2016

Lincoln County CWPP Update

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

USDI National Park Service

Town of Almira
Town of Creston
Town of Harrington
Town of Odessa
Town of Reardan
Town of Wilbur
City of Davenport
City of Sprague

Federal Emergency Management Agency

Unincorporated Communities
&
Local Businesses and Citizens
of Lincoln County

Lincoln County Fire District #1
Lincoln County Fire District #3
Lincoln County Fire District #4
Lincoln County Fire District #6
Lincoln County Fire District #7
Lincoln County Fire District #8
Lincoln County Fire District #9

Lincoln County Conservation District

Washington Department of Fish and Wildlife

Washington State Department of Natural Resources

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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 Lincoln 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 **Lincoln County Community Wildfire Protection Plan** was developed in 2009 by the Lincoln County CWPP committee, the Lincoln County Conservation District, and the Washington Department of Natural Resources with project facilitation and support provided by Northwest Management, Inc. of Moscow, Idaho. Funding for the project was provided by the Bureau of Land Management and the Washington Department of Natural Resources. This Community Wildfire Protection Plan will be reviewed annually and updated at least every five years starting from the year of adoption.*

The Community Wildfire Protection Plan was developed in compliance with the Federal Emergency Management Agency requirements for a wildfire mitigation plan, a chapter of a countywide Multi-Hazard Mitigation Plan.

Signature Pages

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

Lincoln County Commissioners

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

Scott M. Hutsell

12-5-16

Scott M. Hutsell, Chairman -Vice

Date

Lincoln County Commissioner, District 2

Mark R. Stedman

12.5.2016

Mark R. Stedman, Member

Date

Lincoln County Commissioner, District 1

Rob Coffman

12.5.2016

Rob Coffman, Chairman

Date

Lincoln County Commissioner, District 3

Approved As To Form:

Prosecuting Attorney

Signatures of Participation by Lincoln 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 Lincoln County Commissioners.

Mitch Lowry, Chief
Lincoln County F. P. D. #1

Date

Roger Sebesta, Chief
Lincoln County F. P. D. #3

8/10/16
Date

Ryan Rettkowski, Chief
Lincoln County F. P. D. #4

9-27-16
Date

Craig Sweet, Chief
Lincoln County F. P. D. #5

7-25-16
Date

Scott McGowan, Chief
Lincoln County F. P. D. #6

9/30/16
Date

8-1-16

Kevin Coffman, Chief
Wilbur Station, Lincoln County F. P. D. #7

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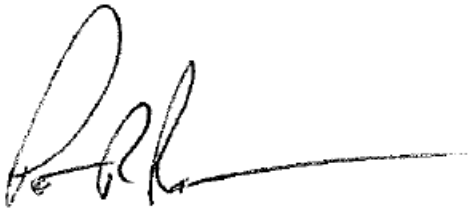

7/22/16

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Date

9/27/16

Jim Derrer, Chief
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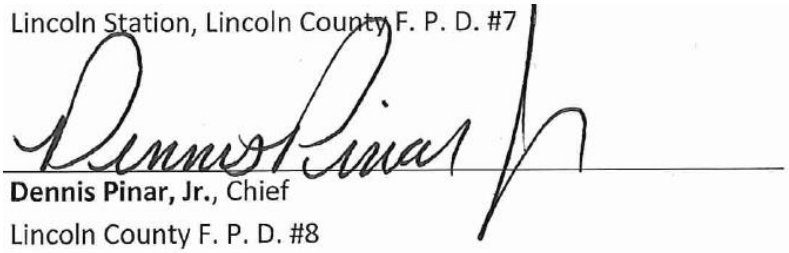

9-5-16

Dennis Pinar, Jr., Chief
Lincoln County F. P. D. #8

Date

9-30-16

C. Ronald Rosenberg, Commissioner
Lincoln County F. P. D. #9

Date

Signatures of Participation by other Lincoln 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 Lincoln County Commissioners.

8·26·2016

Elsa Bowen, District Manager

Date

Lincoln County Conservation District

8-26-16

Wade W. Magers, Sheriff

Date

Lincoln County Sheriff's Office

9/28/2016

Lindsey Babcock, Border Resource Manager

Date

Spokane District Bureau of Land Management

Aaron Everett, Deputy Supervisor,

Date

Forest Practices and Federal Relations, State Forester, Washington State Department of Natural Resources

Chapter 1

Overview of this Plan and its Development

In 2014, the Washington Department of Natural Resources (DNR) and the Bureau of Land Management (BLM) contracted with Northwest Management Inc. to conduct an in-depth risk assessment for the hazards of wildland fire. Wildfire events occur annually in Lincoln 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 December of 2015, the DNR and BLM met with the CWPP Steering Committee to introduce their plans in updating the CWPP.

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

- Communities of Reardan, Edwall, Long Lake
- Lincoln County Citizens
- Lincoln County Fire District #4
- Lincoln County Fire District #5
- Lincoln County Fire District #6
- Lincoln County Fire District #7
- Lincoln County Sheriff's Department
- Lincoln County Conservation District
- Amateur Radio (ARES)
- Washington Department of Natural Resources
- Washington Department of Fish and Wildlife
- Bureau of Land Management
- Lake Roosevelt National Recreation Area (Lake Roosevelt NRA) / National Park Service

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

Promote awareness of the countywide wildland fire hazard and propose workable solutions to reduce the wildfire potential.

Mission Statement

To make Lincoln County residents, businesses, and resources less vulnerable to the negative effects of wildland fires.

Goals

1. Identify and map Wildland Urban Interface (WUI) boundaries
2. Identify and evaluate hazardous fuel conditions, prioritize areas for hazardous fuel reduction treatments, and recommend the types and methods of treatment necessary to protect communities
3. Prioritize the protection of people, structures, infrastructure, natural resources, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy
4. 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
5. Educate communities about the unique challenges of wildfire in the wildland-urban interface
6. Provide a plan that balances private property rights of landowners in Lincoln County with personal safety and responsibility
7. Improve fire service organizations' awareness of wildland fire threats, vulnerabilities, and mitigation opportunities or options
8. Address structural ignitability and recommend measures that homeowners and communities can take to reduce the ignitability of structures
9. Recommend additional strategies for private, state, and federal lands to reduce hazardous fuel conditions and lessen the life safety and property damage risks from wildfires

10. Improve county and local fire agency eligibility for funding assistance (National Fire Plan, Healthy Forest Restoration Act, FEMA, and other sources) to reduce wildfire hazards, prepare residents for wildfire situations, and enhance fire agency response capabilities
11. Provide opportunities for meaningful discussions among community members and local, state, and federal government representatives regarding their priorities for local fire protection and forest management
12. Meet or exceed the requirements of the National Fire Plan and FEMA for a county level Community Wildfire Protection Plan
13. Identify areas of inadequate fire protection, such as gaps in district coverage, and develop solutions

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 attempting to increase property owners' use of protective measures through education, direct

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

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 Lincoln 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 Lincoln 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

[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.

briefly describe some of the existing Lincoln County planning documents and ordinances considered during development of this plan.

Lincoln County Comprehensive Emergency Management Plan (2006)

The purpose of the Comprehensive Emergency Management Plan (CEMP) is to guide the Lincoln County Department of Emergency Management in its responsibility to preserve lives, protect property and the environment, and to ensure public health in times of natural or technological disasters. The organization also provides for the coordination of recovery efforts following disasters, and will provide actions to mitigate the effects of such disasters, to the extent possible.

The CEMP is an all hazard plan that is promulgated by Lincoln County Board of Commissioners and Mayors of the participating cities and towns within the county and applies to all local public and private entities and organizations participating and included in the plan.

The CEMP is an all hazard approach to emergency and disaster situations likely to occur in the county, as described in the Lincoln County Hazard Identification/Vulnerability Analysis (HIVA), and provides the foundation for:

1. The establishment of an organization and guidelines for efficient and effective use of government, private sector and volunteer resources.
2. An outline of local government responsibilities in emergency management activities as described under RCW 38.52 and other applicable laws.
3. An outline of other participants' responsibilities in emergency management activities as agreed upon by the participating agencies and organizations.

Lincoln County Comprehensive Plan (1983)

The Comprehensive Plan is a legal document for guiding the future development of Lincoln County and is currently undergoing a revision process to be concluded in 2010-2011. The Plan is based upon the stated long-term goals and objectives of the county residents. The 1983 document covers land use, recreation, transportation, and economic elements.

Lincoln County Code: Title 16 – Land Divisions

The process by which land is divided is a matter of concern and should be administered in a uniform manner by cities, towns and counties throughout the state. The purpose of this title is to regulate the division of land and to promote the public health, safety, and general welfare in accordance with established standards to prevent the overcrowding of land; to lessen congestion on the streets and highways; to promote effective use of land; to promote safe and convenient travel by the public on streets and highways; to provide adequate provisions for light and air; to

facilitate adequate provisions for water, sewerage, parks and recreation areas, sites for schools and school grounds and other public requirements; to provide for proper ingress and egress; to provide for the expeditious review and approval of proposed subdivisions, which conforms to zoning and development standards and commercial needs of the citizens of the County and where to require uniform monumenting of land subdivisions and conveyancing by accurate legal description. In accordance with Chapter 58.17 RCW, Lincoln County has prescribed a method for controlling the division of land in unincorporated areas. Whereas the board of county commissioners deems the controls, standards, procedures and penalties set forth in this title to be essential to the protection of the public health, safety and general welfare of the citizens of Lincoln County and the adoption to be in the public interest.

Lake Roosevelt National Recreation Area Fire Management Plan (2014)

The preparation of a Wildland Fire Management Plan is required by the National Park Service (NPS) Wildland Fire Management Guidelines (DO-18), which states: "All parks with vegetation that can sustain fire must have a fire management plan. The resource management objectives of the park may determine whether a prescribed fire component is needed". Vegetation at Lake Roosevelt National Recreation (LRNRA) Area includes at least three fire prone ecosystems, these being steppe (semi-arid grassland), shrub/steppe, and ponderosa pine forests.

The NPS at LRNRA needs this plan to guide management decisions in response to wildland fire incidents occurring within LRNRA and adjacent to the area's boundary. Presently and in the future all wildland fires will be suppressed. The size and configuration of LRNRA's land base eliminates the option of using wildland fire to obtain other resource objectives that may be possible in a park with a large aggregate acreage. In contrast, the preferred alternative proposes to add a prescribed fire component that would enhance the NPS's ability to manage and improve the park's ecosystem components and processes while providing for firefighter and public safety.

Swanson Lakes Wildlife Area Management Plan (2006)

Management goals for the Washington State Department of Fish and Wildlife (WADFWS) Swanson Lakes Wildlife Area are to preserve habitat and species diversity for wildlife resources, maintain healthy populations of game and non-game species, protect and restore native plant communities, and provide diverse opportunities for the public to encounter, utilize, and appreciate wildlife and wild areas.

One of the agency's goals, as outlined in the Wildlife Area Management Plan, is to provide fire management on agency lands, which they do by maintaining fire protection contracts with the local fire districts. One of the agency's concerns regarding wildland fire is that it threatens

sensitive habitats within the Wildlife Area. Swanson Lakes Wildlife Area contains fire-sensitive habitat that is critical to the survival of the Columbian sharp-tailed grouse. Deciduous trees and shrubs provide critical winter habitat, and the cover associated with tall bunchgrasses provides needed hiding and escape cover for sharp-tailed grouse.

Lincoln County Livestock Evacuation Program (Ongoing)

Lincoln County is currently working on an effort to provide for the evacuation of all livestock during emergency situations, particularly wildland fire. This effort is organized by a team of volunteers that helps contact livestock owners in the affected areas and work together to either cut fences to allow animals to escape on their own or evacuate the animals to designed round up grounds. The volunteers involved in this program have organized the necessary equipment including trucks, trailers, and communication devices as well as on-call veterinarians to quickly and safely provide for the safety of the animals. The group involved in this program is working closely with the Sheriff's office to develop a formal plan outlining the program and its implementation.

Bureau of Land Management, Spokane Field Office Fire Management Plan (2004)

The purpose of the BLM's Spokane District Office Fire Management Plan (FMP) is to identify and integrate all wildland fire management guidance, direction, and activities required to implement national fire policy and fire management direction from the following: Federal Wildland Fire Management Policy and Program Review-1995 and 2001; The Interagency Fire Management Plan Template; and A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan.

The FMP was developed around the Spokane District office fire management program and addresses all aspects of it, including wildland urban interface (WUI), rural fire assistance, prescribed fire, fuels management, prevention, and suppression. The FMP identifies a fire program that meets its identified fire management objectives.

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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 Lincoln 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 Lincoln 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, Lincoln County Conservation District, 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:

- Reardan
- Edwall
- Long Lake
- Davenport
- Wilbur
- Local Citizens
- Amateur Radio (ARES)
- Lincoln County Fire District #4
- Lincoln County Fire District #5
- Lincoln County Fire District #6
- Lincoln County Fire District #7
- Lincoln County Conservation District
- Lincoln County Sheriff's Department

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 Lincoln 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, Lincoln County's human resources have many demands placed on them in terms of time and availability. In Lincoln 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 Lincoln County Community Wildfire Protection Plan's preparation.

NAME **ORGANIZATION**

- Mike Finch.....Lincoln County Fire District #7 & WDFW
- Forrest Rief.....Lincoln County Fire District #5
- Craig Brouwer .....Lake Roosevelt NRA
- Devin Magers .....Lincoln County Resident
- Ryan Rettkowski.....Lincoln County Fire District #4
- Linda Dougherty.....Lincoln County Fire District #4
- Jon Bennet .....Lincoln County Fire District #4
- SueLani Madsen .....Lincoln County Fire District #4
- Gary Bytnar .....Lincoln County Resident
- Loren Reinhold .....Lincoln County Resident
- Dick Teel.....Lincoln County Resident
- Frank Braun.....Lincoln County Resident
- Diana Braun.....Lincoln County Resident
- Gene Hein.....Lincoln County Resident
- Mike Piper .....Lincoln County Fire District #5
- Craig Sweet .....Lincoln County Fire District #5
- Ron Mielke .....Lincoln County Fire District #6
- Kevin Coffman.....Lincoln County Fire District #7
- Steve Harris .....Washington DNR
- Guy Gifford.....Washington DNR
- Andrew Stenbeck .....Washington DNR
- Wade Magers.....Lincoln County Sheriff's Department
- Lucas Mallon .....Lincoln County Sheriff's Department
- Lea Shields.....Lincoln County Conservation District
- Elsa Bowen .....Lincoln County Conservation District
- Val Vissia .....Lincoln County Conservation District
- Tonya Neider.....Lake Roosevelt NRA
- Michael Solheim.....Spokane District BLM
- Richard Parrish .....Spokane District BLM
- Brad Tucker .....Northwest Management, Inc.
- Meghan McEldery .....Northwest Management, Inc.
- Tiana Luke .....Northwest Management, Inc.

Committee Meeting Minutes

Committee meetings were scheduled and held from December, 2015 through April, 2016. These meetings served to facilitate the sharing of information and to lay the groundwork for the Lincoln 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
Odessa Record	Local Fire Protection Districts
Davenport Times	
Wilbur Register	

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

Figure 2.1 News Article.

Lincoln County Plans to Update Community Wildfire Protection Plan

Working in conjunction with Lincoln County, the Washington Department of Natural Resources (DNR), and the Bureau of Land Management (BLM) has launched the process of updating the county-level Community Wildfire Protection Plan (CWPP). Local agencies and organizations in Lincoln 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 Lincoln 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 next meeting is scheduled for January 27th, 2016 at 6:00 pm and will be held at the Davenport Fire Station located at 701 Morgan Street. This is the second of several monthly meetings, of which, anyone is welcome to attend.

Northwest Management, Inc. has been retained by the DNR and 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, Lincoln County, DNR, National Park Service, BLM, and others.

The intention of the project is to conduct an assessment of wildland fire risk in Lincoln 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 Lincoln 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 of 2016. A notice of the dates and locations of these meetings will be posted in local news outlets. For more information on the Lincoln 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.

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 Lincoln County included one locations: Davenport, Washington. The public meeting was attended by ten individuals on the committee and five from the general public. 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 2.2. Public Meeting Flyer, Date

LINCOLN COUNTY COMMUNITY WILDFIRE PROTECTION PLAN UPDATE

PUBLIC MEETING ANNOUNCEMENT

March 30th
7:00-8:00 pm
PUBLIC WORKS BUILDING
27234 SR 25 N.
Davenport, WA 99122

These public meetings will address the Community Wildfire Protection Plan being developed for Lincoln 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 Lincoln 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.**

Please Attend and Participate

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

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

For more information on the Wild Fire Protection Plan
Contact - Brad Tucker, North West Management
(208) 883-4488 ext 117

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 winter and spring of 2015-2016, 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.

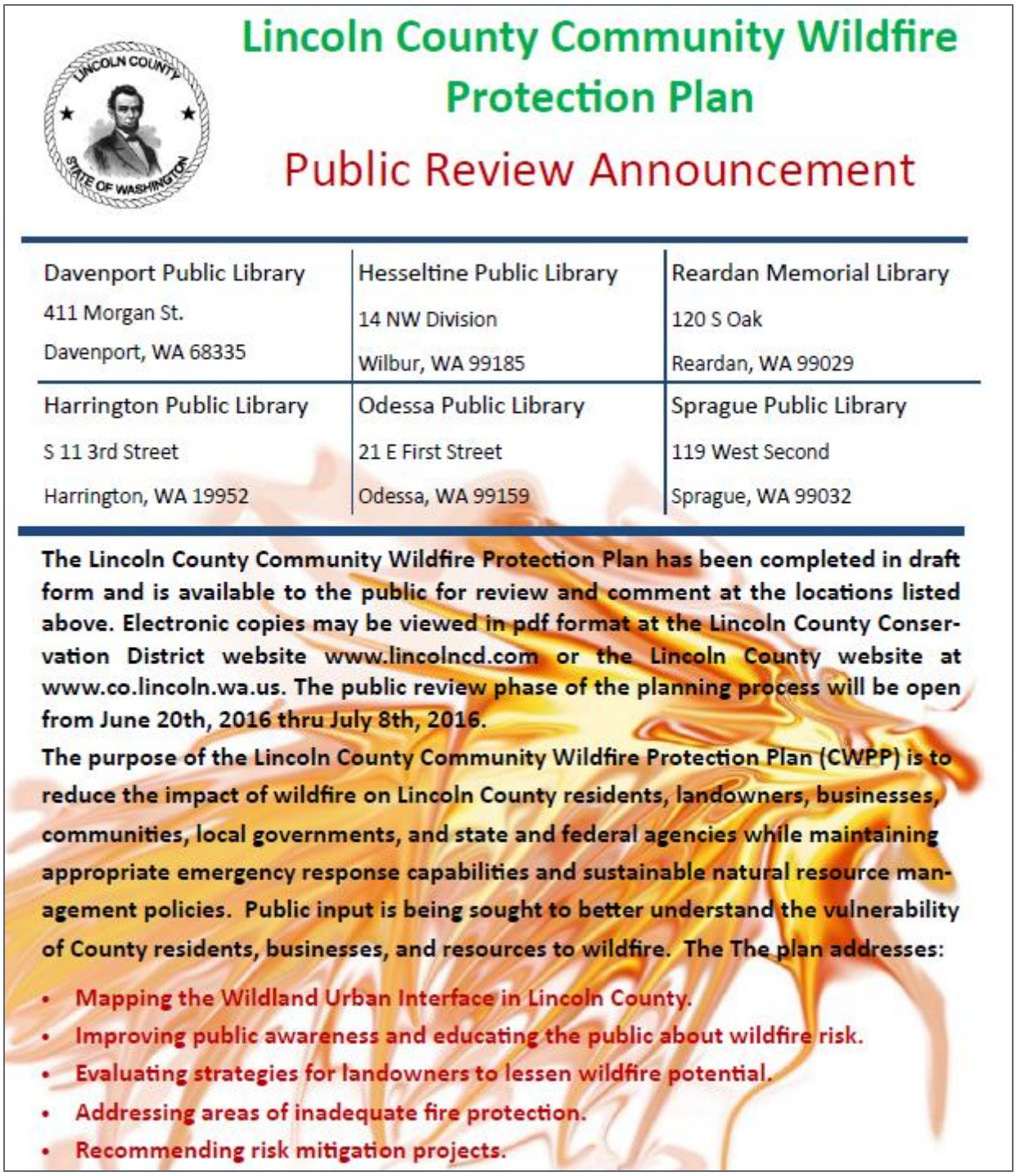
The first draft of the document was prepared after the public meetings and presented to the committee in May for a full committee review. The committee was given 14 to provide comments to the plan.

Public Comment Period

A public comment period was conducted from June 20th to July 8th 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 June 10th 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 Lincoln County Public Libraries in Davenport, Harrington, Wilbur, Odessa, Reardan and Sprague. An electronic version of the plan was made available online at http://www.consulting-foresters.com/?id=clients.

There were no comments received during this timeframe.

Figure 2.3. Press Release #3 – Public Comment Period



Lincoln County Community Wildfire Protection Plan

Public Review Announcement

Davenport Public Library 411 Morgan St. Davenport, WA 68335	Hesseltine Public Library 14 NW Division Wilbur, WA 99185	Reardan Memorial Library 120 S Oak Reardan, WA 99029
Harrington Public Library S 11 3rd Street Harrington, WA 19952	Odessa Public Library 21 E First Street Odessa, WA 99159	Sprague Public Library 119 West Second Sprague, WA 99032

The Lincoln 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 above. Electronic copies may be viewed in pdf format at the Lincoln County Conservation District website www.lincolncd.com or the Lincoln County website at www.co.lincoln.wa.us. The public review phase of the planning process will be open from June 20th, 2016 thru July 8th, 2016.

The purpose of the Lincoln County Community Wildfire Protection Plan (CWPP) is to reduce the impact of wildfire on Lincoln County residents, landowners, businesses, communities, local governments, and state and federal agencies while maintaining appropriate emergency response capabilities and sustainable natural resource management policies. Public input is being sought to better understand the vulnerability of County residents, businesses, and resources to wildfire. The The plan addresses:

- **Mapping the Wildland Urban Interface in Lincoln 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.**

Continued Public Involvement

Lincoln County is dedicated to involving the public directly in review and updates of the Community Wildfire Protection Plan and Wildfire Risk Assessment. The Lincoln County Commissioners, working through the Lincoln County Conservation District, 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 Lincoln 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 Lincoln County Conservation District, 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

Lincoln County Characteristics

Prior to the 1800's, Lincoln County was inhabited by several groups of Native Americans. The rolling plains were considered wasteland by early military authorities. The first permanent settlers arrived in the mid-1800's and settled in the bottomlands close to the water sources. More people settled in Lincoln County with the construction of the Northern Pacific rail lines. The new arrivals discovered that the best agricultural land was on the deep soils of the rolling hills. Lincoln County was officially established in 1883 (Lincoln County Comprehensive Plan 1983).[3] Currently, Lincoln County covers 2,311 square miles with 4.4 persons per square mile.

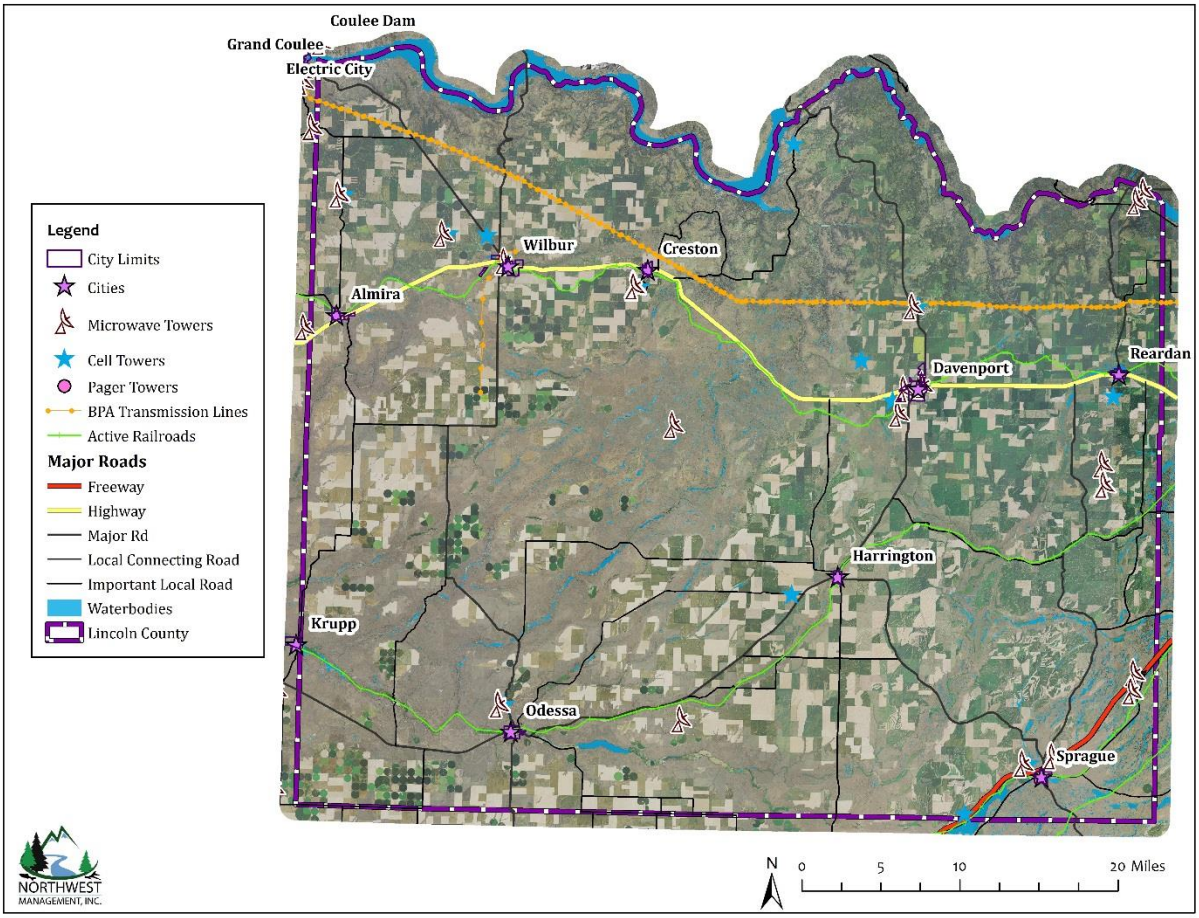
Geography and Climate

Lincoln County is located on the Columbia Plateau, which was created by lava flows hundreds of feet thick, modified by glacial action and scoured by repeated floods during the Miocene and Pliocene eras. This fairly level, rough topography is called the Channeled Scablands and includes features such as plateaus, buttes, and channels. Channels are made up of outwash terraces, bars, loess islands and basins. The plateaus contain circular mounds of loess (biscuits) surrounded by cobble-size fragments of basalt. Soils generally consist of silt loams with varying amounts of rock or gravel, and basaltic rock outcroppings. Generally, the soils along on the northern-most end of the county are derived from the local parent material, which includes granite and basalt, covered by and mixed with imported material, which includes glacial, fluvial, and wind-deposited material. The topsoil layers are most often very thin and vulnerable.[4]

The average daily temperature varies from a low of -13 degrees Fahrenheit to a high of 100 degrees Fahrenheit, averaging 46 degrees. There are 120 to 160 frost-free days in the growing season with annual precipitation averaging between 12 and 16 inches.[4]

[3] Lincoln County. 1983. Lincoln County Comprehensive Plan. Lincoln County Planning Commission. Davenport, WA. 34pp.
[4] Washington Department of Fish & Wildlife. 2006. Swanson Lakes Wildlife Area Management Plan. Wildlife Management Program, Washington Department of Fish and Wildlife, Olympia. 40pp.

Figure 3.1. Lincoln County Aerial Map.



Population and Demographics

The 2010 Census established the Lincoln County population at 10,570, which shows an increase from a population of 10,184 in 2000. Since 1890, the population of Lincoln County has been fluctuating with the highest population occurring in 1910. Table 3.1 shows historical changes in population in Lincoln County.

Lincoln County grew in population to a peak of over 17,000 around 1910. During this time, there were more than 2,000 farms in the county and almost twice as many people lived in the rural areas as in the towns. Presently, farms are much larger in average acreage, but fewer in number.[5]

The U.S. Census Bureau estimates that Lincoln County has only experienced a 4% increase in population since 2000 compared to a 13% increase statewide. The Census Bureau also reported

[5] Lincoln County Comprehensive Plan. 1983.

that there were 257 private nonfarm establishments and 4,457 households. The median income for a household in Lincoln County is $47,195, which is less than the statewide median of $59,478.[6]

Table 3.1. Lincoln County Historical Population Data.

Census	Population
1890	9,312
1900	11,969
1910	17,539
1920	15,141
1930	11,876
1940	11,361
1950	10,970
1960	10,919
1970	9,572
1980	9,604
1990	8,864
2000	10,184
2010	10,570

Land Ownership

The vast majority of Lincoln County is privately owned. Most of the land is used for ranching and farming purposes; although, more and more residents are moving into the rural areas along the Lake Roosevelt shoreline. Numerous subdivisions and housing clusters are developing along the northern border of the county.

Table 3.2. Ownership Categories in Lincoln County.

Land Owner	Percent
Private	89%
Bureau of Land Management	5%
Washington Department of Natural Resources	3%
Water	2%
Washington Department of Fish and Wildlife	1%
Washington State Parks	<1%
Bureau of Reclamation	<1%
Total	**100%**

A map of the land ownership pattern in Lincoln County is included in Appendix 1.

Development Trends

[6] U.S. Census Bureau. State & Quick Facts: http://quickfacts.census.gov/qfd/states/53/53043.html. Accessed December, 2015.

Lincoln County's rural, wide expanses of open lands, diverse farmlands, and arid scablands is one of its most attractive features. The two incorporated cities and six towns make up the urban growth areas that contains half of Lincoln County's population. Outside the urban areas is a significant amount of land comprising the natural resource base of Lincoln 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 Lincoln County.

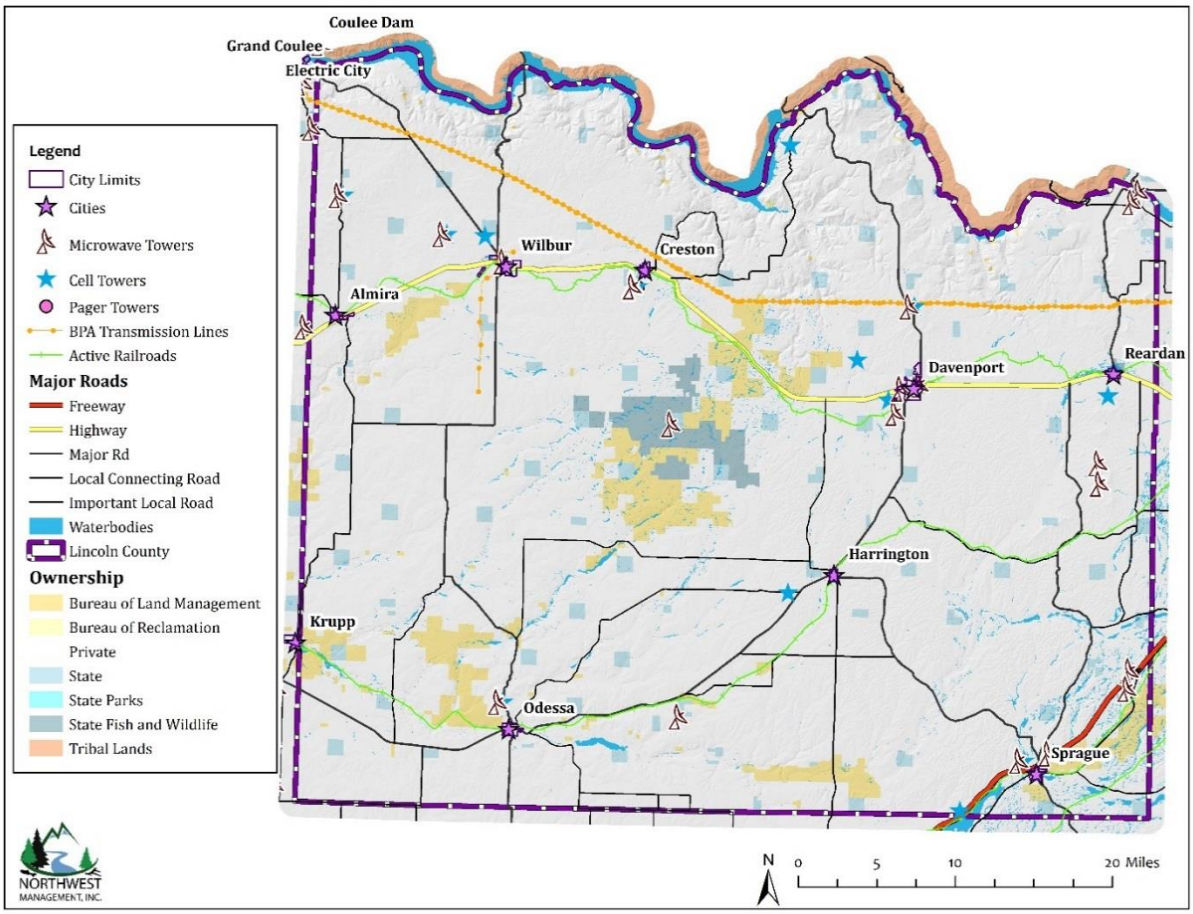
Agriculture

The predominant land use in Lincoln County is agriculture, in the form of dryland/irrigated grain crops (including some in CRP) and rangeland livestock grazing. Irrigated agriculture activities occur on approximately 34,000 acres and are primarily located in the northern portion of the county near Lake Roosevelt. Dryland agriculture occurs on the remainder of the agriculture based land use in the county. The 2012 Agriculture Census ranked Lincoln County as being one of the top fifteen counties in Washington in terms of volume of agriculture sales, $1.8 million.

Lincoln County has 897 farms covering 1,114,940 acres with the average farm size of 1,243 acres per farm.[7]

[7] 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. Lincoln County Ownership



Natural Resources

Lincoln 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 disturbance process. Nearly a century of wildland fire suppression coupled with past land-use practices (primarily timber harvesting and agriculture) has altered plant community succession and has resulted in dramatic shifts in the fire regimes and species composition. As a result, some forests and rangelands in Lincoln County have become more susceptible to large-scale, higher-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 and native vegetation. 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 (House of Representatives, Committee on Agriculture, Washington, DC, 1997).

Vegetation

Much of the terrain in Lincoln County is dominated by shrub-steppe communities, with some grassland interspersed with rock outcrops. The dominant grass and shrub-steppe communities are primarily composed of Bluebunch wheatgrass, Idaho fescue, Wyoming big sage, and rigid sage. Common shrub species are snowberry, rose, serviceberry, and Wax current. Although riparian areas are few, they offer important vertical structure in the vast extent of open grassland. These stands of trees and/or shrubs provide hiding, escape and thermal cover, shade, foraging and nesting sites, perches, and water sources. Overstory trees in riparian zones include quaking aspen, black cottonwood, and water birch, while the understory vegetation is composed of hydrophytic shrub species such as mock orange, alder, Rocky Mountain maple, black hawthorn, and willow.[4]

Located in a semi-arid transition zone, plant communities along the Lake Roosevelt National Recreation Area gradually change from steppe and shrub-steppe communities to ponderosa pine forest. As this is a transition zone between grassland and forest environment, large block definitions can be difficult due to effects of varying aspect and soil types. The three predominant plant communities include bunchgrass grasslands (steppe); shrub-steppe; and transition ponderosa pine forest. Other communities of note include wetland/riparian, lithosolic (rocky soil), rocky outcrops, and mixed-conifer forests.[8]

Table 3.3. Vegetative Cover Types in Lincoln County.

Cover	Percent
Agriculture	53%
Shrubland	28%
Conifer	6%
Grassland	5%
Developed	3%
Non-vegetated	1%
Riparian	<1%
Sparsely-vegetated	<1%
Hardwood	<1%
Conifer-hardwood	<1%
Total	**100%**

[8] Hebner, Scott. 200. Fire Management Plan Environmental Assessment. Lake Roosevelt National Recreation Area. October, 2000. 63pp.

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.

Of critical importance to Lincoln County will be the maintenance of the domestic watershed supplies in the Lower Spokane Watershed (WRIA 54), Lower Lake Roosevelt Watershed (WRIA 53), and Upper Crab-Wilson Watershed (WRIA 43).

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.[9]

The Clean Air Act, passed in 1963 and amended in 1977, is the primary legal authority governing air resource management. The Clean Air Act provides the principal framework for national, state,

[9] 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.

and local efforts to protect air quality. Under the Clean Air Act, OAQPS (Office for Air Quality Planning and Standards) is responsible for setting standards, also known as national ambient air quality standards (NAAQS), 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.[10]

Smoke emissions from fires potentially affect an area and the airsheds that surround it. Climatic conditions affecting air quality in northeast 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. Air quality in the area is generally moderate to good. However, 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. All major river drainages are subject to temperature inversions which trap smoke and affect dispersion, causing local air quality problems. This occurs most often during the summer and fall months and would potentially affect all communities in Lincoln County. Winter time inversions are less frequent, but are more apt to trap smoke from heating, winter silvicultural burning, and pollution from other sources.

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. Lincoln 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.

[10] 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.

Public health, public safety, and forest health can all be served through the application of the 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 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). All future reference to burning in this plan will refer only to silvicultural burning unless otherwise indicated.

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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[11]. 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

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

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.

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.[12]

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.[13]

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.

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

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 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.[14]

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 (1973-2015) as well as a majority of the wildfires that the local Fire Protection District #6 responded to (2008-2015). Most of the federal fires appear to be located within or near the Lake Roosevelt National Recreation Area and Swanson Lakes Wildlife Area and are frequently human caused ignitions, likely the result of 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.

[14] http://www.nwccinfo.blogspot.com. Accessed March 17, 2015.

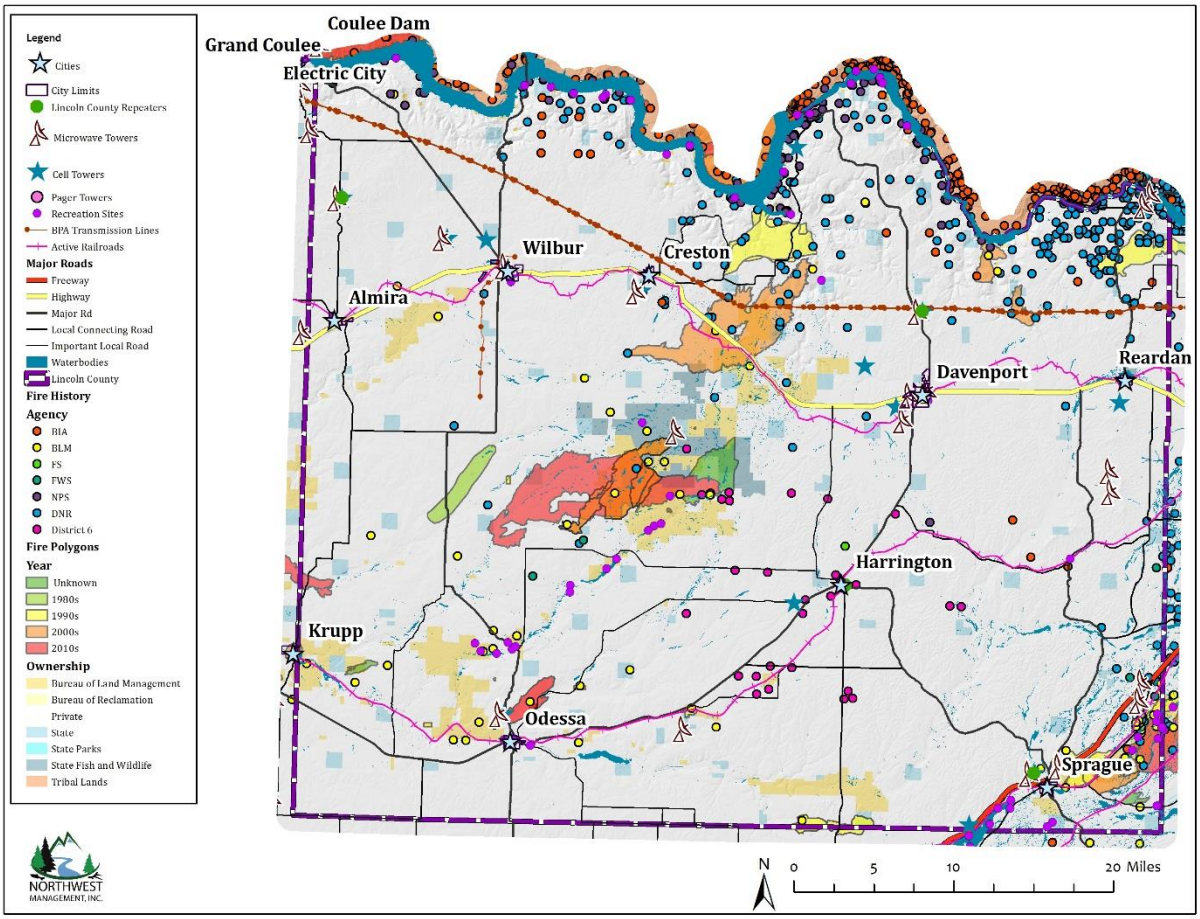
Fire History

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.[15] These fires burned from 1 to 47 years apart, with most at 5- to 20-year intervals.[16] With infrequent return intervals, plant communities tended to burn more severely and be replaced by vegetation different in composition, structure, and age.[17] 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 Lincoln 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.

[15] Johnson, C.G. 1998. Vegetation Response after Wildfires in National Forests of Northeastern Oregon. 128 pp.
[16] 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.
[17] 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 Lincoln County from 1973-2015.



Fire near Sprague knocked down

By Nina Culver

A fire was reported near the town of Sprague in Lincoln County this afternoon and quickly grew to 1,600 acres, but was just as quickly put out.

The fire started just after 4 p.m. next to the eastbound I-90 on-ramp at Sprague, said Lincoln County Fire District 1 firefighter Kyle Cordill. Winds pushed the blaze away from town, burning grass and sagebrush.

“Nobody in Sprague was harmed,” Cordill said. “The wind was blowing to the east.”

Crews from Whitman County, Adams County, Edwall, the Bureau of Land Management and Spokane County Fire District 3 assisted with the fire along with several air tankers.

“The fire’s all out, contained,” Cordill said late Saturday. Eighty percent of the burned land belongs to BLM so they will be monitoring the area, Cordill said.

The cause of the fire is under investigation.

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 and State agencies database of wildfire ignitions (1973-2015) used in this analysis includes ignition and extent data within their jurisdictions. During this period, the agencies recorded an average of 12 wildfire ignition per year resulting in an average total burn area of 7,848 acres per year. The highest number of ignitions (22) occurred 1998, while the most amount of acres burned in a single year occurred in 2007 with over 62,700 acres burned. According to this dataset, the vast majority of fires occurring in Lincoln County are human caused; however, naturally ignited/unknown caused fires do occur.

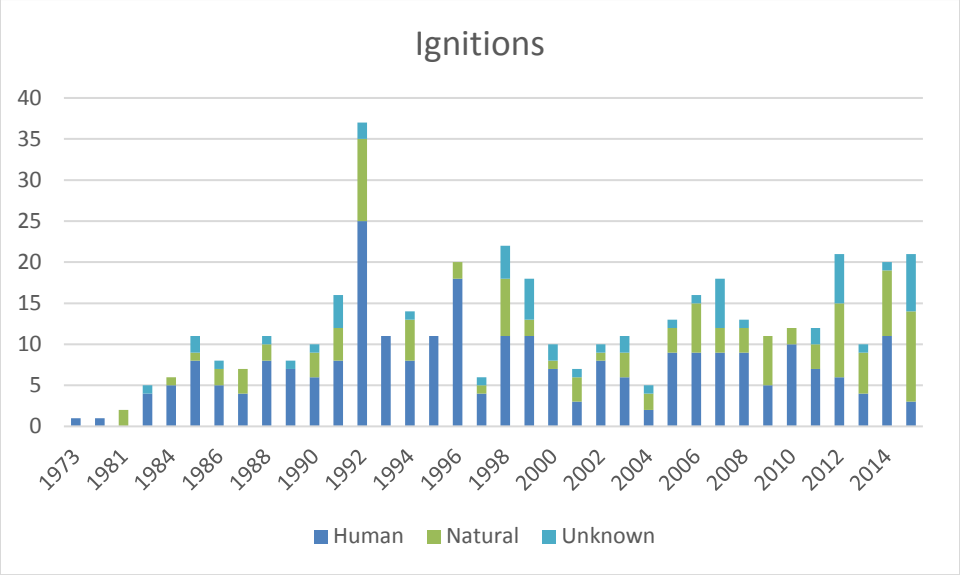
Table 4.1. Summary of Cause from State and Federal databases 1973-2015.

General Cause	Number of Ignitions	Percent of Total Ignitions	Acres Burned	Percent of Total Acres
Human-Caused	264	61%	134,357	48%
Natural Ignition	114	26%	29,201	10%
Unknown	57	13%	118,972	42%
Total	**435**	**100%**	**282,530**	**100%**

Based on the agencies' combined datasets specific to Lincoln 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 Lincoln County. Another contributing factor could be the spread of invasive species. It should be noted that a majority of the wildland fires occurring in Lincoln County are not reported at the State or Federal level, therefore a separate analysis of fire history at the Fire District level is warranted.

Lincoln County Fire District #6 estimated that they responded to 28 ignitions since 2008 which averages approximately four wildland fires per year. Lincoln County Fire District #4 estimated that they responded to 39 forest fires, 25 brush fires and 17 grass fires from 2007 to 2015, which averages to nine wildland fires annually.

Figure 4.2. Summary of Lincoln 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 Lincoln 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 Lincoln 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.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of Fires	96,385	85,705	78,979	78,792	71,971	74,126	67,774	47,579	63,212	68,151
10-year Average ending with indicated year	87,788	80,125	79,918	78,549	76,521	80,465	74,912	74,560	73,128	73,267
Acres Burned (million acres)	9.9	9.3	5.3	5.9	3.4	8.7	9.2	4.3	3.6	10.1
10-year Average ending with indicated year (million acres)	6.5	7.0	6.9	6.9	6.5	7.0	7.3	7.2	6.8	7.0
Structures Destroyed	--	--	--	--	788	5,246	4,244	2,135	1,953	4,636
Estimated Cost of Fire Suppression (Federal agencies only)	$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	$2.1 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.[18] In 2015, Washington was second behind California for the highest structure loss per state, with 343 residences, 23 commercial and 182 outbuildings destroyed during the 2015 fire season.[19]

[18] National Interagency Fire Center. 2015. Available online at http://www.nifc.gov/.

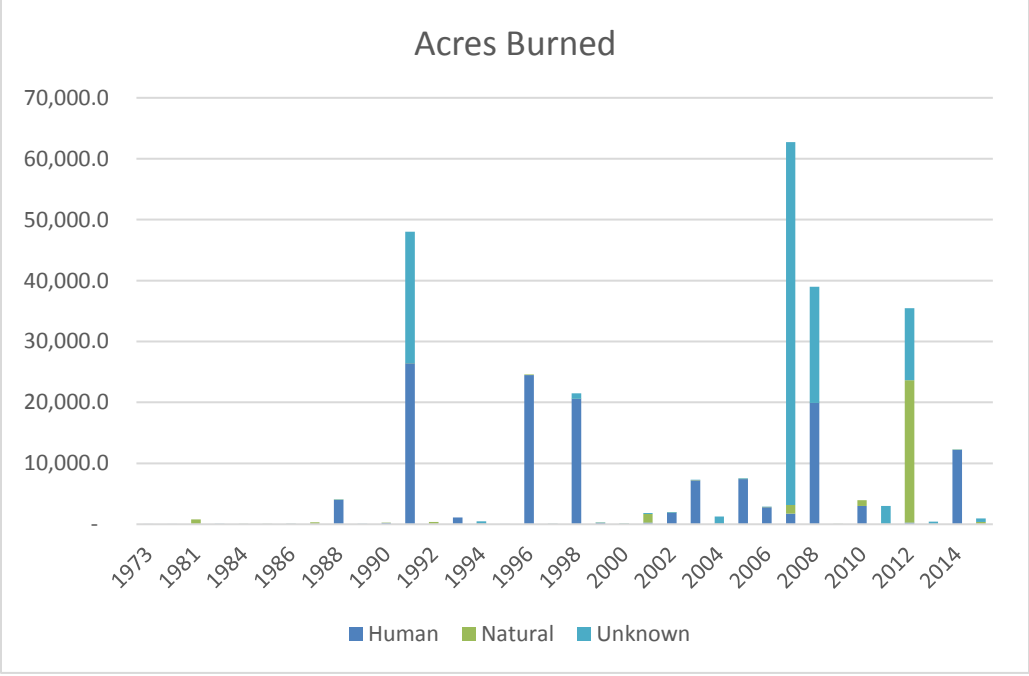
[19] National Interagency Fire Center. Wildland Fire Summary and Statistics Annual Report 2015. Available online at http://www.predictiveservices.nifc.gov/intelligence/2015_Statssumm/annual_report_2015.pdf.

Table 4.3. Total Fires and Acres 1980-2015 Nationally.

Year	Fires	Acres	Year	Fires	Acres
2015	68,151	10,125,149	**1997**	89,517	3,672,616
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

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 4.3. Summary of Lincoln County State and Federal Acres Burned by Cause.



The fire suppression agencies in Lincoln 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

Lincoln 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 Lincoln 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 Lincoln 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.

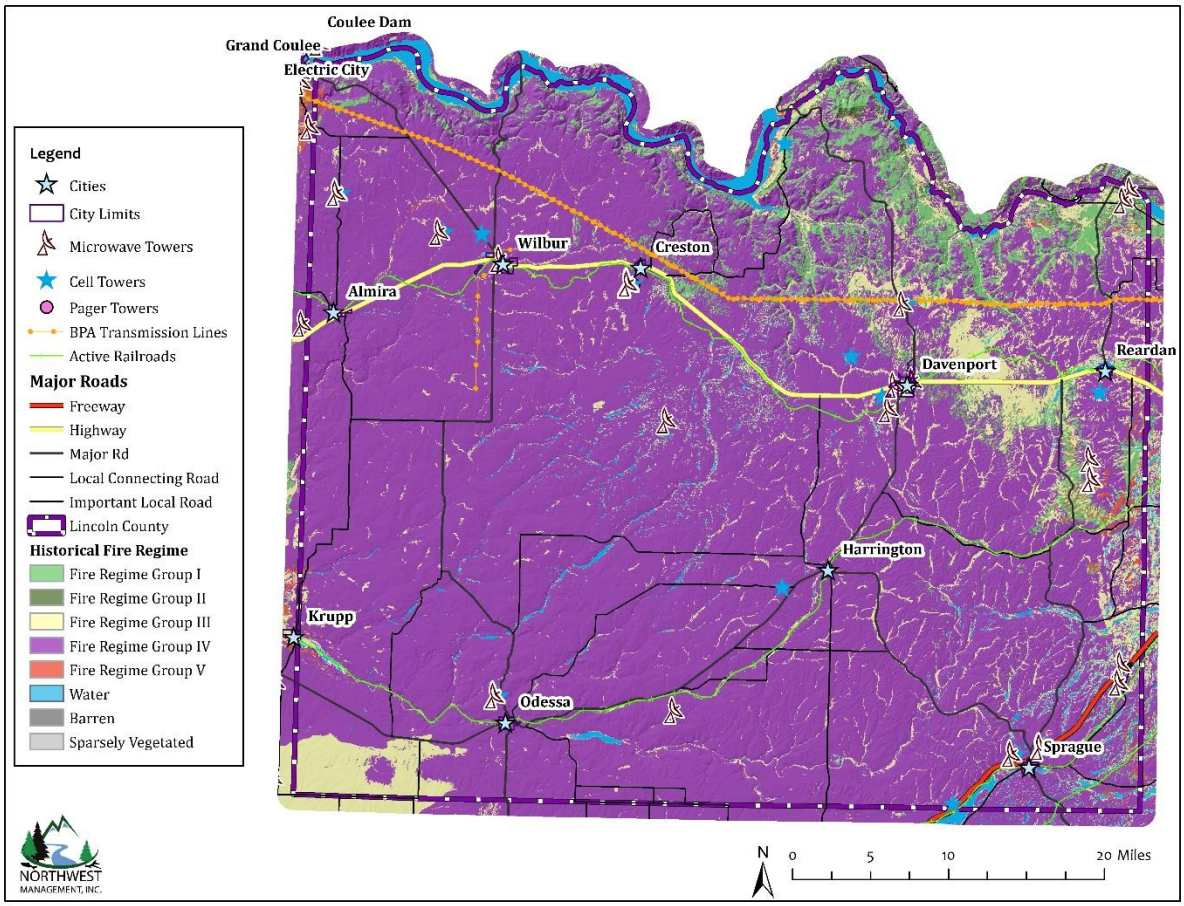
Table 4.4. Historic Fire Regimes in Lincoln County.

Historic Fire Regime	Description	Percent of Total
Fire Regime Group I	<= 35 Year Fire Return Interval, Low and Mixed Severity	5.2%
Fire Regime Group II	<= 35 Year Fire Return Interval, Replacement Severity	0.2%
Fire Regime Group III	35 - 200 Year Fire Return Interval, Low and Mixed Severity	9.8%
Fire Regime Group IV	35 - 200 Year Fire Return Interval, Replacement Severity	83.0%
Fire Regime Group V	> 200 Year Fire Return Interval, Any Severity	0.5%
Water	Water	1.2%
Barren	Barren	0.0%
Sparsely Vegetated	Sparsely Vegetated	0.0%
	Total	**100%**

This model uses only 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 4.4. Historic Fire Regime for Lincoln 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.[20, 21] Coarse scale definitions for historic fire regimes have been developed by Hardy et al[22] and Schmidt et al[23] 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. [24] 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.[25,26] 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 Lincoln County shows that the majority land in the county that has not been converted to agriculture (31%) is considered highly departed (55%) from its historic fire regime and associated vegetation and fuel characteristics. Less than 1% has a low departure and over 11% is considered moderately departed.

Table 4.5. Vegetation Condition Class in Lincoln County.

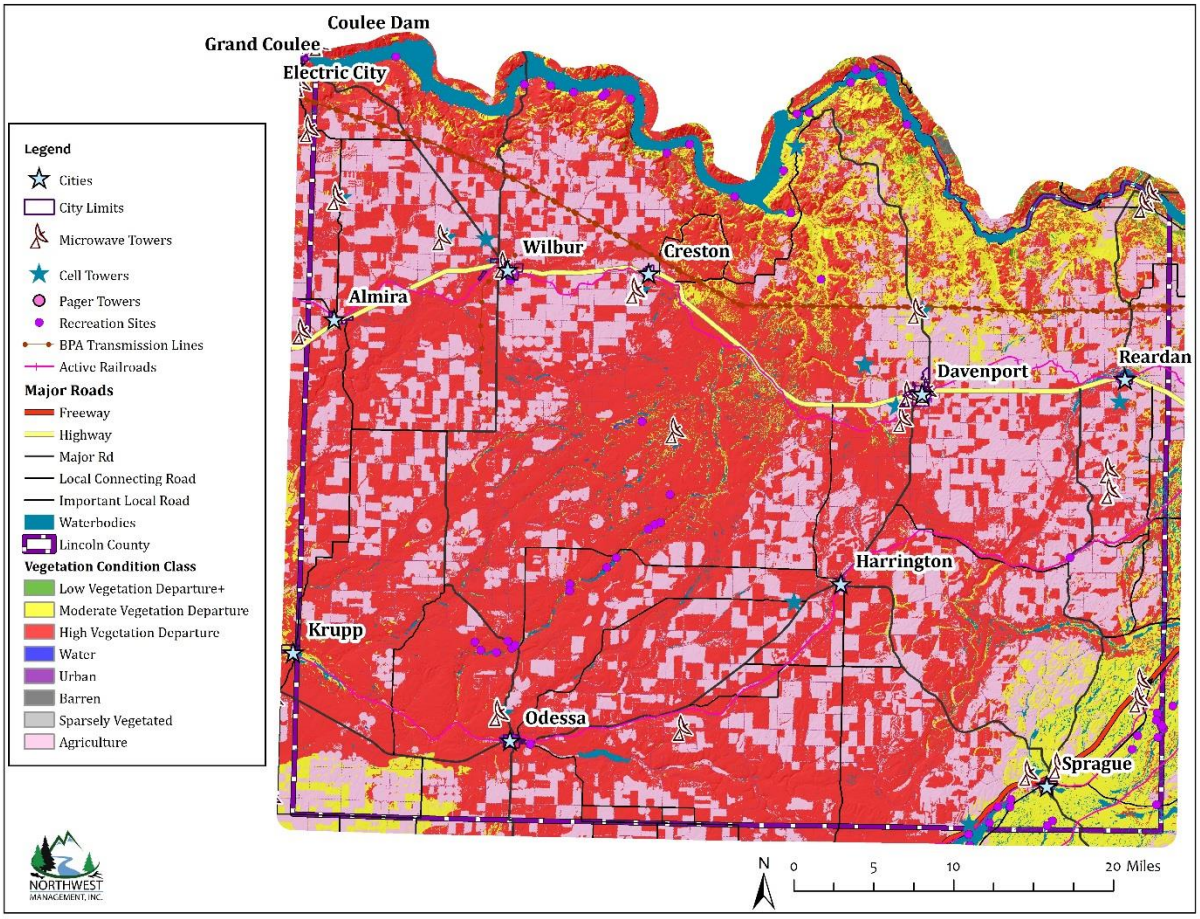
Vegetation Condition Class	Description	Percent of Total
Vegetation Condition Class I	Low Vegetation Departure	<1%
Vegetation Condition Class II	Moderate Vegetation Departure	11%
Vegetation Condition Class III	High Vegetation Departure	55%
Agriculture	Agriculture	31%
Water	Water	1%
Urban	Urban	2%
Barren & Sparsely Vegetated	Barren & Sparsely Vegetated	0%
	Total	**100%**

[20] Agee, J. K. Fire Ecology of the Pacific Northwest forests. Oregon: Island Press. 1993.
[21] 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.
[22] Hardy, C. C., et al. *"Spatial data for national fire planning and fuel management."* International Journal of Wildland Fire. 2001. Pp 353-372.
[23] 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.
[24] 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.
[25] Hardy, C. C., et al. *"Spatial data for national fire planning and fuel management."* International Journal of Wildland Fire. 2001. Pp 353-372.
[26] 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.

The current Vegetation Condition Class model shows that much of Lincoln County is considered to be highly departed. A concentration of the highly departed vegetation occurs throughout the county. 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 4.5. Vegetation Condition Class.



Lincoln 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.[27] "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".[28] The role of the federal agencies in Lincoln 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.[29] 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. [30]

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

[27] 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.
[28] 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
[29] 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
[30] 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.

crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior;[31]

- Improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

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, Lincoln 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 and does not occur in Lincoln County.

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

- Interface Condition: WUI
- Intermix Condition: WUI

[31] McCoy, L. K., et all. Cerro Grand Fire Behavior Narrative. 2001.

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

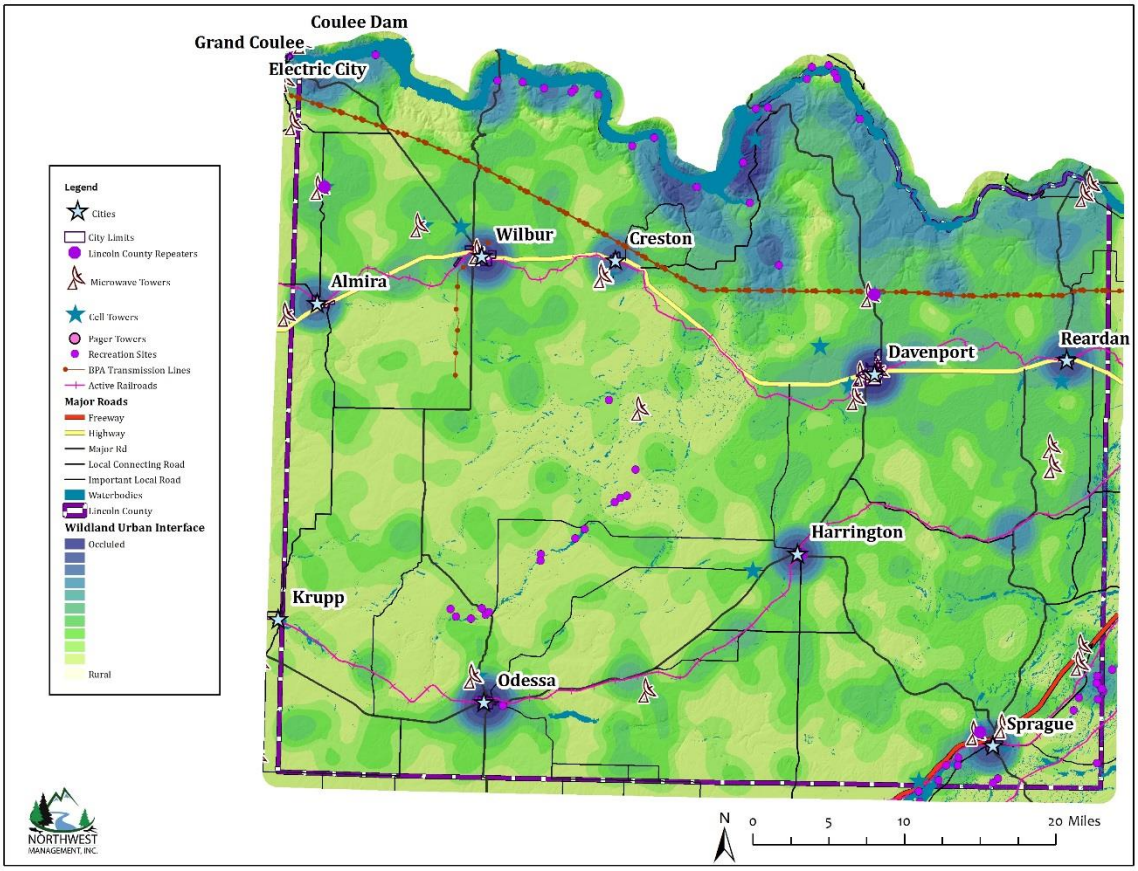
Lincoln County's wildland urban interface (WUI) is primarily based on population density. Relative population density across the county was estimated using a GIS based kernel density population model that uses object locations to produce, through statistical analysis, concentric rings or areas of consistent 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 Lincoln 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 Lincoln 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 Lincoln County WUI is included in Appendix 1.

Figure 4.6. Wildland Urban Interface in Lincoln 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

Lincoln 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 Lincoln 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.[32]

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 Lincoln 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 Lincoln 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 Lincoln 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

[32] "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. 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 Lincoln County were consulted in order to address specific areas of concern and document local wildfire suppression operational tactics.

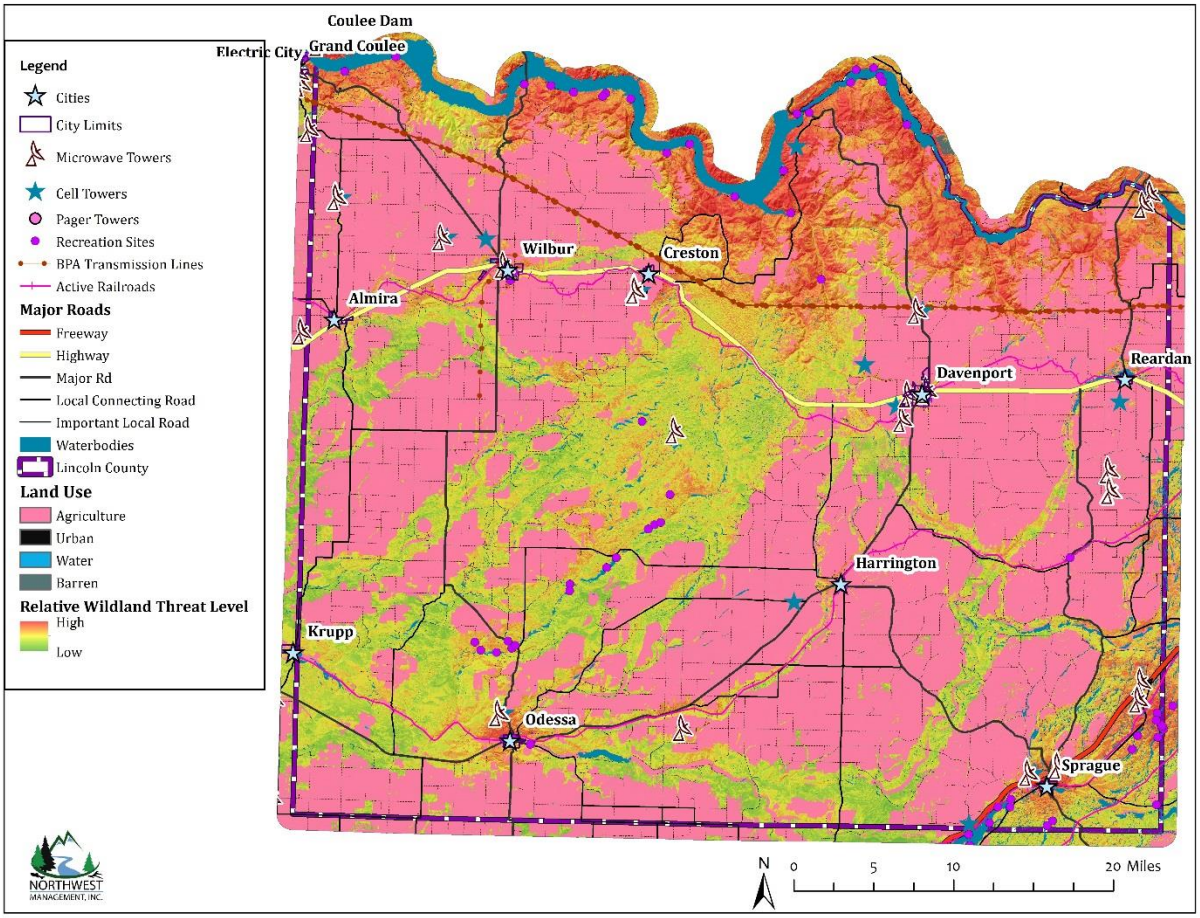
Determination of Relative Threat Level

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 Lincoln 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 Lincoln 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 Lincoln County. A map showing the identified Lincoln County Relative Threat Level is included in Appendix 1.

Figure 4.7. Relative Threat Level Map for Lincoln County.

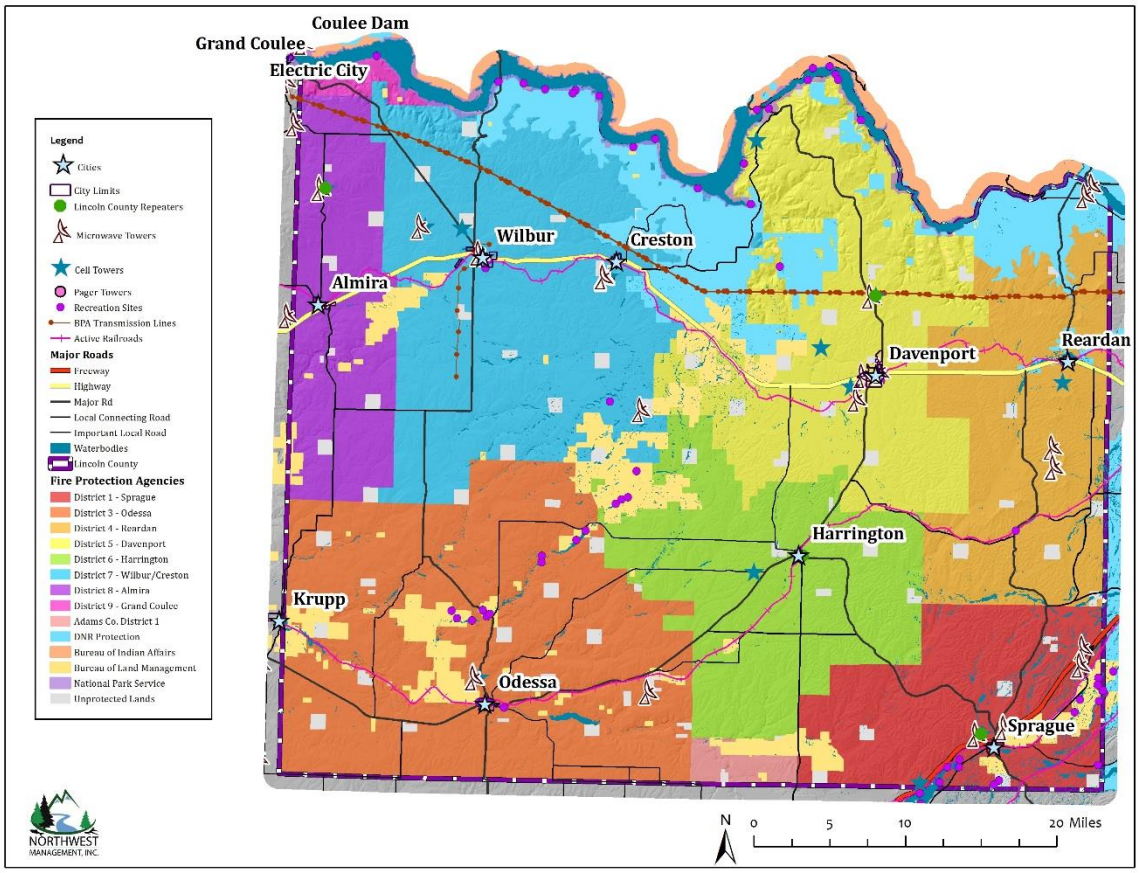


Overview of Fire Protection System

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.

Figure 4.8. 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.

Wilbur Fire Department

Department Summary: The town of Wilbur is located in west central Lincoln County. It has a population of 900 and is 4 square miles. The town fire department has the same personnel as Lincoln County Fire District #7. The department shares the Wilbur fire station with District #7; however, the department does have its own fire equipment. The Wilbur Fire Department has 2 city pumper trucks and 2 Basic Life Support ambulances.

Issues of Concern: The town of Wilbur is surrounded by sage brush, CRP, and wheat fields. It also has 2 petroleum storage plants and 2 large grain elevators. With these potentially high risk components as well as many old buildings, the department's resources could easily be exhausted with any type of fire.

District Needs: The town of Wilbur needs many more fire hydrants for both structure fires and wildland fire defense. The department needs the new generation fire shelters to be able to stay in compliance with new regulations. Funding sources for the department are very scarce. With ever changing federal policies, the Wilbur Department could be required to purchase additional equipment and personal protective equipment in the near future.

Lincoln County Fire District #1

District Summary: Lincoln County Fire District #1 is a volunteer fire district that provides all fire and ambulance services for 400 square miles in the southeast corner of Lincoln County. The topography is typically agricultural, steppe plateau, and channeled scab lands. The district contains approximately 63 households consisting of a total of approximately 200 persons. Also in the district's service area are the City of Sprague, 17 miles of Interstate 90, 17 miles of the Burlington Northern rail line, and 10 miles of Union Pacific rail line. Each day 32,000 automobiles pass through the district on Interstate 90 alone. The Interstate is responsible for two out of every three emergency calls. Interstate 90 provides no tax revenues to the district and does not in any way contribute to staffing levels.

The district carries a roster of 22 volunteers regularly. Of these volunteers, many are only available on a limited basis. Between the railroad, Interstate, and local lake resorts there are many potential ignition sources during the summer months. In 2008, the district responded to 25 active fires. These fires ranged from small confined fires to large fires consuming hundreds of acres. Most resulted from unintentional human ignition caused by vehicles on the Interstate or the 57 trains that travel through the district every 24 hours.

Issues of Concern: Lincoln County Fire District#1 has identified several issues that need to be addressed. Inadequate daytime staffing during summer months has been a very high concern. The district relies on a small community to provide the volunteer manpower to carry out operations that require many trained firefighters to safely and efficiently execute.

In addition to staffing, the district fire station has become inadequate to house the district's apparatus. The current station is leased from the City of Sprague and is too small to house all of the districts equipment and apparatus. There is inadequate room for regular meetings and volunteer training sessions, which are essential to firefighting operations. In December of 2008, the current station sustained damage from six feet of snowfall. At this time, the walls of the station are cracked through to the outside showing daylight through the damaged areas. The structural integrity of the building is significantly threatened by these cracks as well as the location of the building in a floodplain. Replacement of the current building is imperative to the safety and continued operations of Lincoln County Fire District #1.

Water supply has also been identified as a concern. At this time the district relies on one water tender with a 4200 gallon capacity. Once empty, the water tender must leave a fire scene to re-fill.

Training to National Wildfire Coordination Group (NWCG) requirements has vastly improved at Lincoln County Fire District #1, but the task has been difficult. At this time, the district has half of its volunteers trained to Firefighter 2 standards. Necessary classes have been hard to come by during months when the primarily agricultural-based community members are available. Currently, the district has no members qualified to teach these classes or refresh the firefighters on an annual basis as required by NWCG. The training is expensive and time consuming.

District Needs: The district has been actively pursuing remedies to the above mentioned issues of concern. Members are trying very hard to attend classes that will allow them to advance their wildland certification. The district desperately needs qualified individuals who are available to teach classes on flexible schedules. The most appropriate solution to this problem is to have persons in the district who are carded and qualified to teach the classes.

The district also needs a second water tender with two large drop tanks that would allow shuttle operations on a fire scene. A grant has been applied for through the AFG grant program to achieve this goal. The district does not have the revenues to complete this project without grant funding.

The most feasible solution to the fire station and staffing concern is the construction of a new fire station and the creation of a residency program including the hiring of three firefighters for the summer months. The new fire station will replace a 60 year old failing station that is inadequate for current operations. The district is actively pursuing funding for this project through US Senate appropriations due to a lack of funding elsewhere.

Lincoln County Fire District #3

District Summary: Fire District #3 is a large district with 622 square miles and only 598 residents. It contains large areas of sage brush with very few natural fire breaks.

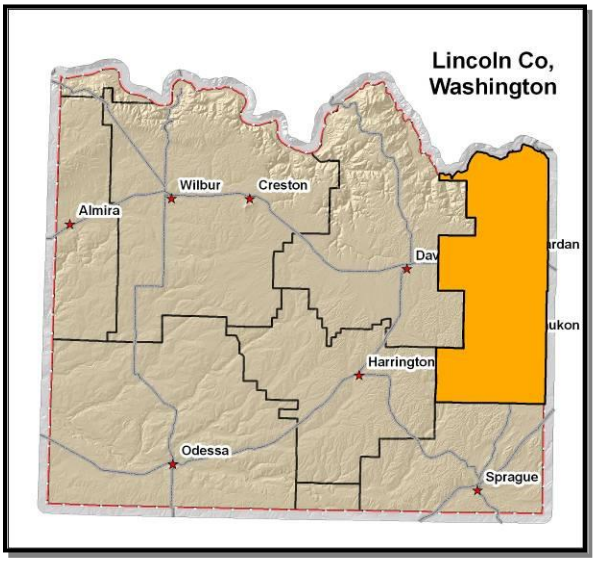
Issues of Concern: New laws are passed without any funding to implement them. Every year it gets harder to find firefighters who are willing and able to respond to calls.

District Needs: Fire District #3 needs a new station, updated trucks, and more volunteers in rural areas.

Lincoln County Fire District #4

District Summary: Lincoln County Fire District #4 protects 288 square miles consisting of farm ground, scablands, timber; and the Town of Reardan and the communities of Edwall, Long Lake, and Waukon. District staffing consists of 12 volunteers at Edwall, 20 volunteers at Reardan, and two volunteers at Long Lake. Paging is handled by the Lincoln County Sheriff. In 2015, the District responded to 150 calls with 80% being calls for EMS.

District #4 is a participant in the Lincoln Countywide Mutual Aid Agreement and has agreements with Spokane County Fire Districts #3 and #5 and Stevens County Fire District #1. District #4 has an automatic response with Spokane County District #5 on structural fires and some EMS calls and has an automatic response when wildland dispatch is high. A DNR agreement is in place for areas north of Highway 2.



There are currently 5 District #4 volunteers with Red Cards; the firefighters have department training in wildland firefighting and the District has not committed to Statewide mobilization.

Issues of Concern: Communications for District #4 are provided through LComm (Lincoln County Communications) with several repeaters. The problem is that the areas north of Reardan, especially by the Spokane River, have very little reception. The repeater on Magnuson Butte has not always provided the coverage around Edwall it was supposed to provide and has led to crews from Reardan and Edwall not being able to communicate. The switch to narrow band has exacerbate coverage problems.

District #4 is always trying to keep current with new standards and replace vehicles in a timely manner; however, budget constraints continue to make this difficult.

Wildland/Urban interface areas are expanding north of Reardan and east of Edwall. Several of these developments have poor access roads and signage that make response to these areas difficult and often dangerous.

Water supply outside the limits of Reardan, Edwall and Long Lake are handled by tender shuttle with some help from the local farm chemical companies. A good water source north of Reardan near the Spokane River would reduce turnaround times.

District Needs: The District is in need of wildland equipment including fire shelters, back pack pumps, hand tools, and the ability to upgrade/replace these items on a regular basis. Also newer personal protection clothing to replace the banana suits currently in use and the ability to upgrade/replace on a regular basis are a necessity.

The District's vehicle needs include a Class A Pumper for Edwall and brush/attack engines to replace some of the 30+ year old vehicles currently in service. The addition of smaller wheel base wildland Engines would help with response.

Communication needs include anything that would improve current coverage and will be able to adapt to future requirements.

District #4 needs to improve its available water resources. Specifically, the addition of two storage tanks north of Reardan in the Bald Ridge area and along Highway 231 or the installation of permanent wells would drastically improve the District's turnaround time. Highway 231 could have its needs filled by being having the necessary equipment to hook into existing irrigation systems; however, this only works when the fields are actively being irrigated.

Lincoln County Fire District #5

District Summary: Lincoln County Fire District #5 covers 395 square miles of north central Lincoln County with the Spokane and Columbia Rivers as the northern border and Bluestem as the southern border. The east boundary is midway between Reardan and Davenport while the west boundary is the Telford rest area.

The district has three stations; one in Davenport, one at Egypt, and one at Deer Meadows. There are approximately 45 volunteer firefighters in the district. The district does contract with the DNR for fire patrols in the timbered areas of the district.

The southern portion of the district is comprised of dryland farming (primarily wheat and barley), CRP, and rangeland. The northern portion of the district is mixed with heavy timber as well as a heavy concentration of urban interface along the edges of the two rivers. These structures are both recreational homes as well as permanent residences. There are estimated to be nearly 500 homes within the district's coverage area.

Issues of Concern: Being in an area with approximately 18 inches of annual rainfall, all of the vegetation becomes tinder dry throughout July, August, and September. These are typically the months when the district receives the greatest number of calls. Lincoln County also tends to get numerous lightning storms during this time. The Hawk Creek area north of Davenport has historically received a great number of lightning strikes in the timbered areas. The Hawk Creek area has also seen significant growth in the number of structures being built on the timbered hillsides. Ingress and egress are also an issue of concern for many of the housing developments throughout the district. They are typically one way in, one way out. Water access is limited in many of the rural areas; thus, tanker trucks are required to shuttle water to supply the firefighting units.

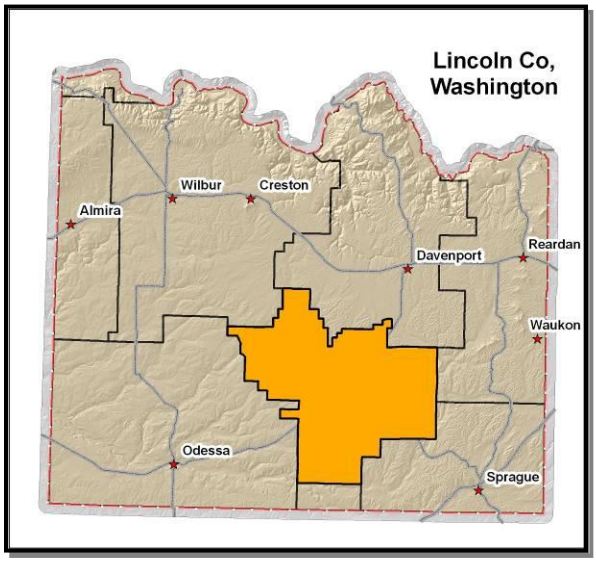
As a 100% volunteer department, personnel are limited during the heavy fire season due to vacations, weekends with the family, or their regular employment.

District Needs: An urban interface truck is needed as the residential growth continues. Also, the federal government is mandating the use of narrow band for radio communication; thus, new,

narrow band compatible communication equipment will be required and additional repeater sites will be needed to provide adequate communication in the canyons and other remote areas. The district also needs to build a multi-agency fire/EMS station with bays for both fire trucks and ambulances with OSHA-approved exhaust removal systems, meeting rooms, offices, and residency quarters for both organizations.

Lincoln County Fire District #6

District Summary: Lincoln County Fire District #6 currently has 22 volunteers serving a population of approximately 700 residents spread over 292 square miles. The fire station is located in the town of Harrington with 3 trucks stationed remotely during fire season. The primary land use in this area is dryland agriculture. The south, east, and western regions of the district have channeled scablands. The district also protects 24 sections of state and federal land.



Issues of Concern: The district has many square miles of land in its Emergency Medical Service coverage area that has limited accessibility. The lack of roads in the southern and west portions of the district makes those areas difficult access and; therefore, provide adequate service. Hundreds of acres of CRP grass is scattered throughout the district with no fuels breaks to separate the unmanaged CRP from the productive agricultural ground. State and federal lands are not currently grazed as much as they were historically, which is adding to the fine fuel load within those areas (see also "Fire Protection Issues" section at the end of this chapter). A major railroad also runs through the district that carries thousands of oil tanker cars annually from Seattle enroute to Spokane, and beyond, often causing fire ignitions.

District Needs: The district would like to improve its fleet of trucks to better serve the outlying areas.

Lincoln County Fire District #7

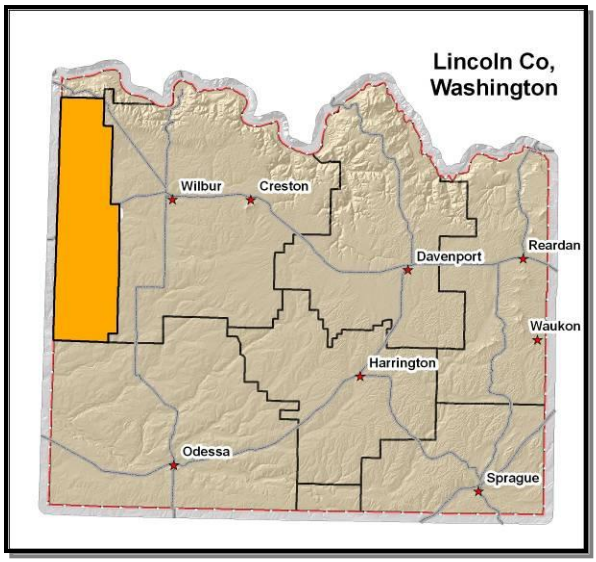
District Summary: Lincoln County Fire District #7 encompasses 520 square miles and serves a population of approximately 2,000. The district maintains a station in Wilbur, Creston, and Lincoln. There are 34 volunteer firefighters serving the Wilbur station, 18 serving the Creston station, and 12 serving the Lincoln station. Presently, all of the district's communication equipment is capable of narrow banding.

Issues of Concern: Fire District #7 is also concerned with additional acres being bought by the federal government. Additional government property within the district reduces their tax base resulting in less money for the fire district. Additionally, the federally managed land is not being grazed as intensely as it was historically causing more fine fuel buildup and therefore, higher potential fire risk (see also "Fire Protection Issues" section at the end of this chapter).

District Needs: Fire District #7 is in need of additional wildland and structural turnout gear as well as updated fire shelters. The district also needs three fire trucks (one for each station). The Creston Station needs an addition to house two fire engines that are currently being stored outside. The Lincoln Station needs an addition for equipment storage.

Lincoln County Fire District #8

District Summary: Lincoln County Fire District #8 is located in the northwest corner of Lincoln County, Washington. It consists of 168 square miles. The district is narrow spanning seven miles at the widest point and nearly thirty miles in length with a centrally located station in Almira. The Almira station currently has one structural engine, one tender, one light rescue, and four type 3 brush engines and one type 6 brush engine. There are twenty-five volunteer firefighters, ten of which are red card certified and eight have EMS certification. Almira is the only town in the district. Fire District #8 has an approximate population of 750 residents and 300 residential structures. The rolling terrain varies in elevation from 2,818 feet at its highest to just below 1,600 feet. Most of the land is used for agriculture that is a variety of crop fallow rotation to yearly re-cropping. Over the last two decades an ever growing amount of cropland has been removed from production and placed into native grasses under the CRP program. A smaller percentage of the land in District #8 is used for grazing or left unmanaged. It is very challenging to provide fire suppression services to these areas due to the lack of accessibility.



Issues of Concern: One issue in District #8 is that it has a large amount of land with little accessibility and no man-made or natural fuel breaks. In the southern end, there are two large conjoining canyons with a mixture of private and public lands. There are only a couple vehicle access points. A related issue is the growing amount of CRP ground. Due to the lack of use on the roads in these areas, there is less of a need for maintenance leaving fewer, smaller fuel breaks. Another concern is the lack of proper communication with the closing of the narrow band line for radios. District #8 will be left with more "dead" spots in their communication system.

District Needs: District #8 has similar needs to other districts throughout the county. Training is and should always be number one. There is nothing more important than making sure all of the district's firefighters go home safely. Red card classes should be a must for every firefighter. This would help bridge the gap between how the district should fight fires and how the district wants to fight fires. With the transition to narrow band, many additional repeaters will be necessary

for effective communication. Finally, the district will need state and federal help on prescribed burns to establish strategically, located fuel breaks.

Lincoln County Fire District #9

D**istrict Summary:** Currently, Fire District #9 contracts with the Grand Coulee Fire Department in neighboring Grant County for fire protection services.

Issues of Concern: Residents in District #9 are concerned that fire apparatus dispatched out of Grand Coulee has a slow response time to the mid and eastern end of the district due to the longer distance. There are several rapidly developing residential areas along Lake Roosevelt that are intermingled with high risk fuels and have poor access. Representatives from Fire District #9 are currently trying to gather support and funding for the construction of a station and establishment of a functional fire department within the District.

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 maintains a statewide fire support system of which the Southeast Region of the DNR supports Yakima, Chelan and Kittitas County with resources to educate the public on fire risks and resources to suppress fires on private and state lands that are under various "patrol assessment" structures.

Cooperative Agreements in Lincoln County: There are no formal agreements between the local fire districts of Lincoln County and the Washington DNR.

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

Washington Department of Fish and Wildlife

Summary: The Swanson Lakes Wildlife Areas is approximately 21,000 acres with about 1,280 of that leased from the Department of Natural Resources. Managed as one unit, Swanson Lakes is located in Lincoln County about 10 miles south of the town of Creston in the upper portion of the Crab Creek Watershed. It has numerous pothole lakes, a handful of rim rock lakes, and on intermittent stream, Lake Creek, a tributary of Rock Creek. Within the channeled scablands of the Columbia Plateau, it also includes plateaus, buttes, and channels. Shrub-steppe and riparian/wetlands are the main habitats. Much of the area is rangeland with some old CRP fields and several hundred acres of restored grassland habitat. A small amount of leased cropland produces cereal grains and hay. Elevation ranges from about 1,640 feet in the southwest to about 2,490 feet in the northeast. Swanson Lakes was acquired mainly between 1993 and 1997 as a Bonneville Power Administration wildlife mitigation project, primarily for Columbian sharp-tailed grouse, a state threatened species. It also supports a mix of species including mule deer, upland game birds, raptors, songbirds, and several reptiles and amphibians.

The WDFW has agreements with the adjacent local fire districts and the DNR to provide fire protection in the Wildlife Area.

Issues of Concern: There are currently no safety zones around the Swanson Lakes Wildlife Area office. There are a few fire breaks planned near the Swanson Lakes area. These will be vital projects since large fires continue to threaten this area.

National Park Service

District Summary: The National Park Service, Lake Roosevelt National Recreation Area contracts with the Washington DNR for fire suppression services; however, one type 6 engine is available with 3-6 firefighters in the Kettle Falls or Fort Spokane area on a limited basis from April 1 to November 15.

Issues of Concern: Defensible space around private homes adjacent to NRA lands is being addressed by fuel reduction crews on NRA lands, but is still a concern since many areas have not received treatment that need it. A landowner that has a structure adjacent to NRA lands may ask the Recreation Area to assess and provide assistance if needed, land owner education is still a priority.

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 Lincoln 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.

Urban and Suburban Growth

One challenge Lincoln 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 Lincoln 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 Lincoln 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 Lincoln 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.

In most western states, state and federal agencies that have wildland fire protection responsibilities have launched a campaign to reiterate to the public that they do not provide structural fire protection. Much of the increasing costs of wildland fires can be directly related to the increasing number of structures in the wildland urban interface. State and federal agencies are trying to make it clear to the public that land and homeowners are responsible for reducing the fire risk on their property and that the agencies are not responsible for or required to provide structural protection.

The CWPP planning committee has made several recommendations targeting increased wildland fire awareness and education for residents living in or moving into the wildland urban interface of Lincoln County.

Fireworks

Due to Lincoln County's close proximity to both the Spokane and Colville Reservations, fireworks are increasingly available to the public in Lincoln County. Even with the existing fireworks ban during periods of high wildland fire risk, the use of fireworks, particularly in recreational areas (which are not allowed by federal statute year-round within Lake Roosevelt NRA), is high. Both the CWPP planning committee and local residents have noted fireworks as a high risk factor for wildfire ignitions. So far, they have not resulted in large fires; however, there are several documented ignitions due to fireworks within Lincoln County.

The CWPP planning committee has identified fireworks as a serious threat to Lincoln County, and thus, has made recommendations for strict regulations and active enforcement of all fireworks-related restrictions.

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 Lincoln 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.

One of the main goals of this CWPP is to identify areas with a high risk of experiencing wildland fires and take direct actions to mitigate those risks. However, in areas where mitigation may be difficult or will take a long period of time to implement, pre-disaster and emergency planning measures have been recommended.

Accessibility

Fire chiefs throughout the County have identified home accessibility issues as a primary concern in some parts of Lincoln County. Many existing housing developments and private driveways have been constructed without regard to access requirements of large emergency vehicles. Additionally, many of these roads are several miles long and dead end with no warning or plans for future connections to other access roads. The lack of road connectivity and general accessibility in some areas restricts engagement by fire suppression resources. Continued enforcement of Lincoln County's current standards regarding road and driveway construction regulations for fire apparatus would prevent accessibility issues in new developments. Wildfire risk can be lessened and firefighter safety can be improved by keeping vegetation including tall grass, brush, and trees a safe distance from the road right-of-way. This will not only improve accessibility, but will also allow the road to serve as a control point for suppression activities.

Additionally, the fire districts have identified several unimproved and unmaintained county roads that could serve as strategic access points for fire suppression activities if they were maintained periodically for this purpose. In some cases, these roads are partially maintained, but are limited by inadequate or nonexistent bridge crossings.

The planning committee involved in the development of this CWPP found accessibility to be one of the primary difficulties with safe emergency ingress and egress. It is a clear goal of this planning process to continue the enforcement and maintenance of the current road standards countywide. As part of this process, the committee has recommended an action item for improvement of existing substandard roads, driveways, and bridges, where necessary, to improve firefighter safety and suppression effectiveness.

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.

Re-introduction of Grouse Species

The Washington Department of Fish and Wildlife (WDFW), in cooperation with the BLM and the Colville Confederated Tribes, are actively working on the reestablishment of both Columbian sharp-tailed grouse and greater sage-grouse in Lincoln County. Declining populations and distribution of the species in Washington have resulted in serious concerns for their long-term conservation status. The WDFW has begun translocating birds from viable populations in the region to release sites in the Swanson Lakes area.

The CWPP planning committee is concerned that some of the proposed fuels treatments recommended in this document may interrupt the successful establishment of both sage-grouse and sharp-tailed grouse populations in Lincoln County. The protection of these species must be balanced with the need to reduce the wildland fire hazards. The committee agreed that the implementation of fuels reduction projects in potential grouse habitat sites should consider methods that alleviate undue stress on the birds. The planning committee believes that the removal of small portions of grouse habitat in strategic areas may serve as a way to protect larger acreages of habitat from loss due to wildfire. However, every effort should be made to conserve important grouse habitat whenever possible.

Fire-Resistant Construction Materials

Due to the multitude of highly publicized wildland-urban interface fires occurring in the western states, there has been an increased level of research, development, and marketing of more fire-resistant construction materials. Information on high risk materials as well as fire-resistant alternatives can be readily found online or through local fire departments.

The planning committee has recommended that additional education regarding wildfire awareness issues and fire-resistant construction materials be provided to those engaged in new construction projects.

Conservation Reserve Program

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.

Due to the difficulties involved with conducting fuel reduction projects on CRP land as well as the enormity of the task in Lincoln County (154,108 acres), the CWPP committee has recommended installing three strategically located fuel breaks on CRP land near the communities of Odessa, Harrington, and Davenport. The goal is to protect these communities by lowering the intensity of a wind-driven CRP fire before it threatens homes and other resources. Additionally, a subcommittee has been recommended to elevate this issue to the regional, state, and

Increasing Federal Land Ownership

Federal land ownership in Lincoln County has increased significantly over the last decade. In certain areas, ground that has been in agricultural production for nearly a century has been transferred to the management of the federal government, primarily the BLM. There is a concern that the County tax base has been affected due to these lands being removed from private ownership. It is important to note that land that has been transferred to federal ownership falls under the Payment In Lieu Of Taxes (PILT) program, which are federal payments to local governments that help offset losses in property taxes due to nontaxable federal lands within their boundaries. In 2016, Lincoln County budgeted $277,360 for PILT payments for lands administered by the BLM and National Park Service (NPS). PILT payments are designed to help local governments carry out such vital services as firefighting and police protection, construction of public schools and roads, and search-and-rescue operations and it has been shown that the amount of money paid to a county through the PILT program is actually higher than when taxes were previously paid by private citizens. PILT payments are made directly to the county and the decision on how to distribute the funds is made by the County Commissioners.

Lake Roosevelt National Recreation Area

The planning committee has recognized the northern boundary of Lincoln County not only has some of the highest risk fuels, but this area is also experiencing an increased level of residential development. The National Park Service owns and maintains the shoreline along the Lake Roosevelt as part of the Lake Roosevelt National Recreation Area. Several areas along the lake

have been developed for recreational purposes included boat docks and camping facilities. Additionally, there are numerous areas along the lake that are frequented by recreationists, but are not developed or maintained for that purpose. The dry, high risk fuels in these areas significantly increase the potential for an ignition.

The wildfire risk is high within the National Recreation Area due to its intense public use as well as the potential ignition sources associated with the recreational activities such as campfires, BBQ pits, fireworks (which are not allowed by federal statute year-round within Lake Roosevelt NRA), and the use of motorized equipment. Many of the residents in Lincoln County have noted that the fuels in these areas need to be better maintained by the National Park Service to lessen the probability of an accidental ignition. Furthermore, additional signing and better enforcement of seasonal fire bans would also lessen the wildland fire risk.

The planning committee has made it a clear goal to work with all of the state and federal agencies with ownerships in Lincoln County in order to reduce fuels and lessen the wildland fire risk. Several recommendations and treatment areas have been proposed to accomplish this task.

Volunteer Firefighter Recruitment

The rural fire departments in Lincoln 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).

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.

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.

Communication

There are several communication issues being addressed in Lincoln County. 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 have begun to establish phone trees and contact lists in order to communicate information at the individual scale; however, this is not being done in all of the high wildfire risk areas within the County.

Another 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.

Communication is a central issue for the planning committee; thus, numerous recommendations targeting the improvement of communications infrastructure, equipment, and pre-planning have been made.

Water Resources

Nearly every fire district involved in this planning process indicated the need to develop additional water resources in several rural areas. 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.

The CWPP planning committee has identified development and mapping of additional water resources as a priority action item in this document.

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.[33] According to some statistical analysis, cheatgrass dominated ranges are about 500 times more likely to burn than a native species dominated range.[34] Fire return intervals in steppe and shrub-steppe fuel types, pre-European settlement was typically between 32 and 70 years.[35] In certain Great Basin rangelands, the fire return interval is now less than 5 years on rangelands dominated by cheatgrass.[36]

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.

[33] Pellant, Mike. 1996. Cheatgrass: The Invader That Won the West. Idaho State Office: Bureau of Land Management. 23p.
[34] Platt, K.; Jackman, E.R. 1946. The cheatgrass problem in Oregon. Extension Bull. 668. Corvallis, OR: Oregon State College. 48 p.
[35] Wright, H.A.; Neuenschwander, L.F.; Britton, C.M. 1979. The role and use of fire in sagebrush and pinyon juniper plant communities: a state-of-the-art review. Gen. Tech. Rep. INT-58. Ogden UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 48 p.
[36] Pellant, Mike. 1990. Unpublished data on file at: U.S. Department of Interior, Bureau of Land Management, Idaho State Office, Boise, ID.

Hazardous Materials

A concern within Lincoln 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.

Building and Zoning

County zoning restrictions, in some instances, allow structures to be built within thirty feet of a property line. Therefore, it may be difficult for a homeowner to adhere to the defensible space requirements that are typically advised by organizations such as Firewise.

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.

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.

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.

Current Wildfire Mitigation Activities

Public Education Programs

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.

Mutual Aid Agreements

Currently the cities, towns, fire protection districts, and wildland fire agencies within Lincoln County have extensive mutual aid agreements that serve to increase the protection and effectiveness of all Lincoln County fire response jurisdictions. Municipal and county fire departments provide mutual aid for each other to the fullest extent possible. These agreements significantly improve the capabilities and effectiveness of any and all individual fire departments as well as provide assistance to the state and federal wildland fire teams. Not only does this improve the safety of Lincoln County residents, structures, infrastructure, and lands, but it also facilitates good interdepartmental working relationships.

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 Lincoln County facilitates extensive farming and ranching operations. Agricultural fields occasionally serve to fuel a fire after curing; burning in much the same manner as low grassy fuels. Fires in grass and rangeland fuel types tend to burn at relatively low intensities with moderate flame lengths and only 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.

Forest and woodland fuels are mostly present in the canyons and river breaks on sloping terrain less favorable to clearing for agricultural development. A patchwork of ponderosa pine and Douglas-fir stands occupy sheltered areas on favorable soil where moisture is not a limiting factor. Wooded areas tend to be on steep terrain intermingled with grass and shrubland providing an abundance of ladder fuels which lead to horizontal and vertical fuel continuity. These factors, combined with arid and windy conditions characteristic of the river valleys in the region, can result in high intensity fires with large flame length and fire brands that may spot long distances. Such fires present significant control problems for suppression resources and often results in large wildland fires.

Development is rapidly occurring along the Spokane and Columbia River breaks on the north side of the county. Many people have purchased small tracts of land in this location and built dwellings amongst the trees and shrubs. Scenic vistas and rolling topography with close proximity to Lake Roosevelt National Recreation Area make this area desirable. 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. Within the forest and woodland areas, large fires may easily produce spot fires up to 2 miles away from the main fire, compounding the problem and creating fires on many fronts. 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.

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 Lincoln 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 Lincoln 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 Lincoln 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 Lincoln 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 Lincoln 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. Zoning ordinances that address minimum setback of structures should be revised to increase space between structures and property lines to allow enough space for homeowners to complete sufficient defensible space around their home without having to rely on neighboring property owners to conduct fuel reduction work on their property. 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 widespread across Lincoln County. Vast areas of deep, rich soil deposits provide for extensive agriculture development. Lincoln County is the second highest wheat and barley producing county in the state. Other crops include grass seed, oats, hay and potatoes as well as extensive areas of fallow land set aside in the CRP. Most of these crops are vulnerable to wild fire at certain times of the year. The agriculture landscape is the predominant cover vegetation and fuel type throughout the county dominating the south, northwest and east central portions of the county. Interspersed throughout this landscape are stream channels and rocky scabland areas. Landownership in the agricultural landscape is predominantly private with many sections owned by the State of Washington and scattered federal holdings. The major populated centers within this landscape type include Davenport, Harrington, Creston, Wilbur, Almira and Reardan. Other 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

US Highway 2, and State Routes 23, and 28 are the primary emergency access routes traveling east to west through the county. State Routes 21, 25, 174, 231, and Harrington Tokio road are the primary access routes running north and south. Interstate 90 passes through the southeast corner of the County. 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 Lincoln County. Bridge load rating signs are mostly in place for the existing bridges and do not impose a limitation to access for firefighting equipment.

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. 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. 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 districts in Lincoln County with the exception of Fire District 9 in the northwest corner of the county. The fire districts provide structural fire protection as well as wildland fire protection. Mutual aid agreements between fire districts supplement wildland fire protection when needed. Additional fire protection is provided by the Washington DNR, which provides wildfire protection and suppression on privately owned forestland and state-owned forestland north of Highway 2 in Lincoln County. 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 Lincoln County and has mutual aid agreements with the DNR for protection of forested land. 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

The channeled scablands are a dominant landscape in Lincoln County. 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. The channeled scablands landscape prevails in the central, southern and southeastern portions of the county and along the major waterways of Crab Creek, Blue Stem Creek, Lake Creek and Cow Creek. Landownership is predominantly private with large acreages owned by the State of Washington and the Bureau of Land Management. State ownership includes school sections 16 and 36, and the Swanson Lakes Wildlife Area managed by the Washington Department of Fish and Wildlife. BLM ownership includes large continuous holdings of rangeland with developed campgrounds, lakes, boat launches, and other recreation areas and interpretive sites. Private landownership includes cattle ranches and in holdings of cultivated farmland and CRP fields. Major population centers within the channeled scabland landscape include Sprague, Odessa, and the Fish Trap Lake area. 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

U.S. Highway 2 and State Routes 28 and 23 are the primary emergency access routes traveling east to west through the county. State Routes 21, 25, 174, and 231 are the primary access routes running north and south. Interstate 90 passes through the southeast corner of the county. 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 of the fire districts in Lincoln County. The fire districts provide structural fire protection as well as wildland fire protection. Mutual aid agreements between fire districts supplement the wildland fire protection response when needed. Additional fire protection is provided by the Washington DNR, which provides wildfire protection and suppression on privately-owned forestland and state-owned forestland north of Highway 2 in Lincoln County. 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 Lincoln County and has mutual aid agreements with the DNR for protection of forested land. 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.

Western River Breaks Landscape Risk Assessment

The western river breaks landscape encompasses an area in the northwest corner of Lincoln County in the Columbia River breaks from the county line near Coulee Dam to Keller Ferry. This area is predominantly shrub-steppe grassland on steep broken terrain and escarpments sloping into the southern shore of Lake Roosevelt. 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 at Lake Roosevelt. Landownership in this area is mostly privately held parcels with several large tracts owned by the Bureau of Reclamation, National Park Service, and The Nature Conservancy. Major population clusters include the subdivisions of Columbia Springs, Lake View Terrace Trailer Park, FDR Estates, the Spring Canyon area, and the Keller Ferry area. Subdivision of land for recreational and home site development is widespread along the lakeshore. 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

State Routes 174 and 21 are the primary access routes running through the western river breaks landscape. Other access routes include Spring Canyon Road, various unimproved gravel roads, and private roads into home sites and housing subdivisions. In remote rural areas, unimproved primitive roads are often seasonal allowing access during the dry season only. Limited access within remote areas and lack of maintenance on existing travel routes increases fire suppression response time and has a direct effect on fire spread that could lead to increased fire size and risk 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 Columbia Springs subdivision and Keller Ferry area have access to municipal water supply systems with fire hydrants. Outside these areas, development relies on individual, co-op, or ranch well systems. Creeks, ponds, and developed drafting areas and cisterns provide water sources for emergency fire suppression in the rural areas to a limited extent. Additional water resources distributed and documented throughout the western river breaks landscape are needed to provide a consistent source of water for fire suppression.

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 spotty along the canyon.

Fire Protection

Two fire districts provide structural and wildland fire protection in the western river breaks landscape. Fire District 9 covers the west side of the area from the Lincoln County line east to Kaufman Canyon. Fire District 7 (Wilbur) covers the remainder of the landscape from Kaufman Canyon east to Keller Ferry. Fire District 9 is a newly established fire district that receives fire protection through a contract with the Grand Coulee Fire Department in Lincoln County. Fire

District 7 fire protection equipment is dispatched out of Wilbur. Additional fire protection is provided by the Washington DNR, which provides wildfire protection and suppression on privately owned forestland and state-owned forestland north of Highway 2 in Lincoln County. 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 Lincoln County and has mutual aid agreements with the DNR for protection of forested land. 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 their property line, 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.

Eastern River Breaks Landscape Risk Assessment

The eastern river breaks landscape includes an area of the Columbia and Spokane River breaks in the north central to northeast corner of Lincoln County from Keller Ferry to the eastern county line. This area is a mix of upland forest and shrub-steppe grassland with areas of agriculture on steep broken terrain and escarpments sloping into the southern shore of Lake Roosevelt and the Spokane River. Douglas-fir and ponderosa pine is the predominant forest tree species. Forested areas are widely distributed throughout the eastern river breaks occupying areas with favorable slope, aspect, soil, and moisture. 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. This vegetation pattern exists throughout the landscape from the agricultural fields at the top of the breaks to the shoreline at Lake Roosevelt and the Spokane River.

Landownership in this area is mostly privately held parcels with several large tracts owned by the Bureau of Reclamation, National Park Service, Washington Department of Natural Resources, or

Bureau of Land Management. Subdivision of land for recreational and home site development is widespread along the Lake Roosevelt National Recreation Area. Major population clusters include the subdivisions of Townsend Estates, Devils Gap, Spring Canyon, Moccasin Bay, Porcupine Bay, Seven Bays, Deer Meadows, Keller Ferry, and Hanson Harbor, which are all located in close proximity to the shoreline. In nearly all developed areas, structures coexist with wildland fuels on steep slopes that become a significant fire risk at certain times of the year.

Wildfire Potential

Wildfire potential in the eastern river breaks landscape is high due to past fire exclusion, steep broken terrain and the introduction of invasive grasses. Prior to settlement in the area, the fire regime was small, relatively frequent fires, which created a mosaic or patchwork of shrubs mixed with discontinuous areas of bunchgrass and widely spaced timber. Recent introduction of organized fire suppression along with cattle grazing and land development for agriculture and home sites have disrupted this fire regime allowing widespread establishment of fire-intolerant sagebrush, dense stands of fire tolerant and intolerant timber species, and establishment of invasive grasses. This heavy buildup of brush and timber over vast acres on steep terrain indicates that future fires will be more frequent with higher intensities over larger acreages creating a significant threat to the scattered human occupation of the area.

Ingress-Egress

State Routes 21, 25, 231, Miles-Creston Road, and Mill Canyon Road are the primary access routes running through the eastern river breaks landscape. Other access routes include a variety of unimproved gravel county roads and private roads into home sites and housing subdivisions, many on steep winding grades. In remote areas, unimproved primitive roads are often seasonal allowing access during the dry season only. Limited access within the remote areas and 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 risk 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 access during a wildfire. Many of these roads have 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. 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 eastern river breaks landscape have limited access to an established fire hydrant system. Most rely on subdivision, co-op, or private wells for their water supply. Creeks, ponds and developed drafting areas and cisterns provide water sources for emergency fire suppression in the rural areas to a limited extent. Additional water resources distributed and documented throughout the eastern river breaks landscape are needed to provide a consistent source of water for fire suppression.

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 spotty in the canyon.

Fire Protection

Three fire districts provide structural and wildfire protection in the western river breaks landscape. Fire District 7 (Wilbur) covers the west side of the area from the Keller Ferry to Hawk Creek. Fire District 5 (Davenport) covers from Hawk Creek to Mill Canyon, and Fire District 4 (Reardan) covers fire protection from Mill Canyon to the eastern county line. These fire districts provide structural fire protection as well as wildland fire protection. Additional protection is provided by the Washington DNR, which provides wildfire protection and suppression on privately owned forestland and state-owned forestland north of Highway 2 in Lincoln County. 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 Lincoln County and has mutual aid agreements with the DNR for protection of forested land. BLM also does not provide structural fire suppression.

Potential Mitigation Activities

The mixed fuels and steep, variable terrain present in this landscape are very conducive to rapidly spreading, highly destructive wildfires. During a wildfire event, families in threatened structures would have very little time to protect their homes and evacuate. Due to the location of fire suppression services, response time would be slow. Response may also be limited in many areas due to inadequate access and water supply. 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 on homes and other structures will help reduce the

risk of loss to fire. Homeowners along Lake Roosevelt should be even more vigilant about maintaining a fuel break between fuels between their homes and property line, as fires caused by recreational use can 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.

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 National Park Service, Bureau of Land Management, State of Washington Department of Fish and Wildlife, 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

US Highway 2, and State Routes 23, and 28 are the primary emergency access routes traveling east to west through the county. State Routes 21, 25, 174, 231, and Harrington Tokio road are the primary access routes running north and south. Interstate 90 passes through the southeast

corner of the County. In addition, Neal Canyon road, Kaufman Canyon road, Hansen Harbor road, Martin Canyon road, Jump Canyon road, Redwine Canyon road, Miles-Creston road, Porcupine Bay road, Mill Canyon road, and Little Falls road all access the Lake Roosevelt NRA. Many of these roads accessing the reservoir have very limited ingress/egress. 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 Lincoln 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 Lincoln 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 often narrow canyons, these areas 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 Lincoln 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 Lincoln 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 land management agencies in Lincoln County, including the Washington Department of Natural Resources and the BLM, are participants in the planning process and have contributed to this plan's development. Where available, their schedule of land treatments has been considered in the planning process to improve the correlation between their identified planning efforts and the efforts of Lincoln County.

Lincoln 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.

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 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.

The Lincoln 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.

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 Lincoln 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	2016 Status
6.1.a: Incorporate the Lincoln County Community Wildfire Protection Plan, by reference, into the Lincoln County Comprehensive Plan.	**CWPP Goal #4 & 11** High	**Lead:** Lincoln County Board of Commissioners **Support:** Lincoln County Planning Department	2 years	Renew for 2016
6.1.b: Consider adopting countywide regulations or codes that will improve rural subdivisions' fire resistance as well as ensure new developments are constructed using fire safe standards.	**CWPP Goal #3, 4, 6, 8, and 13** Moderate	**Lead:** Lincoln County Board of Commissioners **Support:** Lincoln County Fire Districts	2 years	In-progress
6.1.c: Distribute Firewise-type educational brochures with building permit applications.	**CWPP Goal #5, 6, 8, and 11** High	**Lead:** Lincoln County Building Department **Support:** Washington DNR Northeast Region	6 months	Renew for 2016

Table 6.1. Action Items in Safety and Policy

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline	2016 Status
6.1.d: Continue pre-planning emergency evacuation routes with specifications for varying conditions.	**CWPP Goal**	**Lead:** Lincoln County Fire Districts **Support:** Lincoln County Sheriff's Department		Omitted
6.1.e: Support prescribed burning as an effective tool to reduce hazardous fuels in the WUI within applicable regulations as is appropriate.	**CWPP Goal #2 and 9** High	**Lead:** Lincoln County Fire Districts **Support:** Washington DNR, NRCS, NPS	3 year	Renew for 2016
6.1.f: 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, specifically around population centers.	**CWPP Goal #2, 3, 5, 6, 8, 11, and 13** Moderate	**Lead:** CWPP Subcommittee **Support:** Lincoln County Board of Commissioners		Completed. County reached out to FSA but could not reach agreement
6.1.g: 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 #3, 4, 6, 7, 8, 11, and 12** High	**Lead:** Lincoln County Board of Commissioners **Support:** Lincoln County Planning Department	2 years	In-progress

Table 6.1. Action Items in Safety and Policy

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline	2016 Status
6.1.h: Begin dialogue between Lincoln County and the Washington DNR, Southeast Region to provide fire protection services on wooded properties south of Highway 2 in Lincoln County.	**CWPP Goal #3, 8, 9, 10, 11, and 13** High	**Lead:** Lincoln County Fire Districts and Washington DNR **Support:** Lincoln County Board of Commissioners	6 months	In-progress
6.1.i: Continue to regulate and actively enforce all fireworks-related restrictions in Lincoln County.	**CWPP Goal #2, 3, 4, and 9** High	**Lead:** Lincoln County Sheriff's Office and Washington DNR **Support:** Lincoln County Fire Districts, NPS	Ongoing	Completed but continue
6.1.j: Develop a local contact list of individuals that could be used in an advisory capacity to fire suppression teams.	**CWPP Goal #3, 7, 10, and 13** High	**Lead:** Lincoln County Sheriff's Office **Support:** Lincoln County Fire Districts	1 year	Completed
6.1.k: Continue to encourage local residents to develop pre-emergency communication plans including phone trees and contact lists.	**CWPP Goal #3, 7, 10, and 13** High	**Lead:** Lincoln County Sheriff's Office **Support:** Lincoln County Fire Districts	Ongoing	Completed but continue

Table 6.1. Action Items in Safety and Policy

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline	2016 Status
6.1.l: Consider adopting a countywide fireworks ban that is in effect prior to the 4th of July.	**CWPP Goal #2, 3, 4, 5, 8, 9, 11, and 13** High	**Lead:** Lincoln County Board of Commissioners **Support:** Lincoln County Fire Districts and Washington DNR		Completed. The County discussed this and determined not to follow through
6.1.m: Obtain the materials and funding to complete and implement the Lincoln County Livestock Evacuation Plan.	**CWPP Goal #3, 4, 5, and 11** High	**Lead:** Livestock Evacuation Volunteer Group **Support:** Lincoln County Sheriff's Office	On-going	A group was formed who developed a list of potential resources that is available in dispatch as well as a phone tree
6.1.n: Develop a campaign to encourage County residents to sign their cell phone numbers up with the Countywide "My State USA" emergency notification service.	**CWPP Goal #3, 7, 10, and 13** Moderate	**Lead:** Lincoln County Sheriff's Office **Support:** Lincoln County Fire Districts, Conservation District, DNR	1 year	New Item

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 Lincoln County residents.

Residents and policy makers of Lincoln County should recognize certain factors that exist today, the absence of which would lead to increased risk of wildland fires in Lincoln 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 Lincoln 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	2016 Status
6.2.a: Implementation of youth and adult wildfire educational programs.	**CWPP Goal #5 and 12** High	**Lead:** Washington DNR, BLM, and Lincoln County Conservation District **Support:** Lincoln County Fire Districts and local schools	Ongoing	Completed but continue

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

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline	2016 Status
6.2.b: Prepare for wildfire events in high risk areas by working with HOA and individual property owners to conduct home site risk assessments and develop Firewise communities	**CWPP Goal #2, 3, 5, 7, 8, and 13** High	**Lead:** Washington DNR **Support:** Lincoln County Conservation District	Ongoing	Completed but continue
6.2.c: Work with WSU Extension, Master Gardeners, and other existing programs to offer firewise landscaping clinics to assist property owners in maintaining fire-resistant defensible space around structures.	**CWPP Goal #5, 8, and 11** Moderate	**Lead:** Lincoln County Conservation District **Support:** Spokane Master Gardeners and WSU Extension	Ongoing	Completed but continue
6.2.d: Develop educational handbook regarding construction in high risk wildfire areas to be handed out with building permits.	**CWPP Goal #5, 8, and 11** High	**Lead:** Lincoln County Building Department **Support:** Washington DNR, Conservation District	2 years	Renew for 2016
6.2.e: Install wildfire safety zones around the Washington Department of Fish and Wildlife office and housing in Creston.	**CWPP Goal #2, 8, and 9** Moderate	**Lead:** Washington Department of Fish and Wildlife	Ongoing/maintain	Completed but continue

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

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline	2016 Status
6.2.f: Investigate potential for the establishment of a developed shooting range near Sprague to reduce fire ignitions in this area.	**CWPP Goal #2, 6, 9, and 11** High	**Lead:** Lincoln County Fire District #1 **Support:** BLM	1 year	In-progress
6.2.g: Work with the National Park Service to identify and treat high wildfire risk areas within the Lake Roosevelt National Recreation Area, particularly in areas experiencing intense public use.	**CWPP Goal #2, 3, 9, and 11** High	**Lead:** Lincoln County CWPP Planning Committee and NPS **Support:** Lincoln County Fire Districts	Ongoing	Renew for 2016
6.2.h: Develop a Lincoln County fire prevention coop to provide a continuing public wildfire education program and better capture defensible space and prevention teachable moments.	**CWPP Goal**	**Lead:** Washington DNR and BLM **Support:** Lincoln County Fire Districts and WSU Extension		Omitted
6.2.i: Develop a forest and range public education program to encourage healthy management of natural resources on private property.	**CWPP Goal #5 and 11** High	**Lead:** Conservation District **Support:** Lincoln County Conservation District, WSU Extension and Washington DNR	Ongoing	Completed but continue

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

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline	2016 Status
6.2.j: Explore creating a grant funded fire prevention position for Lincoln County.	**CWPP Goal #5, 8, and 10** High	**Lead:** Conservation District **Support:** WSU Extension and Washington DNR	2 years then ongoing	Renew for 2016
6.2.k: Provide funding to WSU Extension to be active in Lincoln County	**CWPP Goal #5, 8, and 10** High	**Lead:** Washington DNR **Support:** CWPP committee and Conservation District		New Item

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 Lincoln 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**	**2016 Status**
6.3.a: Inventory, map, and sign all potential evacuation routes and procedures countywide and educate the public on use.	**CWPP Goal #**	**Lead:** Lincoln County Fire Districts **Support:** Lincoln County Sheriff and GIS Departments		Omitted
6.3.b: Inventory, map 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 #7, 8, 10, and 13** High	**Lead:** Lincoln County Fire Districts **Support:** Lincoln County GIS Department	2 years	Partially completed, District #5 In-progress

Table 6.3 Action Items for Infrastructure Enhancement

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline	2016 Status
6.3.c: Support efforts to provide funding for upgrading the emergency service communication infrastructure to provide for better emergency response and notification countywide.	**CWPP Goal #3, 7, 10, and 13** High	**Lead:** L-Comm	Ongoing	Completed but continue
6.3.d: Improve ingress/egress and create fuel breaks by conducting roadside fuels treatments.	**CWPP Goal #2 and 8** High	**Lead:** Conservation District **Support:** Lincoln County Road Department, BLM & WDFW	Ongoing	Renew for 2016
6.3.e: Re-establish water crossing at Sinking Creek on Smith Prather Road North to provide access to this area for fire suppression apparatus.	**CWPP Goal #3, 7, 8, and 13** High	**Lead:** Lincoln County Road Department **Support:** Lincoln County Board of Commissioners	5 years	
6.3.f: Replace bridge and maintain road surface between Walter Road East and Smith Road East to provide access for fire suppression apparatus.	**CWPP Goal #3, 7, 8, and 13** High	**Lead:** Lincoln County Fire District #6 **Support:** Area landowners	5 years	

Table 6.3 Action Items for Infrastructure Enhancement

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline	2016 Status
6.3.g: Investigate the development of existing high volume wells located on National Park Service property near Sterling Valley Road for fire suppression purposes.	**CWPP Goal #3, 7, 8, 9, and 13** Moderate	**Lead:** National Park Services **Support:** Washington DNR and Lincoln County Fire District #7	2 years	Completed
6.3.h: Investigate the use of the "Instant Alert" school district evacuation notification system as a short term alternative to implementation of a Reverse 911 system.	**CWPP Goal #**	**Lead:** Lincoln County School Districts **Support:** Lincoln County Sheriff's Office		Completed

Resource and Capability Enhancements

There are a number of resource and capability enhancements identified by the rural and wildland firefighting districts in Lincoln 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	2016 Status
6.4.a: Develop additional water resource sites to supplement fire suppression efforts throughout Lincoln County. - Douglas/Sorensen Road - Kiner/Monson Road - Bald Ridge north of Reardan -Highway 231 north of Reardan -Junction of Neal Canyon/Spring Canyon Roads	**CWPP Goal #8, 10, and 13** High	**Lead:** Lincoln County Fire Districts **Support:** Lincoln County Conservation District	Ongoing	Renew for 2016

Table 6.4 Action Items for Resource and Capability Enhancements

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline	2016 Status
6.4.b: Improve departmental capability by establishing a program to increase the retention and recruitment of volunteer firefighters.	**CWPP Goal #3, 10, and 13** High	**Lead:** Lincoln County Fire Districts	Ongoing	Renew for 2016
6.4.c: Update personal protective equipment for all fire districts in Lincoln County.	**CWPP Goal #3, 10, and 13** High	**Lead:** Lincoln County Fire Districts **Support:** Washington DNR	Ongoing	Renew for 2016
6.4.d: Enhance radio availability in each district, link to existing dispatch, improve range within the region, and convert to a consistent standard of radio types.	**CWPP Goal #3, 7, 8, 10, and 13** High	**Lead:** L-Comm **Support:** Lincoln County Fire Districts	Ongoing	Completed but continue
6.4.e: Obtain funding for three additional apparatus and portable generators for Fire District #7.	**CWPP Goal #2, 3, 8, 10, and 13** High	**Lead:** Lincoln County Fire District #7 **Support:** Washington DNR	5 years	?
6.4.f: Obtain funding for building additions at Fire District #7's Creston and Lincoln stations.	**CWPP Goal #2, 3, 8, 10, and 13** High	**Lead:** Lincoln County Fire District #7	5 years	?

Table 6.4 Action Items for Resource and Capability Enhancements

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline	2016 Status
6.4.g: Continue to pursue a mutual aid agreement between Fire District #7 and Fire District #9.	**CWPP Goal**	**Lead:** Lincoln County Fire District 9 **Support:** Lincoln County Fire District 7		Completed
6.4.h: Obtain support and funding for a water storage tank and upgraded water tender for the Washington Department of Fish and Wildlife.	**CWPP Goal #9** High	**Lead:** Washington Department of Fish and Wildlife **Support:** Washington DNR and BLM		Completed
6.4.i: Obtain funding for a new fire station and updated rolling stock for Fire District #3.	**CWPP Goal #2, 3, 8, 10, and 13** High	**Lead:** Lincoln County Fire District #3 **Support:** Washington DNR	5 years	?
6.4.j: Obtain funding for a water tender, two large drop tanks, and a new station for Fire District #1.	**CWPP Goal**	**Lead:** Lincoln County Fire District #1 **Support:** Washington DNR		Completed

Table 6.4 Action Items for Resource and Capability Enhancements

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline	2016 Status
6.4.k: Obtain funding for an urban interface truck for Fire District #5.	**CWPP Goal**	**Lead:** Lincoln County Fire District #5 **Support:** Washington DNR		Completed
6.4.l: Obtain funding for upgraded rolling stock and equipment storage for Fire District #6.	**CWPP Goal**	**Lead:** Lincoln County Fire District #6 **Support:** Washington DNR		Completed
6.4.m: Obtain support and funding for the construction of a fire station and the necessary equipment and training in Fire District #9**.**	**CWPP Goal #2, 3, 8, 10, and 13** High	**Lead:** Lincoln County Fire District #9 **Support:** Washington DNR	5 years	?
6.4.n: Obtain funding for the construction of a multi-agency Fire/EMS station with bays for both fire apparatus and EMS equipment with OSHA-approved exhaust removal systems, meeting rooms, offices, and residency quarters for Fire District #5 and Davenport Ambulance.	**CWPP Goal #2, 3, 8, 10, and 13** High	**Lead:** Lincoln County Fire District #5 **Support:** Davenport Ambulance	5 years	Renew for 2016

Table 6.4 Action Items for Resource and Capability Enhancements

Action Item	Goals Addressed (see pages 8 & 9)	Responsible Organization	Timeline	2016 Status
6.4.o: Obtain funding for the installation of additional fire hydrants around the perimeter of Wilbur to help protect the community from approaching wildland fires.	**CWPP Goal #2, 3, 7, 8, 10, and 13** High	**Lead:** Town of Wilbur	2 years	Renew for 2016
6.4.p: Continue to work with local landowners to provide access to irrigation systems for fire suppression purposes and obtain funding for the necessary adapters.	**CWPP Goal #3, 5, 7, 8, and 11** High	**Lead:** Lincoln County Fire Districts	Ongoing	Renew for 2016
6.4.q: Obtain funding for a Class A pumper in Edwall, wildland engines, and wildland gear for Lincoln County Fire District #4.	**CWPP Goal #2, 3, 8, 10, and 13** High	**Lead:** Lincoln County Fire District #4 **Support:** Washington DNR	3 years	Renew for 2016
6.4.r: Obtain funding for the purchase and operation of a fire and rescue boat, specifically for the patrol of the Lake Roosevelt National Recreation Area.	**CWPP Goal #2, 3, 8, 10, and 13** High	**Lead:** Lincoln County Sheriff's Office **Support:** Lincoln County Board of Commissioners and Lincoln County Fire Districts	3 years	Renew for 2016

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.

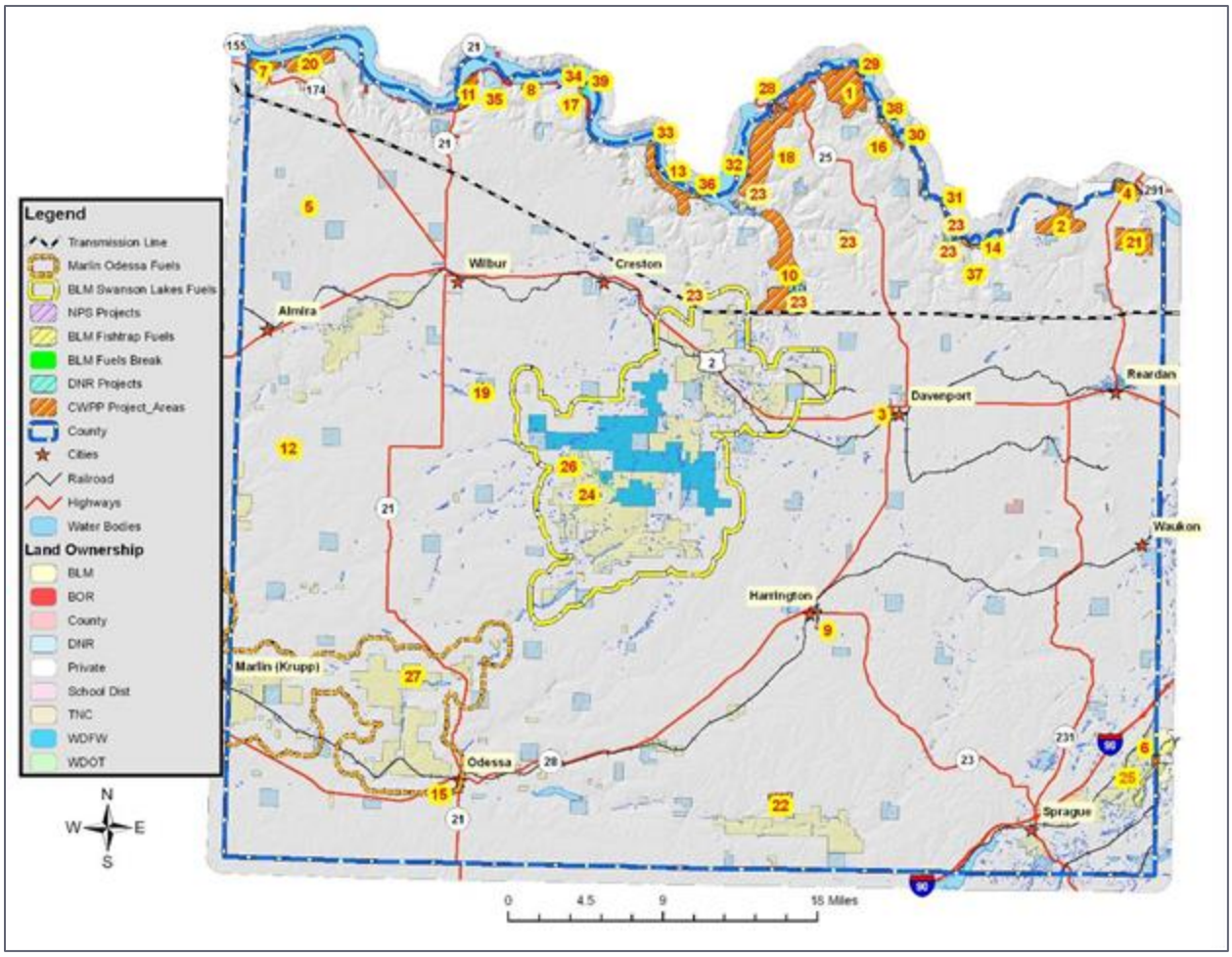
Table 6.5. Proposed 5- Year Project Areas

Map Id#	Project Name	Project Type	Jurisdiction	Acres	Priority Ranking	2016 Status
6	Fishtrap	Defensible Space, Access Improvement	1	157.2	High	
15	Odessa Fuel Break	CRP Fuel Break	3	214.0	High	
2	Cougar Ridge	Defensible Space, Access Improvement	4	2,058.0	High	
4	Devil's Gap	Defensible Space, Access Improvement	4	705.7	High	
14	Moccasin Bay	Defensible Space, Access Improvement	4	458.7	High	
21	Townsend Estates	Defensible Space, Access Improvement	4	1,907.4	High	
1	Chrystal Cove	Access Improvement	5	3,393.4	High	
3	Davenport Fuel Break	CRP Fuel Break	5	87.5	High	
10	Hawk Creek	Defensible Space, Fuels Reduction	5	4,809.2	High	
16	Porcupine Bay	Defensible Space, Access Improvement	5	475.5	High	
18	Seven Bays/Deer Meadows	Defensible Space, Access Improvement	5	5,934.6	High	In-progress
9	Harrington Fuel Break	CRP Fuel Break	6	108.7	High	Omitted
22	Walter/Smith Road Access	Access Improvement, Bridge Replacement	6		High	Continue
8	Hanson Harbor	Defensible Space, Access Improvement	7	255.9	High	
11	Keller Ferry	Defensible Space, Access Improvement	7	769.4	High	

13	Lincoln Area	Defensible Space, Access Improvement	7	1,841.5	High	
17	Rantz Marina	Defensible Space, Access Improvement	7	132.5	High	
19	Smith Prather Road North Bridge	Partial Bridge Replacement	7		High	Omitted
5	Douglas/Sorensen Road Water Supply	Well Installation	8	~1.0	High	
12	Kiner/Monson Road Well	Well Installation	8	~1.0	High	
7	Geo Star/FDR Estates	Defensible Space, Access Improvement	9	660.2	High	
20	Sunny Hills	Defensible Space, Access Improvement	9	1,502.4	High	
23	Thinkin Lincoln	Multiple Fuels Reduction Projects	DNR	1,166.0	High	Omitted
26	Swanson Lake	Development of Fuels Strategy and Projects	WDFW	116,935.0	High	
24	Twin Lakes/Seven Springs Dairy Road	Fuel Break	WDFW	75.0	High	In-progress
27	Odessa	Development of Fuels Strategy and Projects	BLM	83,016.0	High	
26	Swanson Lake	Development of Fuels Strategy and Projects	BLM	116,935.0	High	
25	Fishtrap/Hog Lake	Fuels Reduction	BLM	1,014.0	High	Omitted
24	Twin Lakes/Seven Springs Dairy Road	Fuel Break	BLM	75	High	
28	Fort Spokane	Fuels Reduction	NPS	380.0	High	In-progress
29	Detillion	Fuels Reduction	NPS	11.0	High	
30	Laughbon/Porcupine	Fuels Reduction	NPS	31.0	High	
31	Cayuse Cove	Fuels Reduction	NPS	6.0	High	
32	Seven Bays	Bitterbrush Fuels Reduction	NPS	16.0	High	

33	SterlingValley	Fuels Reduction	NPS	24.0	High	
34	Jones Bay	Understory Burning	NPS	11.0	High	
35	Keller Ferry	Propose Future Project Area	NPS	9.0	High	
36	Lincoln Mill	Proposed Future Project Area	NPS	14.0	High	
37	Mill Canyon	Proposed Future Project Area	NPS	37.0	High	
38	Porcupine CG	Fuels Reduction	NPS	48.0	High	
39	Rantz Marine	Proposed Future Project Area	NPS	9.0	High	
	Firewise Fuel Reduction	Defensible Space	NPS		High	
	Seven Springs Dairy Road	Fuel Break	6			New Project

Figure 6.1. Map of Proposed Projects.



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.[37] 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.[38] 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.

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.

[37] Pyne SJ (1982) Fire in America: A cultural History of Wildland and Rural Fire (Cycle of Fire). Seattle: University of Washington Press.
[38] 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]

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."[39]

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 next fire season. Late fall grazing can also target any fall-germinating cheatgrass before winter dormancy, thus reducing the vigor of these plants the

[39] 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.

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.[40]

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.[41] 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

"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."[42] 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

[40] 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.
[41] 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.
[42] 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.

targeted grazing providers. Managers must determine objectives, then select and implement the appropriate livestock grazing prescription, monitor accomplishments, and make adjustments as needed.[43]

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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[43] 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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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

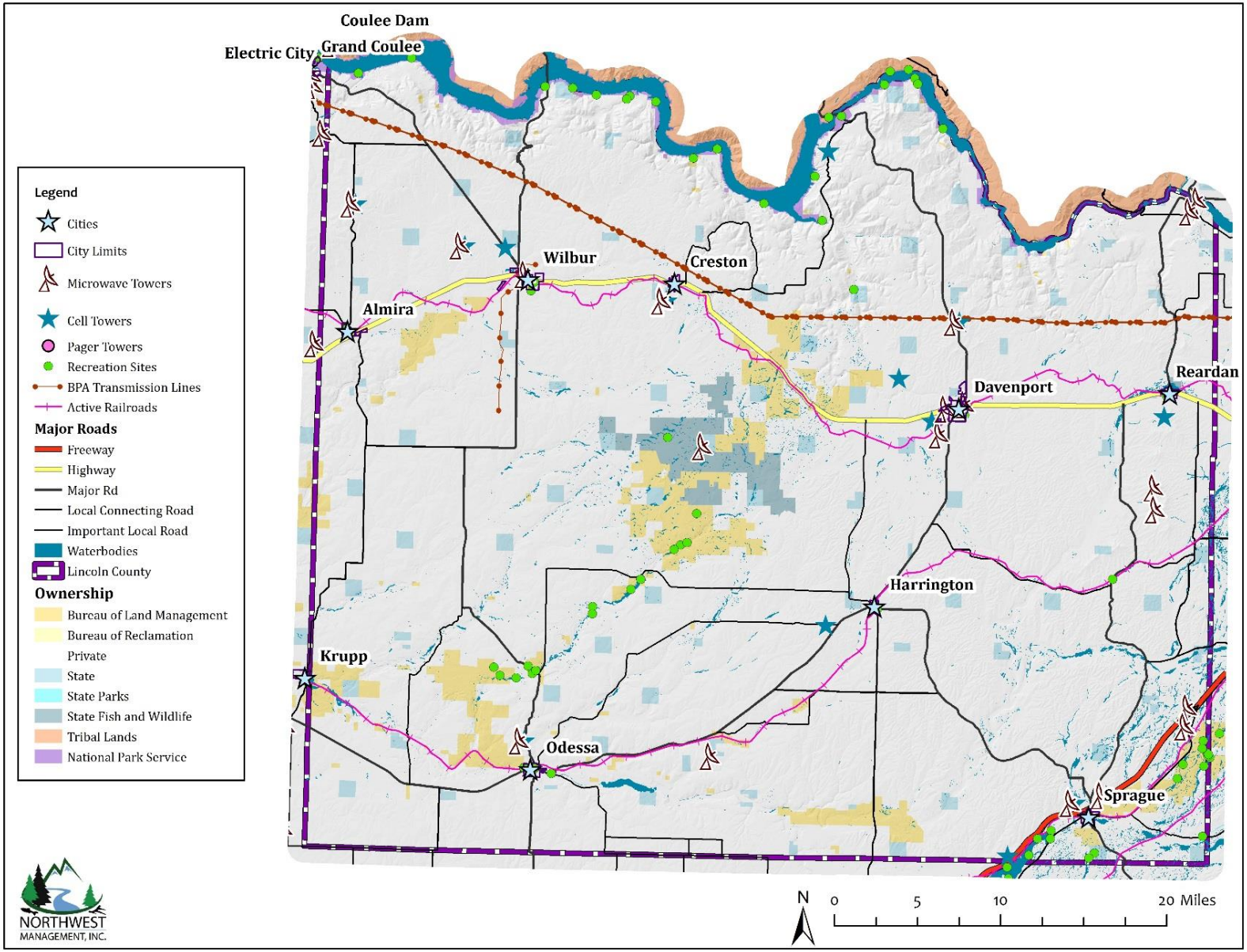


Figure 7.2. Aerial Imagery

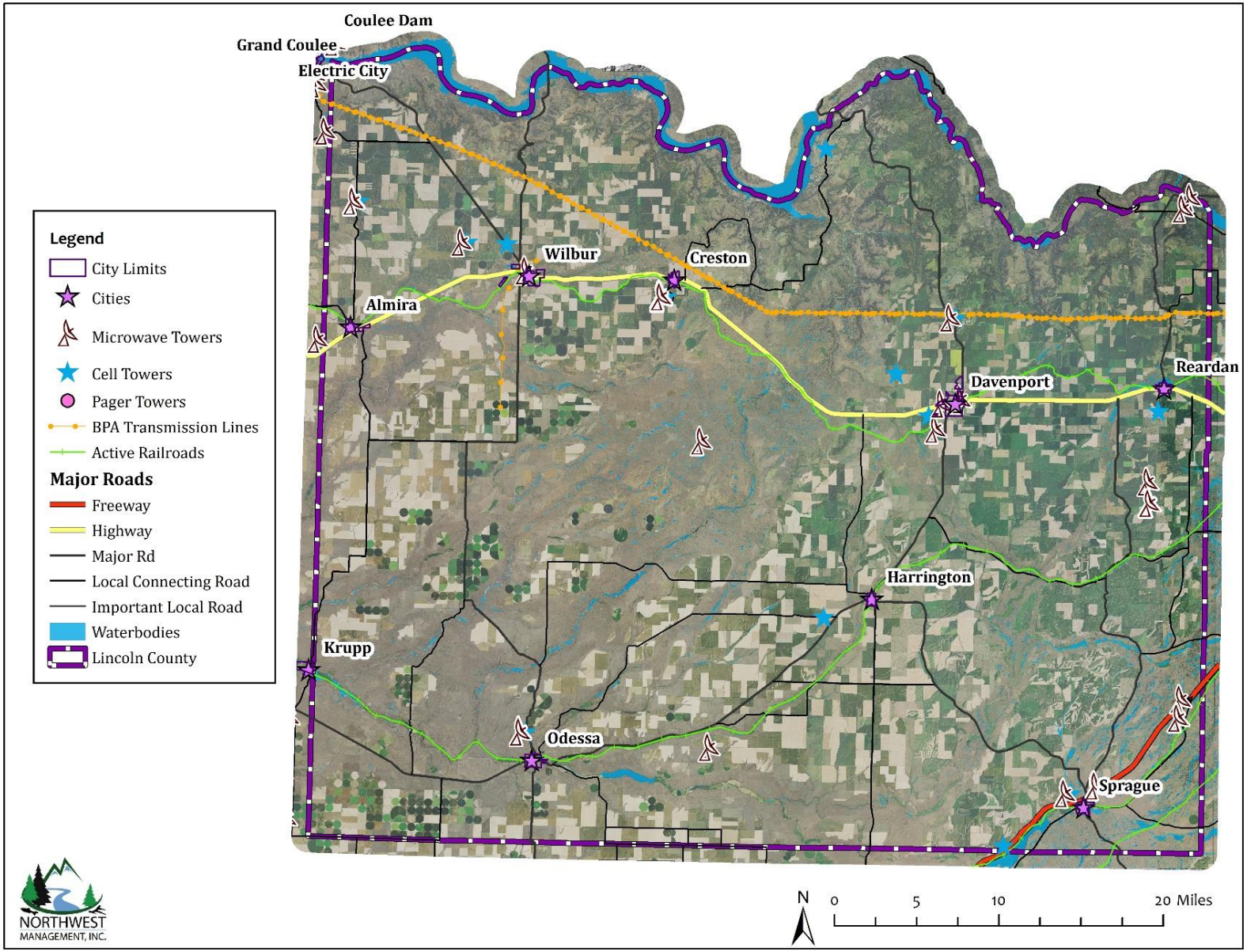


Figure 7.3. Fire Protection Boundary Map

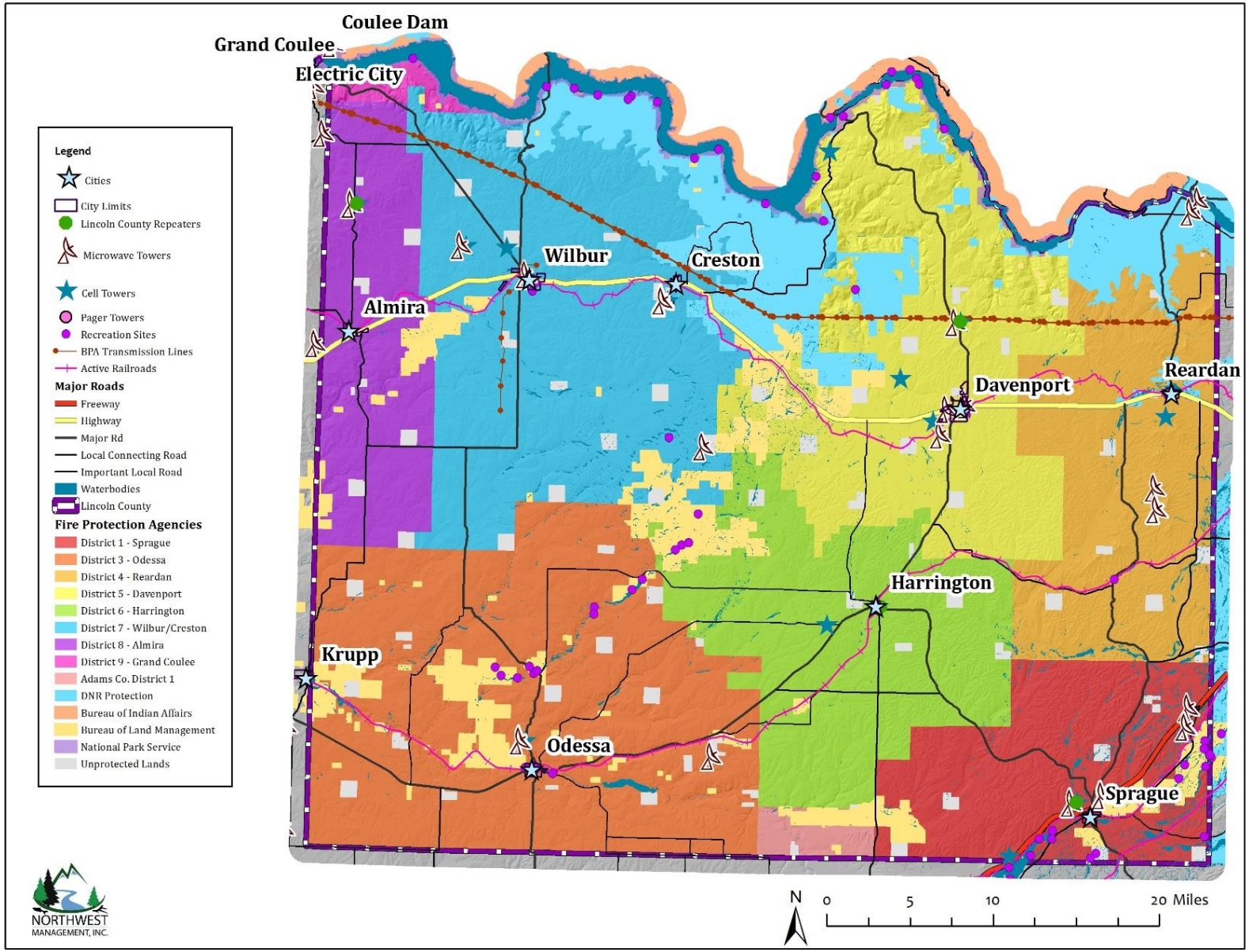


Figure 7.4. Historic Fire Regime Map

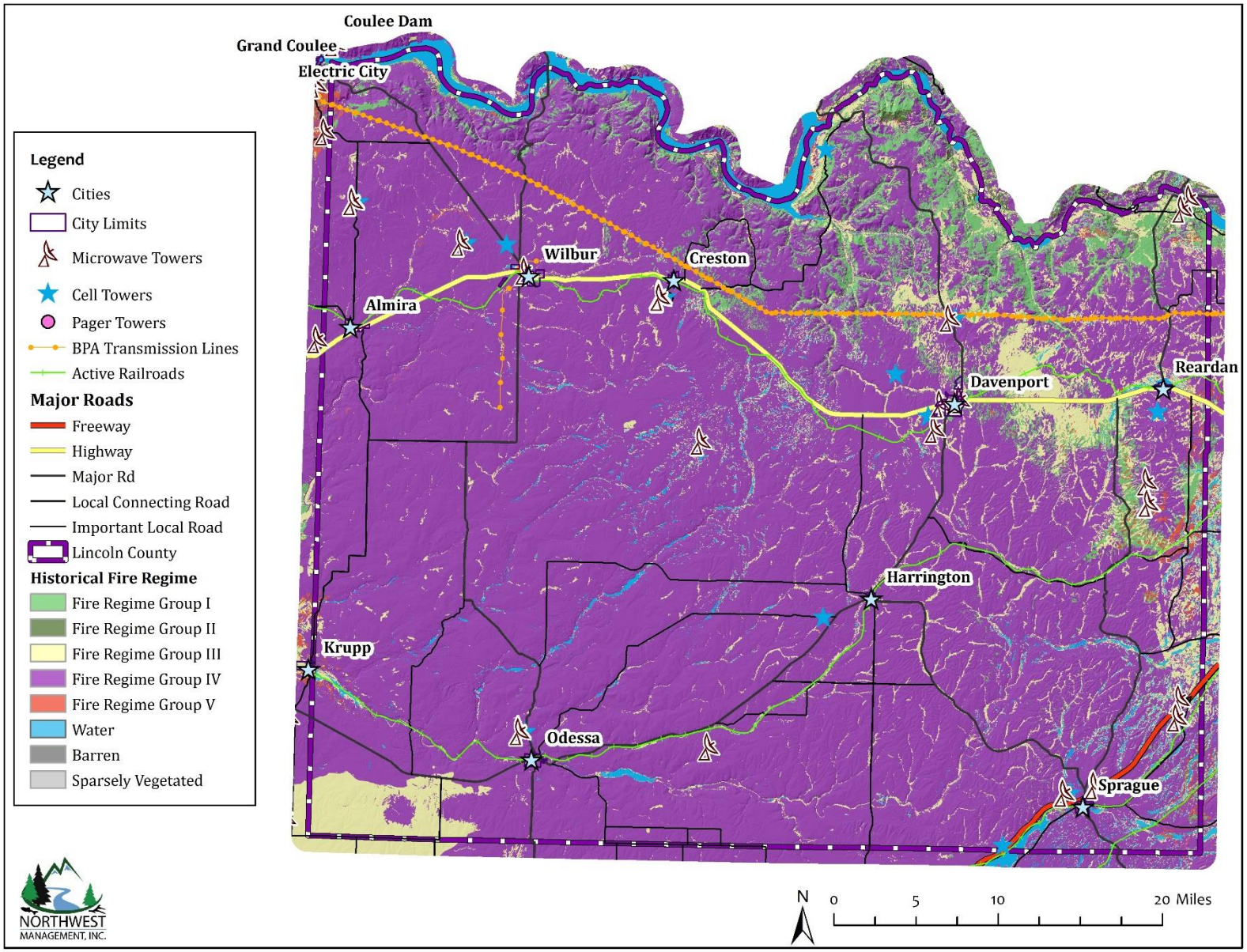


Figure 7.5. Vegetation Condition Class Map

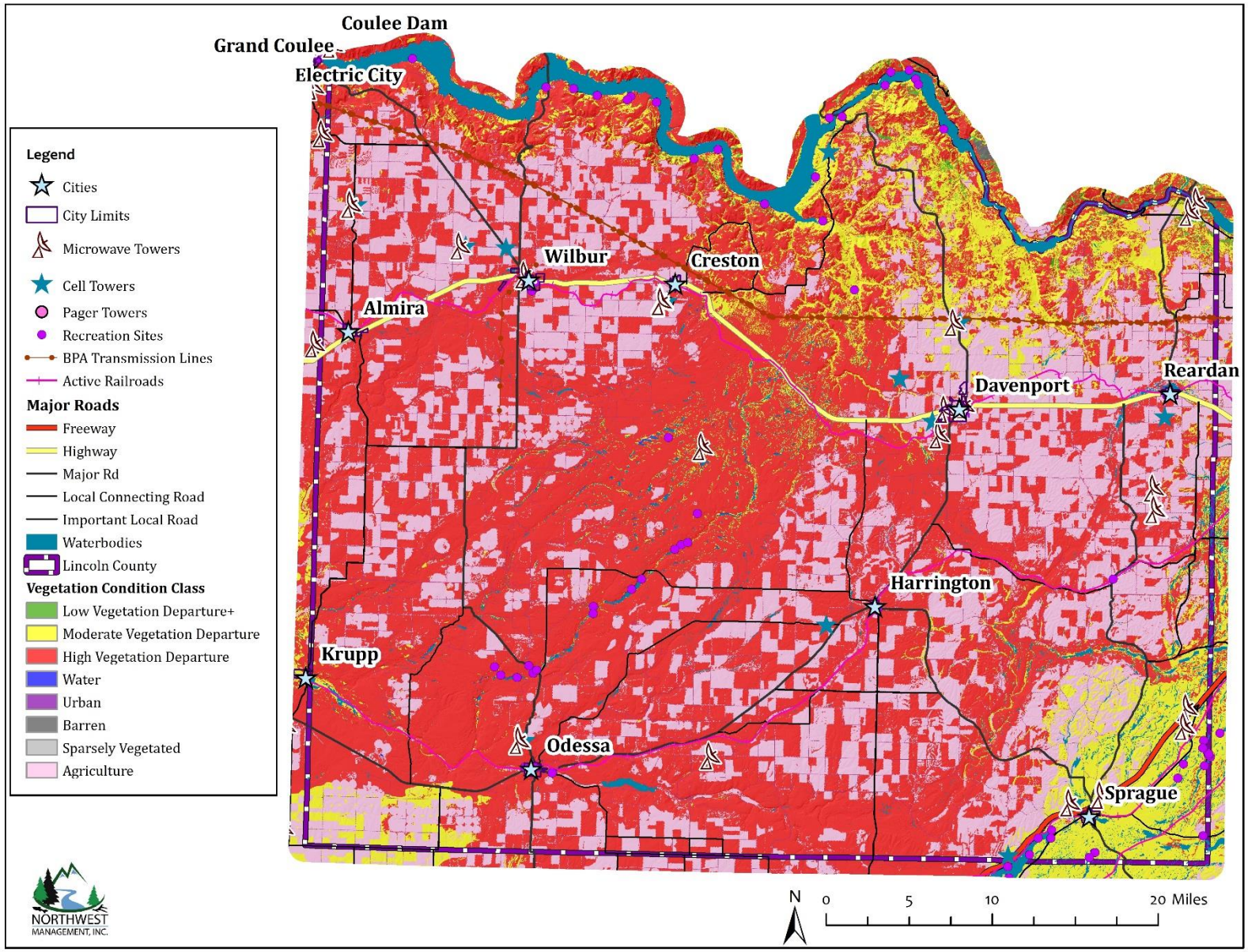


Figure 7.6. Wildland Urban Interface Map

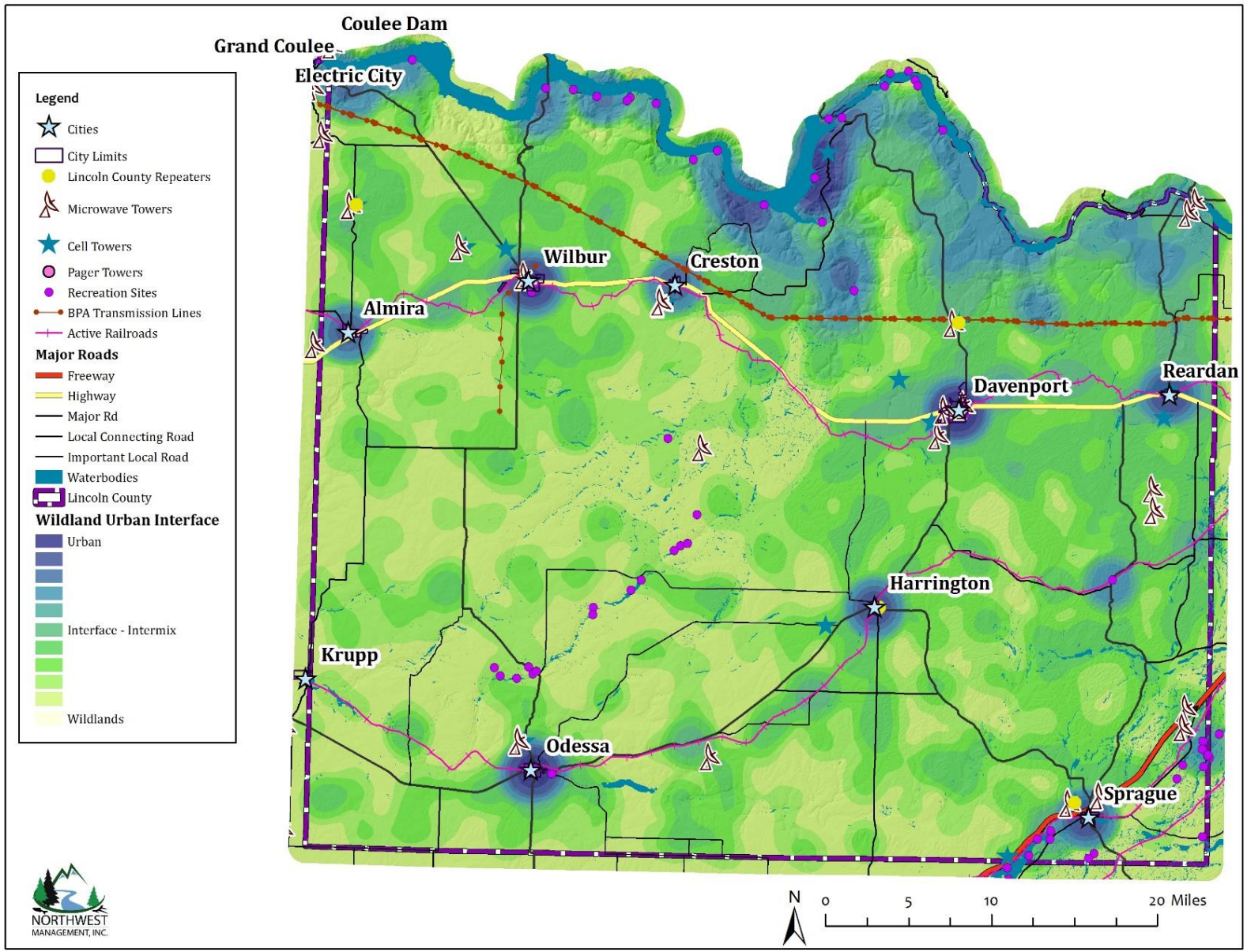


Figure 7.7. Proposed Projects

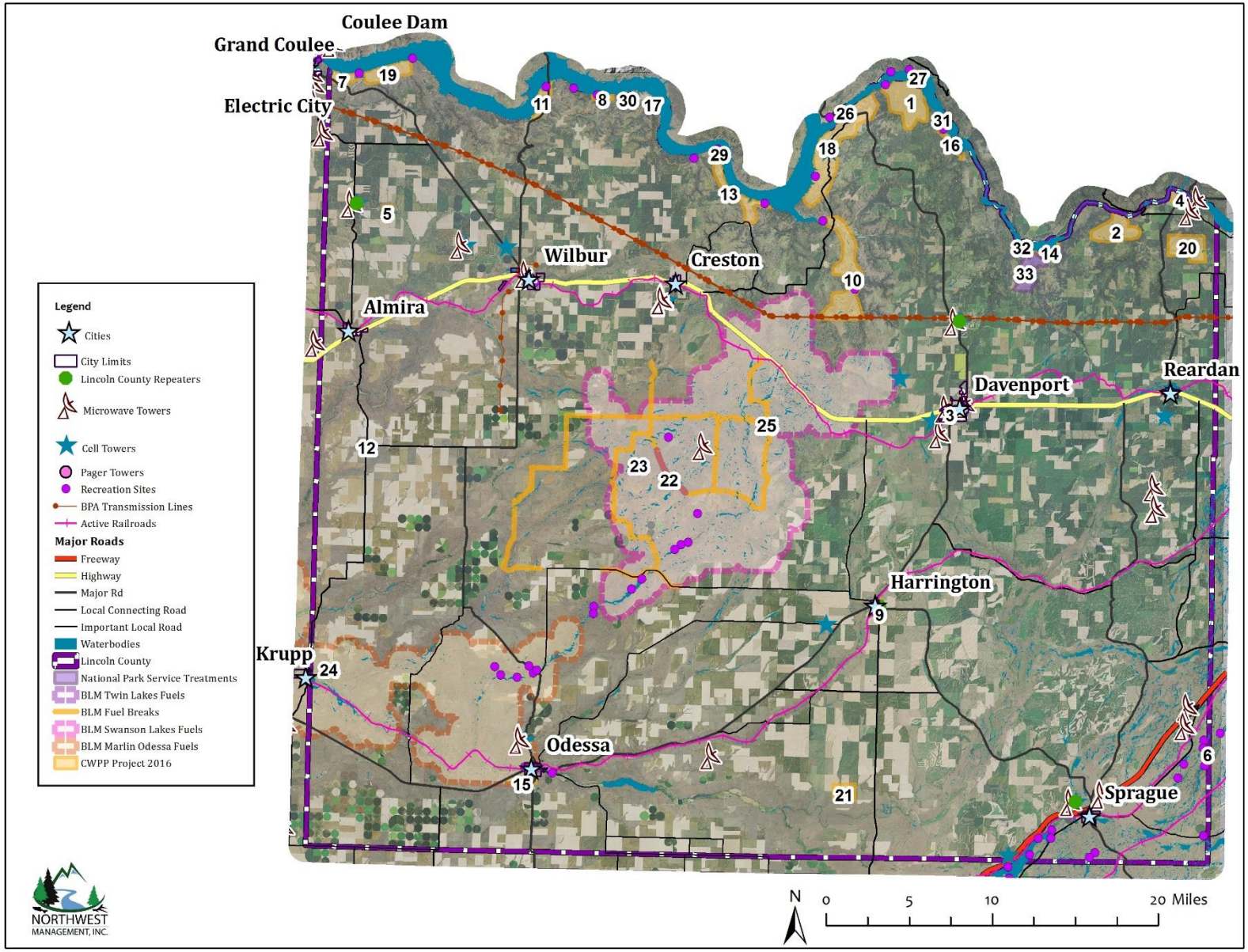


Figure 7.8. Agency Proposed BLM Projects

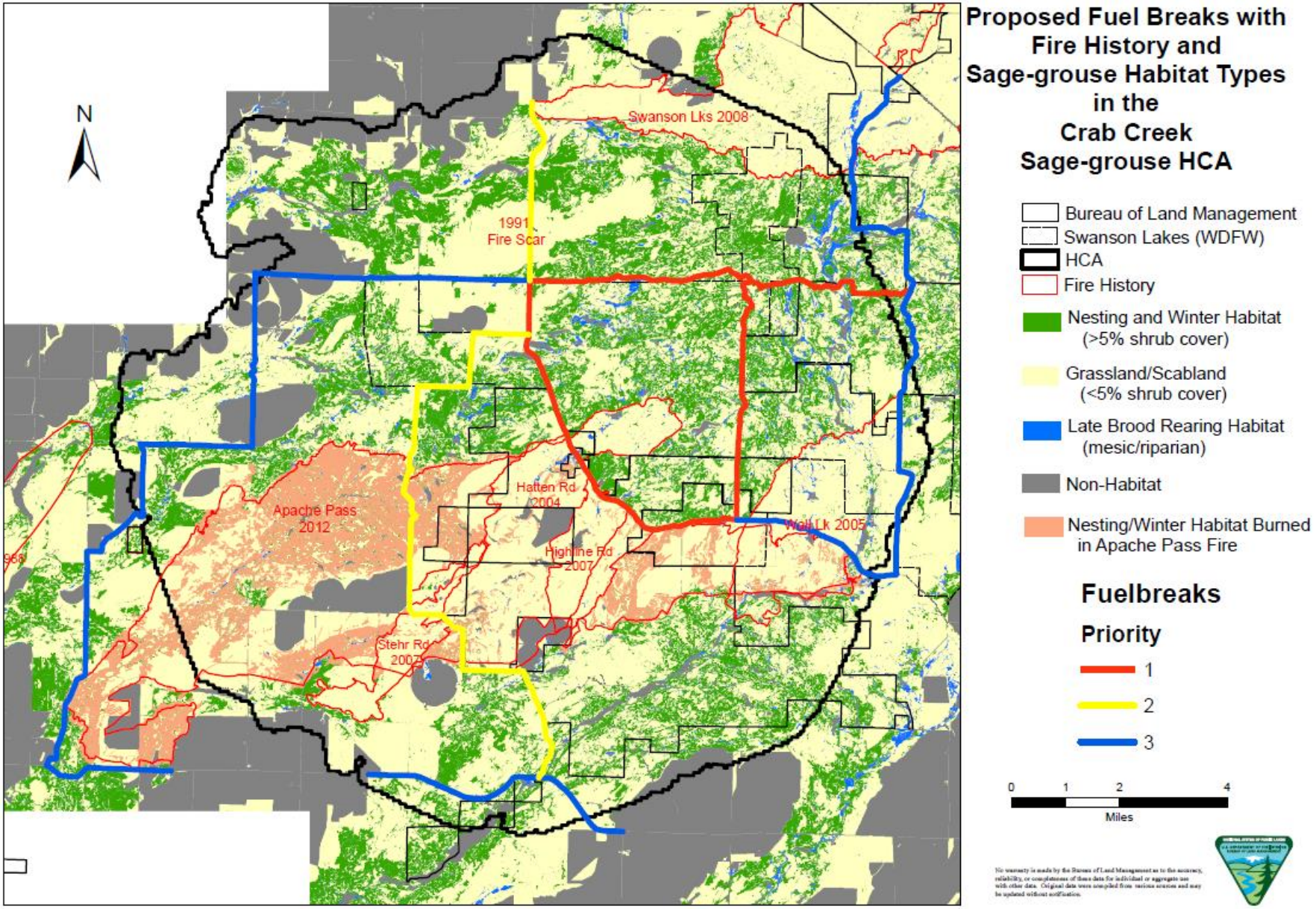
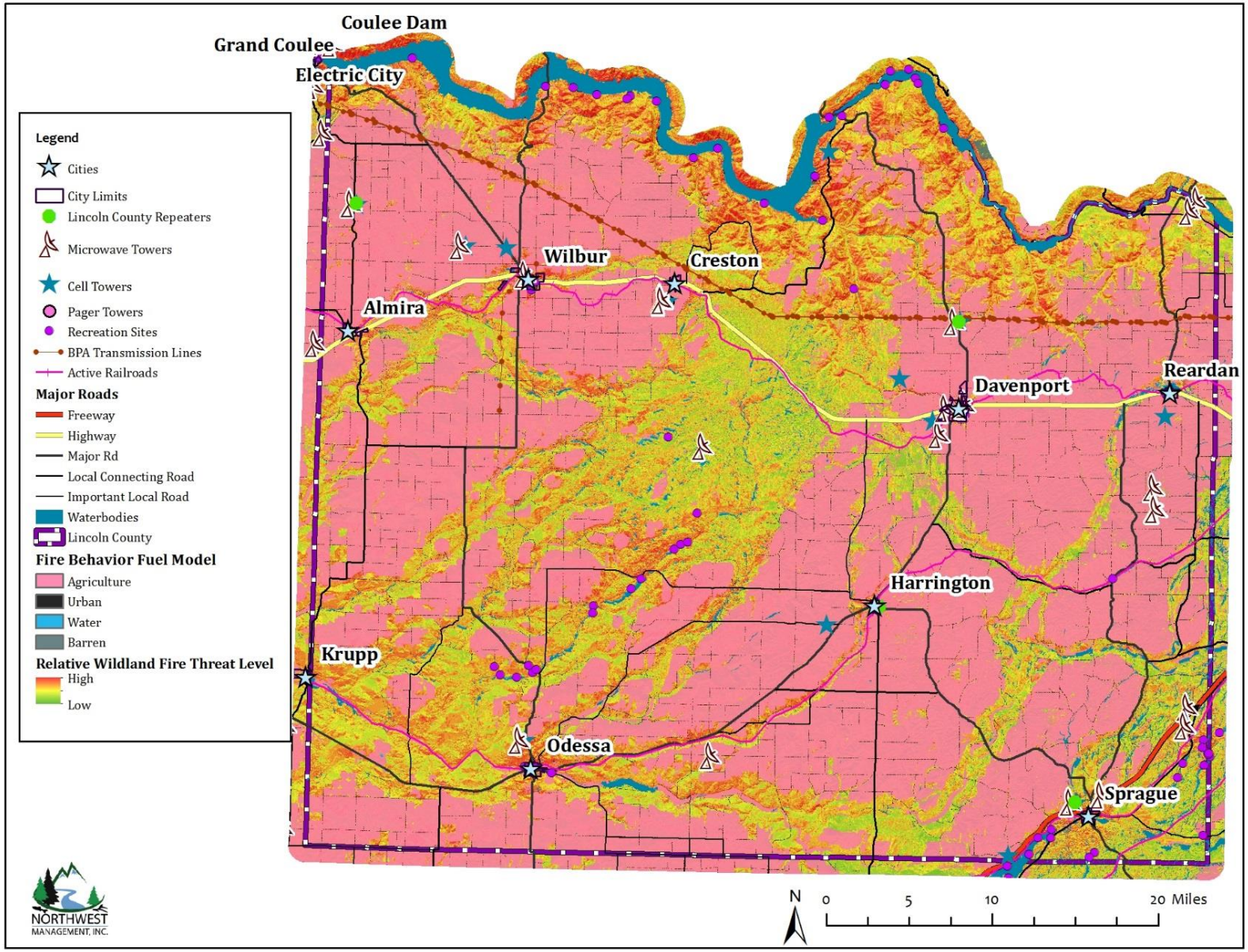


Figure 7.9. Relative Threat Level Map



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

December 16th, 2015 – Davenport, WA

Attendance:

Mike Finch,	Tonya Neider, Lake Roosevelt NRA
Mike Piper, District #5	Andrew Stenbeck, Washington DNR
Craig Sweet, District #5	Forrest Rief
Guy Gifford, Washington DNR	Brad Tucker, Northwest Management
Wade Magers, Lincoln County Sheriff's Department	Meghan McEldery, Northwest Management
Craig Brouwer, Lake Roosevelt NRA	Tiana Luke, Northwest Management
Lea Shields, Lincoln County Conservation District	

Agenda Items #1– Introductions and Presentation:

The group spent a few minutes introducing themselves. Brad Tucker from Northwest Management, Inc. (NMI) introduced the project the folks that were present. Brad gave a brief Powerpoint presentation describing what needs to be done to update Lincoln County's CWPP and explained the planning process to the committee. Brad also informed the group of the timeline for the project. If all goes as planned, the plan should be finished by June and signed by July.

Agenda Item #2– Public Involvement Strategy:

NMI explained that public involvement is a critical requirement in the development of the CWPP. NMI will send press releases to the local papers introducing the project just after the kickoff meeting. NMI will coordinate and host public meetings as we near the midway point of the plan development. A press release will be sent to the local papers announcing the public meetings. Once the final draft of the plan has been reviewed by the committee, it will be made available to the public for review. A press release will be sent to the local papers announcing when and where the public can review the plan and how to comment.

Agenda Item #3 – Mission & Goals

Brad reviewed the mission, vision and goals statements with the group. He asked those in attendance to review the statements and bring comments to the next meeting.

Agenda Item #4 – Fire District Surveys:

Brad passed out an example of a fire district survey and asked anyone representing an entity that has fire suppression responsibilities in Lincoln County to submit updated summaries and resource lists. Brad also made a request to the Fire Districts to provide a fire history for their District over the past decade. This helps Lincoln County to support the need for funding assistance. NMI will provide the Districts with their respective summaries and resource list from the original plan to revise.

Agenda Item #5 – Wildland Urban Interface:

Brad showed the group the original WUI map for Lincoln County and then the updated WUI map. We will look at this map in more detail at the next meeting. NMI uses 911 address locations to identify where population densities occur within the County.

Agenda Item # 8 – Meeting Schedule:

The next meeting is scheduled for January 27th at 1800 hours. The meeting will be held at the Lincoln County Fire District #5 station in Davenport.

January 27th, 2016 – Davenport, WA

Attendance:

Steve Harris, Washington DNR	Ryan Rettkowski, Reardan/Edwall/Long Lake
Ron Mielke, Lincoln County F.D. #6	Linda Dougherty
James Wilson, Amateur Radio ARES	Gary Bytnar
Guy Gifford, Washington DNR	Loren Reinhold
Richard Parrish, Spokane District BLM	Dick Teel
Mike Solheim, Spokane District BLM	Frank Braun
Lea Shields, Lincoln County Conservation District	Diana Braun
Brad Tucker, Northwest Management	Gene Heim
Tiana Luke, Northwest Management	

Agenda Items #1– Old Business:

The group spent a few minutes introducing themselves. Brad Tucker from Northwest Management, Inc. (NMI) introduced the project the folks that weren't present at the previous meeting. The group did not

have any changes to the Mission and Goals statements and recommended to keep the original. Brad reminded the Fire Districts that NMI will need their District Summaries, Resource List, and brief fire history. Check the list at the bottom of these minutes to see what your District still needs to provide.

Agenda Item #2– Maps Presentation:

Tiana, with NMI, gave a brief presentation on the maps that will be used to analyze the risk of wildland fire within Lincoln County. Maps such as; Vegetation Condition Class, Historic Fire Regime, Rate of Spread, Wildfire Intensity, Relative Threat Level, Wildland Urban Interface, will be used to develop the Lincoln County CWPP. She discussed how the maps are developed and what they mean. There was quite a discussion regarding the Relative Threat Level Map and what GIS layers to include within this model.

DNR fire occurrences prior to 2008 should be removed to match the BLM fire occurrence records. This will assist with any areas that are 'over-weighted' with fire occurrences as a result of the extensive DNR data. It was discussed that having the local District fire occurrences would help create a more robust fire history.

NMI will create a species of concern (wildlife and Plant) map for reference when developing the proposed projects throughout the County. NMI will also create a water source map for the plan.

NMI was asked to make some modifications to the Relative Threat Level map and bring it to the next meeting. Specifically NMI was asked to edit some of the weightings of the categories that go into the Relative Threat Level map. NMI will also show on the map the critical infrastructure (eg. radio repeaters, power lines, cell towers, etc.) that could be at risk in the event of a wildland fire.

NMI was asked to make some corrections to the Fire District map. The map should not show that the County Fire Districts have any jurisdiction on BLM ownership. It was advised to check with the DNR to identify State ownership that the State does not provide fire suppression services. If the State does not provide suppression on some of their ownership, these parcels should show that they do not have any protection. Although the local Fire District would perform fire protection on state owned land, however they would not necessarily be reimbursed for this service. Therefore, it is important to identify in the plan where these properties occur.

The group recommended that NMI place the entire County within the WUI. NMI will create another version of the WUI map for the group to review at the next meeting.

Agenda Item #3 – Identify Project Locations

The group spent some time at the end of the meeting reviewing the maps provided. Some projects were identified however, NMI will be asking for more projects at the February meeting. Potential projects may include, but not be limited to; various fuels reduction projects, fire breaks, invasive species eradication, water source development, and any others that may help to mitigate the County's risk to wildland fire.

Agenda Item #4 – Review Chapters 1-5:

NMI passed out draft chapters 1-5 for the group to review prior to the February meeting. Brad briefly went through the content of each chapter and explained what is still missing and what some early analysis of the data is telling us.

Chapter 1 – Overview of Plan Development

Chapter 2 – Documenting the Planning Process

Chapter 3 – Lincoln County Characteristics

Chapter 4 – County Risk Assessment and Preparedness

Chapter 5 – County Specific Landscape Risk Assessments (Ag, Scablands, W. River Breaks, E. River Breaks, Riparian)

Agenda Item #5 – Meeting Schedule:

The next meeting is scheduled for February 24th at 1800 hours. The meeting will be held at the Lincoln County Fire District #5 station in Davenport.

February 24th, 2016 – Davenport, WA

Attendance:

Elsa Bowen, Lincoln Conservation District	Ryan Rettkowski, Lincoln County F.D. #4
Kevin Coffman, Lincoln County F.D. #7	Linda Dougherty, Lincoln County F.D. #4
Mike Finch, WDFW & Lincoln County F.D. #7	Craig Sweet, Lincoln County F.D. #5
Guy Gifford, Washington DNR	Jon Bennet, Lincoln County F.D. #4
Richard Parrish, Spokane District BLM	SueLani, Madsen, Lincoln County F.D. #4
Mike Piper, Lincoln County F.D. #5	Brad Tucker, Northwest Management
Lea Shields, Lincoln County Conservation District	Tiana Luke, Northwest Management

Agenda Items #1– Old Business:

The group spent a few minutes introducing themselves. The group did not have any comments/changes to Chapters 1-5. Brad told the group to send him any comments. Brad reminded the Fire Districts that NMI will need their District Summaries, Resource List, and brief fire history. Check the list at the bottom of these minutes to see what your District still needs to provide.

NMI presented some revised maps based on comments at the January meeting. These included; WUI, Relative Threat Level, Fire History, and Fire Protection. The WUI maps was revised to eliminate any 'wildland' areas within the County. The committee was supportive of the new version of the WUI map, however the terminology in the legend is misleading. It was also recommended to leave the 'wildland'

narrative in the document. Committee members noted that there were some communications towers missing from the map and provided verbal descriptions of locations for those towers.

NMI added Lincoln County Fire District #6 fire history to the County's fire history map. The committee recommended adding a disclaimer to the map explaining that there are differences to the fire records for each agency/district. The committee asked NMI to look into trends of cause, location, size of fires since the inception of the last version of the Lincoln County Community Wildfire Protection Plan. There is a fake fire polygon east of Creston that needs to be removed. NMI was asked to provide a fire history map that is zoomed in on the Swanson Lakes Wildlife Area.

Based on comments at the January meeting, NMI removed any joint jurisdiction designations on the Lincoln County fire protection map. State ownership north of highway 2 was designated as only DNR protection however, the committee decided that it should be joint jurisdiction because of the agreements in place with the local fire districts. State School sections were identified in this version of the map as 'no man's land'. The idea behind this is that the State does not make payment to the fire districts, or reimbursement, for protection of these lands. Guy Gifford will look into this matter and provide an update to NMI as soon as possible. It was also pointed out that some recreation sites that are identified on the map do not provide a threat with regard to wildland fires, NMI will look into removing some of these sites.

The committee spent quite some time reviewing the revised Relative Threat Level map. It was recommended that NMI provide a key that shows 'chains per hour' on the Rate of Spread map and Richard Parrish will provide NMI with natural breaks to weight and include on the Threat map. The group suggested to remove ignitions from the map because the lack of consistency in reporting and record keeping throughout the County. The group feels that the Swanson Lakes Wildlife Area should be a bit higher risk than what it is currently showing.

Agenda Item #2– Chapter 6:

NMI passed out a copy of Chapter 6, which includes the County's Action Items and Proposed Projects. Brad asked the group to review the Action Items and provide NMI with updates. The group reviewed the proposed projects and provided updates.

Agenda Item #3 – Identify Project Locations

The group spent some time at the end of the meeting reviewing the maps provided. Some projects were identified. The Smith Prather Road North Bridge project, Thinkin Lincoln project, and Fishtrap/Hog Lake project were all identified as complete. NMI was asked to contact the NPS for projects that they have scheduled. BLM will provide shapefile for the Swanson Lakes Fuel Break project.

Agenda Item #4 – Field Assessments

NMI informed the group that they will be conducting field assessments the week of our March meeting. Contact Brad if you would like to set up a time to meet and show the field assessment team around.

Agenda Item #5 – Public Meetings

It was decided by the group that there would be one public meeting that will be held in Davenport at the Lincoln County Public Works building. The meeting will be held on March 30th at 6 pm and last approximately 1 to 1.5 hours.

Agenda Item #6 – Meeting Schedule:

The next meeting is scheduled for March 30th at 1930 hours. The meeting will be held at the Lincoln County Public Works building in Davenport.

March, 2016 – Davenport, WA

Attendance:

Elsa Bowen, Lincoln County Conservation District	Mike Piper, Lincoln County F.D. #5
Lea Shields, Lincoln County Conservation District	Craig Sweet, Lincoln County F.D. #5
Val Vissia, Lincoln County Conservation District	Devin Magers, Lincoln County resident
Guy Gifford, Washington DNR	Lucas Mallon, Lincoln County Sheriff's Department
Wade Magers, Lincoln County Sheriff's Department	Brad Tucker, Northwest Management

Agenda Items #1– Old Business:

Brad reminded the Fire Districts that NMI will need their District Summaries, Resource List, and brief fire history. Check the list at the bottom of these minutes to see what your District still needs to provide. If you do not provide an update, we will assume nothing has changed.

Agenda Item #2– Chapter 6:

NMI passed out a copy of Chapter 6, which includes the County's Action Items and Proposed Projects. The group reviewed the Action Items and provided updates to the best of their ability. Some District specific Items remain in question as to the completeness. Elsa from the Lincoln County Conservation District agreed to follow up with each District to determine status of those Action Items. The group determined to remove a few Action Items for various reasons and also developed a couple of new Items.

Agenda Item #3 – Identify Project Locations

The group did not have any additional projects at this time.

Agenda Item #4 – Field Assessments

NMI spent the day exploring the County to identify any additional projects and ground truth maps.

Agenda Item #5 – Public Meeting

The public meeting immediately followed the planning meeting. We had five Lincoln County residents attend the public meeting as well as several members of the planning committee.

Agenda Item #6 – Meeting Schedule:

We will not have another planning meeting unless something arises that the group needs to review. NMI intends to have a full draft ready for the committee to review in the next couple of weeks. The committee will have two to four weeks to review the draft. NMI will send instructions with the electronic version of the draft when it is ready.

Public Meeting Presentation

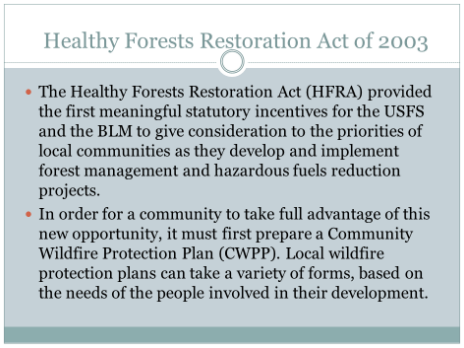
The following slideshow was presented at each of the public meetings by Brad Tucker of Northwest Management, Inc. In addition, where possible, a fire district or other planning committee representative opened the meeting with a brief introduction.

Table 7.1. Slides from Public Meeting.

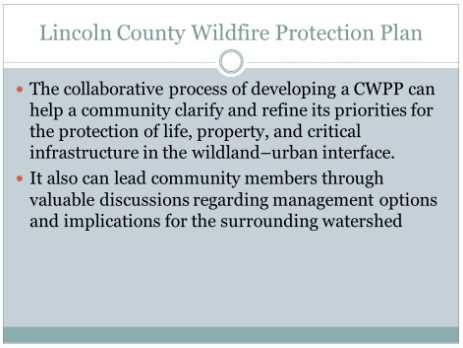
Slide 1

Slide 2

Slide 3



Slide 4



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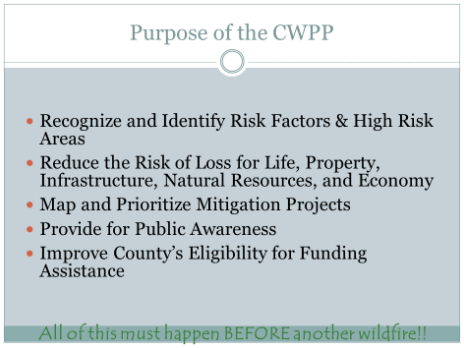


Slide 6

Slide 7

Fire History

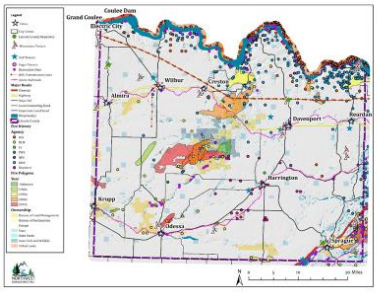
Table 4.1. Summary of Cause from State and Federal databases 1973-2015.

General Cause	Number of Ignitions	Percent of Total Ignitions	Acres Burned	Percent of Total Acres
Human-Caused	264	61%	134,357	48%
Natural Ignition	114	26%	29,201	10%
Unknown	57	13%	118,972	42%
Total	435	100%	282,530	100%

The highest number of ignitions in Lincoln County was witnessed in 1998 with 22 separate ignitions (avg. 12/year). The largest amount of area burned in Stevens County occurred in 2007 with over 62,700 acres (avg. 7,848 ac./year) being burned in a single year.

Slide 8

Fire History Map



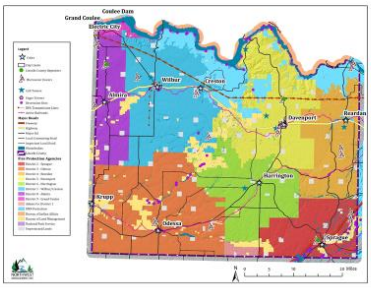
Slide 9

Mapping

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

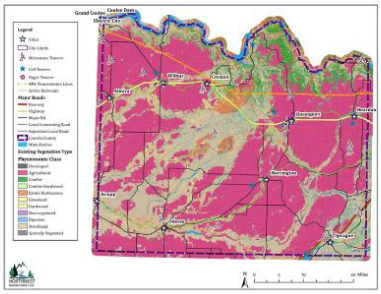
Slide 10

Fire Protection Districts



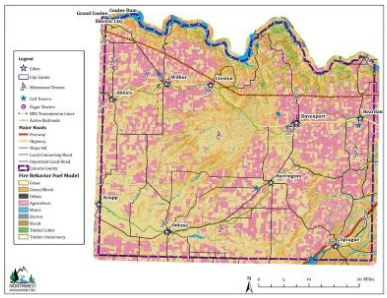
Slide 11

Existing Vegetation



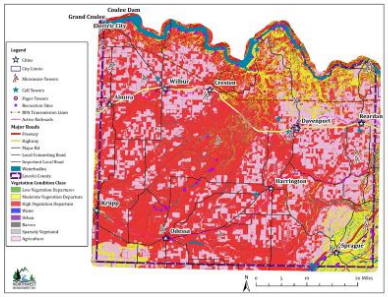
Slide 12

Fire Behavior Fuel Model



Slide 13

Vegetation Condition Class

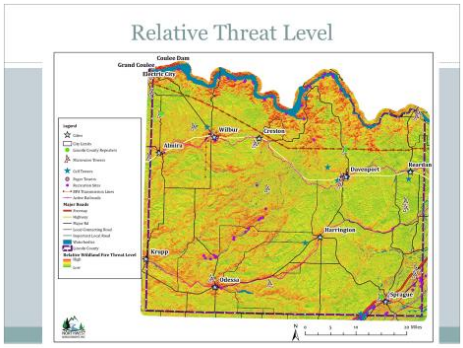


Slide 14

Relative Threat Level

- 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 Lincoln county.
- The agriculture within the county has been masked due to differences in fire behavior depending on the crop and time of year.

Slide 15

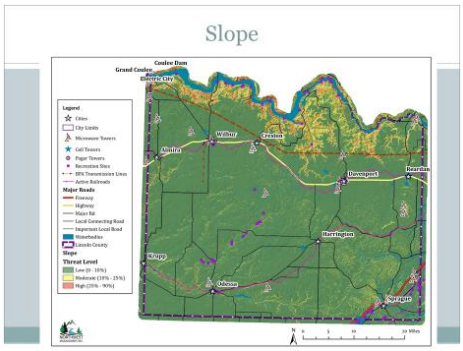


Slide 16

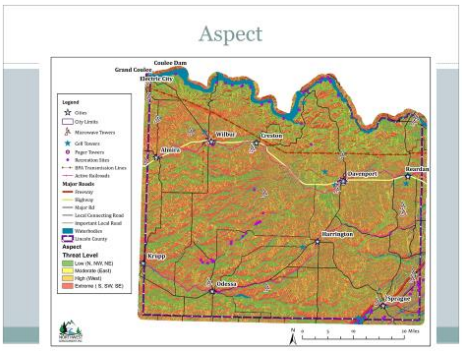
Environmental Factors

- 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 Lincoln County, were given higher threat rankings.

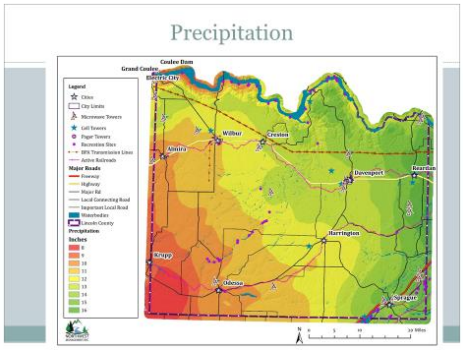
Slide 17



Slide 18



Slide 19

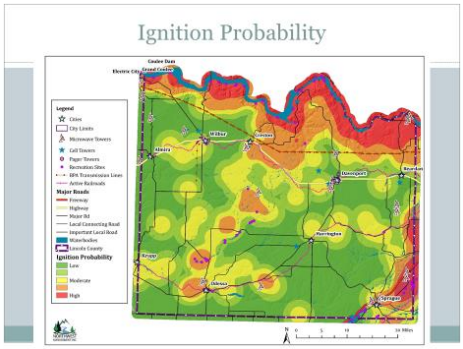


Slide 20

Ignition Probability

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

Slide 21

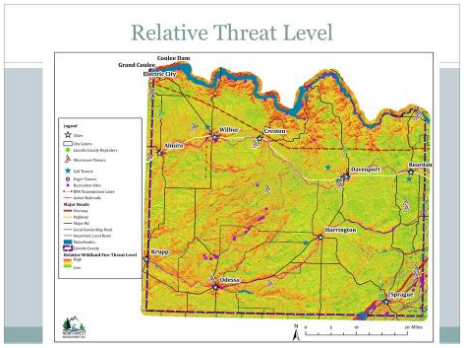


Slide 22

Vegetative Cover Types

- Certain vegetation types are known to carry and produce more intense fires than other fuel types.
- A fuel model is a set of average fuel characteristics—usually loading and surface area-to-volume ratios for fire behavior fuel models—for selected fuel types.
- The flaming front of a wildfire is its leading edge, dominated by flaming combustion and spreading into previously unburned fuel.

Slide 23

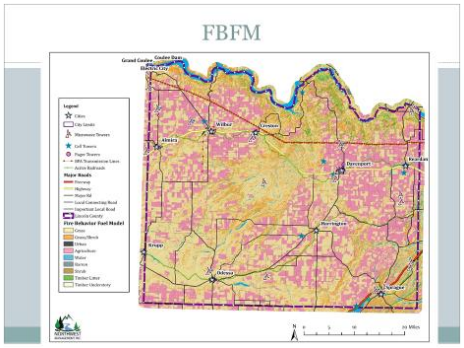


Slide 24

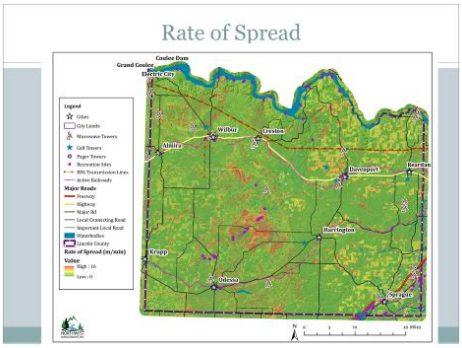
Vegetative Cover Types

- 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

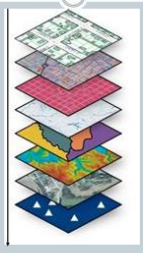


Slide 26

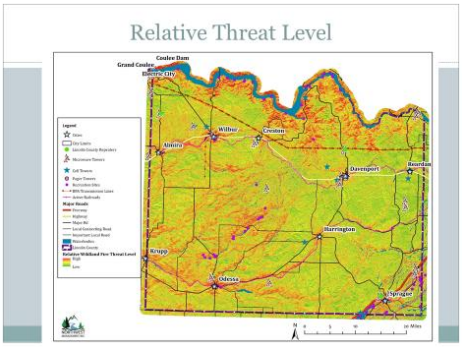


Slide 27

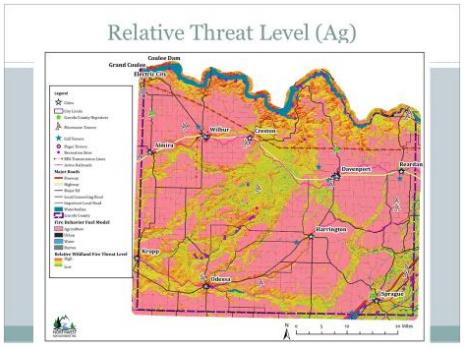
Process all layers in GIS to determine Cumulative Effects



Slide 28



Slide 29



Slide 30

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 31

Wildland/Urban Interface Fire

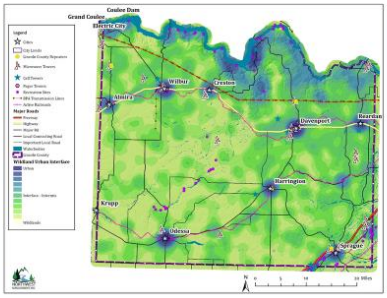
Slide 32

WUI Designation

- 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.
- Lincoln County's WUI is primarily based on population density.

Slide 33

Wildland Urban Interface (WUI)



Slide 34

Protect Your Own

Slide 35

Defensible Space

WWW.FIREWISE.ORG

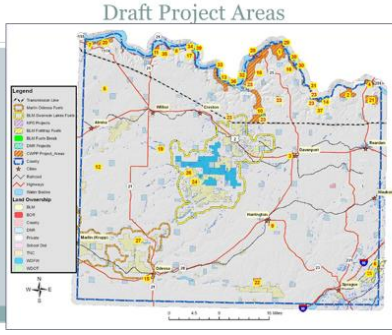
Slide 36

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

Draft Project Areas



Slide 38

Your Input

- Maps on the Walls – Mark them up!
- Talk to one of the planning committee members.
- Let us know your ideas and concerns.
- Make this YOUR Plan!
- Thank you for attending and participating! Please visit with us.

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Lincoln County, Washington
Community Wildfire Protection Plan Update

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.

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.

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.

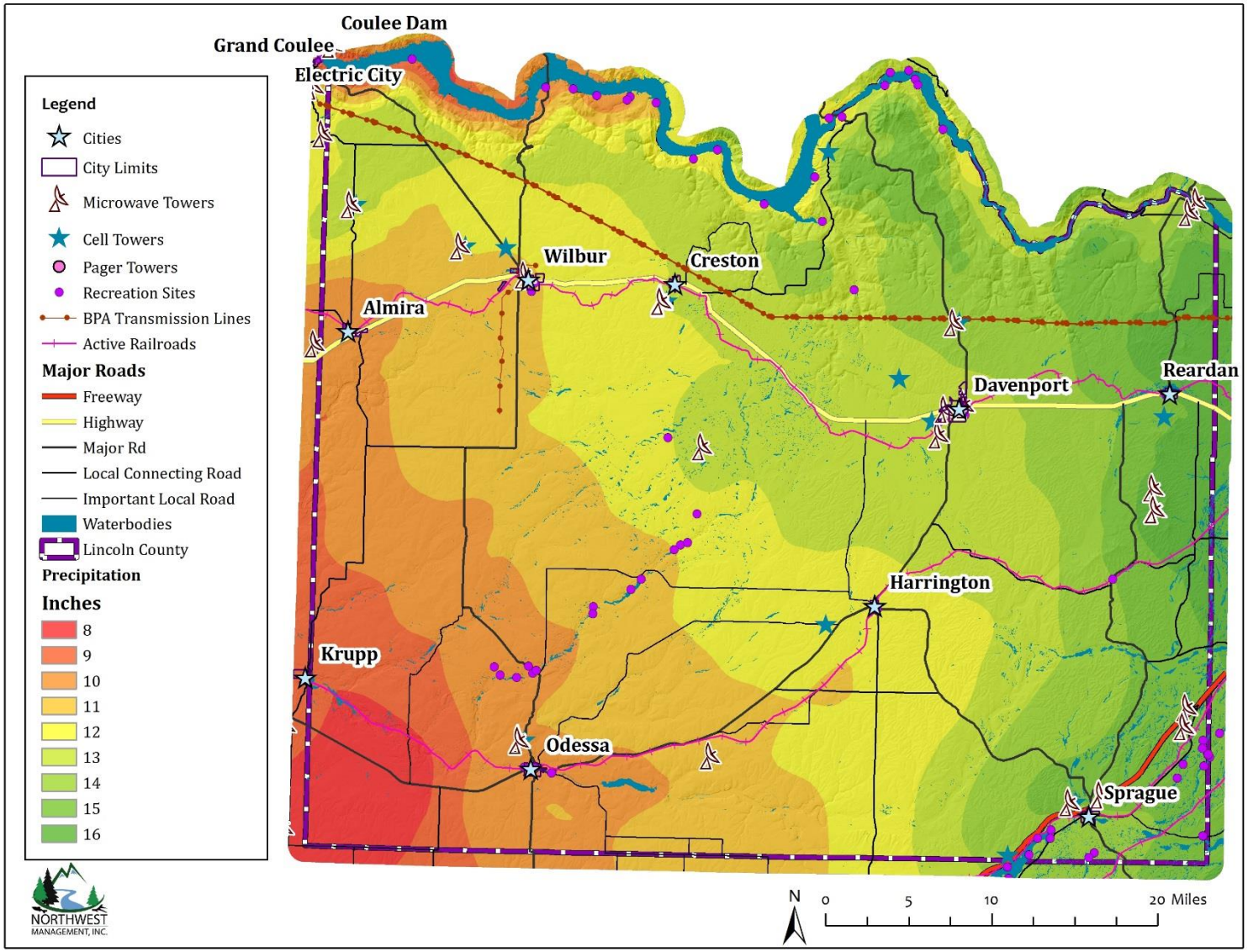
Relative Threat Level

Development of a Threat Level map for the Lincoln 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 Lincoln 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.

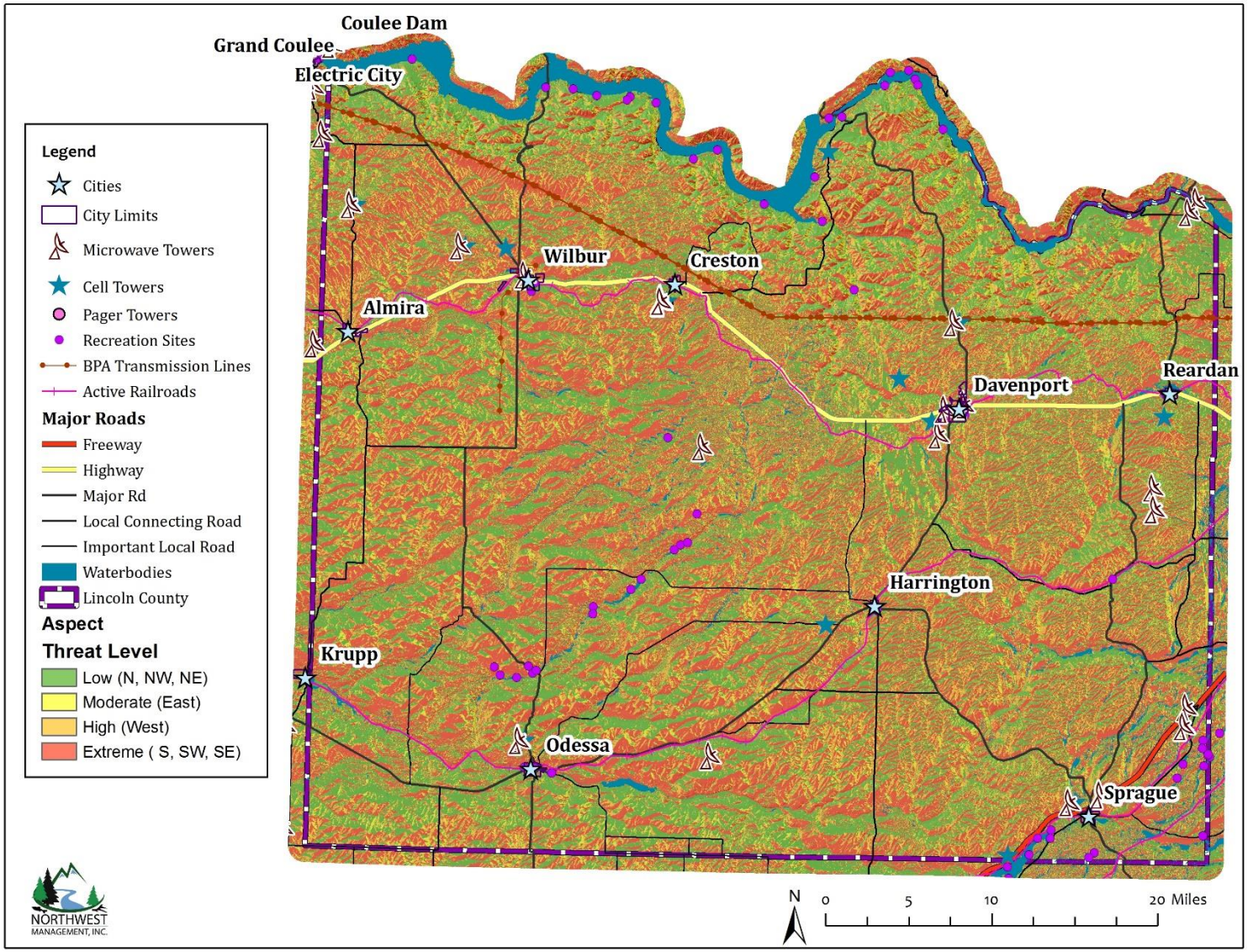
Figure 7.11. Precipitation.



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^{o} 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.

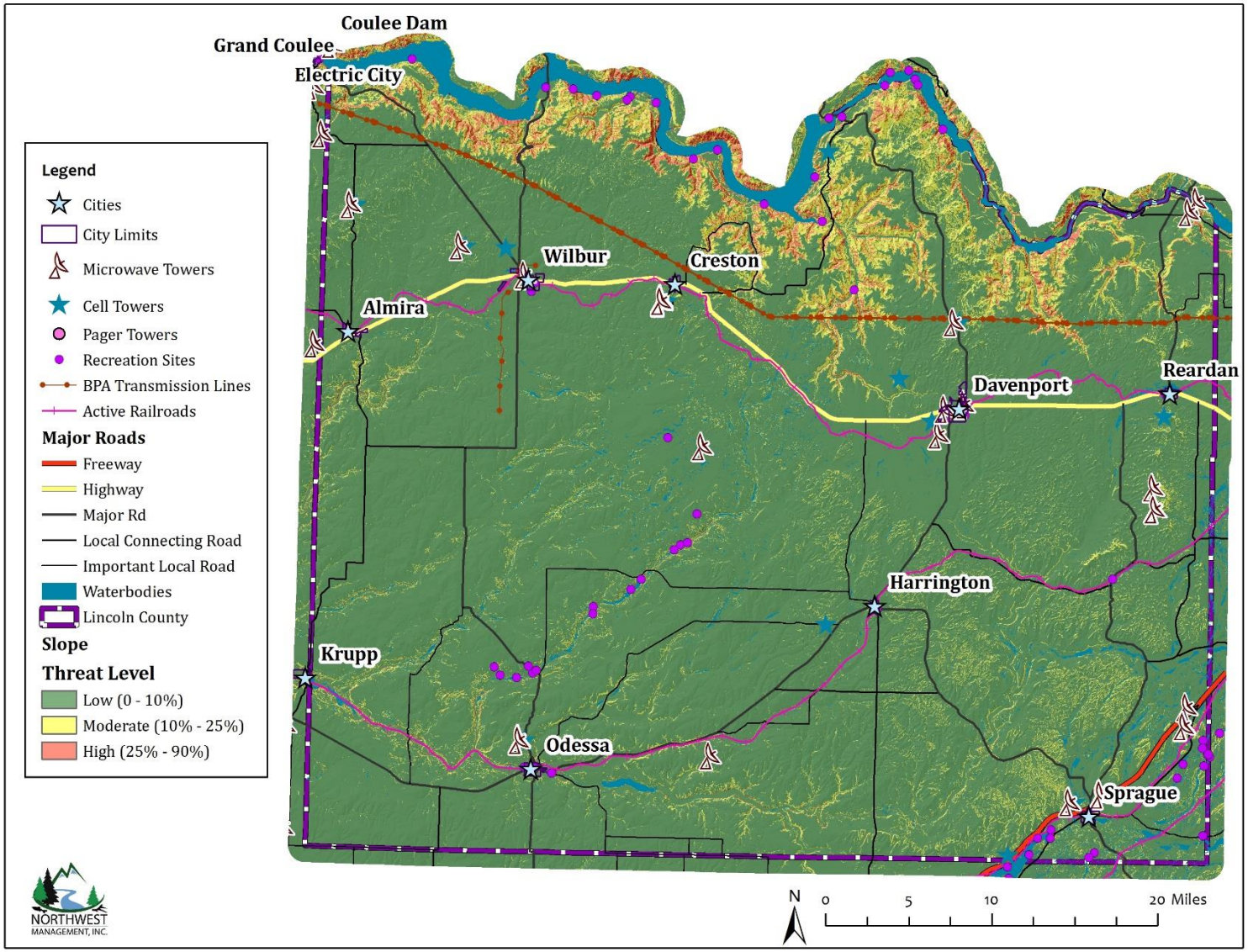
Figure 7.12. Aspect.



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.

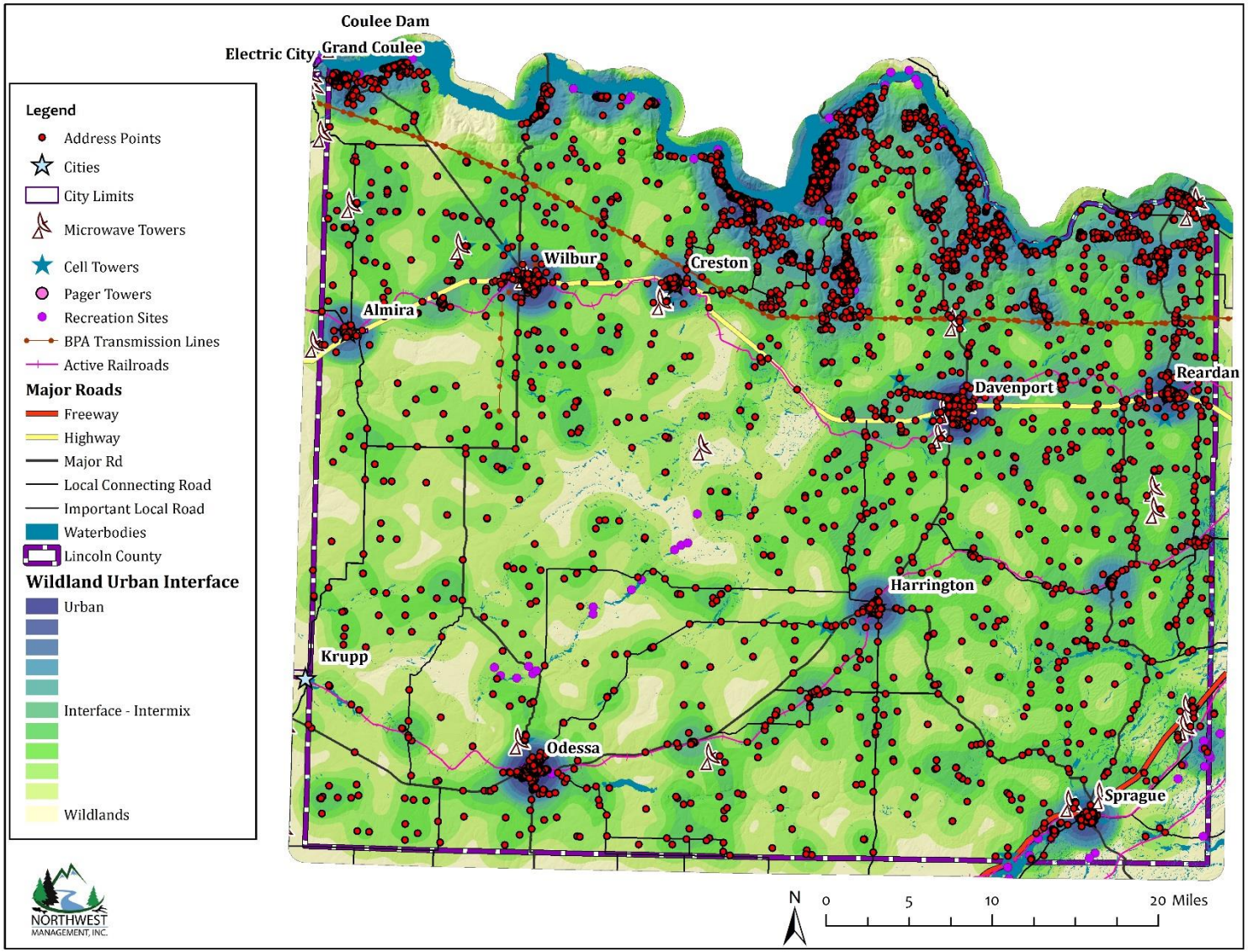
Figure 7.13. Slope.



Population

Population density plays a role in Lincoln 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.

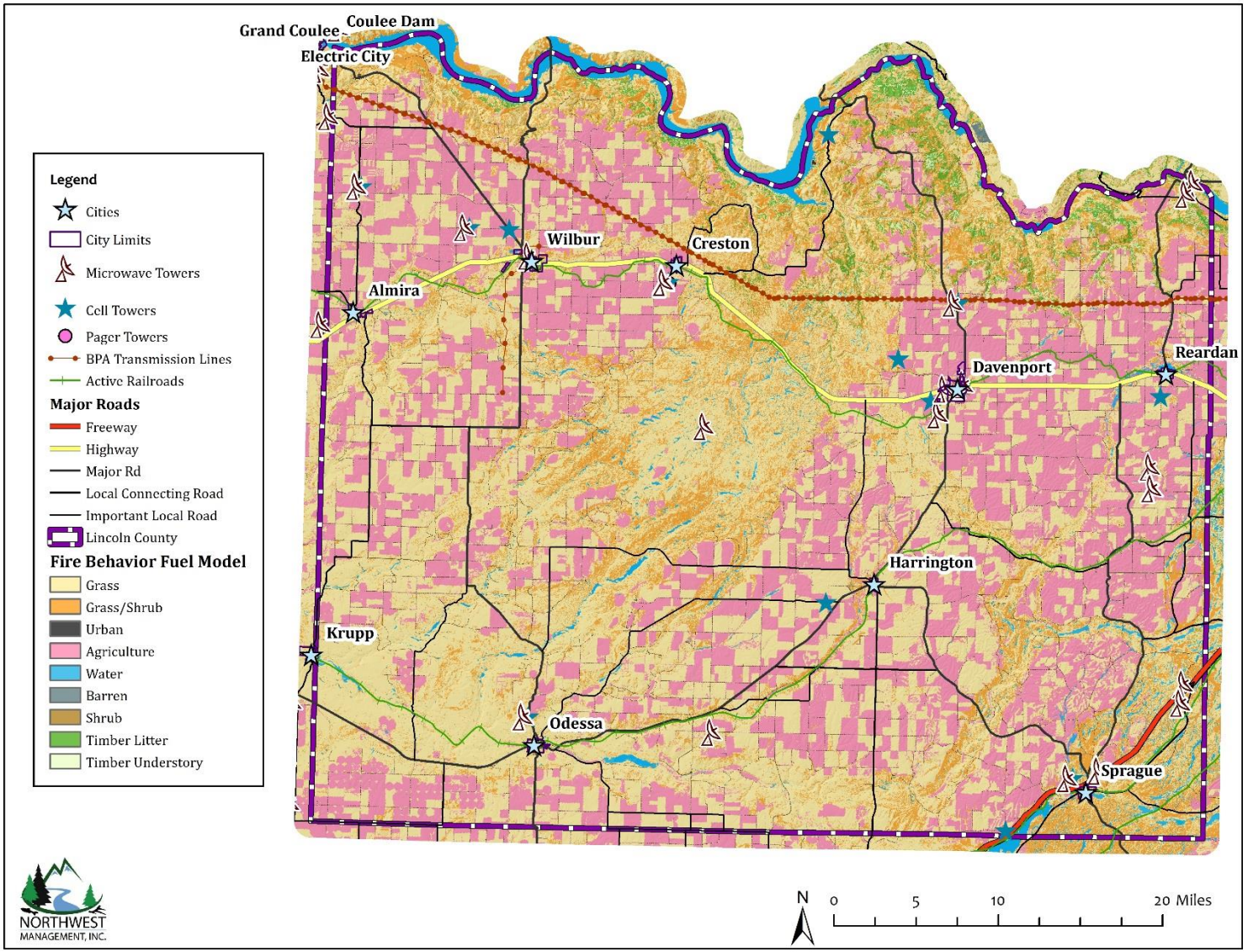
Figure 7.14. Population.



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 Lincoln 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 Lincoln County.

Figure 7.15. 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.

Appendix 4 – Fire Services

Table 7.3. Fire Services Information

Almira Fire Department:	Chief: Dennis Pinar, Jr. Telephone: 509-639-2601 E-Mail: firechief800@hotmail.com Address: PO Box 36 Almira 99103
Creston Fire Department:	Chief: Loren Houger Telephone: 509-636-2881 E-Mail: lthouger@gmail.com Address: 135 Creston Ave PO Box 405 Creston, WA 99117
Davenport Fire Department:	Chief: Craig Sweet Telephone: 509-725-6561 Email: Address: 701 Morgan , PO Box 26 Davenport, WA 99122
Odessa Fire Department:	Chief: Don Strenbeck Telephone: 509-982-2401 E-Mail: dons@odessatrading.com Address: 21 E First Ave, PO Box 218 Odessa, WA 99159
Wilbur Fire Department:	Chief: Craig Haden Telephone: 509-647-5531 E-Mail: wilburfire@odessaoffice.com Address: 10 NW Cole St, PO Box 67 Wilbur, WA 99185
Lincoln County Fire District #1:	Chief: Scott Clemenson Telephone: 509-257-2926 E-Mail: chiefclemenson@aol.com Address: 124 Old Airport Rd Sprague, WA 99032

Lincoln County Fire District #3:	Chief: Roger Sebesta Telephone: 509-982-2656 E-Mail: slfire@smwireless.net Address: 1 N Division, PO Box 6667 Odessa, WA 99159
Lincoln County Fire District #4 :	Chief: Ryan Rettkowski Telephone: 509-796-2623 Email: lcfire@centurytel.net Address: 135 S Lk St, PO Box 295 Reardan, WA 99029
Lincoln County Fire District #5:	Chief: Craig Sweet Telephone: 509-725-8890 Email: cdsweet@centurytel.net Address: 701 Morgan, PO Box 267 Davenport, WA 99122
Lincoln County Fire District #6:	Chief: Scott McGowan Telephone: 509-253-4333 Email: lcfpd6@gmail.com Address: W 308 Willis, PO Box 665 Harrington, WA 99134
Lincoln County Fire District #7:	Chief (Wilbur Station): Kevin Coffman Telephone: 509-641-2212 Email: kcoffman698792@gmail.com Address: PO Box 334 Wilbur, WA 99185 Chief (Creston Station): Pat Rosman Telephone: 509-641-1235 Address: 32755 Creston Butte Rd N Creston, WA 99117 Chief (Lincoln Station): Jim Derrer Telephone: 509-977-1189 Address: 26241 Bobcat Trail E Creston, WA 99117

Lincoln County Fire District #8:	Chief: Dennis Pinar, Jr Telephone: 509-641-0742 Email: townhall@televar.com Address: PO Box 94 Almira, WA 99103

Lincoln County Fire District #9:	Chief: Telephone: 509-647-5400 Address: c/o 44883 SR 174 N Grand Coulee, WA 99133

Joint Fire District Adams #1 & Lincoln #10:	Chief: Scott Kembel Telephone: 509-659-0600 Email: Address: 120 W Main Ritzville, WA 99169

Bureau of Land Management:	Spokane District Office Fire Management Officer: Scott Boyd Telephone: 509-536-1237 Address: 1103 North Fancher Road Spokane, Washington 99212-1275

National Park Service:	Lake Roosevelt National Recreation Area Chief Ranger: Craig Brouwer Telephone: 509-754-7813 Address: 1003 Crest Drive Coulee Dam, Washington 99116

Washington State Department of Natural Resources:	Northeast Region, Arcadia District Fire Unit Forester: D.J. Greene Telephone: 509-684-7474 Address: 225 S. Silke Road Colville, Washington 99114

Table 7.4. Fire Services Resource List

	Type	Resource	Gallons	Drive	Vehicle or License #	Specifications	Location
Wilbur Fire Department	2	Pumper	500			1969 American LaFrance	Wilbur
	2	Pumper	800			2005 Freightliner	Wilbur
Lincoln County Fire District #1	1	Engine	1000	4x4	161	International 7400, 1000 gpm	Sprague
	3	Engine	1200	6x6	117	AM General, 300 gpm	Sprague
	3	Engine	1400	6x6	116	International 4900, 300 gpm	Sprague
	3	Engine	1200	4x4	115	International 7300, 300 gpm	Sprague
	3	Engine	1200	4x4	114	International 7300, 300 gpm	Sprague
	3	Engine	800	4x2	112	GMC C-70, 250 gpm	Sprague
	6	Engine	250	4x4	121	Chevy C-30, 150 gpm	Sprague
	2	Tender	4200	4x2	130	Freightliner FLC, 300 gpm	Sprague
Lincoln County Fire District #3	3	Engine	1000	4x4	310	1985 Ford F-700	Robin Weishaar
	3	Engine	1000	4x4	311	1977 Int 1800	Lamona
	3	Engine	1000	4x4	312	1968 Int 1700	Dallas Deife
	3	Engine	1000	4x4	313	1973 Int 1700	Mike Hardung
	3	Engine	1000	4x4	314	1989 Int 4800	Jeff Melcher
	3	Engine	1100	4x4	315	1968 Kaiser Military	Lani Schorzman
	3	Engine	1000	6x6	316	1975 Int 1700	Colley Walter
	3	Engine	1000	4x4	317	1968 Int 1700	Gary Schmierer
	3	Engine	1000	4x4	318	1990 Int 4800	Irby
	3	Engine	1100	4x4	320	2006 Int 7400	Fink Station
	3	Engine	1100	4x4	321	2006 Int 7400	Odessa
	3	Engine	1100	4x4	322	2003 Int 7400	Odessa
		Command		4x4	323	1999 Chevy Suburban	Odessa

	Type	Resource	Gallons	Drive	Vehicle or License #	Specifications	Location
		Crash Truck		4x4	325	1977 Dodge 200	Odessa
		Tender	3300	6x6	326	1977 AM General	Rick Smith
		Semi-Tender	5000	4x6	327	1985 Kenworth	Odessa
		Semi-Tender	5000	4x6	328	1985 Kenworth	Odessa
		Tender	3300	6x6	329	1990 Peterbilt	Odessa
Lincoln County Fire District #4	6	Brush engine	400	4x4	410 C58123	(Moves to Gravelle in Summer)	Edwall
	3	Attack engine	500	4x4	416 79099C	Structural/Foam	Edwall
		Brush engine	600	4x4	416 61123C	Foam	Edwall
	4	Attack engine	1000	4x4	417 00259C	Structural/Foam	Edwall
	2	Pumper/Tender	3500	2	433 74738C	Structural/Port-a-tank	Edwall
		Support	0	2	413 16358C	Cascade SCBA fill	Edwall
		Brush engine	800	2	420 C14969	Summer only/booster line	Long Lake
	4	Attack engine	500	4x4	412 67786C	Structural/Foam/Extrication	Reardan
	1	Class A engine	1000	2	460 74752C	Structural	Reardan
	4	Attack engine	1000	4x4	411 C66525	Structural/Foam	Reardan
	2	Tender	3000	2	434 22705C		Reardan
	4	Attack engine	1000	4x4	414 28067C	Structural/Foam	Reardan
	2	Tender	3500	2	430 64004C	Port-a-tank/floating pump	Reardan
		Brush engine	250	4x4	419 79098C	Booster Line only	Reardan
Lincoln County Fire District #5		Engine	300	4x4	513	Quick Response	Deer Meadows
		Engine	300	4x4	524	Mini Pumper	Seven Bays
		Engine	750	4x4	526	Brush	Egypt
		Engine	750	4x2	515	Brush	Davenport
		Engine	1000	4x4	512	Brush	Davenport
		Engine	1000	4x2	528	Brush	Deer Meadows
		Engine	1000	4x2	525	Brush	Egypt

	Type	Resource	Gallons	Drive	Vehicle or License #	Specifications	Location
		Engine	1200	4x2	514	Brush	Davenport
		Engine	1300	4x2	527	Brush	Deer Meadows
		Command		4x4	540	Suburban ¾ ton	Davenport
		Tender	3600	6x4	530	Tanker	Davenport
		Engine	250	4x4	516	Brush	Davenport
Lincoln County Fire District #6		Brush Truck	1200	4x4	615	2001 International, 300 gpm	Harrington
		Brush Truck	1200	4x4	613	1985 Ford, 300 gpm	Harrington
		Brush Truck	1200	4x4	610	1982 International, 300 gpm	Harrington
		Brush Truck	1000	4x4	611	1972 International, 275 gpm	Harrington
		Brush Truck	1200	4x4	612	2013 Peterbuilt, 300 gpm	Harrington
		Tanker	1600	4x2	630	1975 International, 225 gpm	Harrington
		Tanker	4000	6x2	631	2003 Dodge, 300 gpm	Harrington
		Brush/Quick attack	300	4x4	614	1993 Chevrolet, 125 gpm	Harrington
Lincoln County Fire District #7	7	Engine	250	4x4	L727	30 gpm, 1982 Dodge, foam	Creston
	3	Engine	1200	4x4	L729	500 gpm, 1993 Int., foam	Creston
	3	Tender	1200	4x4	L730	300 gpm, 1971 Int.	Creston
	2	Structural	500	4x2	L769	750 gpm, 1976 FTI pumper	Creston
	1	Tender	5000	4x2	L739	300 gpm, 1987 White	Creston
	3	Engine	1200	4x4	L710	300 gpm,1974 Int., foam	Creston
		Engine	1200	4x4	L717	300 gpm, 1992 F-800, foam	Creston
	4	Engine	800	4x4	L728	125 gpm, 1968 Int., foam	Lincoln
			750	4x4	L726	500 gpm, 1991 Int.	Lincoln
	2	Structural	500	4x2	L768	1000 gpm, 1980 FTI pumper	Lincoln
	3	Engine	1200	4x4	L711 00284C	300 gpm, 1989 Int., foam	Wilbur
	3	Engine	1200	4x4	L712 44693C	300 gpm.,1997 Int., foam	Wilbur
	6	Engine	300	4x4	L713 11189D	225 gpm,, 1980 GMC, foam	Wilbur

	Type	Resource	Gallons	Drive	Vehicle or License #	Specifications	Location
	7	Engine	250	4x4	L714 29714D	30 gpm, 1986 Chevy, foam	Wilbur
	3	Tender	2000	4x2	L731 C37983	250 gpm, 1992 Ford	Wilbur
	3	Tender	1800	4x4	L732 11190D	250 gpm, 1973 Int.	Lincoln
	7	Engine	250	4x4	L741 C42730	30 gpm, 1968 Jeep	Wilbur
	2	Tender	3000	6x2	L733	300 gpm, 1985 Int.	Wilbur
	1	Tender	5000	6x2	L738	300 gpm, 1992 Ford	Wilbur
		Structural			L761	1250 gpm, Freightliner	Wilbur
		Command		4x2	L740	1987 Ford pickup	Wilbur
Lincoln County Fire District #8	6	Rescue	400			1993 Ford F-350	Almira
	3	Brush engine	600	4x4		1993 Fore F-800	Almira
	3	Brush engine	1400			1982 Chevy	Almira
	3	Brush engine	1200			1997 Freightliner	Almira
	3	Brush engine	750			1970 Chevy	Almira
	T3 S2	Tender	2000			2009 Ferrera	Almira
	1	Structural	1000			2007 Ferrera	Almira
	6	Brush engine	500			1985 Chevy	Almira
	3	Brush engine	1000	6x6		1985	Almira
		Command				1997 Ford F-350	Almira
Lincoln County Fire District #9	Type 1	Engine	1000		32983D	1977 Ford	Main Station
	Type 1	Engine	1000		32959D	2004 Spartan	Main Station
	Type 7	Brush engine	100		40746D	1988 Chevy 3500	B Station
	Type 6	Brush engine	300		20959D	1994 Chevy 3500	B Station
	Type 3	Brush engine	510		32986D	2007 Ford F550	B Station
	Type 6	Brush engine	350		76135C	2006 Ford 550	B Station
		Transport			40747D	1981 Ford Passenger Van	B Station
Linc		Wildland Engine	1200	4x4	2011 #1104	350 GPM Rear engine	Station #1 Ritzville

	Type	Resource	Gallons	Drive	Vehicle or License #	Specifications	Location
		Wildland Engine	1200	4x4	2008 #1105	350 GPM Rear engine	Station #1 Ritzville
		Wildland Engine	1000	4x4	1997 #1107	350 GPM Rear engine	Station #1 Ritzville
		Wildland Engine	1000	4x4	1997 #1108	350 GPM Rear engine	Station #1 Ritzville
		Wildland Engine	1000	4x4	1998 #1124	350 GPM Rear engine	Station #2 Ritzville
		Tender	3300		2006 #1113	PTO	Station #1 Ritzville
		Tender	3300		2005 #1114	PTO	Station #1 Ritzville
		Tender	3000		1985 #1115	PTO	Station #2 Ritzville
		Wildland Engine	1500	6x6		Rear engine	
		Tender	4000			Rear engine	
		Plow		4x4	1985 #1117		Station #1 Ritzville
Washington Department of Natural Resources	5	Wildland	420			Ford	Deer Park
	5	Wildland	420			Ford	Deer Park
	5	Wildland	420			Ford	Deer Park
	5	Wildland	420			Ford	Deer Park
	5	Wildland	420			Ford	Deer Park
	5	Wildland	420			Ford	Deer Park
	5	Wildland	420			Ford	Deer Park
	5	Wildland	420			Ford	Deer Park
	5	Wildland	420			Ford	Deer Park
	5	Wildland	420			Ford	Deer Park
	6	Wildland	240			Ford	Deer Park
	6	Wildland	240			Ford	Deer Park
	2	Helicopter	225		6-9 Helicopters		Ellensburg
	3	SEAT	650		2 Fireboss	Fixed-wing	Deer Park
		Inmate-Crew				4-10 person	
BLM	Type 6	Wildland Engine	300	4x4			Wenatchee Field Office
	Type 6	Wildland Engine	300	4x4			Wenatchee Field Office

	Type	Resource	Gallons	Drive	Vehicle or License #	Specifications	Location
		Handcrew				10 person	Spokane District Office

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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.

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.
- 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 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.

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 Lincoln 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 Lincoln 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 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

Appendix 6 - Potential CWPP Project Funding Sources

Assistance to Firefighters Grant (AFG)

http://www.fema.gov/assistance-firefighters-grant

The primary goal of the Assistance to Firefighters Grant (AFG) is to meet the firefighting and emergency response needs of fire departments and nonaffiliated emergency medical service organizations. Since 2001, AFG has helped firefighters and other first responders to obtain critically needed equipment, protective gear, emergency vehicles, training and other resources needed to protect the public and emergency personnel from fire and 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.

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 2016 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-FMWT) 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.

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.

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.

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.

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.

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 Lincoln 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 Lincoln 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 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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This plan was updated by Northwest Management, Inc. under contract with the Washington Department of Natural Resources.

Citation of this work:

Tucker, Brad and T. Luke *Lead Authors.* 2016 Lincoln County, Washington Community Wildfire Protection Plan Update. Northwest Management, Inc., Moscow, Idaho. Pp 210.

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