fire organizations.

Each district spends a considerable amount of time and resources training and equipping each volunteer, with the hope that they will continue to volunteer their services to the department for

at least several years. One problem that all volunteer-based departments encounter is the diminishing number of new recruits. As populations continue to rise and more and more people build homes in high fire risk areas, the number of capable volunteers has gone down.

Communication

Many of the emergency responders have identified areas of poor reception for both radios and cell phones. The lack of communication between responders as well as with central dispatch significantly impairs responders' ability to effectively and efficiently do their job as well as lessens their safety. The conversion to a narrow band communication system is likely to exacerbate these issues unless numerous additional repeaters are installed.

On a smaller scale, many subdivisions or unincorporated population centers have identified the need to improve emergency communication between residents. In an emergency situation, there is no existing way of notifying each resident in an area of the potential danger, the need for evacuation, etc. Many groups of homeowners would benefit greatly through establishment of phone trees and contact lists in order to communicate information at the individual scale in the high wildland fire risk areas in the County.

A communication issue that was identified during the public meetings is the ability of wildfire suppression teams to tap the local knowledge of many of the area residents, particularly the larger landowners. There are a handful of local landowners that could be an excellent resource advisor regarding the condition of county and private roads, access points, fuel conditions, etc.

Emergency Evacuations

Grant County needs to explore options to inform non-English speaking communities of emergencies and/or evacuations. Options to be researched by Grant County Department of Emergency Management include:

- The use of pre-scripted messages could be sent to area specific Spanish radio stations
- Identify other language specific communities
- Reluctance of illegal immigrants to interact with local government agencies
- Identify trusted agents within specific communities
- Review of specific roles (fire, law, dispatch, emergency management, and Red Cross) in executing evacuations and identifying assembly areas
- Training and education for first responders, elected officials and community residents
- Community literacy
- EAS translations

No Man's Land

A challenge for firefighters in Grant County is the presence of non-jurisdictional lands, or no man's land, particularly on rangelands where swift initial attack is essential to preventing rapid fire spread. The presence of non-jurisdictional areas can lead to delayed response, jurisdictional confusion, disorientation, and lack of coordination that puts residents and firefighters in great danger.

Water Resources

Developing water supply resources such as cisterns, dry hydrants, drafting sites, and/or dipping locations ahead of an incident is considered a force multiplier and can be critical for successful suppression of fires. Pre-developed water resources can be strategically located to cut refilling turnaround times in half or more, which saves valuable time for both structural and wildland fire suppression efforts.

Invasive Species

Cheatgrass (*Bromus tectorum*) contributes to the size and frequency of fires and directly threatens the habitat of the greater sage-grouse and other sagebrush-steppe dependent wildlife. Fire behavior and fire regimes have been altered due to the proliferation of cheatgrass and other invasive species. Cheatgrass invades disturbed open sites and can dominate an area. Cheatgrass ripens and cures much earlier in the season when compared with native species, thus extending the fire season.[40] According to some statistical analysis, cheatgrass dominated ranges are about 500 times more likely to burn than a native species dominated range.[41] Fire return intervals in steppe and shrub-steppe fuel types, pre-European settlement was typically between 32 and 70 years.[42] In certain Great Basin rangelands, the fire return interval is now less than 5 years on rangelands dominated by cheatgrass.[43]

Vegetation management at this scale is complex and requires aggressive and targeted application of both proven techniques and implementation of new practices to control cheatgrass and mitigate habitat impacts from unwanted rangeland fire. Land managers need tools to reduce cheatgrass while simultaneously restoring resilient sagebrush-steppe ecosystems that can withstand fire and resist re-invasion of cheatgrass or other invasive species. Effective strategies developed for early detection and rapid response and implemented in collaboration with a wide range of stakeholders, can help check the rapid expansion of invasive non-native species.

Hazardous Materials

A concern within Grant County are the hazardous materials stored countywide. Pesticides and fertilizers used in the agriculture industry can cause significant hazards should a location storing such materials burn.

Public Wildfire Awareness

As the potential fire risk in the wildland-urban interface continues to increase, it is clear that fire service organizations cannot be solely responsible for protection of lives, structures, infrastructure, ecosystems, and all of the intrinsic values that go along with living in rural areas. Public awareness of the wildland fire risks as well as homeowner accountability for the risk on their own property is paramount to protection of all the resources in the wildland-urban interface.

The continued development of mechanisms and partnerships to increase public awareness regarding wildfire risks and promoting "do it yourself" mitigation actions is a primary goal of the CWPP steering committee as well as many of the individual organizations participating on the committee.

[43] Pellant, Mike. 1990. Unpublished data on file at: U.S. Department of Interior, Bureau of Land Management, Idaho State Office, Boise, ID.

Firewise Communities Program encourages local solutions for safety by involving homeowners in taking individual responsibility for preparing their homes from the risk of wildfire

Fire Adapted Communities incorporates people, buildings, business, infrastructure, cultural resources and natural areas into the effort to prepare for the effects of wildland fire.

Wildfire Community Preparedness Day is an excellent opportunity for neighborhoods and fire agencies to work together to make communities a safer place to live. Efforts raise wildfire awareness and help protect homes, neighborhoods, and entire communities, while increasing safety of wildland firefighter or could lessen current post-fire impacts.

The national **Ready Set Go! Program**, managed by the International Association of Fire Chiefs (IAFC), works to develop and improve dialogue about wildland fire awareness and action between local fire departments and the residents they serve. It is designed to be complimentary and collaborative with Firewise and other wildland fire public education efforts.

NFPA Fire Prevention Week offers information and tools to help public educators teach all audiences about important fire and life safety issues.

FEMA's America's PrepareAthon! Is an opportunity for individuals, organizations, and communities to prepare for specific hazards, including wildfire, through drills, group discussions, and exercises.

Current Wildfire Mitigation Activities

Many of the county's fire departments and agencies are actively working on public education and homeowner responsibility by visiting neighborhoods and schools to explain fire hazards to citizens. Often, they hand deliver informative brochures and encourage homeowners to have their driveways clearly marked with their addresses to ensure more rapid and accurate response to calls and better access.

Chapter 5

Landscape Risk Assessments

Essential to the success of this plan is to improve efforts to work on a landscape-level and better employ science and technology to target areas of high priority for preventing, suppressing, and restoring fire-impacted landscapes using a risk-based approach. A landscape-scale approach to management is one that emphasizes sustainability of entire ecosystems, integrates stakeholder collaboration, and addresses the present and possible future conditions of lands across ownerships. Through application of the "All Hands, All Lands" management, increased collaboration among Federal, state, tribal, and local officials, natural resources managers, and the fire community can improve the efficiency and effectiveness of the overall rangeland fire management effort. The increasing frequency and intensity of rangeland fires and the conversion of sage-brush-steppe ecosystems to invasive annual grasses poses a major threat to ranchers, local communities, and others who live and work in rangeland landscape and depend on these lands and resources to sustain their livelihoods and quality of life.

Cover vegetation and wildland fuels exhibited across the county have been influenced by massive geologic events during the Pleistocene era that scoured and shifted the earth's surface leaving areas of deep rich soil interspersed with rocky canyons and deep valleys. In addition to the geological transformation of the land, wildland fuels vary within a localized area based on slope, aspect, elevation, management practices, and past disturbances. Geological events and other factors have created distinct landscapes that exhibit different fuel characteristics and wildfire concerns.

The mild climate, abundance of sunshine and low annual precipitation results in an environment that is potentially very prone to wildland fire. Although much of the native grasslands have been converted for agricultural purposes, there are many areas of native vegetation and fallow farm land that cures early in the summer and remains combustible until winter. If ignited, these areas burn rapidly, potentially threatening people, homes, and other valued resources.

Not every acre can be effectively treated to prevent rangeland fires, nor can every acre impacted by fire be restored. Setting priorities for prevention, suppression, and restoration is essential to increase the efficiency of operations and the efficacy of treatments. The use of risk-based, landscape-scale assessments, help prioritize treatment areas to reduce fire risk as well as set priorities to strategically guide the allocation and pre-positioning of resources for fire suppression. In order to facilitate a mutual understanding of wildfire risks specific to commonly known areas in the county, the landscape-level wildfire risk assessments in the following sections are based on five predominant landscapes types that exhibit distinct terrain and wildland fuels. The four landscapes identified for the assessments are: agricultural lands, channeled scablands, Shrub/ Steppe, river breaks, and riparian areas. These landscapes, although intermixed in some areas, exhibit specific fire behavior, fuel types, suppression challenges, and mitigation recommendations that make them unique from a planning perspective.

Overall Fuels Assessment

The gentle terrain that dominates Grant County facilitates extensive farming and ranching operations. Agricultural fields occasionally serve to fuel a fire after curing; burning in much the same manner as short to tall grassy fuels. Fires in grass and rangeland fuel types tend to burn at relatively moderate intensity with moderate flame lengths, rapid rate of spread, and short-range spotting. Common suppression techniques and resources are generally quite effective in this fuel type. Homes and other improvements can be easily protected from direct flame contact and radiant heat through adoption of precautionary measures around structures.

Rangelands with a significant shrub component will have much higher fuel loads with greater spotting potential than grass and agricultural fuels. Although fires in agricultural and rangeland fuels may not present the same control problems as those associated with large, high intensity fires in timber, they can cause significant damage if precautionary measures have not been taken prior to a fire event. Wind driven fires in these fuel types spread rapidly and can be difficult to control. During extreme drought and when pushed by high winds, fires in agricultural and rangeland fuels can exhibit extreme rates of spread, which complicates suppression efforts.

Development is scattered throughout Grant County. However, the risk of catastrophic loss from wildfires in this area is significant. Fires igniting along the bottom of the canyon have the potential to grow at a greater rate of speed on the steeper slopes and rapidly advance to higher elevations. Fire suppression efforts that minimize loss of life and structures in this area are largely dependent upon access, availability and timing of equipment, prior fuels mitigation activities, and public awareness.

Riparian areas in arid environments often have a higher amount of fuel loading due to the relatively abundant water supply. Vegetation tends to be more abundant and robust in these areas. Fuel loading often compounds year after year as new growth replaces old growth. Deciduous trees and shrubs are common along waterways and contribute to on the ground fuel loads as they lose their leaves every year. Riparian areas experience a higher amount of recreation use due to various outdoor opportunities (fishing, camping, swimming, etc.). The increased activity may lead to unusually high amounts of ignitions.

Overall Mitigation Activities

There are many specific actions that will help improve safety in a particular area; however, there are also many potential mitigation activities that apply to all residents and all fuel types. General mitigation activities that apply to all of Grant County are discussed below while area-specific mitigation activities are discussed within the individual landscape assessments.

The safest, easiest, and most economical way to mitigate unwanted fires is to stop them before they start. Generally, prevention actions attempt to prevent human-caused fires. Campaigns designed to reduce the number and sources of ignitions can take many forms. Traditional "Smokey Bear" type campaigns that spread the message passively through signage can be quite effective. Signs that remind people of the dangers of careless use of fireworks, burning when windy and leaving unattended campfires have been effective. Fire danger warning signs posted along access routes remind residents and visitors of the current conditions. It's impossible to say just how effective such efforts actually are; however, the low costs associated with posting of a few signs is inconsequential compared to the potential cost of fighting a fire.

Burn Permits: Washington State Department of Natural Resources is the primary agency issuing burn permits in forested areas of Grant County. The Washington DNR burn permits regulate silvicultural burning. Washington Department of Ecology (DOE) is the primary agency issuing burn permits for improved property and agricultural lands. All DOE burn permits are subject to fire restrictions in place with WA DNR & local Fire Protection Districts. Washington DNR has a general burning period referred to as "Rule Burn" wherein a written burn permit is not required in low to some moderate fire dangers.

The timeframes for the Rule Burn are from October 16th to June 30th. Washington DNR allows for Rule Burns to be ten foot (10') piles of forest, yard, and garden debris. From July 1st to October 15th if Rule Burns are allowed, they are limited to four foot (4') piles.

Defensible Space: Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Grant County must be made aware that home defensibility starts with the homeowner. Once a fire has started and is moving toward a structure or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. "Living with Fire, A Guide for the Homeowner" is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space. Residents of Grant County should be encouraged to work with local fire departments and fire management agencies within the county to complete individual home site evaluations. Home defensibility steps should be enacted based on the results of these evaluations. Beyond the homes, forest management efforts must be considered to slow the approach of a fire that threatens a community.

Evacuation Plans: Development of community evacuation plans are necessary to assure an orderly evacuation in the event of a threatening wildland fire. Designation and posting of escape routes would reduce chaos and escape times for fleeing residents. Community safety zones should also be established in the event of compromised evacuations. Efforts should be made to educate homeowners through existing homeowners associations or creation of such organizations to act as conduits for this information.

Accessibility: Also of vital importance is the accessibility of the homes to emergency apparatus. If a home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles.

Fuels Reduction & Restoration: Reducing fuels, particularity the rapid spread of invasive species such as cheatgrass, is a critical part of the strategy for reducing future rangeland fires and protecting important habitat, it is important that vegetation management and habitat restoration (not simply building firebreaks or applying prescribed fire) be in an integral part of the solution. Recreational facilities such as campgrounds and boat launches should be kept clean and maintained. In order to mitigate the risk of an escaped campfire, escape proof fire rings and barbeque pits should be installed and maintained. Better management of rangeland vegetation and reversing the spread of invasive, non-native grasses, such as cheatgrass, is critical to breaking the invasive species-fire cycle that has contributed to the increased frequency and

intensity of rangeland fires. By planning projects at the landscape scale to reduce and control invasive species and rapidly restore lands impacted by fire to native vegetation, progress in protecting and restoring Grant County's unique ecosystems for the benefit of all. Vegetation inventories, treatments, and preventative measures can be used to reduce the risk of rangeland fire such as the appropriate use of herbicides, biological controls, biocides; prescribed fire, greenstripping, and fuel breaks; and the prioritization of efforts to restore fire-impacted landscapes.

Emergency Response: Once a fire has started, how much and how large it burns is often dependent on the availability of suppression resources. In most cases, rural fire departments are the first to respond and have the best opportunity to halt the spread of a wildland fire. For many districts, the ability to reach these suppression objectives is largely dependent on the availability of functional resources and trained individuals. Increasing the capacity of departments through funding and equipment acquisition can improve response times and subsequently reduce the potential for resource loss.

Other Activities: Other specific mitigation activities are likely to include improvement of emergency water supplies, access routes, and management of vegetation along roads and power line right-of-ways. Furthermore, building codes should be revised to provide for more fire-conscious construction techniques such as using fire resistant siding, roofing, and decking in high risk areas.

Agricultural Landscape Risk Assessment

The agricultural landscape is the dominant landscape across Grant County. Grant County is a top producer of wheat, corn, hay, potatoes and several orchard crops. The county is also a major livestock producer as well as extensive areas of fallow land set aside in the CRP (Conservation Reserve Program). Most of these crops are vulnerable to wildland fire at certain times of the year. The agriculture landscape is the predominant cover vegetation and fuel type throughout the county particularly in the central portion of the county. Interspersed throughout this landscape are stream channels and rocky scabland areas. The main population centers in this landscape type include Moses Lake, Quincy, George, Hartline, Warden, Royal City, and Mattawa. Landownership in the agricultural landscape is predominantly private with many sections owned by the State of Washington and scattered federal holdings. Rural development found throughout the agricultural landscape includes individual farms, small subdivisions, railroad sidings and grain elevators. Development is widely distributed. New development occurs primarily near communities and along major roads. Occasionally farmland is subdivided between family members for new home sites or for development of new farming facilities. Most of the pressure for multi-housing subdivisions occurs in close proximity to existing towns. In nearly all developed areas, structures are in close proximity to vegetation that becomes a significant fire risk at certain times of the year.

Wildfire Potential

Wildfire potential in the agricultural landscape is moderate in the rural farmland and moderate to high in the shrubby draws and waterways, pastures, and scattered patches of scabland. Virtually all of the populated areas within the agricultural landscape face similar challenges related to

wildfire control and opportunities for fuels mitigation efforts. Farming and ranching activities have the potential to increase the risk of a human-caused ignition. Large expanses of crops, CRP, rangeland or pasture provide areas of continuous fuels that may threaten homes and farmsteads. Under extreme weather conditions, escaped fires in these fuels could threaten individual homes or a town site; however, this type of fire is usually quickly controlled. Clearings and fuel breaks disrupt a slow moving wildfire enabling suppression before a fire can ignite heavier fuels. High winds increase the rate of fire spread and intensity of crop and rangeland fires. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event in these areas.

Wildfire risk in the agricultural landscape is at its highest during late summer and fall when crops are cured and daily temperatures are at their highest. A wind-driven fire in agricultural fuels or dry native fuel complexes would produce a rapidly advancing, but variable intensity fire. Fires burning in some types of unharvested fields would be expected to burn more intensely with larger flame lengths due to the greater availability of fuels resulting from the higher productivity of the vegetation. Fields enrolled in the CRP or set aside for wildlife habitat can burn very intensely due to an increased amount of fuel build-up from previous years' growth. Fires in these types of fuels are harder to extinguish completely due to the dense duff layer, often leading to hold over fires that may reemerge at a later date causing additional fire starts.

A majority of the farmers use a production practice called summer fallow to allow soil moisture to increase by leaving fields fallow for a full crop year. This allows the wheat producers to rotate half their cropland each year: one year it's planted to wheat and then next year it lies fallow. The relative threat level in this agricultural area increases in July and August because of significant wildfire hazard. Relative humidity is usually lower during this time, afternoon winds tend to increase, and the standing grain is cured to the point where it readily ignites. The ripened wheat, hot daytime temperatures, and erratic winds can produce extreme fire behavior and long flame lengths which can easily spread to adjacent rangelands or CRP/SAFE fields. These fires tend to burn very quickly and intensely. Summer fallow fields act as a natural barrier during these wildfires so if, and when, the fire reaches these areas, it will burn itself out or the fire slows enough that it is easily controlled.

Ingress-Egress

Interstate 90, US Highway 2, and State Routes 26, 24, and 28 are the primary emergency access routes traveling east to west through the county. State Routes 17, 243, 281, 170 and 155 are the primary access routes running north and south. County roads as well as rural ranch access roads are well distributed throughout most of the county often following section lines or circumnavigating the multitude of draws and canyons. In remote rural areas, county roads often change from a paved or maintained gravel surface to unimproved primitive roads making access possible only during certain times of the year. Limited access within remote areas and a lack of maintenance on existing travel routes, increases fire suppression response time and has a direct effect on fire spread leading to increased fire size and destructive potential.

There are a few bridges in the agricultural landscape of Grant County. There are many stakeholders of bridges in Grant County. Federal, State, County, City and Private. All of the bridges in Grant County's inventory are inspected on a regular basis. Those bridges needing load ratings are properly signed per National Bridge Inspection Standards and the MUTCD.

Local public electrical and telephone utility lines travel both above and below ground along roads and highways with limited exposure to failure during a wildfire event. Cell phone service is well-established in most parts of the county with only limited dead zones.

Infrastructure

Urban residents throughout most of agricultural landscape area have municipal water systems, which includes a network of public fire hydrants. New development is required by the International Fire Code to have hydrant placement in their development plan. Subdivisions and development outside municipal boundaries typically rely on community water systems or multiple-home well systems.

Above ground, high voltage transmission lines cross the planning area in many directions in corridors cleared of most vegetation, which provides for a defensible space around the power line infrastructure and may provide a control point for fire suppression, if well maintained. Local public electrical utility lines are both above and below ground traveling through back yards and along roads and highways. Many of these lines are exposed to damage from falling trees and branches. Power and communications may be cut to some of these during a wildfire event.

Public utility lines travel both above and below ground along roads and cross-country to remote facilities. Many irrigation systems and wells rely on above ground power lines for electricity. These power poles pass through areas of dense wildland fuels that could be destroyed or compromised in the event of a wildfire. Cell phone service is well established in most parts of the county with only limited dead zones.

Fire Protection

The agricultural landscape type is present in all of the Fire Protection Districts in Grant County. The Fire Protection Districts provide structural fire protection as well as wildland fire protection. Mutual aid agreements between Fire Protection Districts supplement wildland fire protection when needed. The DNR does not provide structural fire suppression, but does provide wildfire protection on non-forested land that threatens DNR-protected lands. The BLM provides wildfire protection on their ownership within Grant County and will assist neighboring Fire Protection Districts when available. BLM also does not provide structural fire suppression.

Potential Mitigation Activities

Mitigation measures needed in the agricultural landscape include maintaining a defensible space around structures and access routes that lie adjacent to annual crops and other wildland fuels. Around structures, this includes maintaining a green or plowed space, mowing weeds and other fuels away from outbuildings, pruning and/or thinning larger trees, using fire resistant construction materials, and locating propane tanks, fuel tanks and firewood away from structures. Roads and driveways accessing rural residents may or may not have adequate road widths and turnouts for firefighting equipment depending on when the residences were constructed. Performing road inventories in high risk areas to document and map their access limitations will improve firefighting response time and identify areas in need of enhancement. Primitive or abandoned roads that provide key access to remote areas should also be maintained in such a way that enables access for emergency equipment so that response times can be minimized. Roads can be made more fire resistant by frequently mowing along the edges or

spraying weeds to reduce the fuels. Aggressive initial attack on fires occurring along travel routes will help ensure that these ignitions do not spread to nearby home sites. Designing a plan to help firefighters control fires in CRP lands that lie adjacent to agricultural crops would significantly lessen a fire's potential of escaping to the higher value resource. Mitigation associated with this situation might include installing fuel breaks or plowing a fire resistant buffer zone around fields and along predesigned areas to tie into existing natural or manmade barriers or implementing a prescribed burning program during less risky times of the year.

Maintaining developed drafting sites, increasing access to water from irrigation facilities, and developing other water resources throughout the agricultural landscape will increase the effectiveness and efficiency of emergency response during a wildfire.

Channeled Scablands Landscape Risk Assessment

This unique geological feature was created by ice age floods that swept across eastern Washington and down the Columbia River Plateau periodically during the Pleistocene era. The massive erosion caused by the flood events scoured the landscape down to the underlying basalt creating vast areas of rocky cliffs, river valleys, channel ways and pothole lakes. Typical vegetation found throughout this landscape is grass, mixed shrub and sagebrush with areas of wetlands, cultivated crops, and CRP fields. Landownership is predominantly private with large acreages owned by the State of Washington Fish & Wildlife and the Bureau of Land Management. BLM ownership includes large continuous holdings of rangeland with campgrounds, and other recreation areas. Private landownership includes cattle ranches and in holdings of cultivated farmland and CRP fields. New development occurs primarily near communities and along major roads. Most of the pressure for multi-housing subdivisions occurs in close proximity to the towns. Rural development is widely dispersed consisting primarily of isolated ranching headquarters, home sites, irrigation systems, and developed springs or wells. In nearly all developed areas, structures are in close proximity to vegetation that becomes a significant fire risk at certain times of the year.

Wildfire Potential

The channeled scablands landscape has a moderate to high wildfire potential due to a characteristically high occurrence of shrubby fuels mixed with grass, sloping terrain and somewhat limited access. Large expanses of open rangeland or pasture provide a continuous fuel bed that could, if ignited, threaten structures and infrastructure under extreme weather conditions. Cattle grazing will often reduce fine, flashy fuels reducing a fire's rate of spread; however, high winds increase the rate of fire spread and intensity of rangeland fires. A wind-driven fire in dry, native fuel complexes on variable terrain produces a rapidly advancing, very intense fire with large flame lengths, which enables spotting ahead of the fire front.

Wildfire risk in the channeled scablands landscape is at its highest during summer and fall when daily temperatures are high and relative humidity is low. Fires burning in some types of unharvested fields would be expected to burn more intensely with larger flame lengths due to the greater availability of fuels. Fields enrolled in conservation programs or managed for wildlife habitat, can burn very intensely due to an increased amount of fuel build-up from previous years' growth. Fires in this fuel type are harder to extinguish completely due to the dense duff layer,

which often leads to hold-over fires that may reemerge at a later date causing additional fire starts.

Ingress-Egress

Interstate 90, US Highway 2, and State Routes 26, 24, and 28 are the primary emergency access routes traveling east to west through the county. State Routes 17, 243, 281, 170 and 155 are the primary access routes running north and south. County roads as well as rural ranch access roads are well distributed throughout most of the channeled scablands often following section lines or traversing the multitude of draws and drainage ways. In remote rural areas, county roads often change from a paved or maintained gravel surface to unimproved primitive roads making access possible only during certain times of the year. Limited access within remote areas and a lack of maintenance on existing travel routes, increases fire suppression response time and has a direct effect on fire spread leading to increased fire size and destructive potential.

Infrastructure

Residents living in the populated centers and most subdivisions surrounding the towns have access to municipal water supply systems with public fire hydrants. Outside these areas, development relies on individual, co-op, or multiple-home well systems. Creeks, ponds, and developed drafting areas provide water sources for emergency fire suppression in the rural areas to a limited extent. Irrigation systems are capable of providing additional water supply for suppression equipment on a limited basis. Additional water resources distributed and documented throughout the agricultural landscape are needed to provide water for fire suppression.

Public utility lines travel both above and below ground along roads and cross-country to remote facilities. Many irrigation systems and wells rely on above ground power lines for electricity. These power poles pass through areas of dense wildland fuels that could be destroyed or compromised in the event of a wildfire. Cell phone service is well established in most parts of the county with only limited dead zones.

Fire Protection

The channeled scablands landscape type is present in all Fire Protection Districts. The Fire Protection Districts provide structural fire protection as well as wildland fire protection. Mutual aid agreements between Fire Protection Districts supplement the wildland fire protection response when needed. The DNR does not provide structural fire suppression, but it does provide wildfire protection on non-forested land that threatens DNR-protected lands. BLM provides wildfire protection on their lands within Grant County and will assist neighboring Fire Protection Districts when available. BLM also does not provide structural fire suppression.

Potential Mitigation Activities

Mitigation measures needed in the channeled scabland landscape include maintaining a defensible space around structures and access routes that lie adjacent to wildland fuels. Around structures this includes maintaining a green or plowed space, mowing weeds and other fuels away from outbuildings, pruning and/or thinning larger trees, using fire resistant construction materials, and locating propane tanks and firewood away from structures. Roads and driveways accessing rural development need to be kept clear of encroaching fuels to allow escape and

access by emergency equipment. Performing road inventories in high risk areas and documenting and mapping their access limitations will improve firefighting response time and identify areas in need of improvement. Primitive or abandoned roads that provide key access to remote areas should be maintained to allow access for emergency equipment so that emergency response times are minimized. Designing a plan to help firefighters control fires in conservation lands and wildlife habitat areas will significantly lessen a fire's potential of escaping to other areas. Mitigation associated with this situation might include managed grazing in designated fuel reduction areas, creating fuel breaks, and implementing a prescribed burning program during less risky times of the year.

Additional mitigation activities include installing more water storage sites, improving water access from irrigation facilities, and developing other water resources throughout the landscape. This will increase the effectiveness and efficiency of emergency response during a wildfire.

River Breaks Risk Assessment

The River Breaks landscape encompasses an area along the northwestern boundary of Grant County from the county line near Coulee Dam to Mattawa. This area is predominantly shrub-steppe grassland on steep broken terrain and escarpments sloping into the eastern shore of the Columbia River. Shrub-steppe grasslands are a mixed plant community consisting of bunch-grasses, forbs, and a variety of shrubs including big sage brush, rabbit brush, and antelope brush. Some soil types within this area support isolated pockets of Douglas-fir and ponderosa pine forest, but the area is dominated by shrub and grassland from the agricultural fields at the top of the breaks to the water's edge of the Columbia River. Landownership in this area is mostly privately held parcels with several sections owned by the Bureau of Land Management, Bureau of Reclamation, the U.S. Fish & Wildlife Service, and the State of Washington. Major population clusters include Grand Coulee, Electric City, Hartline, Coulee City, Soap Lake, and Mattawa. Subdivision of land for recreational and home site development is widespread along the river. In nearly all developed areas, structures are in close proximity to vegetation on steep slopes that become a significant fire risk at certain times of the year.

Wildfire Potential

Wildfire potential in the western river breaks landscape is high due to past fire exclusion, steep broken terrain and the introduction of invasive grasses. Prior to settlement, the historic fire regime consisted of small, relatively frequent fires that created a mosaic or patchwork of shrubs mixed with discontinuous areas of bunchgrass. Recent introduction of organized fire suppression along with cattle grazing and land development for agriculture have disrupted this fire regime, allowing wide spread establishment of fire-intolerant sagebrush and invasive grasses. This heavy buildup of brush species over vast acres indicates that future fires will be more frequent with higher intensities and cover larger areas than in the past. High intensity fires in large expanses of continuous fuels may threaten structures and infrastructure under extreme weather conditions. A wind-driven fire in dry native fuel complexes on variable terrain produces a rapidly advancing very intense fire with large flame lengths capable of widespread damage. High wildfire risk in the western river breaks landscape typically lasts from late March to mid-October.

Ingress-Egress

U.S. Highway 2 and State Routes 28 and 174 are the primary emergency access routes traveling east to west through the county. State Routes 17 and 97 are the primary access routes running north and south. The steep topography of the River Breaks greatly limits access to the bottom or top of the slopes. There are no roads along the River Breaks between McNeil Canyon and Brewster and from Bridgeport to Coulee Dam. Limited access within remote areas and a lack of maintenance on existing travel routes, increases fire suppression response time and has a direct effect on fire spread leading to increased fire size and destructive potential.

Many private homes and subdivisions are accessed via unimproved, single-lane roads accessible only by small emergency vehicles. Often, access roads and driveways are steep and/or lined with wildland fuels that can limit or prohibit safe access during a wildfire. Many of these roads have only one way in and one way out and lack adequate turnout and turn-around areas for emergency vehicles. The inability of emergency resources to safely access structures reduces or may even eliminate suppression response. Most of the roads in newer subdivisions have been designed to accommodate emergency vehicles with either loop roads or cul-de-sacs with wide turning radii and easily negotiable grades, which are better-suited to all types of emergency response equipment.

Infrastructure

Residents living in the populated centers and most subdivisions surrounding the towns have access to municipal water supply systems with public fire hydrants. Outside these areas, development relies on individual, co-op, or multiple-home well systems. Creeks, ponds, and developed drafting areas provide water sources for emergency fire suppression in the rural areas to a limited extent. Irrigation systems are capable of providing additional water supply for suppression equipment on a limited basis. Additional water resources distributed and documented throughout the agricultural landscape are needed to provide water for fire suppression.

Public utility lines travel both above and below ground along roads and cross-country to remote facilities. Many irrigation systems and wells rely on above ground power lines for electricity. These power poles pass through areas of dense wildland fuels that could be destroyed or compromised in the event of a wildfire. Cell phone service is well established in most parts of the county with only limited dead zones.

Fire Protection

The channeled scabland landscape type is present in all of the Grant County Fire Protection Districts. The Fire Protection Districts provide structural fire protection as well as wildland fire protection. Mutual aid agreements between Fire Protection Districts supplement the wildland fire protection response when needed. The DNR does not provide structural fire suppression, but it does provide wildfire protection on non-forested land that threatens DNR-protected lands. BLM provides wildfire protection on their lands within Grant County and will assist neighboring Fire Protection Districts when available. BLM also does not provide structural fire suppression.

Potential Mitigation Activities

The grass and sagebrush fuels in this landscape are very conducive to rapidly spreading surface fires. During a wildfire event, families in threatened structures would have very little time to protect their homes and evacuate. Therefore, it is very important that a defensible space is maintained around structures prior to an ignition. Keeping a clean and green yard and using fire resistant construction materials will help reduce the risk of loss to fire. Homeowners along the Columbia River should be even more vigilant about maintaining a fuel break between their homes and the shoreline as fires caused by recreational use on the reservoir could start at any time with little warning or chance for suppression by the fire department. The use of campfires, fireworks, and other potential ignition sources should be highly regulated during the fire season, especially in areas adjacent to structures and development. Using escape-proof fire rings and BBQ pits at recreational areas, limiting off-road vehicle use to designated trails, and restricting fireworks will help reduce the potential for an ignition.

Shrub/Steppe Landscape Risk Assessment

The shrub/steppe is a dominant landscape in Grant County, although much of it has been converted to irrigated farm fields. The sagebrush-steppe ecosystem is one of the most imperiled in the United States.[44] This unique landscape supports energy development, ranching, and outdoor recreation such as hunting, hiking, and camping. Many communities are near sage-grouse habitat, and many of the Nation's cultural resources and archaeological sites are located in the sagebrush-steppe landscape. The accelerated invasion of non-native annual grasses, such as cheatgrass, coupled with the effects of intensified drought and climate change, are creating conditions that area leading to larger, more intense rangeland fires across the region. More intense rangeland fires pose an increased threat to many species of birds, plants, and animals, including the greater sage-grouse that rely on this critically important ecosystem. Reducing the frequency and intensity of rangeland fires is essential to protect the safety of communities in the sagebrush-steppe landscape and the livelihoods of Grant County residents.

Typical vegetation found throughout this landscape is grass, mixed shrub and sagebrush with areas of wetlands, cultivated crops, and CRP fields. The shrub/steppe landscape is scattered throughout the county with larger sections prevailing in the central and southern portion of the county. Landownership is predominantly private with large acreages owned by the U.S. Fish & Wildlife Service, the Bureau of Land Management, and the Bureau of Reclamation. Private landownership includes cattle ranches and in holdings of cultivated farmland and CRP fields. Major population centers within the shrub/steppe landscape include Electric City, Coulee City, Soap Lake, Ephrata, Mattawa, Warden, Royal City, Krupp and Wilson Creek. New development occurs primarily near communities and along major roads. Most of the pressure for multi-housing subdivisions occurs in close proximity to the towns. Rural development is widely dispersed consisting primarily of isolated ranching headquarters, home sites, irrigation systems, and developed springs or wells. In nearly all developed areas, structures are in close proximity to vegetation that becomes a significant fire risk at certain times of the year.

[44] Michael Wisdom, PNW Research Station, USDA Forest Service, La Grande, Oregon.

Wildfire Potential

The shrub/steppe landscape has a moderate to high wildfire potential due to a characteristically high occurrence of shrubby fuels mixed with grass, sloping terrain and somewhat limited access. Large expanses of open rangeland or pasture provide a continuous fuel bed that could, if ignited, threaten structures and infrastructure under extreme weather conditions. Cattle grazing will often reduce fine, flashy fuels reducing a fire's rate of spread; however, high winds increase the rate of fire spread and intensity of rangeland fires. A wind-driven fire in dry, native fuel complexes on variable terrain produces a rapidly advancing, very intense fire with large flame lengths, which enables spotting ahead of the fire front.

Cheatgrass (*Bromus tectorum*) is one of the most aggressive, non-native species that thrives in areas disturbed by wildfire and other land-use activities, and can dominate large areas across the landscape. The plant dries early in the summer and remains highly flammable throughout the fire season creating dangerous conditions on the ground. When fire strikes, firefighter safety is the paramount concern because escape routes and safety zones are difficult to establish due to the rapid spread of rangeland fire. With high temperatures, low relative humidity, and strong winds, rangeland fires can quickly produce flame lengths that often prevent direct attack. A wind-driven rangeland fire in cheatgrass can easily burn thousands of acres in an hour, destroying homes, livelihoods, and habitat along the way. If left unchecked, cheatgrass often invades sagebrush habitat after rangeland fires, creating conditions for more frequent, intense fires in the future. For these reasons, the "fire-and-cheatgrass cycle" is a particularly difficult challenge for land managers

Wildfire risk in the shrub/steppe landscape is at its highest during summer and fall when daily temperatures are high and relative humidity is low. Fires burning in some types of unharvested fields would be expected to burn more intensely with larger flame lengths due to the greater availability of fuels. Fields enrolled in conservation programs or managed for wildlife habitat can burn very intensely due to an increased amount of fuel build-up from previous years' growth. Fires in this fuel type are harder to extinguish completely due to the dense duff layer, which often leads to hold-over fires that may reemerge at a later date causing additional fire starts.

Ingress-Egress

Interstate 90, US Highway 2, and State Routes 26, 24, and 28 are the primary emergency access routes traveling east to west through the county. State Routes 17, 243, 281, 170 and 155 are the primary access routes running north and south. County roads as well as rural ranch access roads are well distributed throughout most of the county often following section lines or circumnavigating the multitude of draws and canyons. In remote rural areas, county roads often change from a paved or maintained gravel surface to unimproved primitive roads making access possible only during certain times of the year. Limited access within remote areas and a lack of maintenance on existing travel routes, increases fire suppression response time and has a direct effect on fire spread leading to increased fire size and destructive potential.

There are a few bridges in the shrub/steppe landscape of Grant County. Bridge load rating signs are mostly in place for the existing bridges and do not impose a limitation to access for firefighting equipment.

Infrastructure

Residents living in the populated centers and most subdivisions surrounding the towns have access to municipal water supply systems with public fire hydrants. Outside these areas, development relies on individual, co-op, or multiple-home well systems. Creeks, ponds, and developed drafting areas provide water sources for emergency fire suppression in the rural areas to a limited extent. Irrigation systems are capable of providing additional water supply for suppression equipment on a limited basis. Additional water resources distributed and documented throughout the agricultural landscape are needed to provide water for fire suppression.

Public utility lines travel both above and below ground along roads and cross-country to remote facilities. Many irrigation systems and wells rely on above ground power lines for electricity. These power poles pass through areas of dense wildland fuels that could be destroyed or compromised in the event of a wildfire. Cell phone service is well established in most parts of the county with only limited dead zones.

Fire Protection

Mutual aid agreements between fire districts supplement wildland fire protection when needed. The DNR does not provide structural fire suppression, but does provide wildfire protection on non-forested land that threatens DNR-protected lands. The BLM provides wildfire protection on their ownership within Grant County. BLM also does not provide structural fire suppression.

Potential Mitigation Activities

Protecting, conserving, and restoring the health of sagebrush-steppe ecosystems, while maintaining safe and efficient operations, is a critical fire management priority. Mitigation measures needed in the shrub/steppe landscape include maintaining a defensible space around structures and access routes that lie adjacent to wildland fuels. Around structures this includes maintaining a green or plowed space, mowing weeds and other fuels away from outbuildings, pruning and/or thinning larger trees, using fire resistant construction materials, and locating propane tanks and firewood away from structures. Roads and driveways accessing rural development need to be kept clear of encroaching fuels to allow escape and access by emergency equipment. Performing road inventories in high risk areas and documenting and mapping their access limitations will improve firefighting response time and identify areas in need of improvement. Primitive or abandoned roads that provide key access to remote areas should be maintained to allow access for emergency equipment so that emergency response times are minimized. Designing a plan to help firefighters control fires in conservation lands and wildlife habitat areas will significantly lessen a fire's potential of escaping to other areas. Mitigation associated with this situation might include managed grazing in designated fuel reduction areas, creating fuel breaks, and implementing a prescribed burning program during less risky times of the year.

Successful mitigation in the shrub-steppe landscape should effectively reduce the sagebrush-steppe lost to fire and invasive species in a safe and efficient manner, while increasing the sagebrush-steppe acres restored to a healthy condition.

Additional mitigation activities include installing more water storage sites, improving water access from irrigation facilities, and developing other water resources throughout the landscape. This will increase the effectiveness and efficiency of emergency response during a wildfire.

Riparian Areas Risk Assessment

The Riparian landscape occurs in small to large drainages throughout the County. These areas produce high densities of shrubs and grass with scattered deciduous trees due to the relative abundance of water. Upslope from the waterway, vegetation generally resorts back to typical shrub-steppe fuel type that dominates much of the County. Landownership in this area is mostly privately held parcels with several sections owned by the Bureau of Land Management and the State of Washington. These areas are generally low in population.

Wildfire Potential

The riparian area landscape has a moderate to high wildfire potential due to a characteristically high fuel load occurrence, terrain that can exhibit a chimney effect, high recreation use, and somewhat limited access. The steep walls contribute to rapid rates of spread by funneling fire up canyon. The high amount of fuel loading, coupled with the chimney effect, could create very intense fires.

Wildfire risk in the riparian area landscape is at its highest during summer and fall when daily temperatures are high and relative humidity is low. Fires burning in some types of riparian vegetation would be expected to burn more intensely with larger flame lengths due to the greater availability of fuels. Some riparian areas occur within narrow walls that would increase the intensity of a wildfire. These areas are not easily accessible which would compound the difficulties during fire suppression efforts. Most firefighters learn early that these areas are dangerous to attempt fighting fires due to the unpredictability of fire within narrow canyons.

Ingress-Egress

Interstate 90, US Highway 2, and State Routes 26, 24, and 28 are the primary emergency access routes traveling east to west through the county. State Routes 17, 243, 281, 170 and 155 are the primary access routes running north and south. The steep topography of the riparian areas greatly limits access to the bottom or top of the slopes. Limited access within remote areas and a lack of maintenance on existing travel routes, increases fire suppression response time and has a direct effect on fire spread leading to increased fire size and destructive potential.

Infrastructure

Unimproved campsites as well as interpretive signs are common in these areas providing recreational users with information and areas to camp. The interpretive signs can assist land managers with educating the public about the risk of wildfire and how to minimize the risk. Providing campers with fire rings keeps fires contained to specific sites and reduces the risk of an escape.

Creeks, ponds, and developed drafting areas provide water sources for emergency fire suppression in the rural areas to a limited extent. Irrigation systems are capable of providing additional water supply for suppression equipment on a limited basis. Additional water

resources distributed and documented throughout the agricultural landscape are needed to provide water for fire suppression.

Public utility lines travel both above and below ground along roads and cross-country to remote facilities. Many irrigation systems and wells rely on above ground power lines for electricity. These power poles pass through areas of dense wildland fuels that could be destroyed or compromised in the event of a wildfire. Cell phone service is well established in most parts of the county with only limited dead zones.

Fire Protection

The riparian area landscape type is present in all of the Grant County Fire Protection Districts. The Fire Protection Districts provide structural fire protection as well as wildland fire protection. Mutual aid agreements between Fire Protection Districts supplement the wildland fire protection response when needed. The DNR does not provide structural fire suppression, but it does provide wildfire protection on non-forested land that threatens DNR-protected lands. BLM provides wildfire protection on their lands within Grant County and will assist neighboring Fire Protection Districts when available. BLM also does not provide structural fire suppression.

Potential Mitigation Activities

The high fuel loading and the narrow canyons are very conducive to rapidly spreading surface fires. During a wildfire event, recreationists would have very little time to evacuate. Therefore, it is very important to educate the public on the dangers of wildfires. The use of campfires, fireworks, and other potential ignition sources should be highly regulated during the fire season, especially in areas adjacent to structures and development. Using escape-proof fire rings and BBQ pits at recreational areas, limiting off-road vehicle use to designated trails, and restricting fireworks will help reduce the potential for an ignition.

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Chapter 6

Mitigation Recommendations

Critical to implementation of this Community Wildfire Protection Plan are the identification and implementation of an integrated schedule of action items targeted at achieving a reduction in the number of human caused fires and the impact of wildland fires in Grant County. This section of the plan identifies and prioritizes potential mitigation actions, including treatments that can be implemented in the county to pursue that goal. As there are many land management agencies and thousands of private landowners in Grant County, it is reasonable to expect that differing schedules of adoption will be made and varying degrees of compliance will be observed across various ownerships.

The primary land management agencies in Grant County, specifically the USDI Bureau of Land Management, Bureau of Reclamation, U.S. Fish and Wildlife Service, WA Department of Fish and Wildlife and WA Department of Natural Resources are participants in this planning process and have contributed to its development. Where available, their schedule of land treatments have been considered in this planning process to better facilitate a correlation between their identified planning efforts and the efforts of Grant County.

Grant County encourages the building of disaster resistance in normal day-to-day operations. By implementing plan activities through existing programs and resources; the cost of mitigation is often a small portion of the overall cost of a project's implementation.

All risk assessments were made based on the conditions existing during 2015. Therefore, the recommendations in this section have been made in light of those conditions. However, the components of risk and the preparedness of the county's resources are not static. It will be necessary to fine-tune this plan's recommendations regularly to adjust for changes in the components of risk, population density changes, infrastructure modifications, and other factors.

As part of the policy of Grant County, the Community Wildfire Protection Plan will be reviewed at least annually at special meetings of the CWPP steering committee, open to the public and involving all municipalities/jurisdictions, where action items, priorities, budgets, and modifications can be made or confirmed. Amendments to the plan should be documented and attached to the formal plan as an amendment. Re-evaluation of this plan should be made on the 5th anniversary of its acceptance, and every 5-year period following.

Maintenance and Monitoring

A commitment to monitoring changes in resource conditions to evaluate the effectiveness of different management strategies will improve learning and, through adaptive management, increase the success of wildfire mitigation activities. Monitoring to evaluate the effectiveness of management actions must occur to determine the success of fire prevention, suppression, and restoration actions. Lessons learned from self-evaluation can be shared and inform changes to

correct for ineffective management prescriptions, respond to changes in resource conditions, guide new science and research needs and address changes in management policy and direction. Monitoring and evaluation is an essential part of adaptive management and depends upon timely information, analysis and learning. Strategic application of new management techniques, improved use of risk analysis to set management priorities, and the translation of science and research findings into tools for easy use on the ground to prioritize prevention, suppression, and

The Grant County Wildfire Protection Plan will be reviewed at least annually at meetings convened by the CWPP steering committee, open to the public and involving all municipalities/jurisdictions, where action items, priorities, budgets, and modifications can be made or confirmed. Amendments to the plan should be documented and attached to the formal plan as an amendment. Re-evaluation of this plan should be made on the 5th anniversary of its acceptance, and every five years following.

restoration efforts can help improve the efficacy and efficiency of rangeland fire management. Without careful monitoring and evaluation of management efforts we cannot be certain we are achieving desired outcomes.

Prioritization of Mitigation Activities

The action items recommended in this chapter were prioritized through a group discussion and voting process. The action items in Tables 6.1 – 6.5 are ranked as "High", "Moderate", or "Low" priorities for Grant County as a whole. The CWPP committee does not want to restrict funding to only those projects that are high priority because what may be a high priority for a specific community may not be a high priority at the county level. Regardless, the project may be just what the community needs to mitigate disaster. The flexibility to fund a variety of diverse projects based on varying criteria is a necessity for a functional mitigation program at the county and community level.

Policy and Planning Efforts

Wildfire mitigation efforts must be supported by a set of policies and regulations at the county level that maintain a solid foundation for safety and consistency. The recommendations enumerated here serve that purpose. Because these items are regulatory in nature, they will not necessarily be accompanied by cost estimates. These recommendations are policy related and therefore are recommendations to the appropriate elected officials; debate and formulation of alternatives will serve to make these recommendations suitable and appropriate.

Table 6.1. Action Items in Safety and Policy

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline
6.1.a: Distribute Firewise-type educational brochures with building permit applications.	**CWPP Goal #1 & 4** High	**Lead:** Grant County Planning Department **Support:** Grant County Fire Marshal, Grant County Fire Protection Agencies	6 months
6.1.b: Establish a committee to work with the Farm Service Agency on feasible solutions for reducing the wildland fire risk associated with land enrolled in the Conservation Reserve Program and SAFE.	**CWPP Goal #1 & 2** Moderate	**Lead:** CWPP Subcommittee **Support:** Grant County Board of Commissioners	Ongoing
6.1.c: Continue to work with developers and private landowners to enhance road layout and adherence to accepted road standards that will improve emergency services' accessibility as well as provide for better road connectivity.	**CWPP Goal #1, 2, 4 & 7** High	**Lead:** Grant County Department of Public Works **Support:** Grant County Emergency Management, Grant County Fire Protection Agencies	2 years
6.1.d: Continue to encourage local residents to enroll and update their phones, cell phones, and email addresses in the Telephone Notification System for Grant County.	**CWPP Goal #1, 2 & 7** High	**Lead:** Grant County Emergency Management **Support:** Grant County Fire Protection Agencies	3 years
6.1.e: Obtain the materials and funding to complete and implement a Grant County Livestock Evacuation Plan.	**CWPP Goal #1** High	**Lead:** Grant County Fire Protection Agencies **Support:** Washington Cattleman's Association	2 years
6.1.f: Fund the development of Fire Danger Rating System signs to be placed throughout the County.	**CWPP Goal #1** Moderate	**Lead:** Fire Protection Agencies **Support:** Grant County Emergency Management	1 year
6.1.g: Research and implement protocol to notify Spanish speaking residents, particularly in the south part of the county, of emergency situations such as evacuations.	**CWPP Goal #1 & 6** High	**Lead:** Grant County Emergency Management **Support:** Grant County Fire Districts	1 year

Fire Prevention and Education Projects

The protection of people and structures will be tied together closely because the loss of life in the event of a wildland fire is generally linked to a person who could not, or did not, flee a structure threatened by a wildfire or to a firefighter combating that fire. Many of the recommendations in this section involve education and increasing wildfire awareness among Grant County residents.

Residents and policy makers of Grant County should recognize certain factors that exist today, the absence of which would lead to increased risk of wildland fires in Grant County. The items listed below should be acknowledged and recognized for their contributions to the reduction of wildland fire risks:

Shrub/Steppe Management has a significant impact on the fuel composition and structure in Grant County. The shrub/steppe management programs of the BLM, FWS, BOR, WADNR and numerous private landowners in the region have led to a reduction of wildland fuels. Furthermore, shrub/steppe systems are dynamic and will never be completely free from risk. Treated areas will need repeated treatments to reduce the risk to acceptable levels in the long term.

Table 6.2. Action Items for Fire Prevention, Education, and Mitigation

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline
6.2.a: Implementation of youth and adult wildfire educational and community preparedness programs.	**CWPP Goal #1 & 4** High	**Lead:** Grant County Fire Protection Agencies **Support:** Grant County Emergency Management	1 year
6.2.b: Prepare for wildfire events in high risk areas by conducting home site risk assessments and developing area-specific "Response Plans" to include participation by all affected jurisdictions and landowners.	**CWPP Goal #1, 2, 3, & 4** High	**Lead:** Grant County Fire Protection Agencies **Support:** Grant County Emergency Management	2 years
6.2.c: Work with area homeowner's associations to foster cooperative approach to fire protection and awareness and identify mitigation needs.	**CWPP Goal #1, 2, 3, & 4** High	**Lead:** Grant County Fire Protection Agencies **Support:** Grant County Building Departments	2 years
6.2.d: Work with WSU Extension, Master Gardeners, and other existing programs to offer fire resistant landscaping clinics to assist property owners in maintaining fire-resistant defensible space around structures.	**CWPP Goal #1, 2, 3, & 4** Moderate	**Lead:** Grant County Fire Protection Agencies **Support:** WSU Extension	Ongoing
6.2.e: Distribute educational information regarding construction in high risk wildfire areas with building permits throughout the County.	**CWPP Goal #1, 2, & 4** High	**Lead:** Grant County Fire Protection Agencies **Support:** Grant County Building Departments	1 year

Table 6.2. Action Items for Fire Prevention, Education, and Mitigation

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline
6.2.f: Explore creating a grant funded fire prevention position for Grant County.	**CWPP Goal #1, 2, 3, & 4** Moderate	**Lead:** Grant County Fire Protection Agencies **Support:** Grant Board of County Commissioners	2 years
6.2.g: Training and certification for Grant County Fire agencies to provide better protection for Grant County residents.	**CWPP Goal #1 & 4** High	**Lead:** Grant County Fire Protection Agencies **Support:** BLM	Ongoing
6.2.h: Improve departmental capability by establishing a program to increase the retention and recruitment of volunteer firefighters.	**CWPP Goal #1 & 4** High	**Lead:** Grant County Fire Protection Agencies **Support:** BLM	Ongoing
6.2.i: Fund a grant writing position or provide current Grant County staff to write grants.	**CWPP Goal #1 & 4** High	**Lead:** Grant County Fire Protection Agencies **Support:** Grant County Board of County Commissioners	1 year
6.2.j: Continue meeting as a CWPP Steering Committee to plan mitigation efforts and rehabilitation efforts within Grant County.	**CWPP Goal #1, 2, 3 & 4** Moderate	**Lead:** County Fire Chiefs **Support:** Grant County Emergency Management	Ongoing

Infrastructure Enhancements

Critical infrastructure refers to the communications, transportation, power lines, and water supply that service a region or a surrounding area. All of these components are important to central Washington and to Grant County specifically. These networks are, by definition, a part of the wildland urban interface in the protection of people, structures, infrastructure, and unique ecosystems. Without supporting infrastructure, a community's structures may be protected, but the economy and way of life lost. As such, a variety of components will be considered here in terms of management philosophy, potential policy recommendations, and mitigation recommendations.

Table 6.3 Action Items for Infrastructure Enhancement

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline
6.3.a: Identify areas of the county to inventory, map, and sign all potential evacuation routes and procedures countywide and educate the public on use.	**CWPP Goal #1 & 2** High	**Lead:** Grant County Fire Protection Agencies **Support:** Grant County GIS Analyst	3 years
6.3.b: Map, develop GIS database, and provide signage for onsite water sources such as hydrants, underground storage tanks, and drafting or dipping sites on all ownerships across the county.	**CWPP Goal #1 & 4** High	**Lead:** Grant County Fire Protection Agencies **Support:** Grant County GIS Analyst	1 year
6.3.c: Develop a program to encourage landowners to put up reflective address signage on their drive to allow firefighters to better locate residences.	**CWPP Goal #1, 2, & 4** High	**Lead:** Transportation Land Services **Support:** Grant County Fire Protection Agencies, BLM	1 year
6.3.d: Increase the cellular coverage throughout the County to increase communications.	**CWPP Goal #1 & 4** High	**Lead:** Private Cellular providers **Support:**	5 years
6.3.e: Obtain funding to create County map books to be placed in all emergency vehicles which allow emergency responders to navigate across jurisdictions	**CWPP Goal #1 & 4** High	**Lead:** Grant County Emergency Management **Support:** Grant County GIS Analyst, Fire Protection Agencies	1 year

Resource and Capability Enhancements

There are a number of resource and capability enhancements identified by the rural and wildland firefighting districts in Grant County. All of the needs identified by the districts are in line with increasing the ability to respond to emergencies and are fully supported by the CWPP steering committee.

The implementation of each action item will rely on either the isolated efforts of the rural Fire Protection Districts or a concerted effort by the county to achieve equitable enhancements across all of the districts. Given historic trends, individual departments competing against neighboring departments for grant monies and equipment will not necessarily achieve countywide equity.

Table 6.4 Action Items for Resource and Capability Enhancements

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline
6.4.a: Expand fire station facilities to allow for increased resident firefighters and apparatus storage.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire Protection Agencies **Support**: Grant County Fire Commissioners	3 years
6.4.b: Build a satellite station near Pinto Ridge for Grant County Fire District #13 to provide a more rapid emergency response for residents.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire Protection Agencies **Support**: Grant County Fire Commissioners	3 years
6.4.c: New wildland urban interface engines.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire District **Support**: Grant County Fire Commissioners	5 years
6.4.d: Incorporate Sherriff's Office into annual wildland fire planning meetings.	**CWPP Goal #1 & 4** High	**Lead**: Fire Protection Agencies **Support**: Grant County Sheriff's Office	2 years
6.4.e: Install draft pipes on canal bridges to increase response efficiency and firefighter safety.	**CWPP Goal #1 & 4** High	**Lead**: Fire Protection Agencies **Support**: BOR, local irrigation district, Grant County Public Works Department	2 years

Table 6.4 Action Items for Resource and Capability Enhancements

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline
6.4.f: Build a satellite fire station near the intersection of Sunland Estates and Silica Rd. in Grant #3 to provide for a more rapid emergency response for residents.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire Protection Agencies **Support**: Grant County Fire Commissioners, U.S. Bureau of Reclamation, Grant County Commissioners	3 years
6.4.g: Build a satellite fire station in the Trinidad Crescent Bar area in Grant #3 to provide for a more rapid emergency response for residents.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire Protection Agencies **Support**: Grant County Fire Commissioners, Grant PUD, County Commissioners, Crescent Bar Home Owners Associations	2 years
6.4.h: Build a static water supply in the area of Willow Springs Rd and Baird Springs Rd to increase response efficiency and firefighter safety.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire Protection Agencies **Support**: Grant County Fire Commissioners, Local land owners, Grant County Commissioners	3 years
6.4.i: Build a static water supply in the area of Monument Hill Rd and Baird Springs Rd to increase response efficiency and firefighter safety.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire Protection Agencies **Support**: Grant County Fire Commissioners, local land owners, Grant County Commissioners	3 years
6.4.j: Expand fire station facilities to allow for increased resident firefighters and apparatus storage.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire Protection Agencies **Support**: Grant County Fire Commissioners	3 years
6.4.k: Build a satellite station near Pinto Ridge for Grant County Fire District #13 to provide a more rapid emergency response for residents.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire Protection Agencies **Support**: Grant County Fire Commissioners	3 years
6.4.l: New wildland urban interface engines.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire District **Support**: Grant County Fire Commissioners	5 years

Table 6.4 Action Items for Resource and Capability Enhancements

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline
6.4.m: Install draft pipes on canal bridges to increase response efficiency and firefighter safety.	**CWPP Goal #1 & 4** High	**Lead**: Fire Protection Agencies **Support**: BOR, local irrigation district, Grant County Public Works Department	2 years
6.4.n: Build a satellite fire station near the intersection of Sunland Estates and Silica Rd. in Grant #3 to provide for a more rapid emergency response for residents.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire Protection Agencies **Support**: Grant County Fire Commissioners, U.S. Bureau of Reclamation, Grant County Commissioners	3 years
6.4.o: Build a satellite fire station in the Trinidad Crescent Bar area in Grant #3 to provide for a more rapid emergency response for residents.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire Protection Agencies **Support**: Grant County Fire Commissioners, Grant PUD, County Commissioners, Crescent Bar Home Owners Associations	2 years
6.4.p: Build a static water supply in the area of Willow Springs Rd and Baird Springs Rd to increase response efficiency and firefighter safety.	**CWPP Goal #1 & 4** High	**Lead**: Grant County Fire Protection Agencies **Support**: Grant County Fire Commissioners, Local land owners, Grant County Commissioners	3 years

Proposed Project Areas

The following project areas were identified by the CWPP steering committee and from citizens' recommendations during the public meetings. Most of the sites were visited during the field assessment phase. The areas where these projects are located were noted as having multiple factors contributing to the potential wildfire risk to residents, homes, infrastructure, and the ecosystem. Treatments within the project areas will be site specific, but will likely include homeowner education, creation of a wildfire defensible space around structures, fuels reduction, and access corridor improvements. All work on private property will be performed with consent of, and in cooperation with the property owners. Specific site conditions may call for other types of fuels reduction and fire mitigation techniques as well. Defensible space projects may include, but are not limited to commercial or pre-commercial thinning, pruning, brush removal, chipping, prescribed burning, installation of greenbelts or shaded fuel breaks, and general forest and range health improvements.

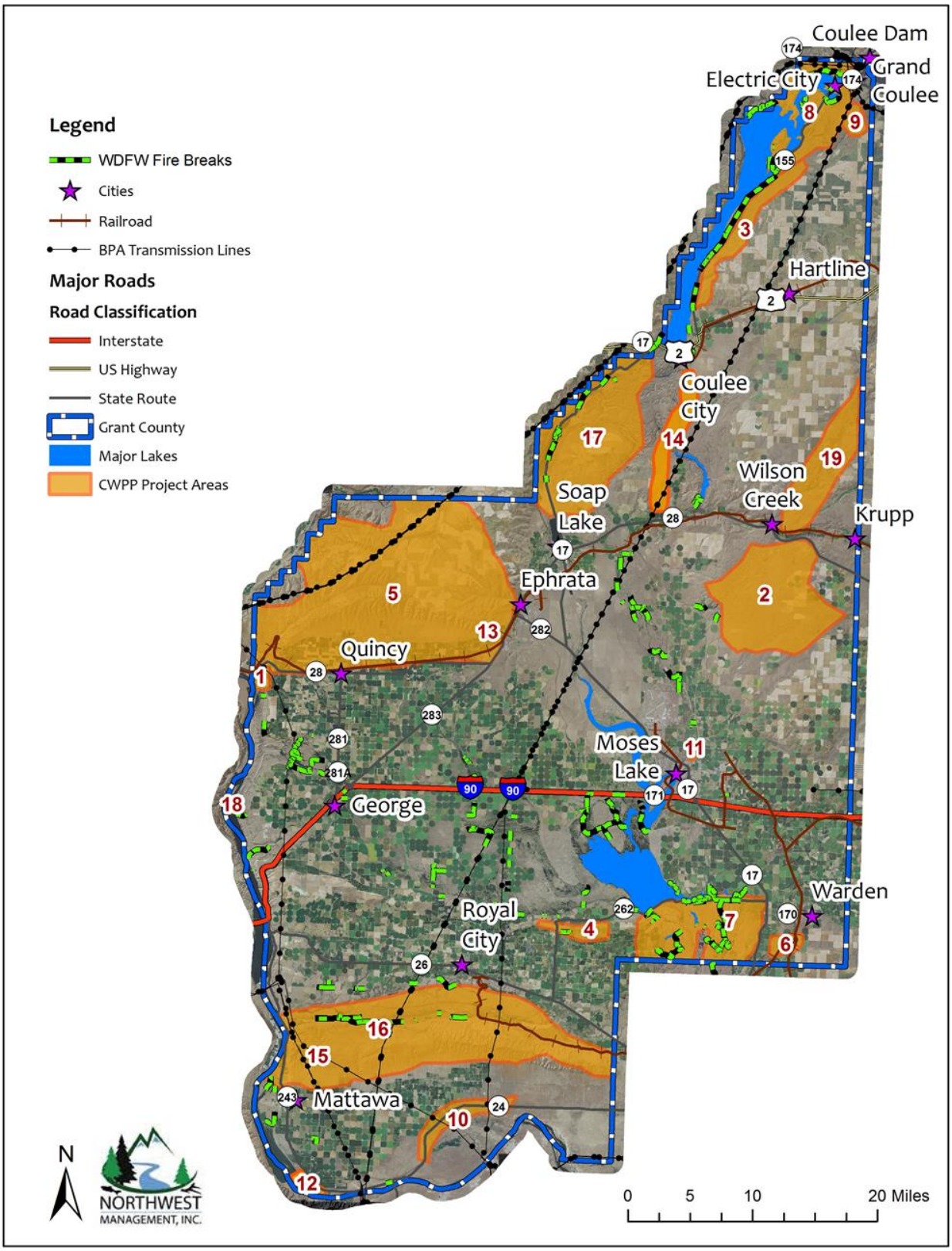
The steering committee does not want to restrict funding to only those projects that are high priority because what may be a high priority for a specific community may not be a high priority at the county or agency level. Regardless, the project may be just what the community needs to mitigate disaster. The flexibility to fund a variety of diverse projects based on varying criteria, landowner participation, and available dollars is a necessity for a functional mitigation program at the county and community level.

The Washington Department of Natural Resources, Bureau of Land Management, Conservation District, and/or individual Fire Protection Agencies may take the lead on implementation of many of these projects; however, project boundaries were purposely drawn without regard to land ownership in order to capture the full breadth of the potential wildland fire risk. Coordination and participation by numerous landowners will be required for the successful implementation of the identified projects. A map of the Proposed Project Areas is included in Appendix 1.

Table 6.5. Proposed 5- Year Project Areas

Map Id#	Project Name	Project Type	Jurisdiction	Acres
1	Crescent Bar Limited Access	Limited Access	GCFD 3	1,741
2	Eagle Springs Ranch	Limited Access and Defensible Space	GCFD 12	41,746
3	East Banks Limited Access	Limited Access	GCFD 6	10,085
4	Frenchman Hills CRP	CRP	GCFD 11	3,675
5	GCFD3 Water Supply	Water	GCFD 3	137,938
6	GCFD4 Water and Access East	Water and Access	GCFD 4	2,434
7	GCFD4 Water and Access for Structure Protection	Water, Access, Recreation	GCFD 4	30,075
8	GCVFD Interagency Coordination	Coordination	GCVFD	27,772
9	Grant Coulee Hill	Limited Access	GCFD 14	2,331
10	HWY 24 FWS Fuel Breaks	Fuel Breaks	GCFD 8	7,696
11	K2 Road Recreation	Recreation	GCFD 5	235
12	New Campsite Recreation Concern	Recreation	GCFD 8	1,916
13	Painted Hills Community	Defensible Space	GCFD 13	339
14	Pinto Ridge Road	Roadside Fuels Treatment	GCFD 6, 12	10,131
15	Saddle Mountain ORV Use Area	Recreation	GCFD 8, 10	15,868
16	South Grant Interagency Water and Access	Water and Access	GCFD 8, 10, 11	90,075
17	Sun Lakes One Way Limited	Limited Access	GCFD 7, 12	47,778
18	Sunland Estates	Limited Access and Defensible Space	GCFD 3	554
19	Wilson Creek Road CRP	Limited Access	GCFD 6, 12	19,370

Figure 6.1. Map of Proposed Projects.



Representative Fuels Treatment Project Prescriptions

The following project areas were identified during the field assessments and interviews as potentially having several factors contributing to high wildfire risk as well as being representative of the types of projects likely to be pursued for grant funding. The intent is that these project prescriptions be as site specific as possible, but serve as templates for writing prescriptions for similar projects throughout the County. These projects/templates will aid land stewards in applying for grants specific to their property. The chosen project areas do not reflect the highest priority projects identified by the steering committee, but were written for communities with a high level of existing interest in implementation.

- Saddle Mountain is a heavily used by Off Road Vehicle (ORV) enthusiasts. There is approximately 15,800 acres within the project area, however there are likely far more acres in this region that are used for this type of activity.
- Eagle Springs Ranch is a sparsely populated community that encompasses approximately 42,000 acres located in the east central portion of the county. The fuels in this area are consistent with a shrub/steppe community. Terrain in this project area is deceivingly inaccessible.
- Grant County Fire District #4 has limited water resources and access in certain portions of the District. This project area is located just south of Warden, Washington in the southeast corner of the County. GCFD #4 covers 140 square miles and responds to an average of 265 calls annually.

The project areas were identified without regard for landownership boundaries; thus, site-specific prescriptions will require coordination and approval by the various landowners. The following descriptions provide as much detail as possible regarding the objectives, prescription, and unique nature of each project; however, exact acreages and site plans will be determined after consultation with the affected landowners. The prescriptions described in the following projects may be modified to suit other similar projects, for example the GCFD #4 project may apply to the South Grant Interagency Water and Access project. Contact your local fire department representative for assistance in developing goals and prescriptions specific to your project.

Saddle Mountain ORV Use Area

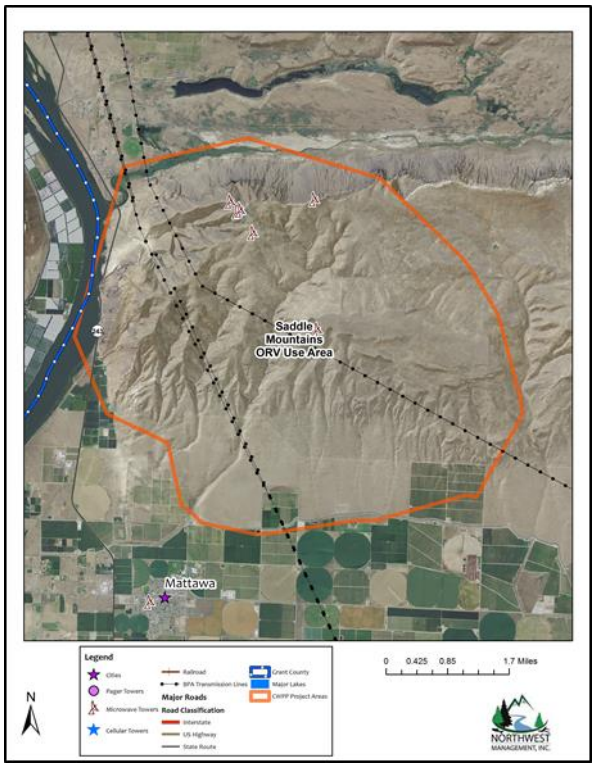
Saddle Mountain is the highest point in Grant County. Much of the project area is managed by the Bureau of Land Management and the Bureau of Reclamation. Elevations range from a low of 486 feet at the Columbia River to approximately 2,700 feet at Wahatis Peak to the east. The Saddle Mountains have a gentle southern slope in contrast to the precipitously bold relief of the north-facing cliffs. The vegetation in this project area consists of big sagebrush with a variety of bunchgrasses. The densities of the grass and shrubs varies depending on aspect, soil stability, and moisture availability. Substantial amounts of cheatgrass does occur in places within the project area due to the high amount of disturbance.

Saddle Mountain is accessible from three state highways (Highways 243, 24 and 26) and two county roads. State Highway 243, which parallels the Columbia River, provides physical access to the western portion of the area. The southwestern portion of the Saddle Mountains can be accessed from Highway 24 via"R" Road, one mile east of the town of Mattawa and County right

of way via O road, 4 miles east of Mattawa. The eastern portion can be accessed from Highway 24 via Corfu Road located at the entrance to the Wahluke Wildlife Recreation Area (about 20 miles east of Mattawa). This road crosses the mountain and eventually intersects Highway 26 at Corfu, Washington.

Project Prescription

Education is often the most critical part in protecting an ORV area such as Saddle Mountain. Placing a large informative sign at trailheads informing users of the dangers that exist in the area regarding wildland fire are often the most effective tool in mitigating the risk.



Local Fire Districts could host a booth at the County fair, or other similar venues, is another form of education that would benefit the Saddle Mountain ORV area. Have a raffle and other free items to attract people to the booth. Provide handouts explaining the risks that ORV use has with regard to wildland fire and provide examples of wildfires that were caused by this activity.

Regional ORV clubs are also a great way to spread the word about the risks of ORV use. ORV clubs could require that their members carry collapsible buckets, small shovels, and other tools to quickly put out a fire. Local Fire Districts could attend a club event each spring to remind members the proper techniques to safely operate ORVs.

Patrols by law enforcement or fire districts could provide a certain level of accountability for ORV users. This of course, is an extreme measure and would only be recommended if wildland fires became a significant issue.

The Bureau of Land Management and any other landowners in the area could be approached to provide funding or other types of support for any of these projects.

Eagle Springs Ranch

The Eagle Springs Ranch project is a sparsely populated region in east central Grant County. The project area encompasses nearly 42,000 acres in GCFD #12. There is irrigated and dryland agriculture surrounding this project area. Access is extremely limited in this region. Highway 28 is the northern boundary of the project area and there are no roads that cross the vast expanse of this project area.

Vegetation in this area consists of sagebrush and a variety of annual and perennial grasses. The terrain in this area is considered gentle however that is deceiving because of the exposed rocks and dry coulees that are common throughout the area. For this reason, access is extremely

limited. The Eagle Springs Ranch is an arid environment and water availability for filling fire engines are long distances away.

Project Prescription

Homeowners should manage their property with Firewise principles in mind. This means that structures should have a three to five foot wide strip of non-combustible material around the perimeter of the structure. Shrubs that occur within thirty feet of the structure should be heavily thinned (2.5 times a shrub's height between shrubs or clusters of shrubs).

Roadside fuels will be treated to create fuel breaks throughout the community. This will also enable fire apparatus to gain access to structures if needed. This will be achieved through a thirty foot 'buffer' in addition to the road width. The buffer can be done on one side of the road or thirty feet on each side of the road. Roadside treatments should include thinning shrubs to the same standards as mentioned above. Monitor and spray herbicides to reduce invasive weeds along roads and around homes.

Education is often the most critical part in protecting a community such as Eagle Springs Ranch. Often, having a trained individual perform a home assessment for a homeowner is sufficient. The home assessment determines a score telling the homeowner the level of risk their property would face in the event of a wildland fire. The trained individual would then provide advice on how to minimize the risks identified in the home assessment.

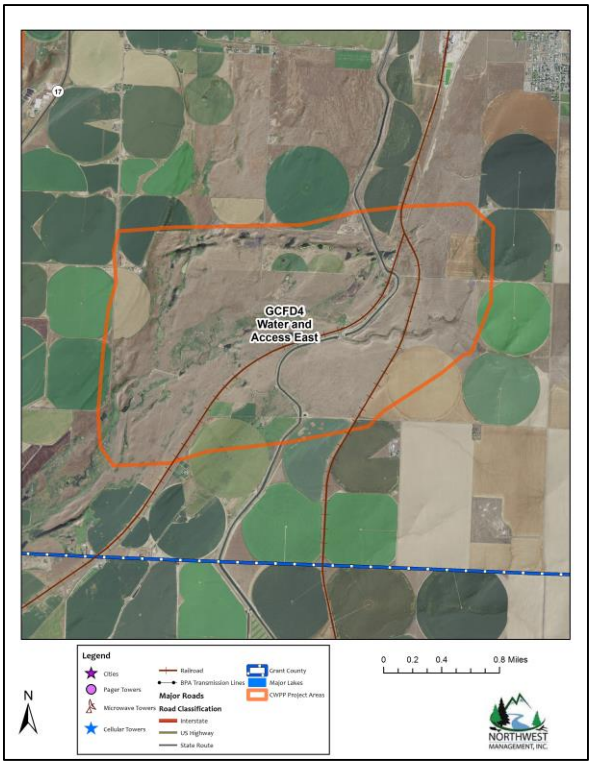
A community workshop is another form of education that will benefit the community. The workshop will be scheduled for a weekend that allows as many people to attend as possible. Free lunch and fire safe plant giveaways are a great way to get people to attend. Experts from Bureau of Land Management, Washington Department of Natural Resources, conservation districts, weed boards, consultants, and any others will be invited to attend to provide the homeowners with advice.

Select a property to be a 'demo' for other properties to use as guidance can also be a useful tool in educating a community. The demo property will be in a highly visible location and the property owner should be extremely motivated to maintain the property and provide encouragement to neighbors. Homeowners are often reluctant to conduct thinning because they want it to look natural and not like a construction site. Providing these homeowners with a property that allows them to visualize what their property will look like often gets them over that hurdle.

GCFD4 Water and Access East

Grant County Fire District 4 Water and Access East is roughly 2,400 acres just south of Warden in the southeast corner of the County. This area is economically valued for both dryland and irrigated agriculture and has scattered structures. The remainder of this project area is grassland or CRP fields. The terrain in this project area is gentle and easily accessible. Aside from the Bureau of Reclamation irrigation canal that circumnavigates the community of Warden before turning south and passing through the project area, this region is largely without sufficient water sources.

Establishing suitable water supply in this region for the local fire district is critical to the district's ability to effectively respond to wildland fires. This would reduce turnaround times for wildland engines to resupply with water and allow them to continue suppression efforts in the event of a wildland fire.



Project Prescription

The local fire district would have to identify where water storage tanks would be most effective. Then the district would likely have to gain permission from private landowners to allow the district to place a water tank on their property, as much of the project area is privately owned. A 20,000 gallon above ground water storage tank can cost anywhere from $14,000 to $25,000.

The district may also ask the Bureau of Reclamation or irrigation district to strategically place drafting sites along the canal. This could end up costing more than purchasing the tanks depending on access to the canal and infrastructure upgrades that may be required to create a sufficient drafting site. The Bureau of Reclamation is often operating on a limited budget so the district would likely have to acquire most of the funds.

Regional Land Management Recommendations

Wildfires will continue to ignite and burn depending on the weather conditions and other factors enumerated earlier. However, active land management that modifies fuels, promotes healthy shrubland and grassland conditions, and promotes the use of natural resources (consumptive and non-consumptive) will ensure that these lands have value to society and the local region. The Washington DNR, Washington Department of Fish and Wildlife Service, BLM, USFS, private forest landowners, and all other landowners in the region should be encouraged to actively manage their wildland-urban interface lands in a manner consistent with reducing fuels and wildfire risks.

Control Invasive Weeds

Non-native or invasive plants have been spreading across the western United States since Euro-Americans began settling the region. With the aid of grazing livestock and human disturbance, some non-native species have spread over vast areas and can out-compete many native species. This change in vegetation regime often comes with secondary impacts such as an increase fire frequency or fire intensity, as well as many other impacts.

There are many methods that can be utilized to control non-native species from spreading. The size of the outbreak and the species involved will determine the most effective method to control the outbreak. Small outbreaks of non-native plants can often be pulled by hand and disposed of

before the plant goes to seed. Mowing, spraying, and even biological (insect) methods can be employed to control larger outbreaks. Regardless of the method, timing is often very important and a quality plan will ensure the treatment is successful.

Control Insects and Disease

Insects and diseases have been a common occurrence within forests and shrublands throughout the western U.S. for millennia. In the past, these impacts generally occurred in specific locations and would eventually 'run their course', often times benefiting the ecosystem by creating natural openings in the forest. Currently, our forests are unhealthy due to a variety of reasons and are subject to outbreaks of insect and/or disease over much larger areas than historically normal. These large outbreaks lead to severe impacts because it leaves the forest susceptible to stand replacing wildland fires.

Having a healthy forest or shrubland is the first, and most effective, step in combating the effect of insect or disease outbreaks. Insecticide can be sprayed over affected areas to eradicate harmful insects. Pheromones can be used, on a smaller scale, to deter certain species of insects from attacking an individual tree.

Thin Shrublands

Many of the shrublands throughout the western U.S. have become overstocked and stagnant. There are numerous reasons to explain why this is, but regardless of the reason, it is widely accepted that some management is required. Overstocking leads to numerous other health issues including susceptibility to insects, disease, and drought.

A suitable spacing for shrubs is selected to reduce the ability of fire to spread between shrubs. The shrubs are cut by hand or with a machine and mulched or piled for burning. The result is a stand of shrubs that is less dense which allows the remaining shrubs to have access to more resources (water, sunlight, and nutrients) than there was pre-thinning, creating a healthier ecosystem that is more resistant to insect and disease outbreaks.

Reintroduce Fire to the Ecosystem

Fire has been removed from the system for several decades because it was once seen as destroyer of our nation's natural resources.[45] This exclusion has resulted in an unnatural build-up of fuel that, when fire does occur, has higher potential to be a stand replacing event.[46] The lack of wildland fires has also changed the species composition that historically occurred in many areas by allowing fire intolerant species to dominate or co-dominate the canopy.

Reintroducing wildland fire can be accomplished in multiple ways. The first and most obvious is to simply conduct prescribed burns. Another way is to manually collect downed woody debris and either removing it from the site or to pile it for burning. Chipping or mulching is yet another method that mimics the effects of fire by reducing large amounts of fuel into small chips that decompose more rapidly than a large diameter log would. These are just a few suggestions of how to reintroduce fire or mimic the effects of fire.

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[45] Pyne SJ (1982) Fire in America: A cultural History of Wildland and Rural Fire (Cycle of Fire). Seattle: University of Washington Press.

[46] Dennis C. Odion, Et. Al. 2014. Examining Historical and Current Mixed-Severity Fire Regimes in Ponderosa Pine and Mixed-Conifer Forests of Western North America. DOI: 10.1371/journal.pone.0087852.

"Today, livestock grazing is being rediscovered and honed as a viable and effective tool to address contemporary vegetation management challenges, like controlling invasive exotic weeds, reducing fire risk in the wildland-urban interface, and finding chemical-free ways to control weeds in organic agriculture." [43]

Targeted Livestock Grazing

Livestock grazing, particularly cattle, has been a long standing tradition in the rangelands of central Washington. Historically, ranchers were able to make agreements with state and federal land managers to expand their grazing operations on public ground for mutual benefit. In the last 30 years, this practice has been limited due to liability issues, environmental concerns, and litigation. Additionally, where federal grazing allotments are still available, the restrictions on timing are often inappropriate and/or too inflexible for the objectives of reducing fuel loads (i.e. wildfire risk), eradicating noxious and invasive species, and restoring native grass and sagebrush communities.

Most rangeland ecologists agree that in ***site-specific*** situations, livestock can be used as a tool to lower fire risk by reducing the amount, height, and distribution of fuel. Livestock can also be used to manage invasive weeds in some cases and even to improve wildlife habitat.

Targeted grazing can indeed reduce the amount, height, and distribution of fuel on a specific rangeland area, potentially decreasing the spread and size of wildfires under normal burning conditions. By definition, "Targeted grazing is the application of a specific kind of livestock at a determined season, duration, and intensity to accomplish defined vegetation or landscape goals."[47]

There are many factors to consider regarding the use of livestock for reducing the amount, height, and continuity of herbaceous cover (especially cheatgrass) in site-specific situations:

- During the spring, cheatgrass is palatable and high in nutritional value before the seed hardens. Repeated intensive grazing (two or three times) at select locations during early growth can reduce the seed crop that year, as well as the standing biomass. In areas where desirable perennial species are also present, the intensive grazing of cheatgrass must be balanced with the growth needs of desired plants that managers and producers want to increase.
- Late fall or winter grazing of cheatgrass-dominated areas, complemented with protein supplement for livestock, should also be considered. After the unpalatable seeds have all dropped, cheatgrass is a suitable source of energy, but low in protein. Strategic intensive grazing of key areas can reduce carry-over biomass that would provide fuel during the

[47] Karen Launchbaugh, Walker, J. Targeted Grazing – A New Paradigm for Livestock Management. University of Idaho. Accessed online October, 2014 at: http://www.webpages.uidaho.edu/rx-grazing/handbook/Chapter_1_Targeted_Grazing.pdf.

next fire season. Late fall grazing can also target any fall-germinating cheatgrass before winter dormancy, thus reducing the vigor of these plants the following spring. Fall/winter grazing when desirable perennial grasses are dormant and their seeds have already dropped, results in minimal impact to these species and therefore can be conducted with minimal adverse impact to rangeland health in many areas.

- The Bureau of Land Management (BLM) in some locations has an active "green-strip" program designed to reduce fire size and spread in key areas. Obviously, livestock can be used to maintain such green-strips to reduce the fine fuels (grasses) and control the spread of fire.
- The concept of "brown-strips" refers to areas where one or more treatments (prescribed fire, mechanical thinning, herbicide, and/or grazing) are used to reduce shrub cover, releasing the native perennial grasses. These grassy areas are preferred by cattle, which can then be grazed to reduce herbaceous fuels. This method leaves "brown-strips" when the stubble dries out in mid-summer, serving as fuel breaks to control the spread of wildfire. Where appropriate, protein-supplemented cows or sheep could be used to intensively graze and create brown-strips (e.g. along fences) to reduce the spread of fires during or after years of excess fuel build-up.
- Targeted grazing for the management of herbaceous fuels often requires a high level of livestock management, especially appropriate timing, as well as grazing intensity and frequency. In order to meet prescription specifications, operators often use herders, portable fencing, and/or dogs to ensure pastures are grazed to specification before the livestock are moved. Other expenses may include feed supplements, guardian dogs and/or night enclosures for protection from predators, water supply portability, mobile living quarters, and grazing animal transport. Targeted grazing is a business whose providers must earn a profit. Therefore, land management agencies need the option of contracting such jobs to willing producers and paying them for the ecosystem service rendered. This payment approach is already being implemented in some private and agency-managed areas to a limited extent, primarily for control of invasive perennial weeds. The use of and payment for prescription livestock grazing as a tool has substantial potential in the immediate and foreseeable future for managing vegetation in site-specific situations.
- In general, and less intensively, livestock can be used strategically by controlling the timing and duration of grazing in prioritized pastures where reduction of desirable perennial grass cover is needed for fire reduction purposes. Strategic locations could be grazed annually to reduce fuel loads and continuity at specific locations. Rotation of locations across years prevents overgrazing of any one area but confers the benefits of fuel load reductions to much larger landscapes. Even moderate grazing and trampling can reduce fuels and slow fire spread.[48]

[48] McAdoo, Kent, et al. "Northeastern Nevada Wildfires 2006: Part 2 – Can Livestock Grazing be Used to Reduce Wildfires?" University of Nevada Cooperative Extension. Fact Sheet-07-21. Available online at http://www.unce.unr.edu/publications/files/nr/2007/fs0721.pdf. Accessed June 2011.

Dormant season grazing of perennial grasses has also been reported to aid in seedling recruitment. Some seeds require scarification before they will germinate. That can be accomplished by passage through the digestive tract or by hoof action on the seed. Hoof action can also press the seed into the ground and compress the soil around it, i.e. preparing a beneficial seed bed. These processes can also reasonably be expected to provide some benefit to the exotic annual grasses. These grasses; however, appear to succeed very well without that assistance. One can speculate that the perennial grasses would demonstrate a greater response to these effects and thus would gain some edge in the struggle for dominance with the exotic annuals. If those annuals were also grazed in the early spring before the perennials started or during fall germination events, or both, it is likely the annuals would have less vigor and produce less seed which would detract from their ability to out compete the perennials.[49] While the exact details of how the perennials benefit from dormant season grazing are not fully understood, Agricultural Research Service research in Nevada has reported success in decreasing annual grass dominance.

"The role of grazing as a tool for fuel management is generally supported, but it should be cautiously evaluated on a case-by-case basis because fire potential is influenced by interactions among several ecosystem variables."[46]

"The role of grazing as a tool for fuel management is generally supported, but it should be cautiously evaluated on a case-by-case basis because fire potential is influenced by interactions among several ecosystem variables."[50] Targeted grazing can reduce wildfire risk in specific areas. The targeted grazing strategies discussed above all require a very flexible adaptive management approach by both land management agencies and targeted grazing providers. Managers must determine objectives, then select and implement the appropriate livestock grazing prescription, monitor accomplishments, and make adjustments as needed.[51]

Many local residents feel that livestock grazing is a more desirable tool for managing wildland fire risk on both private and public lands because it poses less risk than prescribed burning, is less expensive than chemical applications, can be managed effectively for the long-term, and it benefits a large sector of the local economy.

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[49] Schmelzer, L., Perryman, B. L., Conley, K., Wuliji, T., Bruce, L. B., Piper, K. 2008. *"Fall grazing to reduce cheatgrass fuel loads"*. Society for Range Management 2008.

[50] Fuhlendorf, S. D., D. D. Briske, and F. E. Smeins. 2001. Herbaceaous vegetation change in variable rangeland environments: the relative contribution of grazing and climatic variability. Applied Vegetation Science 4: 177-188.

[51] McAdoo, Kent, et al. "Northeastern Nevada Wildfires 2006: Part 2 – Can Livestock Grazing be Used to Reduce Wildfires?" University of Nevada Cooperative Extension. Fact Sheet-07-21. Available online at http://www.unce.unr.edu/publications/files/nr/2007/fs0721.pdf. Accessed June 2011.

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Chapter 7

Appendices

Appendix 1 - Mapping Products

Northwest Management, Inc.

233 East Palouse River Dr.
P.O. Box 9748
Moscow, ID 83843
208-883-4488
www.Consulting-Foresters.com

The information on the following maps was derived from digital databases held by Northwest Management, Inc. Care was taken in the creation of these maps, but all maps are provided "as is" with no warranty or guarantees. Northwest Management, Inc. cannot accept any responsibility for errors, omissions, or positional accuracy, and therefore, there are no warranties accompanying this product. Although information from land surveys may have been used in the creation of this product, in no way does this product represent or constitute a land survey. Users are cautioned to field verify information on this product before making any decisions.

Figure 7.1. Land Ownership Map

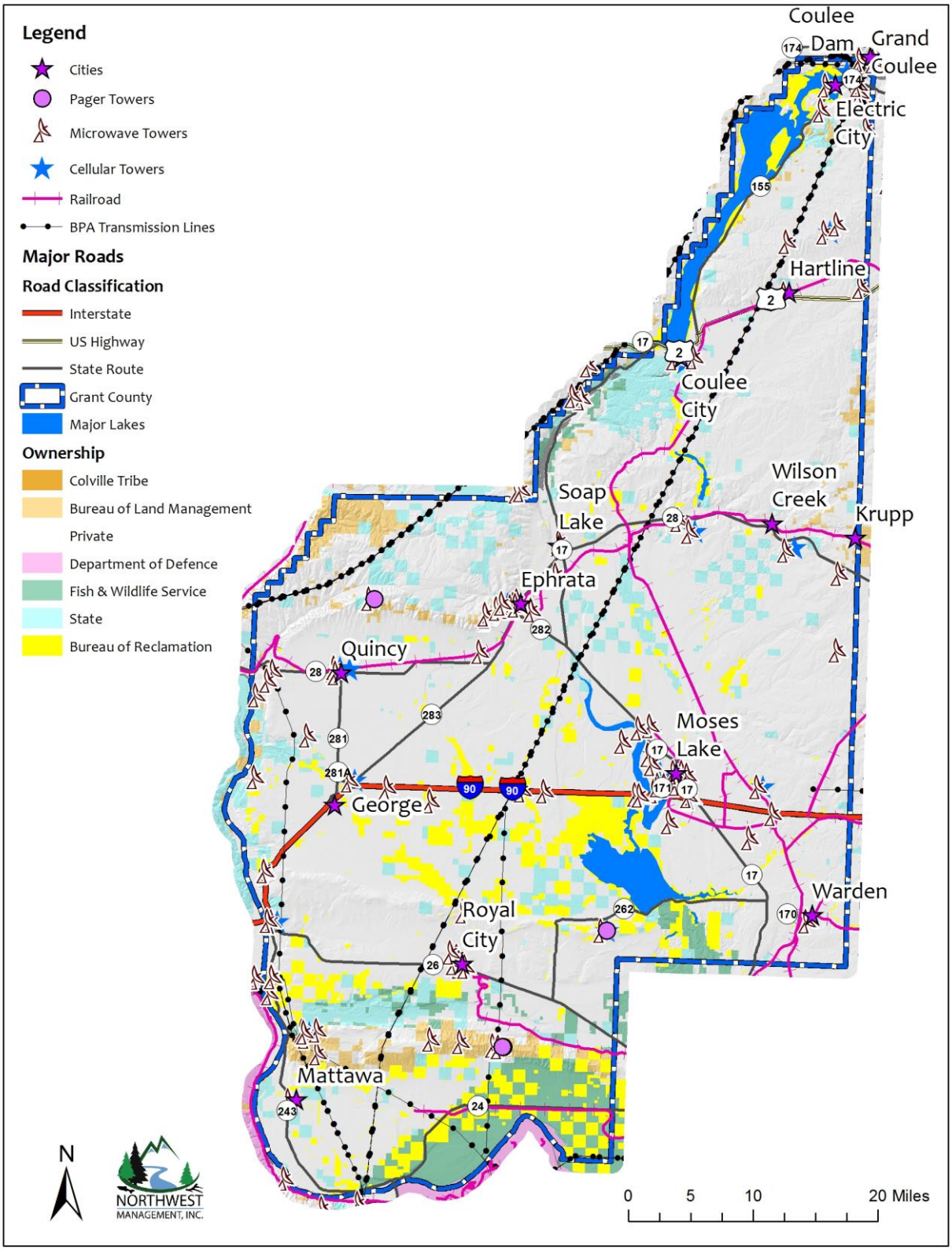


Figure 7.2. Aerial Imagery

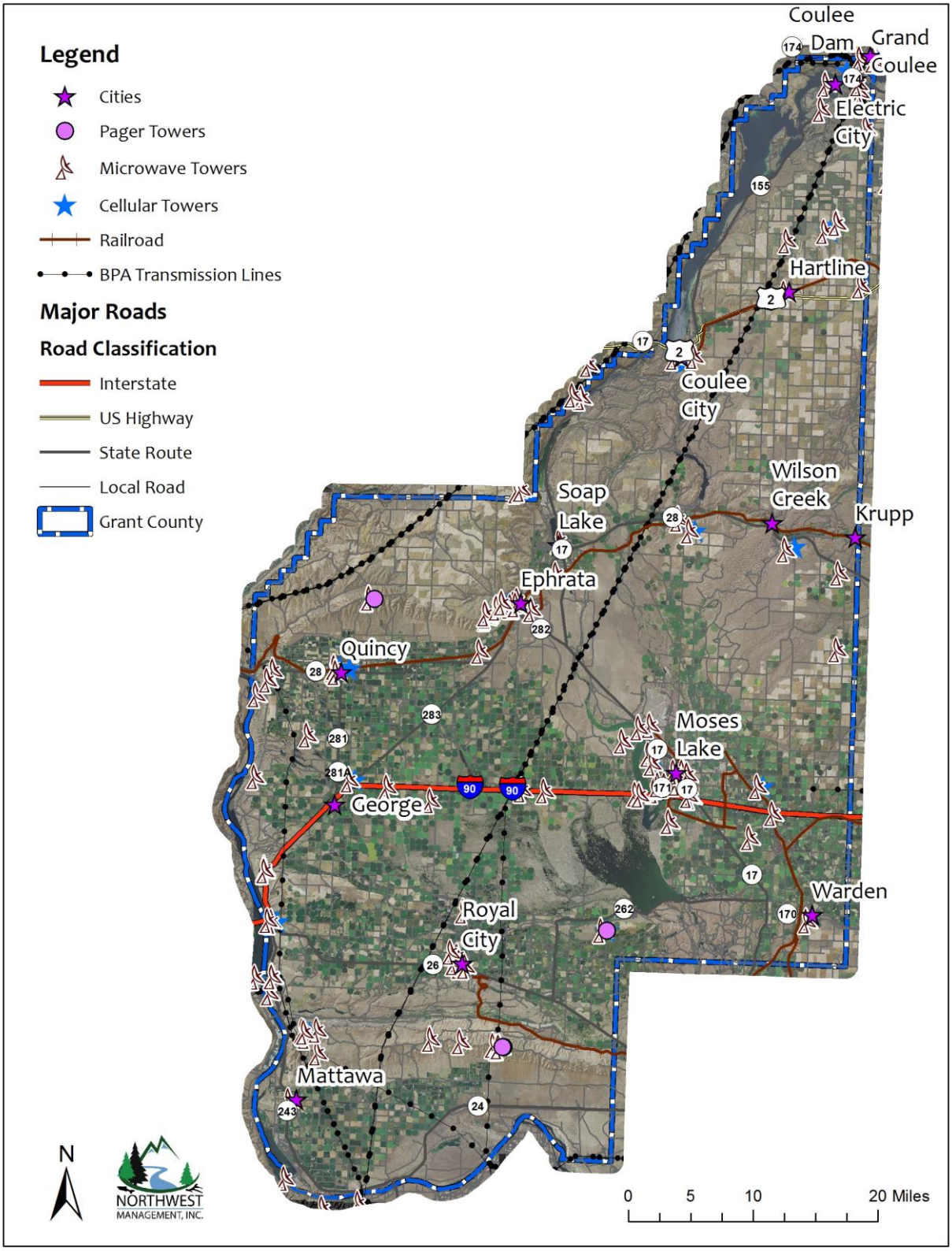


Figure 7.3. Fire Protection Boundary Map

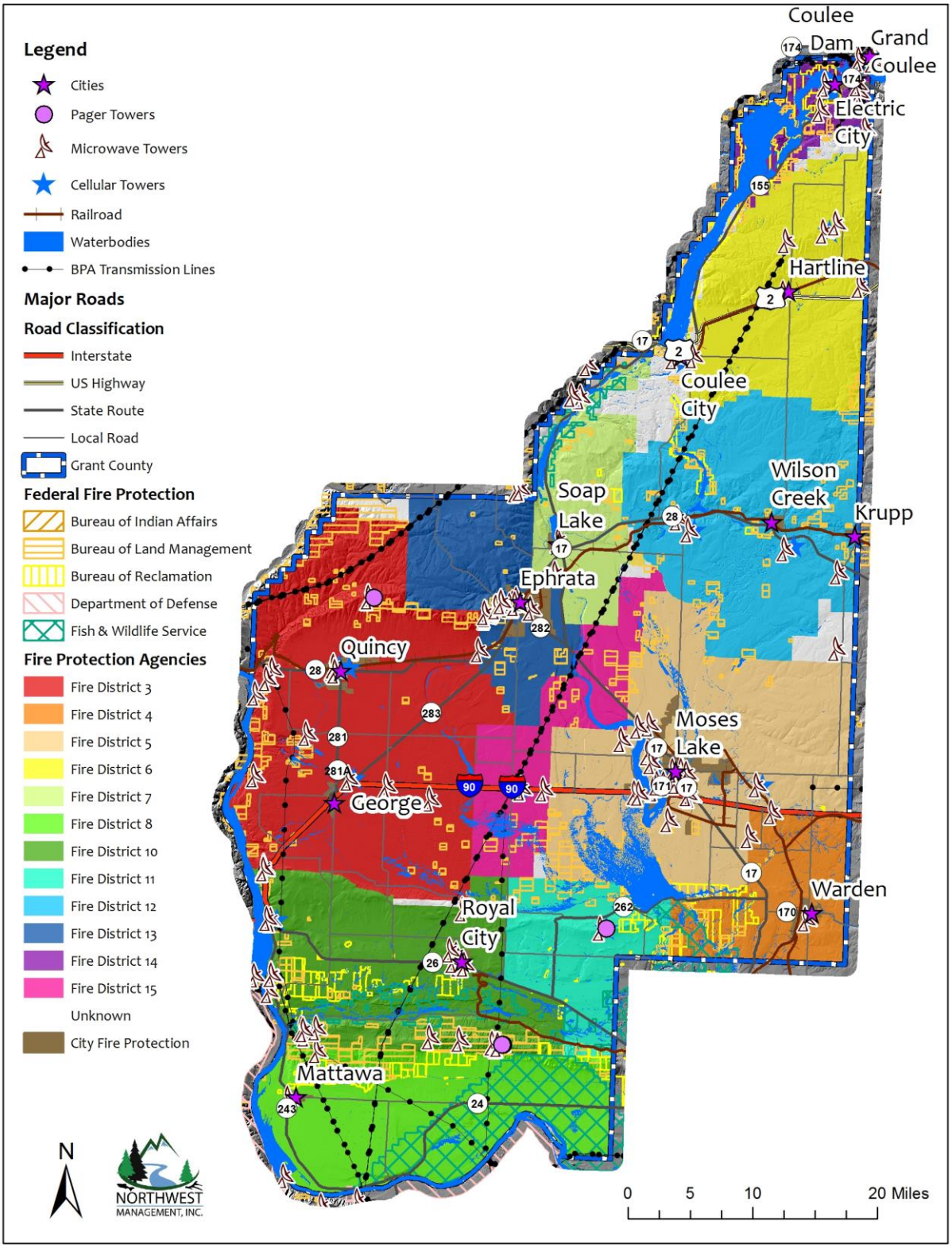


Figure 7.4. Historic Fire Regime Map

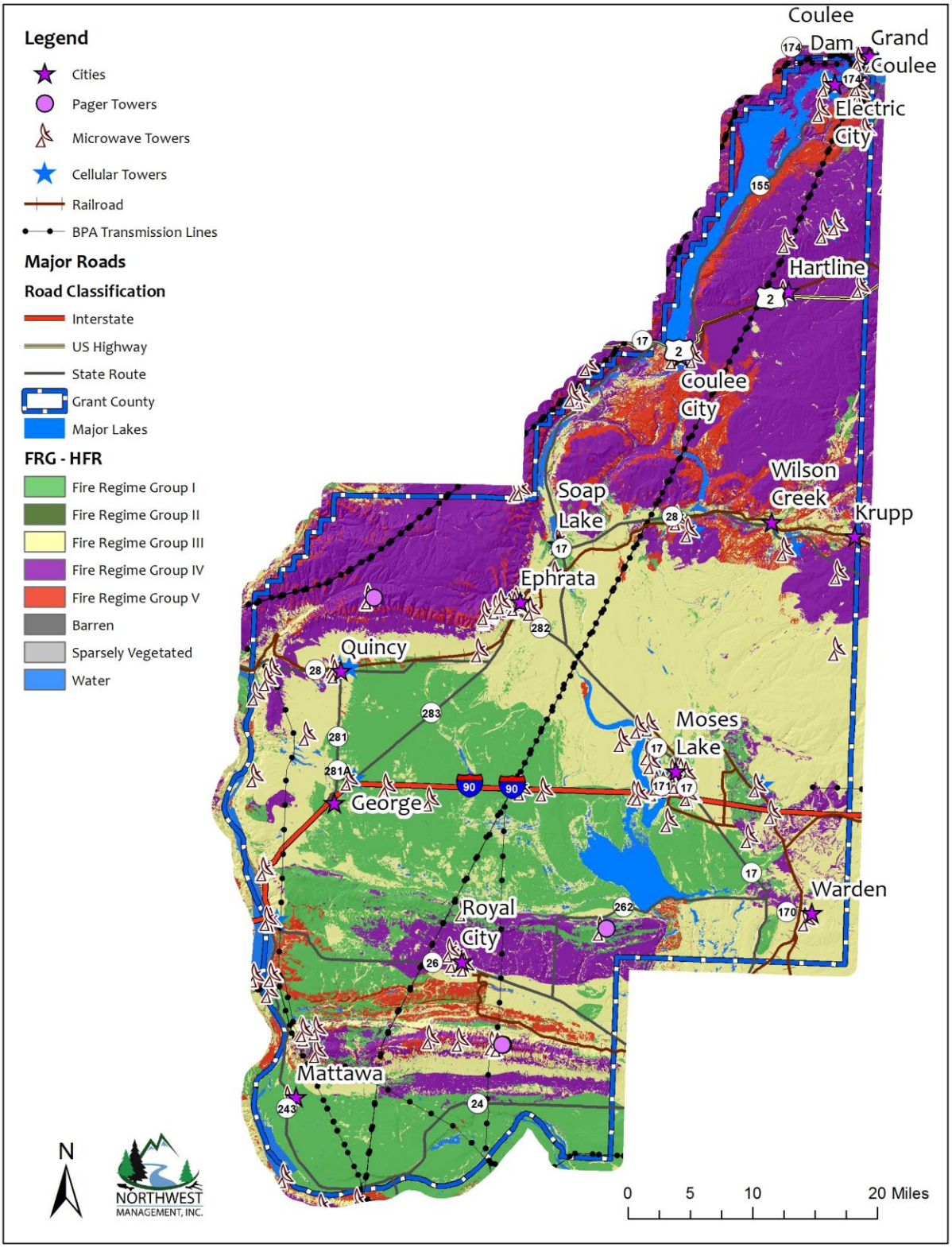


Figure 7.5. Vegetation Condition Class Map

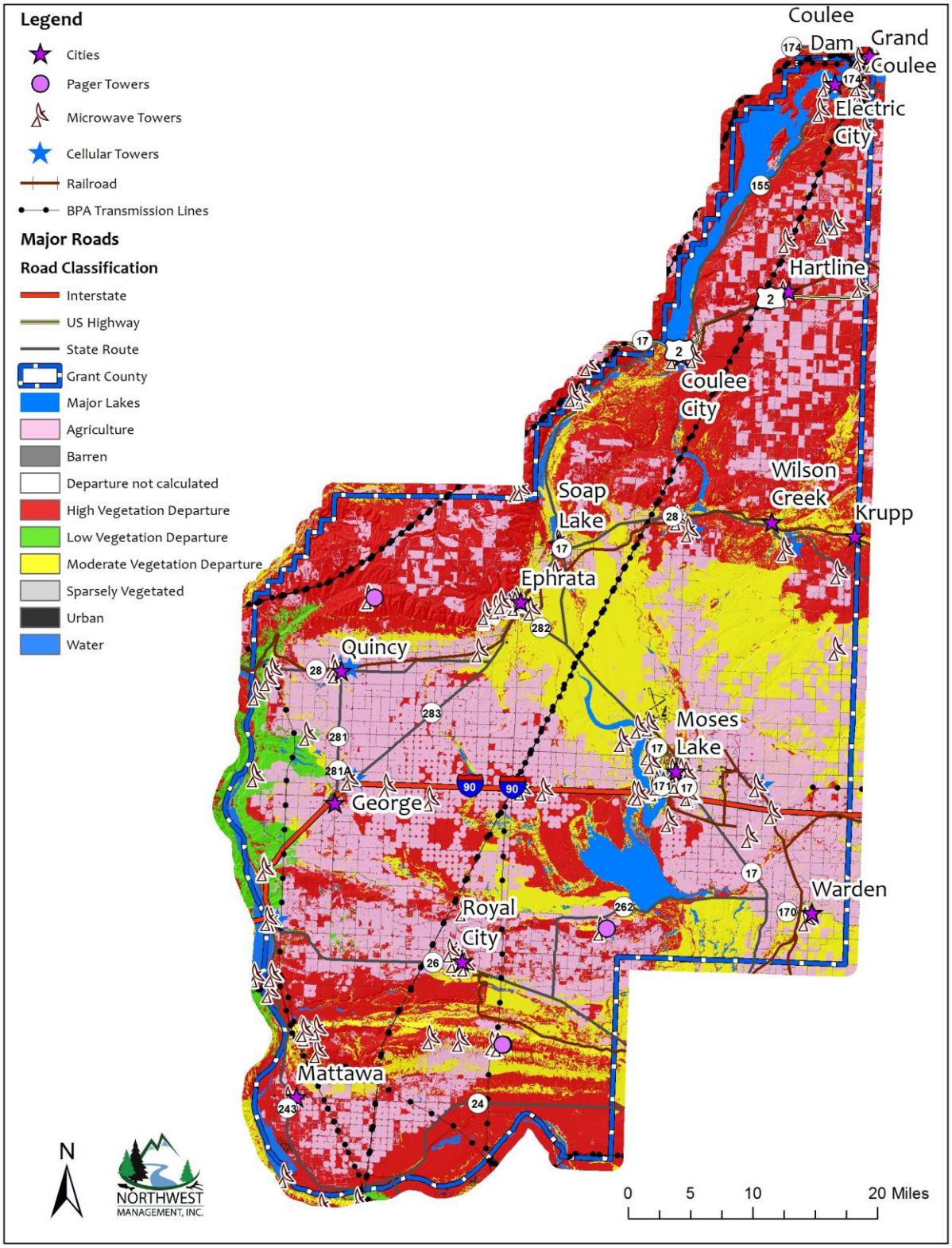


Figure 7.6. Wildland Urban Interface Map

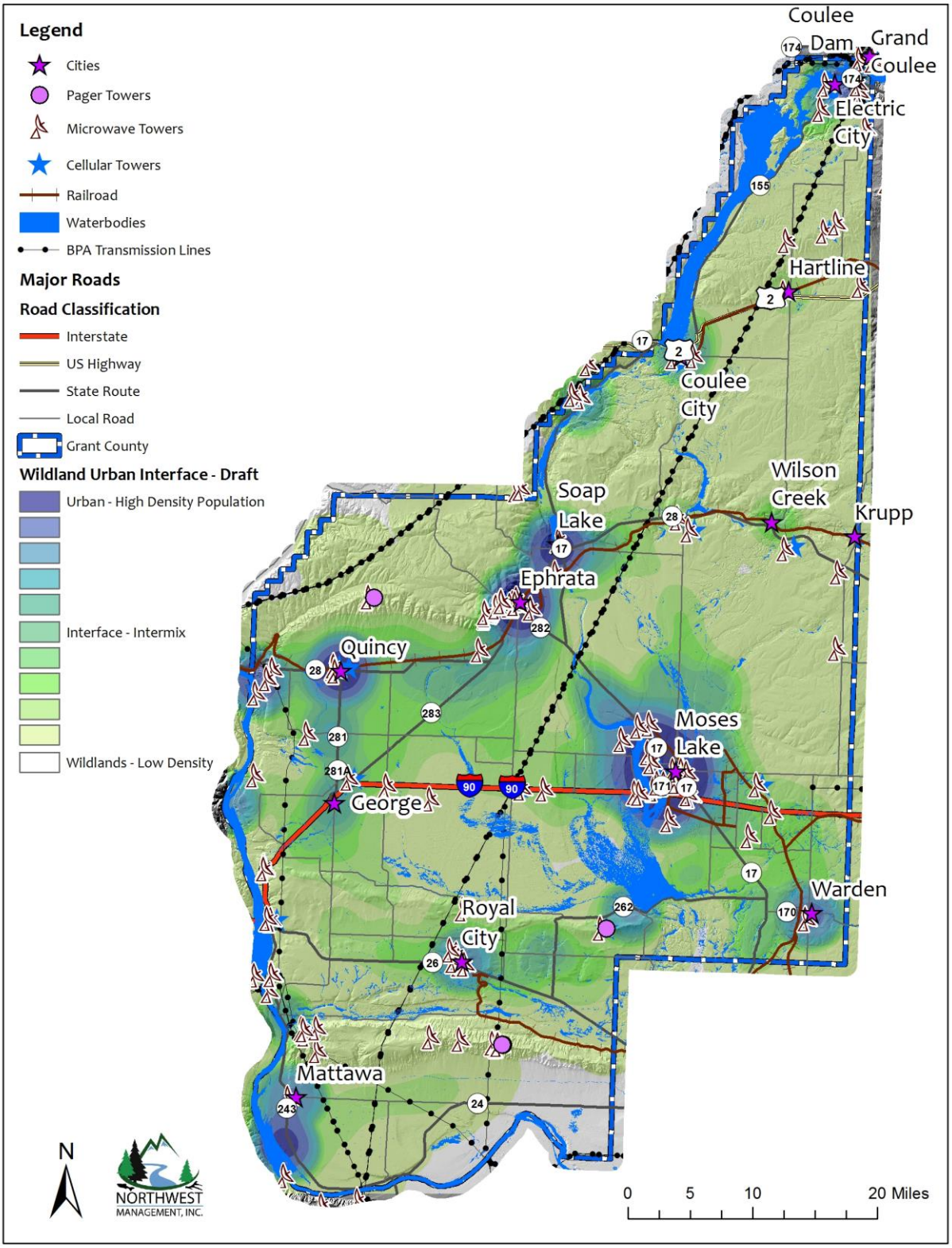


Figure 7.7. Water Sources

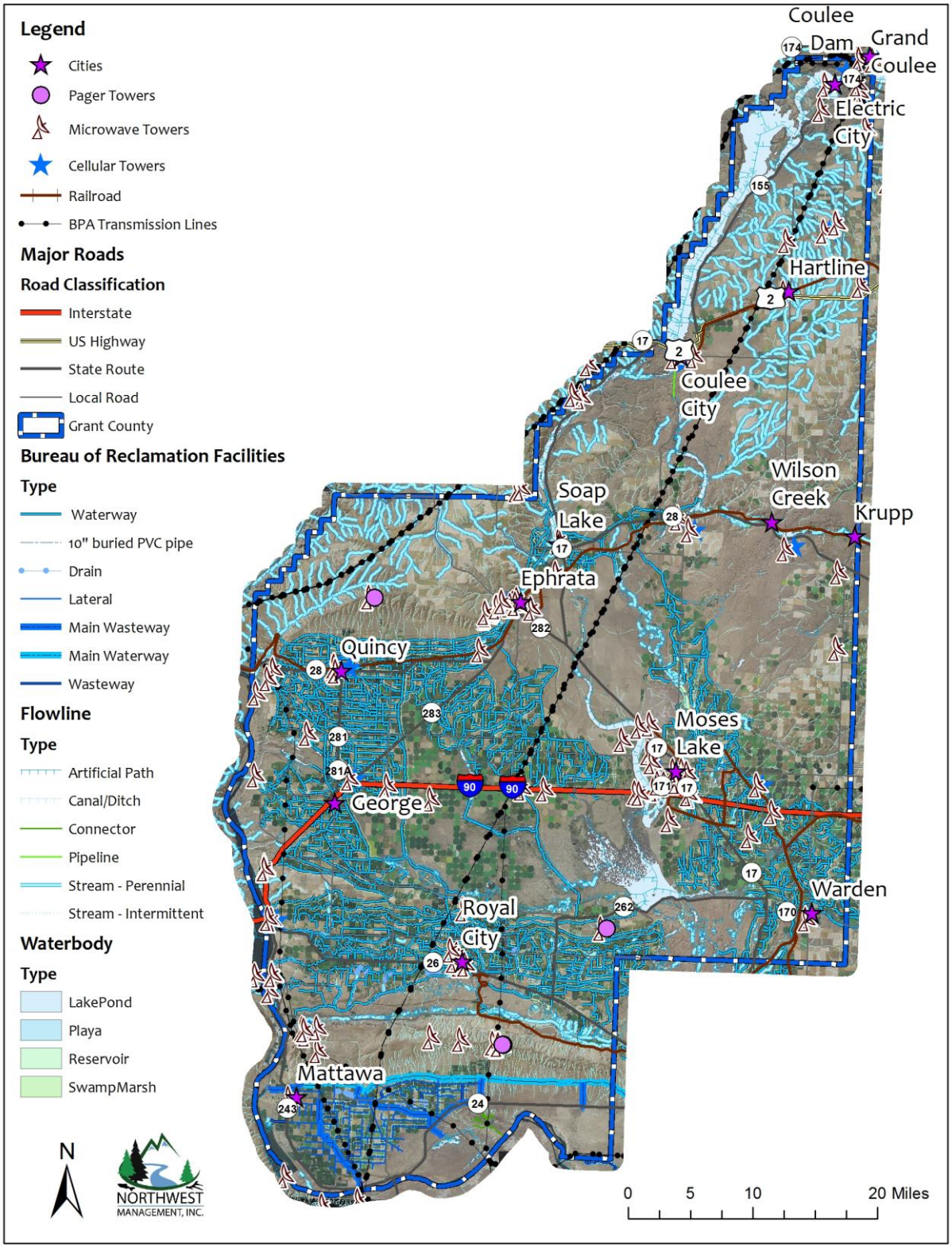


Figure 7.8. Proposed Treatment Area Map

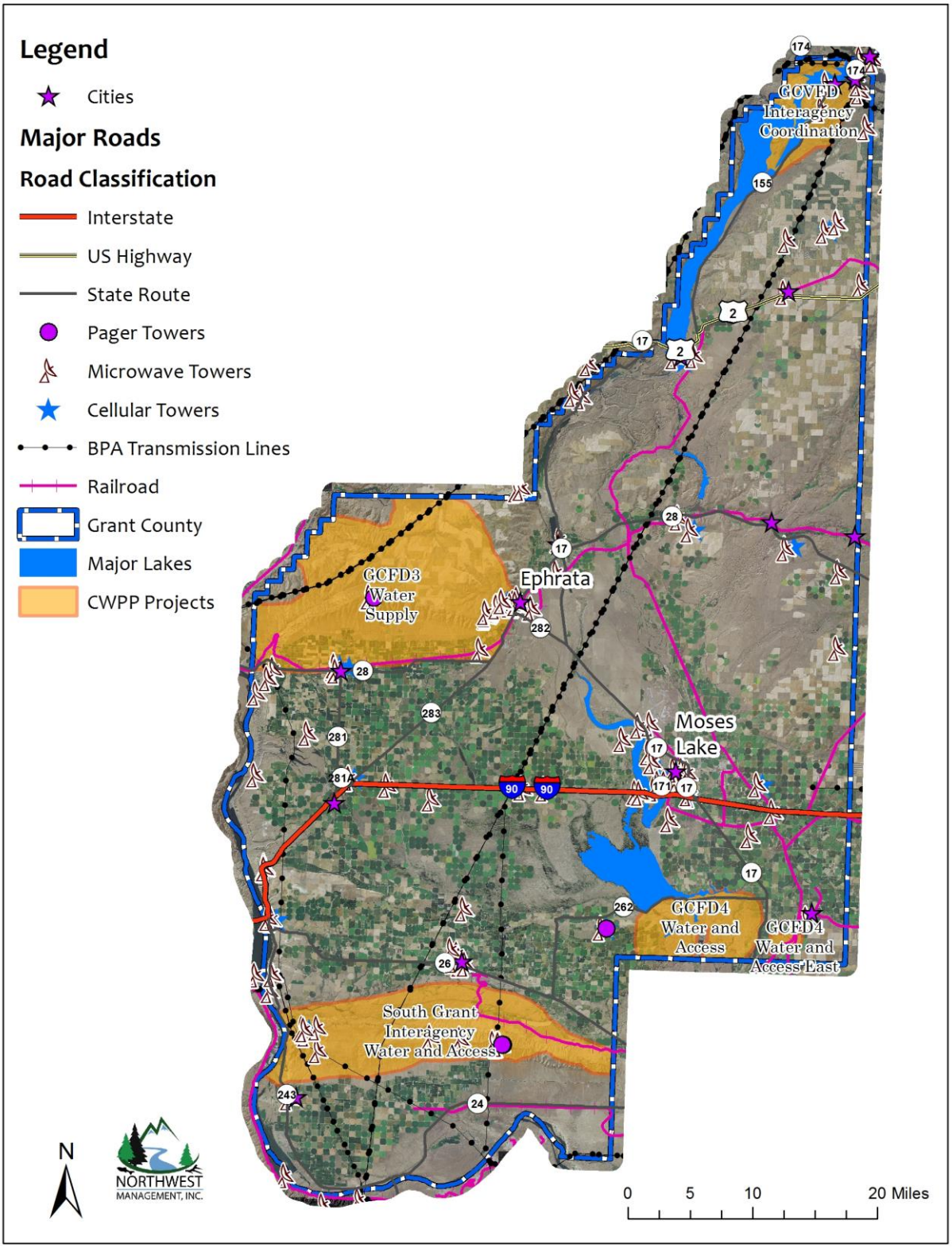
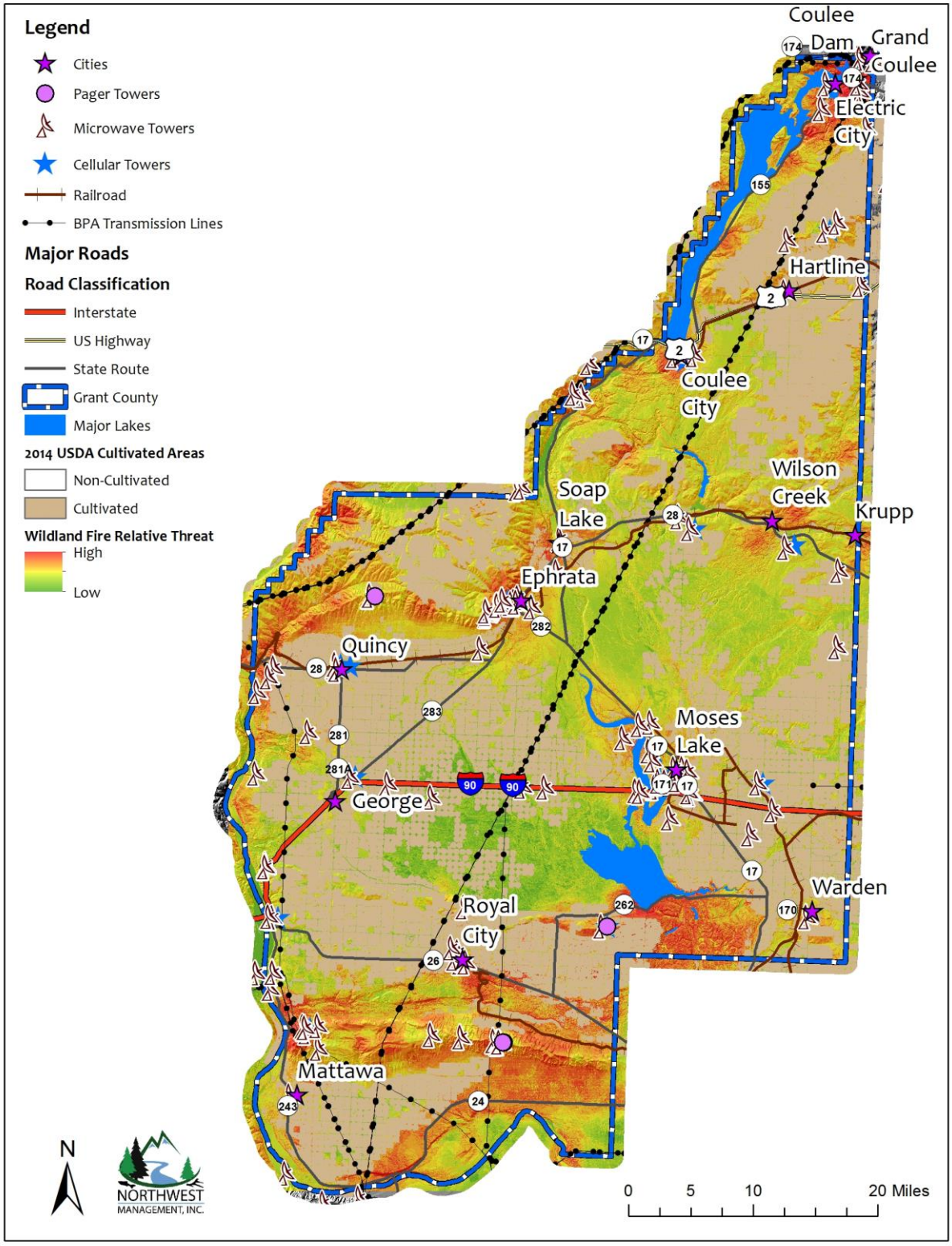


Figure 7.9. Relative Threat Level Map



Appendix 2 - Documenting the Planning Process

Documentation of the planning process, including public involvement, is necessary to meet FEMA's DMA 2000 requirements (44CFR§201.4(c)(1) and §201.6(c)(1)). This appendix includes the minutes taken at planning committee meetings, a record of published articles regarding the CWPP, and the presentation given at local public meetings.

Planning Committee Meeting Minutes

January 8th, 2015 – 4H-building, Moses Lake, WA

Attendance:

Mike Solheim	Don Rushton
John Janak	Jim Stucky
Dan Smith	Cindy Carter
Zack Zeilenga	Carolaun Swartz
Michele Haughton	Richard Stevens
Randy Wiggins	Rick Wentworth
Tom Taylor	David Nelson
David Patterson	Kirk Sheppard
Jeremy Burns	Brian Evans
Nick Bechtold	Don Fortier
Meghan McEldery	Brad Tucker

Brad Tucker started the meeting off with introductions and Mike Solheim provided a brief overview of the project background and presented the option of rolling the risk assessment into a county wildfire protection plan.

Agenda Item #1

Northwest Management Presentation: Brad provided a PowerPoint introduction to explain the process and outline what is expected of the steering committee. Brad provided information on what a county wildfire protection plan would provide the county in addition to the risk assessment. More information was requested by the committee as well as a price quote.

Agenda Item #2

Map Products: Brad provided some initial map of the county for examples and reviewed and requested any additional information that members of the steering committee have available that would be useful for the project.

Agenda Item #3

Immediate Concerns: Brad opened the floor up for questions and concerns the committee had about the risk assessment process. The committee was interested in what funding a county wildfire protection plan would become available and what qualifies for funding. The committee was also interested in setting up a planning support system following the completion of the plan to help facilitate future updates.

Agenda Item #4

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Public Involvement Strategy: Brad provided a brief overview of the public involvement strategy and opened it up to the committee to think of any additional ways to reach the public and other parties that would be important to the planning process.

Agenda Item #5

Meeting Schedule: The next meeting date and time is TBD.

February 18th, 2015 – 4H-building, Moses Lake, WA

Attendance:

Randy Wiggins	Elisabeth Lauver
David Patterson	Eric Pentico
Ron Bunday	Nick Bechtold
Robert Schneider	Mike Solheim
Richard Stevens	Michelle Price
Bruce Gribble	Carolann Swartz
Jeremy Burns	Brad Tucker
Sandi Duffey	Tiana Luke
Jim Stucky	Meghan McEldery
Don Rushton	

The Grant County Community Wildfire Protection Plan (CWPP) working group met on February 12, 2015 at 1:30 pm at the Grant County Fairgrounds, 4H building to discuss the CWPP plan development. The Bureau of Land Management (BLM) has contracted with Northwest Management Inc (NMI) to conduct an assessment for the hazards of wildfire in Grant County. NMI will contract with Grant County Department of Emergency Management to develop a Community Wildfire Protection Plan for Grant County.

NM Inc, Meghan McEldery, conducted the meeting, and provided an overview of the formation of the group. . Ms. McEldery gave the group an opportunity to ask questions about the planning process. She then provided information as to what the committee's expectations are for the CWPP planning process. NWI provide draft copies of Chapters 1 & 2 to the group for review and comments. Comments are due back to NMI by February 26th. (See attached copy of Chapter 1&2)

A group discussion took place identifying the language for the plans Mission, Vision Statement, and Goals. Bordering counties (Franklin, Douglas, and Lincoln) CWPP plans were reviewed. There was a mutual agreement that NMI will use the same mission, vision and goals for Grant County's plan, as stated in the bordering counties plan. The following goal elements shall be included into Grant County's plan.

Goals

- Public Education,
- Safety – Fire wise
- Habitat, Property, Economic and Crop Protection
- Bordering counties boundary coordination

DRAFT

Maps were posted on the wall, and provided for review and comment from the group. The group identified the need to have the maps titled and labeled as to what the maps are displaying.

The next CWPP work group will hold the next meeting during the Grant County Fire Chiefs, and Commissioners meeting, on March 19, at 7:00 pm, at the Grant County Fairgrounds Huck Fuller Building

Please provide agenda items by March 16 to Grant County DEM.

March 19th, 2015 – Huck Fuller Building, Moses Lake, WA

Attendance:

Brad Tucker	Richard Paris
Becky Stokoe	Jeremy Burns
Shane Heston	Todd Hufman
David Patterson	Jonathan Brooks
Randy Wiggins	Don Fortier
Daryl Dormaier	Scott Mortimer
Robert D. WEber	Kirk Sheppard
Tiana Luke	Brian Evans
Meghan McEldery	Dwight VanderVorste
Rick Kummer	Michele Haughton
Rand Brixby	Jon Ness

Grant County Community Wildfire Protection Plan (CWPP) working group met on March 19, 2015 at 7:00 pm at the Grant County Fairgrounds, Huck Fuller Building to discuss and review the CWPP plan.

NM Inc, Meghan McEldery, conducted the meeting. Ms. McEldery asked the group if they wanted to elect a chair for the Planning Committee. The group elected Chief Jeremy Burns to act as the liaison between the Grant County Fire Agencies, and Northwest Management Inc the plan developers.

The plan will need signed by all agencies listed in the plan, before sending to the State for approval.

Meghan will develop a list of action items and projects. The action items and projects will link to the goals and objectives within the plan.

NW Inc, Tiana Luke, provided new GIS mapping of Grant County for the committee's review. Fire Agencies marked areas on the map; Wildland Urban Interface map will be developed from this information.

Each Fire Agency will have the opportunity to review the Wildland Urban Interface mapping to be included into the plan.

The group discussed additional GIS maps, to be developed;

- Conservation Reserve Program (CRP)
- Irrigated and Non-irrigated ground

Action items;

DRAFT

- Water
- Fire History
- High risk areas
- Fire Districts/Agency Summary

Areas of Concern

- No Man's Land (Non Fire Protection Districts)

NW Inc, Megan McEldery, provided Chapters 3 and 4 for review and comments to the group. After a review of the chapters, a suggestion was made that these chapters needed some additional review.

The next CWPP work group will hold the next meeting at Grant County Fire District # 4, April 16 at 7:00 pm.

April 16th, 2015 – Grant County Fire District #4, Warden, WA

Attendance:

Igor Shaporda	Kirk Sheppard
David Patterson	Nick Bechtold
Daryl Dormaier	Scott Mortimer
Jonathan Brooks	Randy Wiggins
Todd Hufman	Jeremy Burns
Michele Haughton	Eric Pentico
David A. Nelson	Timothy J. Cawley-Murphree
Brad Tucker	Meghan McEldery

Grant County Community Wildfire Protection Plan (CWPP) steering committee met on April 16, 2015 at 7:00 pm at the Grant County Fire District # 4, Warden to discuss and review the CWPP plan. NM Inc, Meghan McEldery, conducted the meeting. Ms. McEldery reviewed the current chapters developed for the CWPP Chapters 1-5. There will be a checklist developed to identify missing information.

Meghan asked if there was a formal educational program for "Fire Wise Communities" in the county, there is no formal program for education at this time.

Under the policy, section of the plan is where this type of an educational program could be developed for the public.

The group is still having difficulty obtaining information on the ground designated to Conservation Reserve Program (CRP).

The steering committee worked to develop action items for the CWPP. Please see the attached draft copy of the plan.

The next CWPP meetings will be held at the following locations.

May 11, 2015 Ephrata Fire Dept 800 A Street SE	May 12, 2015 Coulee City Location 317 W Main ST	May 13, 2015 Royal City Location 336 Camelia ST NE

DRAFT

Ephrata, WA **6:00 PM**	Coulee City WA **6:00 PM**	Royal City WA **5:30 PM**

June 9th, 2015 – Ephrata Fire Department

Attendance:

Randy Wiggins	Kirk Sheppard
David Patterson	Sheryl Dotson
Sandi Duffey	Brad Tucker
Scott Mortimer	Pete Kunjara
Jackie Jones	Don Fortier
Becky Stokoe	Todd Hufman
Dwight VanderVorste	Brian Evans
Michael Moore	Robert Weber
Dan Smith	Michele Haughton
Richard Paris	Ryan Fish
Dean Hane	Jeremy Burns

This meeting was held in conjunction with the Grant County Fire Chiefs' and Commissioners Meeting.

Presentations/Discussions:

- CWPP Draft – Fire District 3, 4, & 7 have submitted their plans. Discussion involved creating a committee to contact agencies that had not submitted their summary/profile yet to assist in completing this project. Committee members include: FD8, D Patterson, MLFD, P Kunjara, & GCFD, R Paris. Agencies will have 30 days to complete their summary/profile and submit it to Michele Haughton at Emergency Management. Also discussed was everyone reviewing the CWPP plan and sending corrections to Sandi Duffey at Emergency Management. All additions, corrections, formatting will then be sent to CWPP and the District Summary will be updated. After the update is complete, the CWPP will send a press release and copies to Public Libraries for public viewing. Jeremy asked about adding to EFD's Facebook page with a link attached. It was decided to obtain permission from individual Fire Agencies to have their commissioners to approve the Fire Chiefs signing the Summary.

Reports:

1. **MACC –** Jackie reported on the new phone system MACC is putting in with a cutover date of July 22nd. MACC and TAIT Radio are doing coverage testing of the new Vantage Radio Tower, should be ready for use the end of July. Neighborhood agencies will be tested and activated first, then will add all other agencies. MACC has hired a new Dispatcher that started June 1st and a lateral Dispatcher that will start July 1st. Will be starting the hiring process again in August for one more Dispatcher.

DRAFT

2. **County EMS –** Rick reported that there was a new contract providing $76,000 for Agency Level Training. EMS council has purchased a high-tech CPR Manikin for training.
3. **Fire TAC –** Jeremy reported that MACC advised after working with Priority Dispatch that the DRC (Dispatch Review Committee) that was originally planned to involve outside agencies is no longer needed. MACC can review calls and give updates to FIRE/EMS TAC. Discussion on 20 minute timers for ALL EMS calls was discussed. Group was in favor of this decision. It was decided to leave this to EMS Council to make final decision and work with MACC on how the system will work.
4. **Region Training Council –** N/R
5. **Region Life Safety/Investigation Council –** Next meeting Thursday June 11th at 1000 hrs. at Wenatchee Fire Department. Looking at reinitiating this group.
6. **Emergency Management –** Sandi discussed Crude Rail training in Pueblo, Co. FEMA may assist in funding and BNSF may assist with getting your agency personnel into a class easier. EFD has 2 going and FD3 has 1 going.
7. **First Defense Committee- Dan** Jeremy to get a contact list to Dan
8. **Washington Fire Chiefs – Don** Last meeting at Chief's Conference was in May. Finalized Strategic Plan. Don was elected for two more years. Don will send report to Jeremy to send out.
9. **Washington Fire Commissioners – Dwight** Meeting was in April, heard reports. Everything is going fine.

Active Issues:

- Balance being held by the Ephrata Fire Fighters Association is $402.38
- Earlier discussion, no further

Action Items for this Meeting:

- **Radio Programming, Emergency Button Programming – Dean** Dean to reprogram all radios. Wants everyone to think about their scan list. Discussion on scanning your agencies Geographical TAC Channels. Reported Dispatch, Data and Car2Car will be going to encryption in the near future. There are still a handful of channels that Fire/EMS will be able to talk to Law Agencies on. Scene 1 and Event 1 will not be encrypted. Dean reported updates on the Vantage Tower. Will first update radio for FD3, FD10, FD11, & FD5. Then will continue will all other agencies.
- **Radio Emergency Activation Policy development:** Lengthy discussion on Radio Emergency Activation Policy for Fire/EMS. It was decided there needs to be two policies. One for Firefighters/EMT down and in need of assistance and/or accidental activation and one for Firefighter/EMT in need of assistance from Law. Need a step by step policy that is easily trained and remembered.

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- **Burn Ban –** Kirk recommended a proposal to County Fire Marshal for burn ban to be put into place earlier this year due to exceptionally hot weather and dry conditions. This would not include Agricultural, permitted burns or recreational fire in approved pits and/or campgrounds. **M/S – Sheppard/Evans** **Motion passed**

New Issues and Good of the Order

- Mobilization Call Out Discussion – It was discussed of having outside agencies call MACC to have FD5 call them for a mobilization due to fact of FD5 possibly being tied up on calls and not able to answer phones.
- Jackie advised Port Fire has a new on scene Fire Chief, John Hoyt.

Public Meeting Presentation

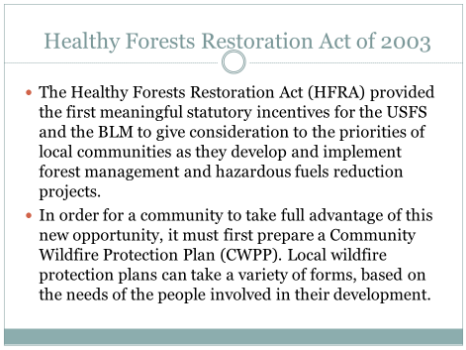
The following slideshow was presented at each of the public meetings by Brad Tucker of Northwest Management, Inc. In addition, where possible, a fire district or other planning committee representative opened the meeting with a brief introduction.

Table 7.1. Slides from Public Meeting.

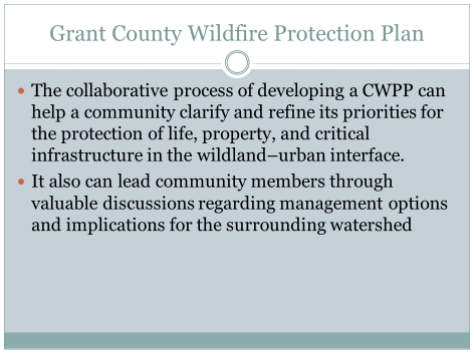
Slide 1

Slide 2

Slide 3



Slide 4



Slide 5

Purpose of the CWPP

- Recognize and Identify Risk Factors & High Risk Areas
- Reduce the Risk of Loss for Life, Property, Infrastructure, Natural Resources, and Economy
- Map and Prioritize Mitigation Projects
- Provide for Public Awareness
- Improve County's Eligibility for Funding Assistance

All of this must happen BEFORE another wildfire!!

Slide 6

Who is on the committee?

- Cities of Moses Lake, Ephrata, Coulee City
- Grant County Commissioners
- Grant County GIS
- Grant County Emergency Management
- Grant County Fire Marshall
- Local Fire Protection Districts
- Local City Fire Departments
- Moses Lake School District
- Desert Aire Owners Association
- Washington Department of Natural Resources
- Washington Department of Fish & Wildlife
- U.S. Fish & Wildlife Service
- Bureau of Land Management
- Grant County Public Works Department

Slide 7

Fire History

Table 4.1. Summary of Cause from State and BLM databases 1982-2014.

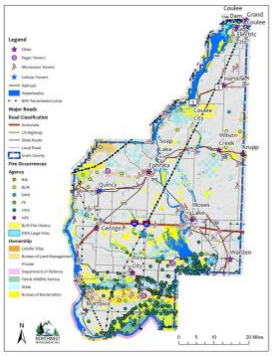
General Cause	Number of Ignitions	Percent of Total Ignitions	Acres Burned	Percent of Total Acres
Human-Caused	313	87%	100,439	76%
Natural Ignition	45	12%	30,962	24%
Unknown	3	<1%	30	<1%
Total	**361**	**100%**	**131,431**	**100%**

During this period, the agencies recorded an average of 11 wildfire ignition per year resulting in an average total burn area of 4,107 acres per year. According to this dataset, the vast majority of fires occurring in Grant County are human caused; however, naturally ignited/unknown caused fires do occur.

The fire ignition history only shows State and Federal data, there is likely a significant amount of fire history not captured in the chart from the local fire districts.

Slide 8

Fire History



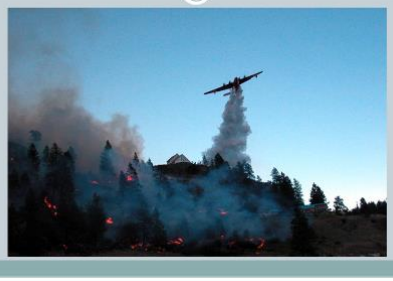
Slide 9

Mapping

- Using GIS to run models and analyze outputs
- Utilize local experts to help refine outputs
- Ground truth outputs through field assessments

Slide 10

...the Wildland/Urban Interface Fire



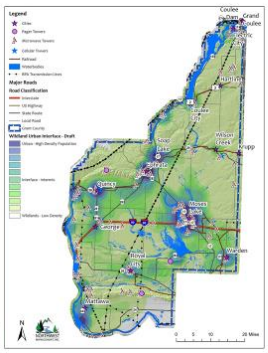
Slide 11

THE WUI

- The Wildland Urban Interface is a zone where structures and other human development intermingle with undeveloped wildland or vegetative fuels.
- The CWPP, under the Healthy Forests Restoration Act, allows the CWPP steering committee to define the County's WUI.
- Grant County's WUI is primarily based on population density.

Slide 12

Wildland Urban Interface



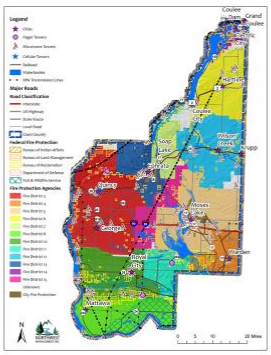
Slide 13

Fire Protection Districts

- The majority of the County has a local fire protection district or city fire protection that covers both structural and wildland fire response.
- Additional areas of federal fire protection that covers wildland fire response can be seen on the map.

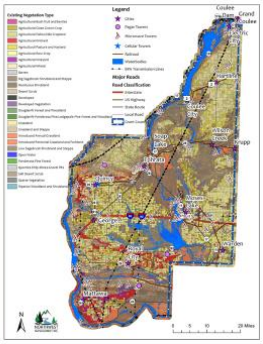
Slide 14

Fire Protection Districts



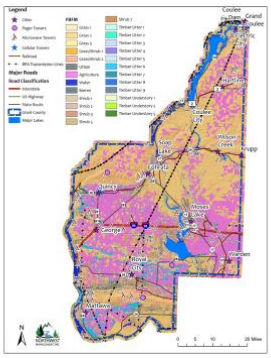
Slide 15

Existing Vegetation



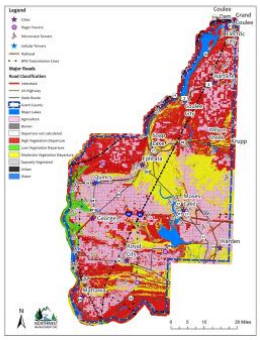
Slide 16

Fire Behavior Fuel Model



Slide 17

Fire Regime Condition Class



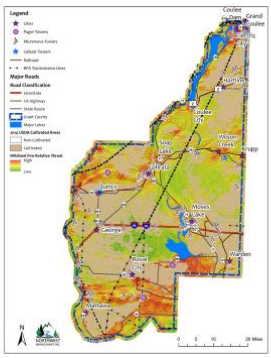
Slide 18

The Relative Threat Map

- The Relative Threat Level Model uses slope, aspect, precipitation, fuel models, fire risk, and population density.
- The ranked values are color coded to show areas of highest threat (red) to lowest threat (green) relative to grant county.
- The agriculture within the county has been masked due to differences in fire behavior depending on the crop and time of year.

Slide 19

Relative Threat Level

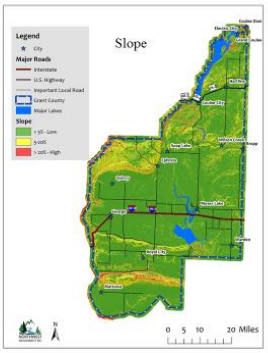


Slide 20

Environmental Factors

- Slope, aspect, and precipitation all can have an enormous impact on the intensity of a wildfire.
- Areas with steep slopes, dry aspects, or lesser amounts of precipitation, relative to Grant County, were given higher threat rankings.

Slide 21



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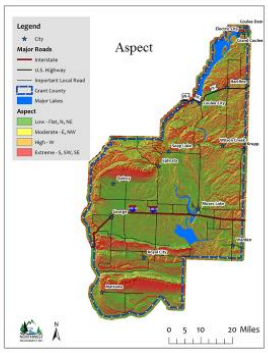

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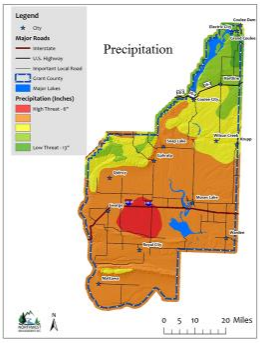


Slide 24

Vegetative Cover Types

- Certain vegetation types are known to carry and produce more intense fires than other fuel types.
- For Grant County, shrub and grass fuel models were given higher rankings followed by short grass/agriculture, and forest types (shrub understory) fuel models.

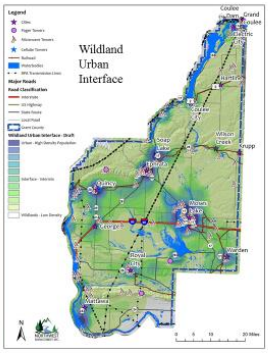
Slide 25

Slide 26

Populated Areas & Critical Infrastruture

- These areas were ranked higher due to the presence of human populations, structures, and infrastructure requiring protection from fire.
- Areas or assets that cannot be replaced or afford special wildfire protection such as critical infrastructure, cultural or historic sites, and recreational areas were overlayed onto the Relative Threat Level Map to show those areas where critical infrastructure is most at risk.
- This allows land managers to focus mitigation efforts in those identified areas

Slide 27

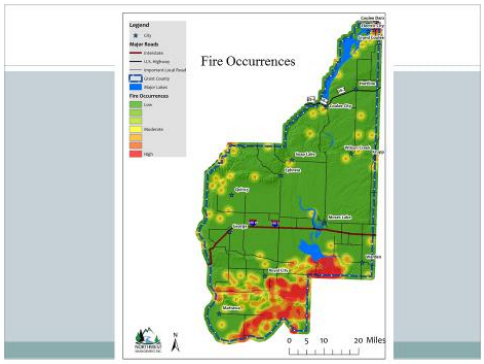


Slide 28

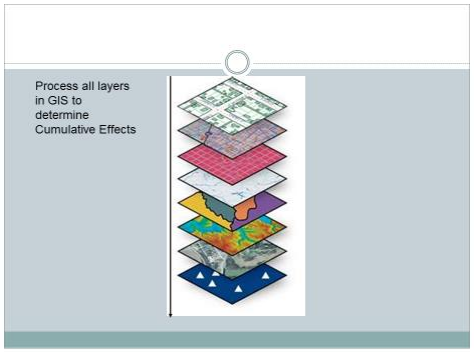
Fire Occurance

- Areas were identified using fire ignition history data to determine what areas are at higher risk

Slide 29



Slide 30



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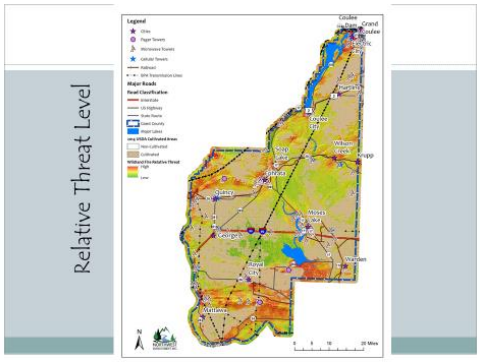


Slide 32

Preparedness

- Fire Services & Emergency Services
  - Resources & Training
- Wildland Fire Protection
  - Who's Jurisdiction?
  - What MOUs are in place?
- Local Government
  - Protecting citizens through policy & education
- Local Organizations
  - Find out how you can get involved

Slide 33

Public Involvement

- Press Releases about planning efforts
- Informational flyers
- Public Meetings X3
- Public Review of the DRAFT Plan

Slide 34

Protect Your Own

Slide 35

Defensible Space

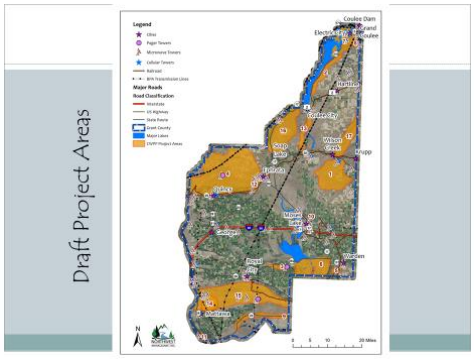
WWW.FIREWISE.ORG

Slide 36

Types of Projects

- Defensible Space
  - Thinning, pruning, construction materials, etc.
- Roadside Fuels Treatments
- Access Issues
  - Bridges, turnouts, ingress/egress, etc.
- Emergency Response Needs
  - Training, equipment, recruitment, etc.
- Policy Issues
  - WUI building codes, public education, etc.
- Pre-planning Efforts in High Risk Areas
  - Evacuation routes, safety zones, etc.

Slide 37



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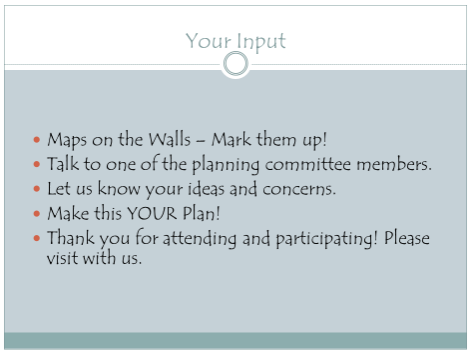

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Public Comments

There have been no public comments regarding this plan to this point.

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Appendix 3 - Risk Analysis Models

Historic Fire Regime

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Coarse-scale definitions for natural (historical) fire regimes have been developed by Hardy et al. (2001) and Schmidt et al. (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes include: I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced); II – 0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced); III – 35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced); IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced); V – 200+ year frequency and high (stand replacement) severity.

A database of fire history studies in Washington was used to develop modeling rules for predicting historical fire regimes (HFRs). Tabular fire-history data and spatial data was stratified into ecoregions, potential natural vegetation types (PNVs), slope classes, and aspect classes to derive rule sets which were then modeled spatially. Expert opinion was substituted for a stratum when empirical data was not available.

Fire is one of the dominant disturbance processes that manipulate vegetation patterns in Washington. The HFR data were prepared to supplement other data necessary to assess integrated risks and opportunities at regional and subregional scales. The HFR theme was derived specifically to estimate an index of the relative change of a disturbance process, and the subsequent patterns of vegetation composition and structure.

These data were derived using fire history data from a variety of different sources. These data were designed to characterize broad scale patterns of historical fire regimes for use in regional and subregional assessments. Any decisions based on these data should be supported with field verification, especially at scales finer than 1:100,000. Because the resolution of the HFR theme is 30 meter cell size, the expected accuracy does not warrant their use for analyses of areas smaller than about 10,000 acres (for example, assessments that typically require 1:24,000 data).

Vegetation Condition Class

Vegetation Condition Class (VCC) is an interagency, standardized tool for determining the degree of departure from reference condition vegetation, fuels, and disturbance regimes. Assessing VCC can help guide management objectives and set priorities for treatments.

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As scale of application becomes finer the five historic fire regimes may be defined with more detail, or any one class may be split into finer classes, but the hierarchy to the coarse scale definitions should be retained. Coarse-scale VCC classes have been defined and mapped by Hardy et al. (2001) and Schmidt et al. (2001). They include three condition classes for each historic fire regime. The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. This departure results in 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). There are no wildland vegetation and fuel conditions or wildland fire situations that do not fit within one of the three classes.

The three classes are based on low (VCC 1), moderate (VCC 2), and high (VCC 3) departure from the central tendency of the natural (historical) regime (Hann and Bunnell 2001, Hardy et al. 2001, Schmidt et al. 2002). 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.

Characteristic vegetation and fuel conditions are considered to be those that occurred within the natural (historical) fire regime. Uncharacteristic conditions are considered to be those that did not occur within the natural (historical) fire regime, such as invasive species (e.g. weeds, insects, and diseases), "high graded" forest composition and structure (e.g. large trees removed in a frequent surface fire regime), or repeated annual grazing that maintains grassy fuels across relatively large areas at levels that will not carry a surface fire.

Determination of amount of departure is based on comparison of a composite measure of fire regime attributes (vegetation characteristics; fuel composition; fire frequency, severity and pattern) to the central tendency of the natural (historical) fire regime. The amount of departure is then classified to determine the vegetation condition class. A simplified description of the vegetation condition classes and associated potential risks follow.

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Table 7.2. Vegetation Condition Class Description.

Vegetation Condition Class	Description	Potential Risks
Condition Class 1	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime. Risk of loss of key ecosystem components (e.g., native species, large trees, and soil) is low.
Condition Class 2	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe). Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate. Risk of loss of key ecosystem components is moderate.
Condition Class 3	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high. Risk of loss of key ecosystem components is high.

Relative Threat Level

Development of a Threat Level map for the Grant County CWPP involved geographically developing and ranking the various threat categories identified by the CWPP Committee. Threat categories identified for the analysis include Slope, Aspect, Fire Behavior Fuel Model, Predicted Flam Length Class, Precipitation Levels, Predicted Rate of Fire Spread, Predicted Wild Fire Intensity and Population Density. The various data sets for each threat or condition were developed and ranked based on their significance pertaining to wildfire. The various ranked layers were then analyzed in a geographical information system to produce a cumulative effects map based on the ranking. Following is a brief explanation of the various threats identified for the analysis, and the general value ranking scheme used for each. The Relative Threat Level Map is found on page 9 of the appendices of the CWPP document.

Precipitation

A GIS precipitation data layer developed by the USDA/NRCS – National Cartography & Geospatial Center, was used to identify average precipitation across Grant County. The dataset provides derived average annual precipitation in polygon contour format according to a model using point precipitation and elevation data for the 30 year period of 1971-2000. Precipitation plays a role in wildfire threat; areas of lower precipitation are more likely to exhibit a higher threat than high precipitation areas. For the threat level analysis, a precipitation layer value was derived using the average for the range of values, multiplied by two, and subtracting the range value. This gives an inverse value relationship indicating that increased precipitation has a decreased threat level. The threat level range is between 7 and 23 with low precipitation areas exhibiting the high threat level value, and high precipitation area the low value.

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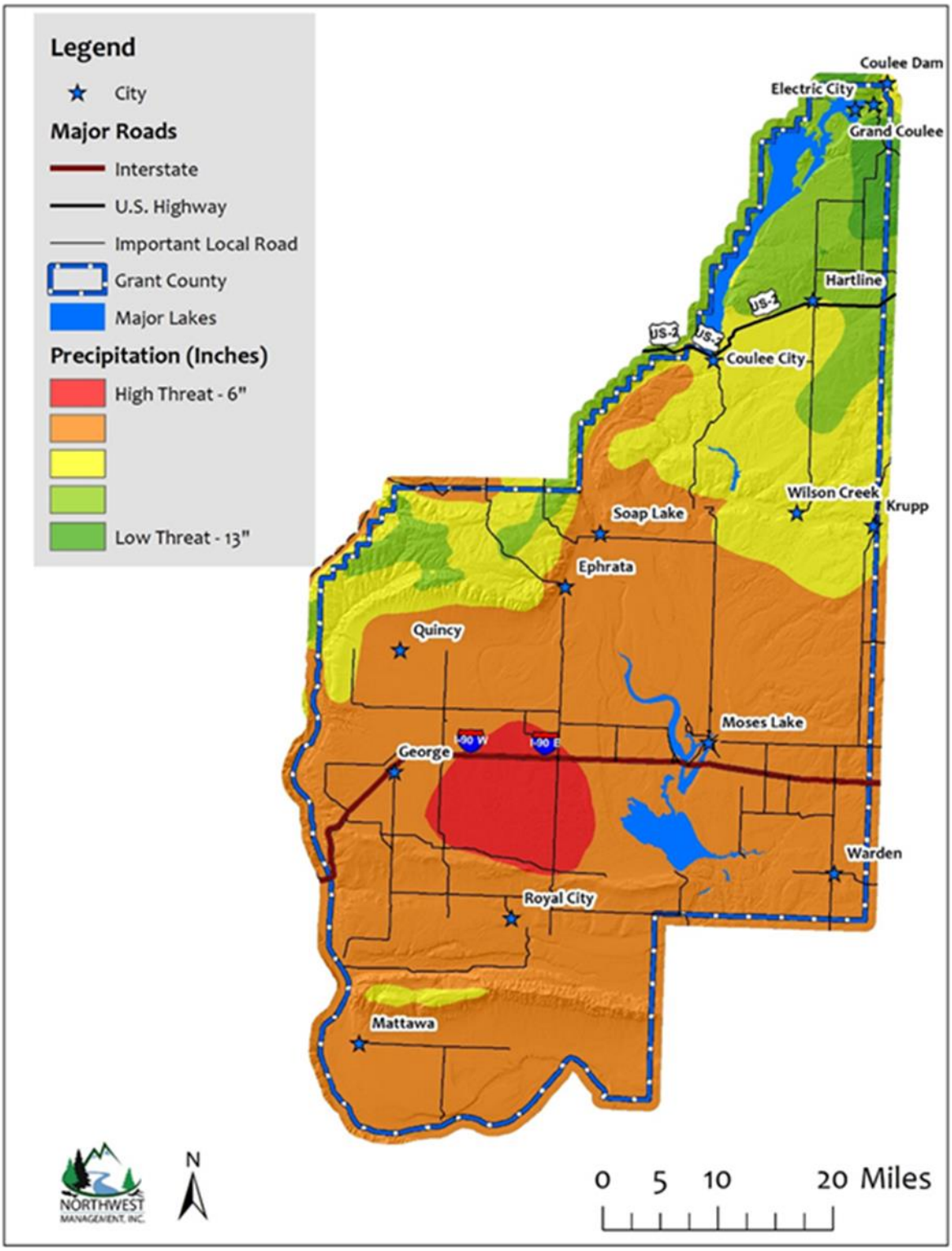
Figure 7.10. Precipitation.



Aspect

An aspect raster data layer was created in ArcGIS using the Spatial Analyst extension and a 10 meter digital elevation model. Data processing in ArcGIS assigns an aspect value from 0-359° to each pixel to represent compass azimuths. These azimuths were interpreted and given a treat value based on their relative contribution to wildfire behavior. In general, the southerly and westerly aspects have a higher threat level than the easterly and northerly aspects. Based on this, the raster values were classified into 4 aspect threat levels and assigned a threat value. The aspects Flat, North and Northeast were assigned a value of 2 for low, East and Northwest were assigned a value of 4 for moderate, West was assigned a value of 8 for high, and Southwest, South and Southeast were assigned a value of 12 for extreme aspect threat level.

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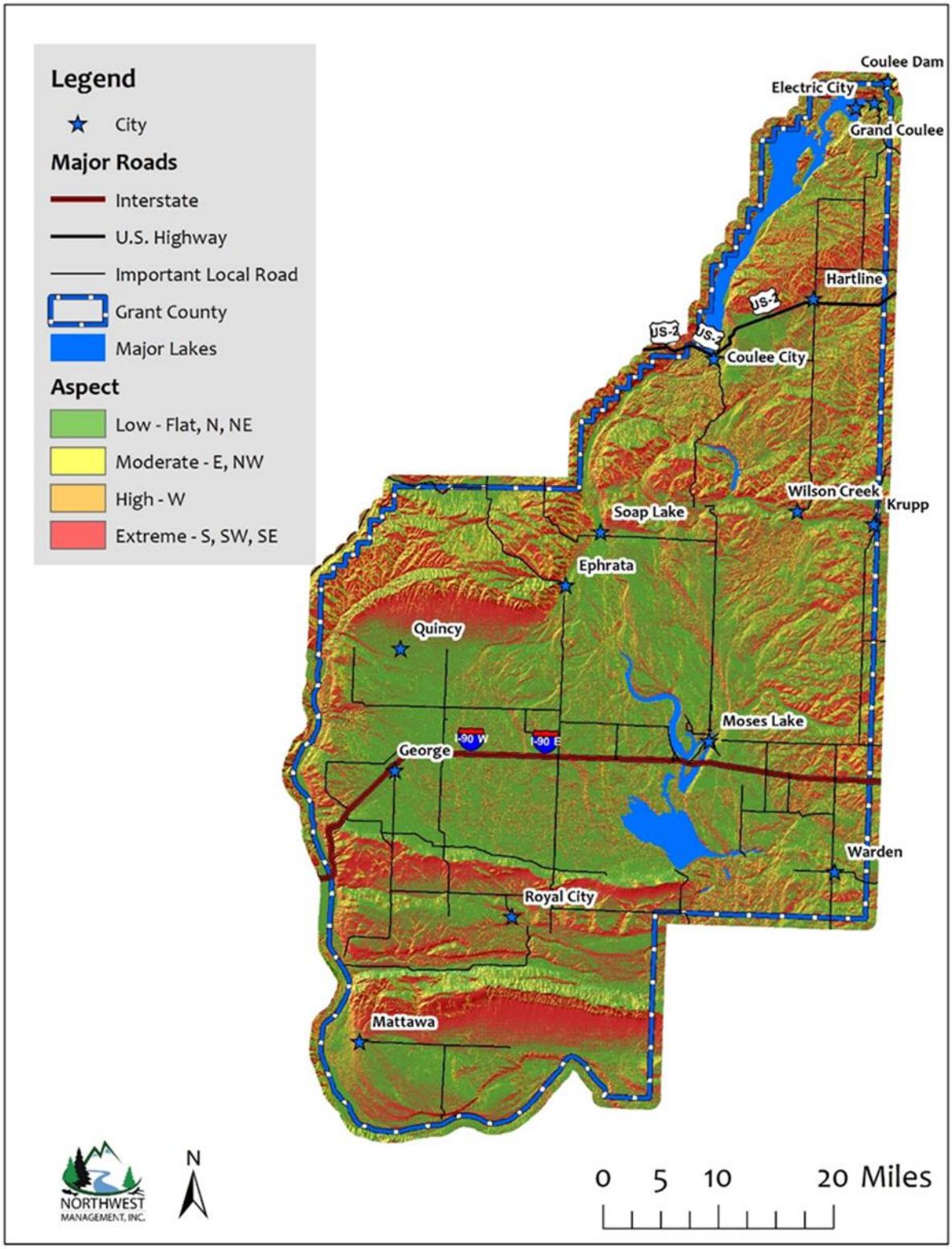
Figure 7.11. Aspect.



Slope

A slope raster data layer was created in ArcGIS using the Spatial Analyst extension and a 10 meter digital elevation model. Data processing in ArcGIS assigns a slope value in percent for each pixel. Once created, the slope model was classified into 4 groups, Low, Moderate, High and Extreme for final analysis. From a wildfire stand point, the treat from fire increases with increased slope. For this analysis, 0-25% slope was assigned a value of 8 for low threat, 25-50% slope a value of 25 for moderate threat, 50-75% slope a value of 32 for high threat, and greater than 75% slope a value of 50 for extreme threat.

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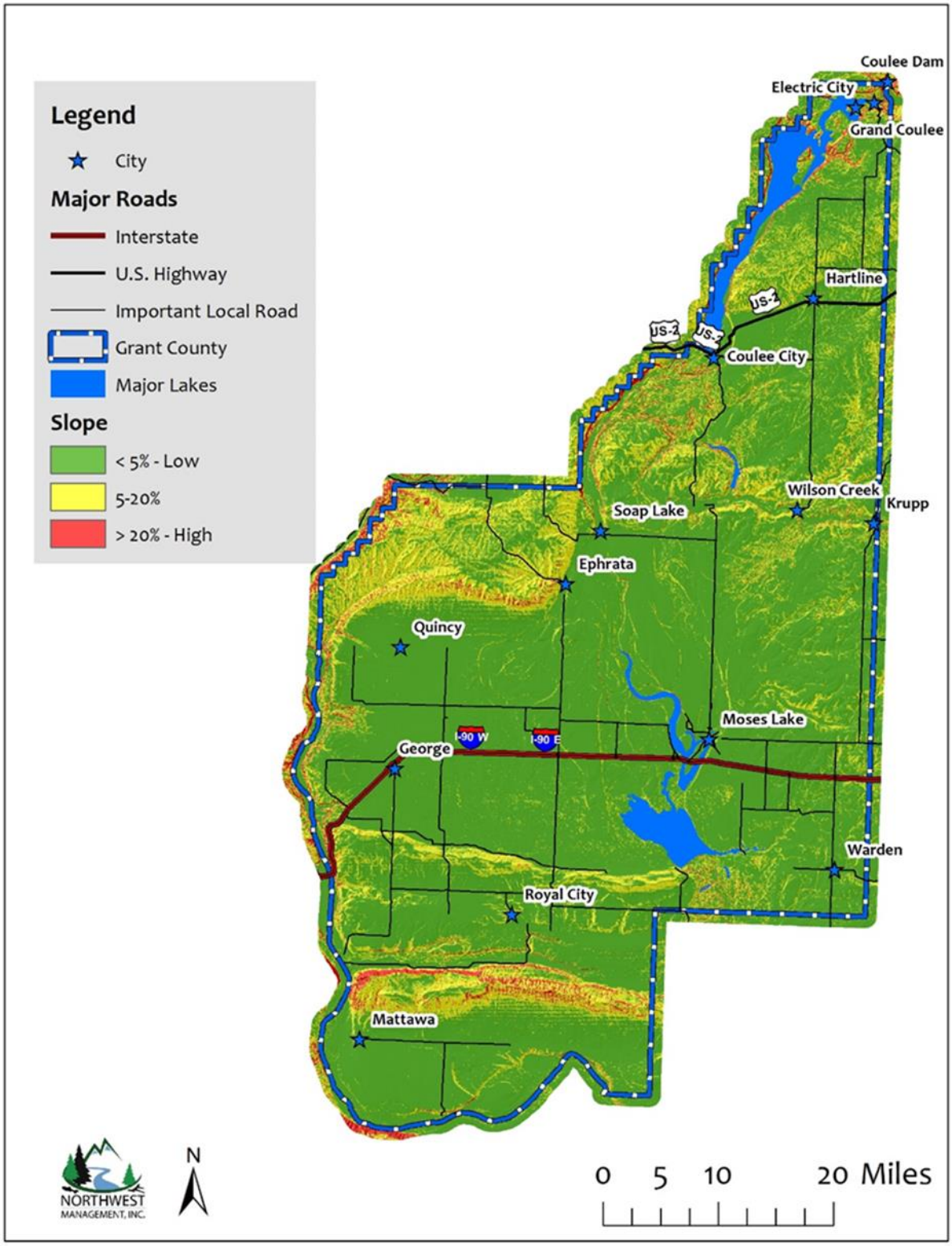
Figure 7.12. Slope.



Population

Population density plays a role in Grant County wildfire threat. Most wildfires in the county are man caused. To represent this in a threat level analysis, population density across the county was mapped using a Kernel density model based on structure point locations. The output from this analysis produces contour polygons of equal population density across the landscape. The contour polygon data set was then reclassified into four categories and assigned a population threat level value. The assigned threat level values represent the relative threat caused by population density and the increased risk of fire being man caused as population increases. The four values used are 1 for very low population density, 3, 7 and 12 for high density.

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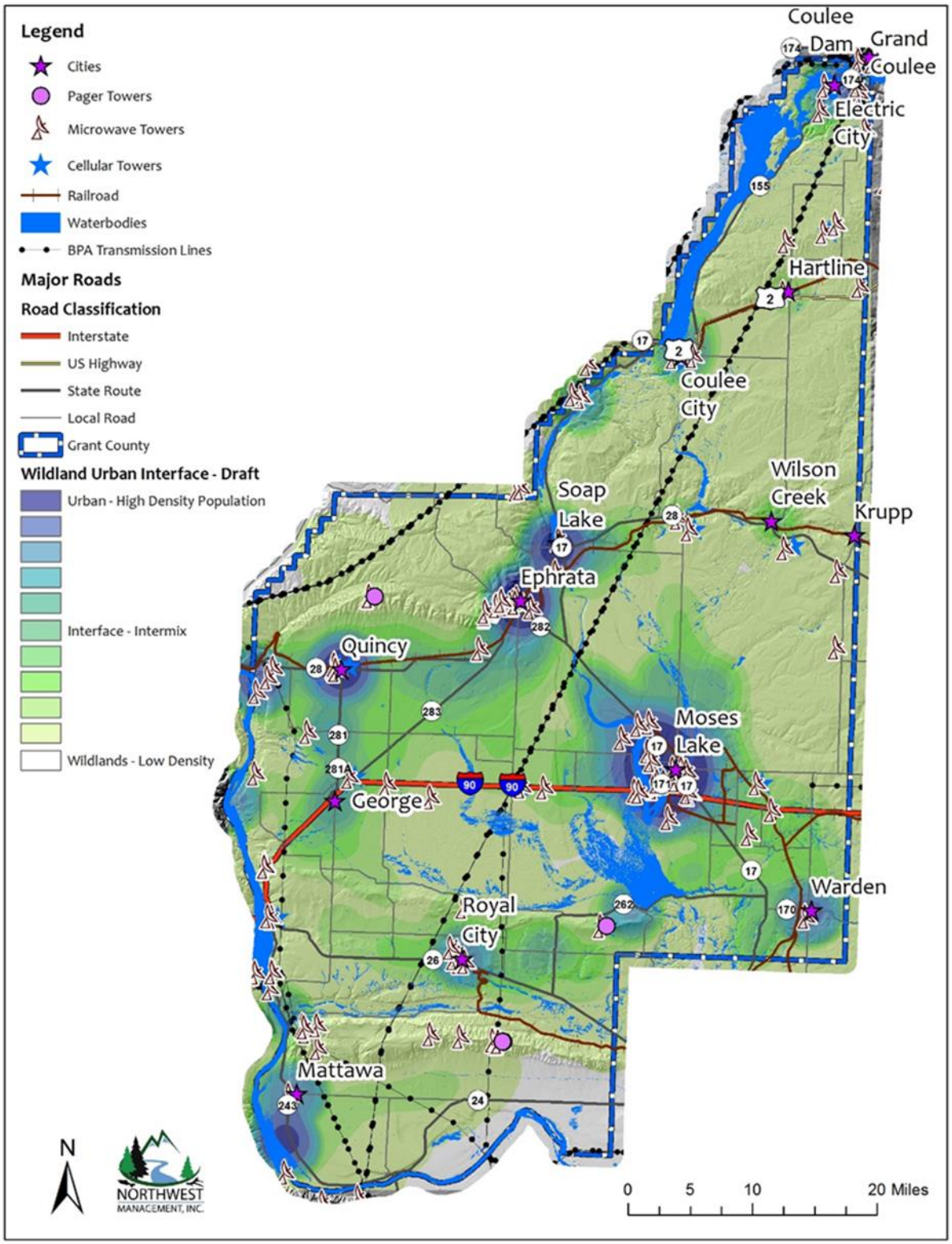
Figure 7.13. Population.



Fire Behavior Fuel Model

Scott and Burgan's 40 Fire Behavior Fuel Model was used in the threat level analysis to provide wildfire fuels information. For this analysis, the variety of fuels present in Grant County that were depicted in the fuels layer were grouped into 5 threat level value categories based on perceived relative contribution to wildfire threat. The following ranking was used in the analysis. Agricultural areas were assigned a value of 0, timber fuels were assigned a value of 10, grasslands were assigned a value of 20, mixed shrub and grass were assigned a value of 30, and tall grass and CRP fields were assigned a value of 40. The values given the categories are meant to represent the role various surface fuels contribute to overall wildfire threat in Grant County.

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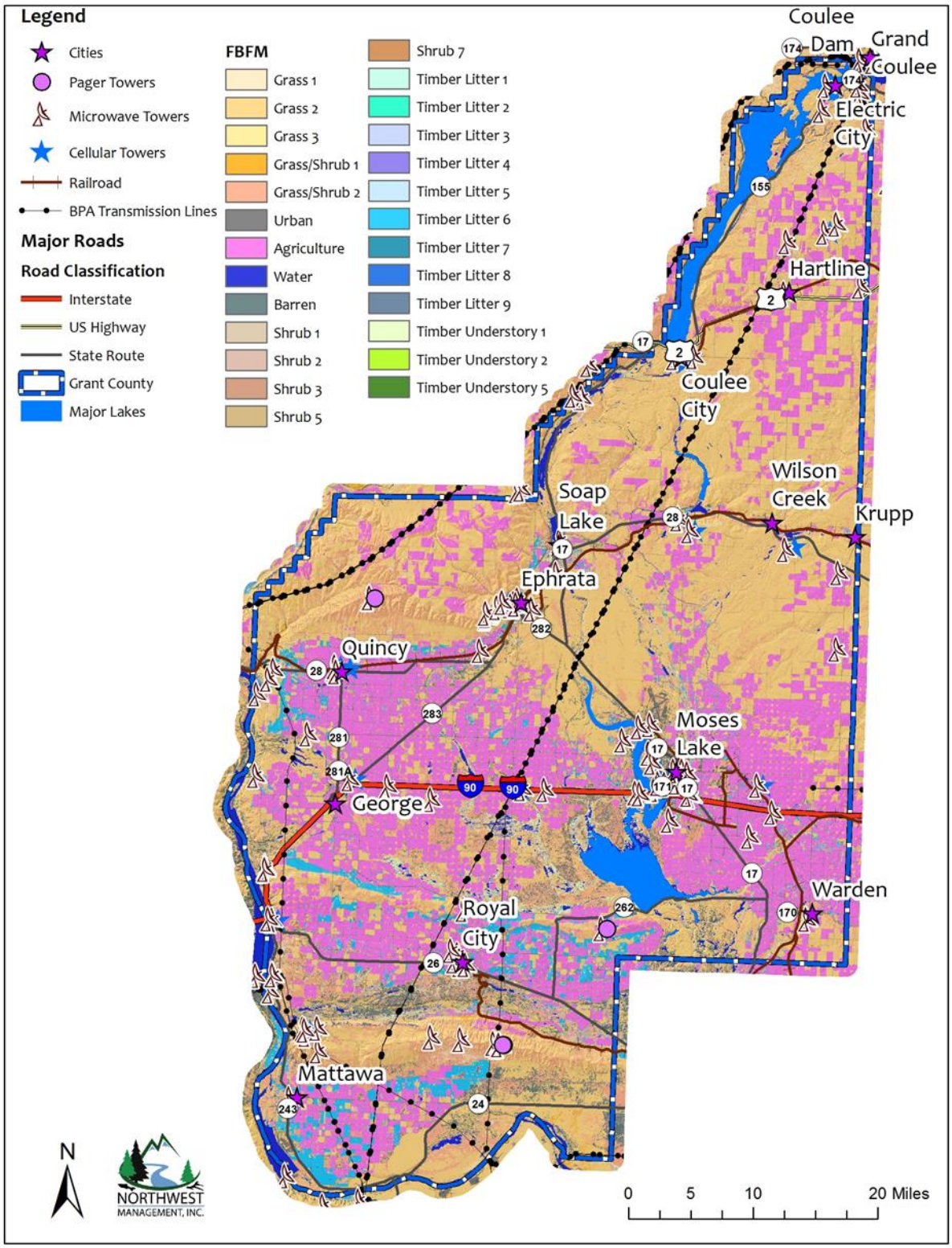
Figure 7.14. Fire Behavior Fuel Model



Each data layer was developed, ranked and converted to a raster format using ArcGIS 9.3.1. The ten data layers were analyzed in ArcGIS using the Spatial Analyst extension to calculate their cumulative effects. This process sums the ranked overlaid values geographically at the pixel level to produce a draft overall threat map layer. The draft layer had many areas of mixed pixel classification. To clean up and create a final output the draft data set was reprocessed in ArcGIS Spatial Analyst using the Majority Filter and Boundary Clean tools. This process cleaned and generalized areas of the data layer by grouping areas of scattered and mixed pixelization into areas of uniform pixelization. Values in the cleaned version were then grouped into four categories based on the summed value and color coded to produce the final threat map layer. The final layer show areas of highest threat using red, to lowest threat using purple (see threat level map). Areas with the highest values are the areas of concern based on the threats identified and values used. Varying results will occur by adjusting the threat value with in a particular layer, or omitting layers from the analysis. All threat values used in this analysis are based on discussion with committee members, documentation and general wildfire behavior characteristics. Adjusting or varying threat level values may result in a different final threat level in a particular geographic area.

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Appendix 4 – Fire Services

Table 7.3. Fire Services Information

Coulee City Fire Department:	Chief: Don Rushton Telephone: 509-632-5331 E-Mail: couleecityfire@hotmail.com Address: 317 W Main, PO Box 398 Coulee City, WA 99115
Electric City Fire Department:	Chief: Mark Payne Telephone: 509-633-1510 E-Mail: Address: 15 Western Ave, PO Box 666 Electric City, WA 99123
Ephrata Fire Department:	Chief: Jeremy Burns Telephone: 509-754-466 Website: www.ephrata.org Address: 800 A St SE Ephrata, WA 98823
Grand Coulee Volunteer Fire Department:	Chief: Richard Paris Telephone: 509-633-2536 E-Mail: gcfire@couleemail.com Address: 205 Spokane Way, PO Box 180 Grand Coulee, WA 99133
Hartline Volunteer Fire Department:	Chief: Jim Stephens Telephone: 509-639-2522 E-Mail: Address: 925 Willard St, PO Box 132 Hartline, WA 99135

Moses Lake Fire Department:	Chief: Tom Taylor Telephone: 509-765-2204 E-Mail: ttaylor@cityofml.com Address: 701 E Third Ave, Moses Lake WA 98837

Soap Lake Fire Department:	Chief: Mike Gray Telephone: 509-246-0463 E-Mail: slfire@smwireless.net Address: 239 2nd Ave SE, PO Box 1270 Soap Lake, WA 98851

Grant County Fire Protection District #3 :	Chief: Don Fortier Telephone: 509-787-2713 Email: info@gcfd3.net Address: 1201 Central Ave S, PO Box 565 Quincy, WA 98848

Grant County Fire Protection District #4:	Chief: Randy Wiggins Telephone: 509-349-2471 Email: gcfd401@scml.us Address: 114 N Oak St, PO Box 368 Warden, WA 98857

Grant County Fire Protection District #5:	Chief: Dan Smith Telephone: 509-765-3175 Email: gcfd5@gcfd5.org Address: 11058 Nelson Rd, Moses Lake WA 98837

Grant County Fire Protection District #6:	Chief: Daryl Dormaier Telephone: Address: 935 Willard St, PO Box 132 Hartline, WA 99135

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Grant County **Fire Protection District #7:**	Chief: Kirk Sheppard Telephone: 509-246-0321 Email: Address: 155 Hwy 28 W, PO Box 1449 Soap Lake, WA 98851

Grant County **Fire Protection District #8:**	Chief: Dave Patterson Telephone: 509-932-4777 Website: www.gcfd8.net Address: 510 Government Way, PO Box 1728 Mattawa, WA 99349

Grant County **Fire Protection District #10:**	Chief: Eric Linn Telephone: 509-346-2658 Email: office@grantfire10.com Address: 336 Camelia St NE, PO Box 220 Royal City, WA 99357

Grant County **Fire Protection District #11:**	Chief: Eric Linn Telephone: 509-346-9464 Email: Address: 7240 Rd 17 SW, Royal City WA 99357

Grant County **Fire Protection District #12:**	Chief: Scott Mortimer Telephone: 509-345-2267 Website: www.grant13firerescue.org Address: 4th and Railroad St. PO Box 73, Wilson Creek, WA 98860

Grant County **Fire Protection District #13:**	Chief: James Stucky Telephone: 509-754-3276 Website: grant13firerescue.org/ Address: 1227 Berschauer Industrial Park, PO Box 812, Ephrata, WA 98823

Grant County **Fire Protection District #14:**	Chief: Telephone: 509-663-3466 Email: Address: PO Box 282, Electric City, WA 99123

Grant County **Fire Protection District #15:**	Chief: Telephone: 509-765-3175 Email: Address: 11058 Nelson Rd, Moses Lake, WA 98837

Bureau of Land Management	Spokane District District FMO: Dennis Strange Telephone: 509-536-1237 Address: 1103 N. Fancher, Spokane Valley, WA 99212

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Table 7.4. Fire Services Resource List

	Type	Resource	Gallons	Drive	Vehicle or License #	Specifications	Location
Coulee City Fire Department							
Electric City Fire Department							
Ephrata Fire Department							
Grand Coulee Fire Department							

	Type	Resource	Gallons	Drive	Vehicle or License #	Specifications	Location
Hartline Fire Department							
Moses Lake Fire Department							
Soap Lake Fire Department							
Grant County Fire District #3							

	Type	Resource	Gallons	Drive	Vehicle or License #	Specifications	Location
Grant County Fire District #4							
Grant County Fire District #5							
Grant County Fire District #6							
Grant County Fire District #7							

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	Type	Resource	Gallons	Drive	Vehicle or License #	Specifications	Location
Grant County Fire District #8							
Grant County Fire District #10							
Grant County Fire District #11							
Grant County Fire District #12							

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	Type	Resource	Gallons	Drive	Vehicle or License #	Specifications	Location
Grant County Fire District #13							
Grant County Fire District #14							
Grant County Fire District #15							
BLM	Type 6	Wildland Engine	300	4x4	E-6696		Spokane
	Type 6	Wildland Engine	300	4x4	E-6695		Wenatchee
	Type 2	Handcrew		4x4	C-6201	10-person handcrew	Spokane
	ICT3	Command Vehicle					Spokane
		Chipper		Trailer		Vermeer BC1200	Spokane

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	Type	Resource	Gallons	Drive	Vehicle or License #	Specifications	Location
Washington Department of Natural Resources	Type 5				WA-NWS-E5-462 H5S-4198		
	Type 5				WA-NWS-E5-463 H5S-5230		
	Type 5				WA-NWS-E5-465 H5S-5232		
	Type 5			4 X 4	WA-NWS-E5X-541 H4S-0007		
	Type 5			4 X 4	WA-NWS-E5X-542 H4S-0022		
	Type 5			4 X 4	WA-NWS-E6X-543 H4S-0010		
	Type 5				WA-NWS-E5-566 H5S-088		
	Type 6			4X 4	WA-NWS-E6X-421 A1S-4540		
	Type 6			4 X 4	WA-NWS-E6X-523 A1S-4259 w/ tow hitch		
	Type 5				WA-NWS-E5-563 H5S-4197		
	Type 5				WA-NWS-E5-564 H5S-4199		
	Type 5				WA-NWS-E5-565 H5S-072		

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Appendix 5 - State and Federal CWPP Guidance

National Cohesive Strategy

In response to requirements of the Federal Land Assistance, Management, and Enhancement (FLAME) Act of 2009, the Wildland Fire Leadership Council (WFLC) directed the development of the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy).

The Cohesive Strategy is a collaborative process with active involvement of all levels of government and non-governmental organizations, as well as the public, to seek national, all-lands solutions to wildland fire management issues.

The Cohesive Strategy is being implemented in three phases, allowing stakeholders to systematically develop a dynamic approach to planning for, responding to, and recovering from wildland fire incidents. This phased approach is designed to promote dialogue between national, regional and local leadership.

Phase I involved the development of two documents: *A National Cohesive Wildland Fire Management Strategy* and the *The Federal Land Assistance, Management And Enhancement Act Of 2009 - Report to Congress*. These documents provide the foundation of the Cohesive Strategy.

In Phase II, regional assessments were completed to address the national goals to the needs and challenges found at regional and local levels. Regional Strategy Committees representing three regions of the country—the Northeast, Southeast, and West—examined the processes by which wildland fire, or the absence thereof, threatens areas and issues that American value, including wildlife habitats, watershed quality, and local economies, among others.

Phase III involves taking the qualitative information gathered in Phase II and translating it into quantitative models that can help inform management actions on the ground. Once the strategy is finalized, it will be implemented across the country and overseen by the Wildland Fire Executive Council (WFEC), which will establish a five-year review cycle to provide updates to Congress.

The Wildland Fire Executive Council (WFEC) accepted the final Regional Action Plans for each of the Cohesive Strategy Regions: Northeast, Southeast, and West in April 2013. The WFEC tasked the Cohesive Strategy Sub-Committee (CSSC) to use the regional action plans to inform the development of the national action plan. The National Risk Analysis Report and National Action Plan will become WFEC recommendations to the Wildland Fire Leadership Council (WFLC) and ultimately to the Secretaries of the Interior and Agriculture. The regional action plans reflect the regional perspective that is important in the development of that national-level recommendation. Implementation of actions identified in Regional Action Plans is the responsibility of the sponsoring organizations at the discretion of those organizations.

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National Fire Plan

The National Fire Plan (NFP) was developed by the U.S. Departments of Interior and Agriculture and their land management agencies in August 2000, following a landmark wildland fire season, with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. The NFP addresses five key points: Firefighting, Rehabilitation, Hazardous Fuels Reduction, Community Assistance, and Accountability. The National Fire Plan continues to provide invaluable technical, financial, and resource guidance and support for wildland fire management across the United States. Together, the USDA Forest Service and the Department of the Interior are working to successfully implement the key points outlined in the National Fire Plan.

This Community Wildfire Protection Plan fulfills the National Fire Plan's 10-Year Comprehensive Strategy Implementation Plan (WFLC 2006). The projects and activities recommended under this plan are in addition to other federal, state, and private / corporate forest and rangeland management activities. The implementation plan does not alter, diminish, or expand the existing jurisdiction, statutory and regulatory responsibilities and authorities or budget processes of participating federal and state agencies.

The NFP goals of this Community Wildfire Protection Plan include:

1. Improve Fire Prevention and Suppression
2. Reduce Hazardous Fuels
3. Restoration and Post-Fire Recovery of Fire-Adapted Ecosystems
4. Promote Community Assistance

By endorsing this implementation plan, all signed parties agree that reducing the threat of wildland fire to people, communities, and ecosystems will require:

- Maintaining firefighter and public safety continuing as the highest priority.
- Communities and individuals in the wildland-urban interface to initiate personal stewardship and volunteer actions that will reduce wildland fire risks.
- A sustained, long-term and cost-effective investment of resources by all public and private parties, recognizing overall budget parameters affecting federal, state, county, and local governments.
- A unified effort to implement the collaborative framework called for in the strategy in a manner that ensures timely decisions at each level.
- Accountability for measuring and monitoring performance and outcomes, and a commitment to factoring findings into future decision making activities.
- The achievement of national goals through action at the local level with particular attention to the unique needs of cross-boundary efforts and the importance of funding on-the-ground activities.

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- Management activities, both in the wildland-urban interface and in at-risk areas across the broader landscape.
- Active forestland management, including thinning that produces commercial or pre-commercial products, biomass removal and utilization, prescribed fire and other fuels reduction activities to simultaneously meet long-term ecological, economic, and community objectives.

The National Fire Plan identifies a three-tiered organizational structure including 1) the local level, 2) state/regional and tribal level, and 3) the national level. This plan adheres to the collaboration and outcomes consistent with a local level plan. Local level collaboration involves participants with direct responsibility for management decisions affecting public and/or private land and resources, fire protection responsibilities, or good working knowledge and interest in local resources. Participants in this planning process include local representatives from federal and state agencies, local governments, landowners and other stakeholders, and community-based groups with a demonstrated commitment to achieving the strategy's four goals. Existing resource advisory committees, watershed councils, or other collaborative entities may serve to achieve coordination at this level. Local involvement, expected to be broadly represented, is a primary source of planning, project prioritization, and resource allocation and coordination. The role of the private citizen should not be underestimated as all phases of risk assessment, mitigation, and project implementation are greatly facilitated by their involvement.

National Association of State Foresters

This plan is written with the intent to provide decision makers (elected and appointed officials) the information they need to prioritize projects across the entire county. These decisions may be made by the Board of Commissioners or other elected body or through the recommendations of ad hoc groups tasked with making prioritized lists of communities at risk as well as project areas. It is not necessary to rank communities or projects numerically, although that is one approach. Rather, it may be possible to rank them categorically (high priority set, medium priority set, and so forth) and still accomplish the goals and objectives set forth in this planning document.

The following was prepared by the National Association of State Foresters (NASF), June 27, 2003, and is included here as a reference for the identification and prioritizing of treatments between communities.

Purpose: To provide national, uniform guidance for implementing the provisions of the "Collaborative Fuels Treatment" Memorandum of Understanding (MOU), and to satisfy the requirements of Task e, Goal 4 of the Implementation Plan for the 10-Year Comprehensive Strategy.

Intent: The intent is to establish broad, nationally compatible standards for identifying and prioritizing communities at risk, while allowing for maximum flexibility at the state and regional level. Three basic premises are:

- Include all lands and all ownerships.
- Use a collaborative process that is consistent with the complexity of land ownership patterns, resource management issues, and the number of interested stakeholders.
- Set priorities by evaluating projects, not by ranking communities.

The National Association of State Foresters (NASF) set forth the following guidelines in the Final Draft Concept Paper; Communities at Risk, December 2, 2002.

Task: Develop a definition for "communities at risk" and a process for prioritizing them, per the Implementation Plan for the 10-Year Comprehensive Strategy (Goal 4.e.). In addition, this definition will form the foundation for the NASF commitment to annually identify priority fuels reduction and ecosystem restoration projects in the proposed MOU with the federal agencies (section C.2 (b)).

Conceptual Approach

1. NASF fully supports the definition of the Wildland Urban Interface (WUI) previously published in the Federal Register. Further, proximity to federal lands should not be a consideration. The WUI is a set of conditions that exists on, or near, areas of wildland fuels nationwide, regardless of land ownership.
2. Communities at risk (or, alternately, landscapes of similar risk) should be identified on a state-by-state basis with the involvement of all agencies with wildland fire protection responsibilities: state, local, tribal, and federal.
3. It is neither reasonable nor feasible to attempt to prioritize communities on a rank order basis. Rather, communities (or landscapes) should be sorted into three, broad categories or zones of risk: high, medium, and low. Each state, in collaboration with its local partners, will develop the specific criteria it will use to sort communities or landscapes into the three categories. NASF recommends using the publication "Wildland/Urban Interface Fire Hazard Assessment Methodology" developed by the National Wildland/Urban Interface Fire Protection Program (circa 1998) as a reference guide. (This program, which has since evolved into the Firewise Program, is under the oversight of the National Wildfire Coordinating Group (NWCG)). At a minimum, states should consider the following factors when assessing the relative degree of exposure each community (landscape) faces.
    - **Risk:** Using historic fire occurrence records and other factors, assess the anticipated probability of a wildfire ignition.
    - **Hazard:** Assess the fuel conditions surrounding the community using a methodology such as fire condition class, or [other] process.
    - **Values Protected:** Evaluate the human values associated with the community or landscape, such as homes, businesses, and community infrastructure (e.g. water

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systems, utilities, transportation systems, critical care facilities, schools, manufacturing and industrial sites, and high value commercial timber lands).

- **Protection Capabilities:** Assess the wildland fire protection capabilities of the agencies and local fire departments with jurisdiction.

4. Prioritize by project not by community. Annually prioritize projects within each state using the collaborative process defined in the national, interagency MOUs, "For the Development of a Collaborative Fuels Treatment Program." Assign the highest priorities to projects that will provide the greatest benefits either on the landscape or to communities. Attempt to properly sequence treatments on the landscape by working first around and within communities, and then moving further out into the surrounding landscape. This will require:

   - First, focusing on the zone of highest overall risk but considering projects in all zones. Identify a set of projects that will effectively reduce the level of risk to communities within the zone.
   - Second, determining the community's willingness and readiness to actively participate in an identified project.
   - Third, determining the willingness and ability of the owner of the surrounding land to undertake, and maintain, a complementary project.
   - Last, setting priorities by looking for projects that best meet the three criteria above. It is important to note that projects with the greatest potential to reduce risk to communities and the landscape may not be those in the highest risk zone, particularly if either the community or the surrounding landowner is not willing or able to actively participate.

5. It is important, and necessary, that we be able to demonstrate a local level of accomplishment that justifies to Congress the value of continuing the current level of appropriations for the National Fire Plan. Although appealing to appropriators and others, it is not likely that many communities (if any) will ever be removed from the list of communities at risk. Even after treatment, all communities will remain at some, albeit reduced, level of risk. However, by using a science-based system for measuring relative risk, we can likely show that, after treatment (or a series of treatments); communities are at "*reduced risk.*"

Using the concept described above, the NASF believes it is possible to accurately assess the relative risk that communities face from wildland fire. Recognizing that the condition of the vegetation (fuel) on the landscape is dynamic, assessments and re-assessments must be done on a state-by-state basis, using a process that allows for the integration of local knowledge, conditions, and circumstances, with science-based national guidelines. We must remember that it is not only important to lower the risk to communities, but once the risk has been reduced, to maintain those communities at a reduced risk.

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Further, it is essential that both the assessment process and the prioritization of projects be done collaboratively, with all local agencies with fire protection jurisdiction taking an active role.

Healthy Forests Restoration Act

On December 3, 2003, President Bush signed into law the Healthy Forests Restoration Act of 2003 to reduce the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes. The legislation is based on sound science and helps further the President's Healthy Forests Initiative pledge to care for America's forests and rangelands, reduce the risk of catastrophic fire to communities, help save the lives of firefighters and citizens, and protect threatened and endangered species.

The Healthy Forests Restoration Act (HFRA) seeks to:

- Strengthens public participation in developing high priority projects;
- Reduces the complexity of environmental analysis allowing federal land agencies to use the best science available to actively manage land under their protection;
- Creates a pre-decisional objections process encouraging early public participation in project planning; and
- Issues clear guidance for court action challenging HFRA projects.

The Grant County Community Wildfire Protection Plan was developed to adhere to the principles of the HFRA while providing recommendations consistent with the policy document. This should assist the federal land management agencies with implementing wildfire mitigation projects in Grant County that incorporate public involvement and the input from a wide spectrum of fire and emergency services providers in the region.

Federal Emergency Management Agency Philosophy

Effective November 1, 2004, a hazard mitigation plan approved by the Federal Emergency Management Agency (FEMA) is required for Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Program (PDM) eligibility. The HMGP and PDM programs provide funding, through state emergency management agencies, to support local mitigation planning and projects to reduce potential disaster damages.

The local hazard mitigation plan requirements for HMGP and PDM eligibility are based on the Disaster Mitigation Act (DMA) of 2000, which amended the Stafford Disaster Relief Act to promote an integrated, cost effective approach to mitigation. Local hazard mitigation plans must meet the minimum requirements of the Stafford Act-Section 322, as outlined in the criteria contained in 44 CFR Part 201. The plan criteria cover the planning process, risk assessment, mitigation strategy, plan maintenance, and adoption requirements.

FEMA only reviews a local hazard mitigation plan submitted through the appropriate State Hazard Mitigation Officer (SHMO). FEMA reviews the final version of a plan prior to local

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adoption to determine if the plan meets the criteria, but FEMA will not approve it prior to adoption.

A FEMA designed plan is evaluated on its adherence to a variety of criteria.

- Adoption by the Local Governing Body
- Multi-jurisdictional Plan Adoption
- Multi-jurisdictional Planning Participation
- Documentation of Planning Process
- Identifying Hazards
- Profiling Hazard Events
- Assessing Vulnerability: Identifying Assets
- Assessing Vulnerability: Estimating Potential Losses
- Assessing Vulnerability: Analyzing Development Trends
- Multi-jurisdictional Risk Assessment
- Local Hazard Mitigation Goals
- Identification and Analysis of Mitigation Measures
- Implementation of Mitigation Measures
- Multi-jurisdictional Mitigation Strategy
- Monitoring, Evaluating, and Updating the Plan
- Implementation through Existing Programs
- Continued Public Involvement

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Appendix 6 - Potential CWPP Project Funding Sources

Assistance to Firefighters Grant (AFG)

http://www.fema.gov/assistance-firefighters-grant
To provide direct assistance, on a competitive basis, to fire departments of a State or tribal nation for the purpose of protecting the health and safety of the public and firefighting personnel against fire and fire-related hazards.

Fire Service Grants and Funding (AFGP)

http://www.usfa.fema.gov/grants/

Under the Federal Emergency Management Agency's Assistance to Firefighters Grant Program (AFGP), career and volunteer fire departments and other eligible organizations can receive funding through three different grants to:

- *Enhance a fire department's/safety organization's ability to protect the health and safety of the public.*
- *Protect the health of first responders.*
- *Increase or maintain the number of trained, "front-line" firefighters available in communities.*

Staffing for Adequate Fire & Emergency Response Grant (SAFER)

http://www.fema.gov/staffing-adequate-fire-emergency-response-grants

The Staffing for Adequate Fire and Emergency Response Grants (SAFER) was created to provide funding directly to fire departments and volunteer firefighter interest organizations to help them increase or maintain the number of trained, "front line" firefighters available in their communities. The goal of SAFER is to enhance the local fire departments' abilities to comply with staffing, response and operational standards established by the NFPA (NFPA 1710 and/or NFPA 1720).

Fire Prevention & Safety Grants (FP & S)

http://www.fema.gov/fire-prevention-safety-grants

The Fire Prevention and Safety (FP&S) Grants are part of the Assistance to Firefighters Grants (AFG) and support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to reduce injury and prevent death among high-risk populations. In 2005, Congress reauthorized funding for FP&S and expanded the eligible uses of funds to include Firefighter Safety Research and Development.

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Buffer Zone Protection Program (BZPP)

http://www.fema.gov/pdf/government/grant/bzpp/fy06_bzpp_guidance.pdf
The FY 2006 BZPP provides funds to build capabilities at the state and local levels to prevent and protect against terrorist incidents primarily done through planning and equipment acquisition.

Emergency Management Performance Grant Program

https://www.fema.gov/fiscal-year-2015-emergency-management-performance-grant-program
The purpose of the EMPG Program is to provide Federal grants to states to assist state, local, territorial, and tribal governments in preparing for all hazards, as authorized by the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Stafford Act), as amended (42 U.S.C. §§ 5121 et seq.) and Section 662 of the Post Katrina Emergency Management Reform Act of 2006, as amended (6 U.S.C. § 762). Title VI of the Stafford Act authorizes FEMA to make grants for the purpose of providing a system of emergency preparedness for the protection of life and property in the United States from hazards and to vest responsibility for emergency preparedness jointly in the Federal government and the states and their political subdivisions. The Federal government, through the EMPG Program, provides necessary direction, coordination, and guidance, and provides necessary assistance, as authorized in this title, to support a comprehensive all hazards emergency preparedness system.

State Homeland Security Program

https://www.fema.gov/fiscal-year-2015-homeland-security-grant-program
The SHSP assists state, tribal and local preparedness activities that address high-priority preparedness gaps across all core capabilities and mission areas where a nexus to terrorism exists. SHSP supports the implementation of risk driven, capabilities-based approaches to address capability targets set in urban area, state, and regional Threat and Hazard Identification and Risk Assessments (THIRAs). The capability targets are established during the THIRA process, and assessed in the State Preparedness Report (SPR) and inform planning, organization, equipment, training, and exercise needs to prevent, protect against, mitigate, respond to, and recover from acts of terrorism and other catastrophic events

Urban Areas Security Initiative

https://www.fema.gov/fiscal-year-2015-homeland-security-grant-program
The UASI program funds addressed the unique risk driven and capabilities-based planning, organization, equipment, training, and exercise needs of high-threat, high-density Urban Areas based on the capability targets identified during the THIRA process and associated assessment efforts; and assists them in building an enhanced and sustainable capacity to prevent, protect against, mitigate, respond to, and recover from acts of terrorism.

Operation Stonegarden

https://www.fema.gov/fiscal-year-2015-homeland-security-grant-program
OPSG program supports enhanced cooperation and coordination among Customs and Border Protection (CBP), United States Border Patrol (USBP), and local, tribal, territorial, state, and Federal law enforcement agencies. The OPSG Program funds investments in joint efforts to secure the United States' borders along routes of ingress from international borders to include travel corridors in states bordering Mexico and Canada, as well as states and territories with International water borders.

Pre-Disaster Mitigation Grant Program

https://www.fema.gov/pre-disaster-mitigation-grant-program
The PDM Program, authorized by Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, is designed to assist States, territories, Federally-recognized tribes, and local communities in implementing a sustained pre-disaster natural hazard mitigation program. The goal is to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding in future disasters. This program awards planning and project grants and provides opportunities for raising public awareness about reducing future losses before disaster strikes. PDM grants are funded annually by Congressional appropriations and are awarded on a nationally competitive basis.

Community Assistance Grants

http://www.fs.fed.us/r6/fire/fireplan/apply/
The 2015 National Fire Plan grant process has been scaled down to accommodate a limited source of funding that is directly tied to state planning efforts. At a minimum, project proposals must reside within high priority areas identified in the statewide assessments and resource strategies (refer to links below) to be considered.

In order to focus limited resources and funding (potentially $875,000 within each state), the interagency Pacific Northwest Wildfire Coordinating Group, FMWT Fuels Management Working Team (PNWCG-F MWT) has asked the Washington Department of Natural Resources (DNR) and the Oregon Department of Forestry (ODF) to collaborate with communities that are within high priority areas.

Projects should address and reduce the threat of wildfire within Eligible Project Areas and be identified as high priority in a completed Community Wildfire Protection Plan (CWPP). DNR will work with local CWPP groups to identify and prioritize projects.

Western States Fire Managers Wildland Urban Interface Grant Program

http://wflccenter.org/state-private-forestry/wui-grants/

The focus of much of this funding is mitigating risk in Wildland Urban Interface (WUI) areas. In the West, the State Fire Assistance (SFA) funding is available and awarded through a competitive process with emphasis on hazard fuel reduction, information and education, and community and homeowner action. This portion of the National Fire Plan was developed to assist interface communities manage the unique hazards they find around them. Long-term solutions to interface challenges require informing and educating people who live in these areas about what they and their local organizations can do to mitigate these hazards.

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Appendix 7 - Additional Information

Glossary of Terms

Defensible Space - The area within the perimeter of a parcel, development, neighborhood or community where basic wildland fire protection practices and measures are implemented, providing the key point of defense from an approaching wildfire or defense against encroaching wildfires or escaping structures fires. The perimeter as used in this definition is the area encompassing the parcel or parcels proposed for construction and or development, excluding the physical structure itself. The establishment and maintenance of emergency vehicle access, emergency water reserves, street names and building identification, and fuel modification measures characterize the area.

Disturbance - An event which affects the successional development of a plant community (examples: fire, insects, windthrow, and timber harvest).

Diversity - The relative distribution and abundance of different plant and animal communities as well as species within an area.

Exotic/Invasive Plant Species - Plant species that are introduced and not native to the area.

Fire Behavior - The manner in which a fire reacts to the influences of fuel, weather, and topography.

Fire Behavior Prediction Model - A set of mathematical equations that can be used to predict certain aspects of fire behavior when provided with an assessment of fuel and environmental conditions.

Fire Danger - A general term used to express an assessment of fixed and variable factors such as fire risk, fuels, weather, and topography which influence whether fires will start, spread, and do damage; also the degree of control difficulty to be expected.

Fire Exclusion - The disruption of a characteristic pattern of fire intensity and occurrence (primarily through fire suppression).

Fire Intensity Level - The rate of heat release (BTU/second) per unit of fire front. Four foot flame lengths or less are generally associated with low intensity burns and four to six foot flame lengths generally correspond to "moderate" intensity fire behavior. High intensity flame lengths are usually greater than eight feet and pose multiple control problems.

Fire Prone Landscapes – The expression of an area's propensity to burn in a wildfire based on common denominators such as plant cover type, canopy closure, aspect, slope, road density, stream density, wind patterns, position on the hillside, and other factors.

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Fireline - A loose term for any cleared strip used in control of a fire. That portion of a control line from which flammable materials have been removed by scraping or digging down to the mineral soil.

Fire Management - The integration of fire protection, prescribed fire and fire ecology into land use planning, administration, decision making, and other land management activities.

Fire Prevention - An active program in conjunction with other agencies to protect human life, prevent modification of the ecosystem by human-caused wildfires, and prevent damage to cultural resources or physical facilities. Activities directed at reducing fire occurrence, including public education, law enforcement, personal contact, and reduction of fire risks and hazards.

Fire Regime - The fire pattern across the landscape, characterized by occurrence interval and relative intensity. Fire regimes result from a unique combination of climate and vegetation. Fire regimes exist on a continuum from short-interval, low-intensity (stand maintenance) fires to long-interval, high-intensity (stand replacement) fires.

Fire Return Interval - The number of years between two successive fires documented in a designated area.

Fire Risk - The potential that a wildfire will start and spread as determined by the presence and activities of causative agents.

Fire Severity - The effects of fire on resources displayed in terms of benefit or loss.

Fire Use – The management of naturally ignited fires to accomplish specific prestated resource management objectives in predefined geographic areas.

Flashy Fuel - Quick drying twigs, needles, and grasses that are easily ignited and burn rapidly.

Fuel - The materials which are burned in a fire: duff, litter, grass, dead branchwood, snags, logs, etc.

Fuel Break - A natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled.

Fuel Loading - Amount of dead and live fuel present on a particular site at a given time; the percentage of it available for combustion changes with the season.

Fuel Model - Characterization of the different types of wildland fuels (trees, brush, grass, etc.) and their arrangement, used to predict fire behavior.

Fuel Type - An identifiable association of fuel elements of distinctive species; form, size, arrangement, or other characteristics, that will cause a predictable rate of fire spread or difficulty of control, under specified weather conditions.

Fuels Management - Manipulation or reduction of fuels to meet protection and management objectives, while preserving and enhancing environmental quality.

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Habitat - A place that provides seasonal or year-round food, water, shelter, and other environmental conditions for an organism, community, or population of plants or animals.

Habitat Type - A group of habitats that have strongly marked and readily defined similarities that when defined by its predominant or indicator species incites a general description of the area; *e.q. a ponderosa pine habitat type*.

Heavy Fuels - Fuels of a large diameter, such as snags, logs, and large limbwood, which ignite and are consumed more slowly than flashy fuels.

Human-Caused Fires - Refers to fires ignited accidentally (from campfires, equipment, debris burning, or smoking) and by arsonists; does not include fires ignited intentionally by fire management personnel to fulfill approved, documented management objectives (prescribed fires).

Intensity - The rate of heat energy released during combustion per unit length of fire edge.

Inversion - Atmospheric condition in which temperature increases with altitude.

Ladder Fuels - Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees with relative ease. They help initiate and assure the continuation of crowning.

Landsat Imagery - Land remote sensing, the collection of data which can be processed into imagery of surface features of the Earth from an unclassified satellite or satellites.

Landscape - All the natural features such as grasslands, hills, forest, and water, which distinguish one part of the earth's surface from another part; usually that portion of land which the eye can comprehend in a single view, including all its natural characteristics.

Lethal - Relating to or causing death.

Lethal Fires - A descriptor of fire response and effect in forested ecosystems of high-severity or severe fire that burns through the overstory and understory. These fires typically consume large woody surface fuels and may consume the entire duff layer, essentially destroying the stand.

Litter - The top layer of the forest floor composed of loose debris, including dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Mitigation - Actions to avoid, minimize, reduce, eliminate, replace, or rectify the impact of a management practice.

Monitoring Team - Two or more individuals sent to a fire to observe, measure, and report its behavior, its effect on resources, and its adherence to or deviation from its prescription.

Native - Indigenous; living naturally within a given area.

Natural Ignition - A wildland fire ignited by a natural event such as lightning or volcanoes.

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Noxious Weeds - Rapidly spreading plants that have been designated "noxious" by law which can cause a variety of major ecological impacts to both agricultural and wildlands.

Planned Ignition - A wildland fire ignited by management actions to meet specific objectives.

Prescribed Fire - Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescription - A set of measurable criteria that guides the selection of appropriate management strategies and actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Seral - Refers to the stages that plant communities go through during succession. Developmental stages have characteristic structure and plant species composition.

Stand Replacing Fire - A fire that kills most or all of a stand.

Surface Fire - Fire which moves through duff, litter, woody dead and down and standing shrubs, as opposed to a crown fire.

Watershed - The region draining into a river, river system, or body of water.

Wetline - Denotes a condition where the fireline has been established by wetting down the vegetation.

Wildland Fire - Any non-structure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Use - The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in FMP's. Operational management is described in the WFIP. Wildland fire use is not to be confused with "fire use," which is a broader term encompassing more than just wildland fires.

Wildland Fire Use for Resource Benefit (WFURB) - A wildland fire ignited by a natural process (lightning), under specific conditions, relating to an acceptable range of fire behavior and managed to achieve specific resource objectives.

Wildland-Urban Interface (WUI) - For purposes of this plan, the wildland-urban interface is located defined in Section 4.5. In general, it is the area where structures and other human development meet or intermingle with undeveloped wildland.

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General Mitigation Strategies

There are many actions that will help improve safety in a particular area; there are also many mitigation activities that can apply to all residents and all fuel types. General mitigation activities that apply to all of Grant County are discussed below while area-specific mitigation activities are discussed within the strategic planning area assessments.

Prevention. The safest, easiest, and most economical way to mitigate unwanted fires is to stop them before they start. Generally, prevention actions attempt to prevent human-caused fires. Campaigns designed to reduce the number and sources of ignitions can be quite effective and can take many forms.

Limiting Use. The issues associated with debris burning during certain times of the year are difficult to negotiate and enforce. However, there are significant risks associated with the use of fire adjacent to expanses of flammable vegetation under certain scenarios. Fire departments typically observe the State of Washington closed fire season between July 1st to September 30th. During this time, an individual seeking to conduct an open burn of any type shall obtain a permit to prescribe the conditions under which the burn can be conducted and the resources that need to be on hand to suppress the fire. Although this is a statewide regulation, compliance and enforcement has been variable between fire districts.

Defensible Space. Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Franklin County must be made aware that home defensibility starts with the homeowner. Once a fire has started and is moving toward a structure, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the building. The Firewise Communities USA program is an excellent tool for educating homeowners on the steps to take in order to create an effective defensible space. Residents of Grant County should be encouraged to work with local fire departments and fire management agencies within the county to complete individual home site evaluations. Home defensibility steps should be enacted based on the results of these evaluations. Beyond the homes, forest management efforts must be considered to slow the approach of a fire that threatens a community.

Evacuation. Development of community evacuation plans is necessary and critical to assure an orderly evacuation in the event of a threatening wildland fire. Designation and posting of escape routes would reduce chaos and escape times for fleeing residents. Community safety zones should also be established in the event safe evacuation is impossible and 'sheltering in place' becomes the better option.

Access. Also of vital importance is the accessibility of homes to emergency apparatus. The fate of a home will often be determined by homeowner actions prior to the event. A few simple

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guidelines such as widening or pruning along driveways and creating a turnaround area for large vehicles, can greatly enhance home survivability.

Facility Maintenance. Recreational facilities near communities or in the surrounding forests such as parks or natural areas should be kept clean and maintained. In order to mitigate the risk of an escaped campfire, escape-resistant fire rings and barbeque pits should be installed and maintained. In some cases, restricting campfires during dry periods may be necessary. Surface fuel accumulations in nearby forests can also be kept to a minimum by periodically conducting pre-commercial thinning, pruning and limbing, and possibly controlled burns.

Fire District Response. Once a fire has started, how much and how large it burns is often dependent on the availability of suppression resources. In most cases, rural fire departments are the first to respond and have the best opportunity to halt the spread of a wildland fire. For many districts, the ability to reach these suppression objectives is largely dependent on the availability of functional resources and trained individuals. Increasing the capacity of departments through funding and equipment acquisition can improve response times and subsequently reduce the potential for resource loss.

Development Standards. County, city, and even fire district policies can be updated or revised to provide for more fire conscious techniques such as using fire resistant construction materials; improving roads, and establishing permanent water resources.

Other Mitigation. Other actions to reduce fire hazards are thinning and pruning timbered areas, creating a fire resistant buffer along roads and power line corridors, and strictly enforcing fire-use regulations. Ensuring that areas beneath power lines have been cleared of potential high risk fuels and making sure that the buffer between the surrounding lands is wide enough to adequately protect the poles as well as the lines is imperative.

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