Ferry County, Washington

Community Wildfire Protection Plan

Approved by the

Ferry County Commissioners

2014

This plan was developed by the Ferry County Community Wildfire Protection Plan steering committee.

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.

Ferry/Okanogan County Fire Protection District #13
Ferry/Okanogan County Fire Protection District #14
Ferry County Joint Fire Protection District #3

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Copies of this plan can be found at:

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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 forest 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 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 Ferry County Commissioners' 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 **Ferry County Community Wildfire Protection Plan** is designed to expand on the wildfire chapter of a Multi-Hazard Mitigation Plan. This project was funded by the Washington Department of Natural Resources and the Bureau of Land Management.*

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Chapter 1

Overview of this Plan and its Development

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

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

- Ferry County Commissioners
- Ferry County Planning Department
- Ferry Conservation District
- Ferry County Fire District 13
- Malo Grange
- Washington State University Ferry County Extension
- Washington Department of Natural Resources
- U. S. Forest Service
- Bureau of Land Management

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.

Mission Statement

The Ferry County Community Wildfire Protection Plan is meant to identify wildfire response capability, educate homeowners as to what actions can be taken to reduce the ignitability of

structures, and evaluate critical infrastructure throughout the county. To identify prioritized areas for hazardous fuel reduction treatments on Federal, State, and Private land and to build on existing efforts to restore healthy forest conditions within the county. This plan will clarify and refine our priorities for the protection of life, property, critical infrastructure, and identify wildland-urban interface areas.

Vision Statement

Promote a countywide wildfire hazard mitigation concept through leadership, professionalism, and excellence, leading the way to a safe, sustainable Ferry County.

Goals

1. To reduce the area of WUI land burned and losses experienced because of wildfires where these fires threaten communities in the wildland-urban interface.
2. Prioritize the protection of people, structures, infrastructure, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy.
3. Educate communities about the unique challenges of wildfire in the wildland-urban interface (WUI).
4. Establish mitigation priorities and develop mitigation strategies in Ferry County.
5. Strategically locate and plan fuel reduction projects.
6. Provide recommendations for alternative treatment methods, such as modifying forest stand density, herbicide treatments, fuel reduction techniques, and disposal or removal of treated slash.
7. Meet or exceed the requirements of the National Fire Plan and FEMA for a County-level Wildfire Protection Plan.

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. Although losses from fires made up only 2.2 percent of all insured catastrophic losses from 1991 to 2010[1], fires can result in billions of dollars in damages.

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) For the homeowner to create and maintain a buffer, called defensible space, from 30 to 100 feet wide around a structure, where flammable vegetation and other objects are reduced; and (2) for the

[1] Rocky Mountain Insurance Information Association website at, http://www.rmiia.org/Catastrophes_and_Statistics/Wildfire.asp accessed in November, 2013.

homeowner to install 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 both their primary and 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 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).
- Healthy Forests Restoration Act (2003).
- National Cohesive Wildland Fire Management Strategy (March 2011). 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 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).

Update and Review Guidelines[3]

- *Deadlines and Requirements for Regular Plan Reviews and Updates*: In order to apply for a FEMA PDM project grant, Tribal and local governments must have a FEMA-approved mitigation plan. Tribal and local governments must have a FEMA-approved mitigation plan in order to receive HMGP project funding for disasters declared on or after November 1, 2004. States and Tribes must have a FEMA-

[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.

[3] Federal Emergency Management Agency. Multi-Hazard Mitigation Planning Guidance Under the Disaster Mitigation Act of 2000. Original Release March, 2004 With revisions November, 2006, June, 2007 & January 2008.

approved Standard or Enhanced Mitigation Plan in order to receive non-emergency Stafford Act assistance (i.e., Public Assistance categories C-G, HMGP, and Fire Management Assistance Grants) for disasters declared on or after November 1, 2004. State mitigation plans must be reviewed and reapproved by FEMA every three years. Local Mitigation Plans must be reviewed and reapproved by FEMA every five years.

- *Plan updates*. In addition to the timelines referenced above, the Rule includes the following paragraphs that pertain directly to the update of State and local plans,
  - ✓ §201.3(b)(5) [FEMA Responsibilities]…Conduct reviews, at least once every three years, of State mitigation activities, plans, and programs to ensure that mitigation commitments are fulfilled….
  - ✓ §201.4(d) Review and updates. [State] Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities and resubmitted for approval…every three years.
  - ✓ §201.6(d) [Local] plans must be reviewed, revised if appropriate, and resubmitted for approval within five years in order to continue to be eligible for…project grant funding.

  Plan updates must demonstrate that progress has been made in the past three years (for State plans), or in the past five years (for local plans), to fulfill commitments outlined in the previously approved plan. This will involve a comprehensive review and evaluation of each section of the plan and a discussion of the results of evaluation and monitoring activities detailed in the Plan Maintenance section of the previously approved plan. FEMA will leave to State discretion, consistent with this plan update guidance, the documentation of progress made. Plan updates may validate the information in the previously approved plan, or may involve a major plan rewrite. In any case, a plan update is NOT an annex to the previously approved plan; it must stand on its own as a complete and current plan.

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 Ferry 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 Ferry 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. This plan should be referred to for guidance when updating pertinent county plans and policies. The following sections identify and briefly describe some of the existing Ferry County planning documents and ordinances considered during development of this plan.

Ferry County All Hazard Mitigation Plan

The Ferry County Local Hazard Mitigation Plan was developed to meet the requirements of the Disaster Mitigation Act of 2000. The Ferry County Hazard Mitigation Advisory Group was established to make the population, neighborhoods, businesses, and institutions of the County more resistant to the impacts of future disasters. The Advisory Group completed a comprehensive, detailed evaluation of the vulnerabilities of the community to all types of future, natural, technological, and societal hazards in order to identify ways to make the communities of the planning area more resistant to their impacts. The Plan further addresses the mitigation goals and objectives established by the Advisory Group.

Mitigation planning is a dynamic process that can be adjusted when warranted to account for changes in the community and to further refine the information, judgments, and proposals documented in the local mitigation plan. Maintenance of the Hazard Mitigation Plan will included the Advisory Group's activities every five years to monitor implementation of the Plan, to evaluate the effectiveness of implemented mitigation initiatives, to revise and update the Plan to include initiatives proposed within the 5-year period, and to continually strive to engage the community in the planning process.

Ferry County Comprehensive Plan 2012

The Ferry County Comprehensive Plan provides a vision for the County that indicates how it wants to develop and make public investments over the next 20 years. It analyzes land use, natural resources, public facilities, local services, population, economics, and housing to identify local issues and devise appropriate policies that will address those issues in a manner consistent with this vision. It provides the long-range focus to help decision-makers set priorities and evaluate whether development proposals are consistent with this vision. It is a tool to coordinate with other government agencies and to communicate to citizens and developers the vision of the community. The Comprehensive Plan provides the framework for regulatory updates, land use decisions, and public investments and will be an invaluable resource for the County as it enters the 21st Century.

The Comprehensive Plan is a dynamic document that represents a continuous process of setting goals and establishing priorities on actions to achieve those goals. This Plan provides for periodic updates and review of the plan. These updates will allow the County to reflect changing conditions and take advantage of new opportunities.

Critical Areas Ordinance 2013

The purpose of this ordinance is to promote the general health, safety and welfare of county residents, public and private property and the natural environment inherent in Ferry County. The regulations included in this ordinance are designed to protect against loss of critical areas. This ordinance also implements the regulations of the Growth Management Act and the goals and policies of the Ferry County Comprehensive Plan.

Shoreline Master Program 2002

The Shorelines Management Act of 1971 states that "it is the policy of the state to provide for the management of the shorelines of the state by planning for and fostering all reasonable and appropriate uses." Also "this policy contemplates protecting against adverse effects to the public

health, the land and its vegetation and wildlife, and the waters of the state and their aquatic life, while protecting generally public rights of navigation and corollary rights incidental thereto."

Lower Kettle River Community Wildfire Protection Plan

The Lower Kettle River (Orient) area was chosen as one of the first areas for a Community Wildfire Protection Plan in the Colville National Forest area with planning efforts beginning in the summer of 2004. A very active community was involved in the planning process as well as several fire suppression agencies working in the Lower Kettle River area, representatives from the Forest Service and Washington Department of Natural Resources, and private individuals. This CWPP provides an overall view of the watershed and its relationship with fire. It suggests ways the relationship can be improved; individually and as a community. It also provides direction to local agency land managers and concerned landowners who want to work with their neighbors in developing hazardous fuel reduction strategies.

The Lower Kettle River CWPP was finalized in December of 2005. Representative from the core team that worked on the Lower Kettle River CWPP have been invited to the table and are actively participating in the development of the Ferry County Community Wildfire Protection Plan. Specific components of the Lower Kettle River CWPP are being incorporated into the Ferry County CWPP to ensure that the County Plan smoothly dovetails with the assessments, goals, and mitigation measures outlined in the Lower Kettle River Plan.

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 Ferry 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 Ferry 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, 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:

- Ferry County Commissioners
- Ferry County Planning Department
- Ferry County Fire District #13
- Ferry Conservation District
- Malo Grange
- Washington State University Ferry County Extension
- Washington Department of Natural Resources
- U.S. Forest Service
- Bureau of Land Management

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

NAME	ORGANIZATION
Brad Miller	Ferry County Commissioner
Irene Whipple	Ferry County Planning Department
Jon Chrysler	Ferry County Fire District #13 and Malo Grange
John Foster Fanning	Ferry County Fire District #14
Lloyd Odell	Ferry Conservation District
Steve Harris	Washington Department of Natural Resources
Myron Boles	Washington Department of Natural Resources
Arne Johnson	Washington Department of Natural Resources
Paul Nelson	Washington Department of Natural Resources
Trevor Lane	Washington State University Ferry County Extension
Richard Parrish	Bureau of Land Management
Mike Solheim	Bureau of Land Management
Al Crouch	Bureau of Land Management
Reed Heckly	Colville National Forest
Ben Curtis	Colville National Forest
Tera King	Northwest Management, Inc.
Brock Purvis	Northwest Management, Inc.
Vincent Corrao	Northwest Management, Inc.
Vaiden Bloch	Northwest Management, Inc.
Brad Tucker	Northwest Management, Inc.

Committee Meeting Minutes

Committee meetings were scheduled and held from April, 2014 through August, 2014. These meetings served to facilitate the sharing of information and to review sections of the Ferry 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

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

Print Media	Other Media
The View	Local Fire Districts
Statesman Examiner	Planning Department
Omak Chronicle	Grocery Stores
	KOMW Radio

Figure 2.1. Press Release, April, 2014.

Ferry County Press Release

April 18, 2014

Ferry County Plans to Update Community Wildfire Protection Plan

Working in conjunction with Ferry 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 Ferry 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 Ferry 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 first meeting is scheduled for April 29th, 2014 and will be the first of several monthly meetings.

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, Ferry County, DNR, Forest Service, BLM, and others.

The intention of the project is to conduct an assessment of wildland fire risk in Ferry 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 Ferry 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 in the summer of 2014. A notice of the dates and locations of these meetings will be posted in local news outlets. For more information on the Ferry 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. 123.

Public Meetings

Public meetings were scheduled in strategic locations during 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 first meeting was held in Republic at the Ferry County Fairgrounds Carousel Building on the 29th of July. Two citizens and three committee members attended this meeting. The second meeting was held in Curlew at the 'Old Fire Hall' on the 30th of July. This meeting was attended by zero citizens and three committee members. The last meeting was held on July 31st at the Barstow Training Center, which was attended by one citizen and six committee members. The public meeting announcement was sent to the local newspapers on July 10, 2014 and committee members were asked to post the flyer shown in Figure 2.2 around their communities.

Figure 2.2. Public Meeting Flyer July 10, 2014.

Ferry County Community Wildfire Protection Plan

Public Meeting Announcement

NORTHWEST MANAGEMENT, INC.

Ferry County Fair Grounds Carousel Building (Republic), July 29th, 6:30 pm

Old Fire Hall, River St. (Curlew), July 30th, 6:30 pm

Barstow Training Center (25266 Hwy 395 N), July 31st, 6:30 pm

These public meetings will address the Community Wildfire Protection Plan being developed for Ferry 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 Ferry County.
- Improving public awareness and educating the public about wildfire risk.
- Evaluating strategies for landowners to lessen wildfire potential.
- Addressing areas of inadequate fire protection.
- Recommending risk mitigation projects.

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

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

Documented Review Process

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

During regularly scheduled committee meetings in the spring and summer of 2014, 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 August for a full committee review. The committee was given thirty days to provide comments on the plan.

Public Comment Period

A public comment period was conducted from September 8th – 30th, 2014 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 View, the Statesman Examiner, the Omak-Okanogan Chronicle on August 28th 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 the Republic Library and Ferry County Commissioners' Office. An electronic version of the plan was made available on the Northwest Management, Inc. website. A majority of the comments that were received during the public review phase were minor grammatical changes. There were some comments that wanted to see stronger language regarding homeowner responsibility to protect their property and not to expect firefighting resources to be assigned to their home. A copy of the comments received from the public are included in the Appendices.

Figure 2.4. Press Release #3 – Public Review Period, August 28th, 2014.

Ferry County

Media Release

From: Steve Harris, Washington Department of Natural Resources
Date: August 28th, 2014
RE: Ferry County Community Wildfire Protection Plan

Ferry County Community Wildfire Protection Plan Available for Public Review

The Ferry County Community Wildfire Protection Plan has been completed in draft form and is available to the public for review and comment at the locations listed below. Electronic copies may be viewed in pdf format at (http://www.consulting-foresters.com/?id=clients). The public review phase of the planning process will be open from today thru September 30th, 2014.

Republic Library	**Commissioners' Office**
794 S Clark Ave.	290 E Tessie Ave.
Republic, WA 99166	Republic, WA 99166

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

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

Comments on the CWPP must be submitted to the attention of Brad Tucker, Northwest Management, Inc. at tucker@nmi2.com or mailed to Northwest Management, Inc., PO Box 9748, Moscow, Idaho 83843 by close of business on September 30th, 2014. For more information on the Ferry County CWPP update process, contact Brad Tucker at 208-883-4488 ext. 123.

Continued Public Involvement

Ferry County is dedicated to involving the public directly in review and updates of the Community Wildfire Protection Plan. The Ferry County Commissioners, working through the CWPP steering committee, are responsible for review and update of the Plan as recommended in chapter 6 of this document.

The public will have the opportunity to provide feedback annually on the anniversary of the adoption of this plan, at an open meeting of the steering committee. Copies of the 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 the Ferry County Homeland Security Coordinator, 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 concerns, opinions, or ideas about the Plan. The County Commissioners' office 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.

Chapter 3

Ferry County Characteristics

Ferry County was created on February 21, 1899[4]. The county was split from Stevens County which is east of Ferry County. Ferry County was named after Elisha P. Ferry, the state's first governor.

Description

Information adapted from the North Ferry Area Soil Survey Manuscript.

Ferry County is in the northeastern part of Washington. Ferry County is east of the Columbia River and is bounded on the north by the international boundary with Canada. The southern boundary is the Roosevelt Lake. The area is characterized by a hilly to mountainous topography and narrow stream valleys. For the most part, the stream valleys are oriented in a north-south direction. The Kettle River Range, a part of the Okanogan Highlands, divides the area into two parts. This range rises to an elevation of 5,000 to more than 7,000 feet and is crossed by the highest all-weather road in the State. Copper Butte, the high point of this range, rises to an elevation of 7,135 feet.

The only railroad in the area follows the Kettle River north from Kettle Falls to Laurier and then extends west to Grand Forks in Canada. It returns to Washington at Danville, continues south through Curlew and Malo, and ends at Republic. The segment between Grand Forks and Republic has been abandoned and is currently designated as a rail trail.

Republic, the county seat, overlooks the Sanpoil River Valley, which is in western Ferry County. Republic is the largest town in Ferry County. The Sanpoil River, Curlew Creek, and the Kettle River are the three main streams draining the western part of the area. Curlew Lake, approximately 885 acres in size, is just north of Republic.

The chief industries are lumbering, mining, and farming. The major timber types are Douglas-fir, western larch, and ponderosa pine. A number of the mountains in the area contain, besides gold, deposits of copper, iron, silver, lead, and other ores. Breeding and raising beef cattle is the chief farming enterprise. Hay and small grain are the main crops.

Geography and Climate

The **Okanogan Highlands** province is situated east of the Cascade Range and north of the Columbia Basin. To the east and north, the highlands extend into northern Idaho and southern British Columbia, respectively. They are characterized by rounded mountains with elevations up to 8,000 feet above sea level and deep, narrow valleys. The Columbia River divides the Okanogan Highlands into two geographic regions: to the east of the river are the Selkirk, Chewelah, and Huckleberry Mountains; to the west are the Kettle, Sanpoil, and other mountains.

[4] HistoryLink.org website at http://www.historylink.org/index.cfm?DisplayPage=output.cfm&File_Id=5380. Accessed May, 2014.

The Okanogan Highlands were covered by great ice sheets during the Pleistocene Epoch. As the ice sheets retreated to the north, lakes formed in the valleys of the Columbia and Pend Oreille Rivers. Along the Canadian boundary, terrace deposits indicate lake levels 2,000 feet above current sea level. Melt waters filled these lakes with sand, silt, and clay.

Ferry County's topography ranges from 1,400 feet in the lowland areas along the Columbia River corridor to a high point on Copper Butte with an elevation of 7,140 feet. Besides being bordered for much of the County's perimeter by the Columbia River, the County has several rivers that provide a range of recreational opportunities including; the Kettle River, the Sanpoil River, and Curlew Creek as well as Curlew Lake.

The climate of Ferry County is influenced by elevation, topography, distance and direction from the ocean, prevailing westerly winds and the position and intensity of the high and low pressure centers in the western Pacific Ocean. Temperature ranges can vary noticeably between the lowland river corridor areas and the plateau, but they generally average between 30 degrees in January, to 85 degrees in the summer months. Average annual precipitation totals about 16 inches, with the heaviest precipitation occurring during the winter months and late spring.[5]

Population and Demographics

The 2010 Census established the Ferry County population at 7,551, which is up from 7,260 in 2000. Table 3.1 shows historical changes in population in Ferry County.

Table 3.1. Historical and Current Population by Community.

1960	1970	1980	1990	2000	2010
3,889	3,655	5,811	6,295	7,260	7,551

Since 1980, Ferry County has been steadily growing following several decades of decrease population between 1930 and 1970. Since the 1970's the county's population has grown, on average by over 20%.

Of the county's residents, about 14% (1,073) live in Republic. The majority of the remaining residents (6,478) are concentrated in unincorporated parts of Ferry County as well as some of the smaller communities such as Inchelium.

The 2010 Census reported that ethnicity in Ferry County is comprised of 77% white, 17% American Indian, 0.5% African American, 1% Asian, and 4.8% people reporting two or more races. Approximately 48% of residents are female. There are 4,408 housing units (71.4% homeownership rate) in Ferry County.[6]

Land Ownership

A relatively large percentage of the county is publicly owned. The majority of the property is held either as public property or as Indian lands. Private land is becoming more and more expensive as the population grows and more property is developed. This factor combined with

[5] Western Regional Climate Center website. Available online at http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?warepu Accessed April, 2014.

[6] US Census Bureau. State & County QuickFacts. Available online at http://quickfacts.census.gov/qfd/states/53/53019.htmlt Accessed March, 2014.

the mountainous nature of the geography is expected to produce significantly higher demands on privately held land in the future.

Table 3.2. Land Ownership Categories in Ferry County		
Entity	**Acres**	**Percent of Total Area**
Tribal	716,288	50%
US Forest Service	474,629	33%
Private	198,913	14%
WA Department of Natural Resources	28,855	2%
US Bureau of Land Management	8,955	<1%
Water	8,741	<1%
WA Department of Fish and Wildlife	6,928	<1%
WA State Parks	124	<1%
Local Government	3	<1%
Federal Government	3	<1%
	1,443,438	**100%**

The data used to develop this table was provided by the 2010 BLM database. Local government property (i.e. County) is likely under the Private ownership category. There may be more accurate information but this table shows general trends, which is sufficient for the purpose of this plan.

Residential properties in Ferry County represent 8% of the total land use. There are approximately 10 square miles throughout the county used as commercial or as industrial land sites. These are mining sites, gravel pits, saw mills, and miscellaneous commercial developments. The total area is approximately less than 0.5% of the total land base of the county. Most of the commercial development is within the city of Republic and some in the town sites around the county.

Ferry County has approximately 109,086 acres in crops and rangeland. Lands currently in crop production total 29,300 acres. These lands generally lie in the valley bottoms and are limited in extent because of the soil and topographic restrictions to crop production. Private rangeland is approximately 79,786 acres allowing cattle ranches to be more diverse in areas. Also, Forest Service and Tribal lands are leased for grazing.

Ferry County has a total of approximately 700,000 acres of different classes of timberland. This is about ½ of the total land mass of the county. The total private acreage of timberland is approximately 140,000. Of this, approximately 91,000 acres are being held by lumber producing companies and 49,000 acres are in private, non-industrial ownership.

Development Trends

The following section was taken from the Northeast Washington Trends website.[7]

Residential building permits are an important subset of total construction permits, and hence activity, in a regional economy. An increase in these permits reflects an increase in population

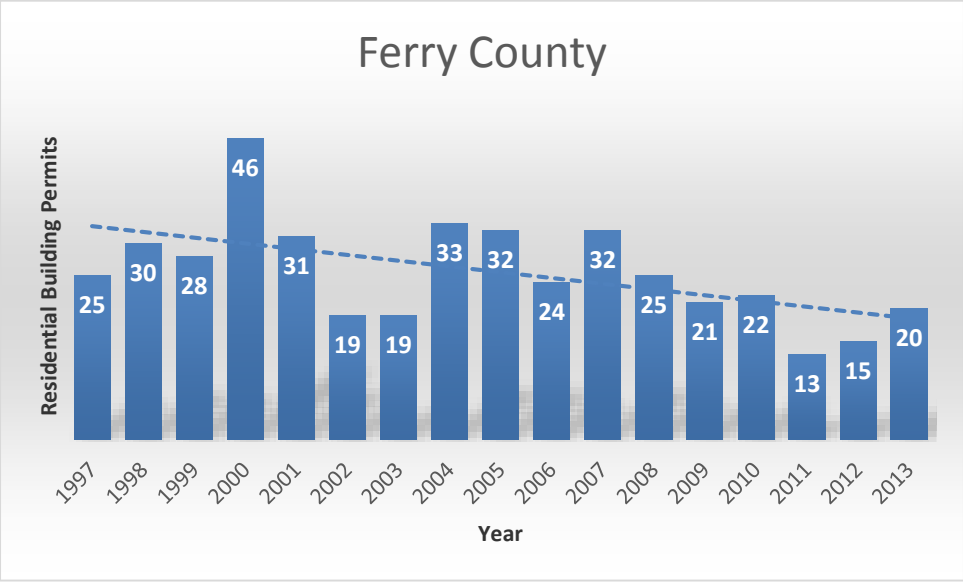
[7] Northeast Washington Trends website available at: http://www.northeastwashingtontrends.ewu.edu/hiSpeed/index.cfm. Accessed June, 2014. Provided by Eastern Washington University.

growth or a desire by current residents to change their dwelling, usually the most important financial asset of a family or household.

As in the case of general construction, changes in these permits signal the direction of near-term activity to the construction trades and real estate industry. The direction of building permit trends also informs local government about future sales tax revenues, since residential building leads to taxable sales.

Changes in numbers of residential building permits signal the direction of near-term activity to the construction trades and real estate industry. The direction of building permit trends also informs local government about future sales tax revenues, since residential building leads to taxable sales.

Figure 3.1. Ferry County Building Permits.



During 2013 in Ferry County, the total number of residential building permits issued was 20, decreasing by 20% since 1997 when there were 25.

During 2013, number of residential building permits issued per 1,000 residents in:

- Ferry County was 2.6, decreasing from 3.5 per 1,000 residents in 1997.
- Washington State was 4.9, decreasing from 7.3 per 1,000 residents in 1997.

Natural Resources

Ferry County is a diverse ecosystem with a complex array of vegetation, wildlife, and fisheries that have developed with, and adapted to fire as a natural/man-induced disturbance process. Nearly a century of wildland fire suppression coupled with past land-use practices (primarily agriculture and grazing) has altered plant community succession and has resulted in dramatic shifts in the fire regimes and species composition. As a result, some areas of Ferry County have become more susceptible to large-scale, high-intensity fires posing a threat to life, property, and natural resources including wildlife and plant populations. High-intensity, stand-replacing fires have the potential to seriously damage soils, native vegetation, and fish and wildlife populations. In addition, an increase in the number of large, high-intensity fires throughout the nation's forest

and rangelands has resulted in significant safety risks to firefighters and higher costs for fire suppression.

Fish and Wildlife –There are many species of wildlife that inhabit the forested region of northcentral Washington. Some of the species present even rely on this type of ecosystem to survive. Lynx and grizzly bears once heavily populated this region of Washington, however due to habitat loss and overharvest; these populations have been drastically reduced in numbers. There has been a significant effort by federal, state, and private landowners in recent years to increase the available preferred habitat.[8]

Vegetation – Ferry County supports a landscape of primarily forested ecosystem with a mosaic of native steppe and shrub-steppe vegetation. Ponderosa pine occurs on southerly aspects and at lower elevations, while Douglas fir and western larch dominate all other aspects and the higher elevations with lodgepole pine. Other species that exist at the higher elevations include; Engelmann spruce, alpine fir, and hemlock. Cottonwood trees and deciduous shrubs primarily occur in the riparian areas. The scattered shrubs that occur in patches throughout the county are typically ninebark and snowberry with a bunchgrass cover. Grass cover includes; bluebunch wheatgrass, Idaho fescue, and Sandberg bluegrass in areas without dense tree cover, while pinegrass is common under the tree canopy. Cheatgrass occurs where native species are sparse, particularly in disturbed areas, and can increase the length of the fire season in the county because of how quickly this species matures and then cures.

Table 3.3. Vegetative Cover Types in Ferry County.

Land Cover	Acres	Percent of Total Area
Conifer	1,011,414	70%
Exotic Herbaceous	121,874	8%
Grassland	115,061	8%
Shrubland	84,270	6%
Riparian	52,200	4%
Non-vegetated	35,364	2%
Sparsely Vegetated	10,343	1%
Agricultural	6,959	<1%
Developed	3,990	<1%
Hardwood	2,400	<1%
Total	**1,443,965**	**100%**

Vegetation in Ferry County is dominated by forestland with a mix of shrubland, grassland, riparian, and some agricultural ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the vegetation of the area. The most represented vegetation cover type is forest occurring on over 70% of the total acres in the county which is followed by grassland (16% with exotic herbaceous included), shrubland (6%), and riparian (4%) areas.

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

Hydrology

The Washington Department of Ecology & Water Resources Program is charged with the development of the Washington State Water Plan.[9] 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 Ferrry County will be the maintenance of the domestic watershed supplies in the Columbia River, Middle Lake Roosevelt (WRIA 58), Lower Lake Roosevelt (WRIA 53), Sanpoil (WRIA 52), Kettle (WRIA 60), and Nespelem (WRIA 51).

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.[10]

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

[9] Washington Department of Ecology website http://www.ecy.wa.gov/water.html Accessed March, 2014.

[10] 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.

Tribal, and local governments) through national standards and strategies to control pollutant emissions from automobiles, factories, and other sources.[11]

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

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

Washington Department of Ecology[12]

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. Ferry 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[13]

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

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

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[11] 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.

[12] Washington Department of Ecology website http://www.ecy.wa.gov/air.html Accessed March, 2014.

[13] Washington State Department of Natural Resources, Smoke Management Plan 1993. http://www.dnr.wa.gov/Publications/rp_burn_smptoc.pdf Accessed March, 2014.

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

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

Chapter 4

Risk and Preparedness Assessments

Wildland Fire Characteristics

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

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

Weather

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

Topography

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

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

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

Fuels

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

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

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

Wildfire Hazards

In the 1930s, wildfires consumed an average of 40 to 50 million acres per year in the contiguous United States, according to US Forest Service estimates. By the 1970s, the average acreage burned had been reduced to about 5 million acres per year. Over this time period, fire suppression efforts were dramatically increased and firefighting tactics and equipment became more sophisticated and effective. For the 11 western states, the average acreage burned per year since 1970 has remained relatively constant at about 3.5 million acres per year.

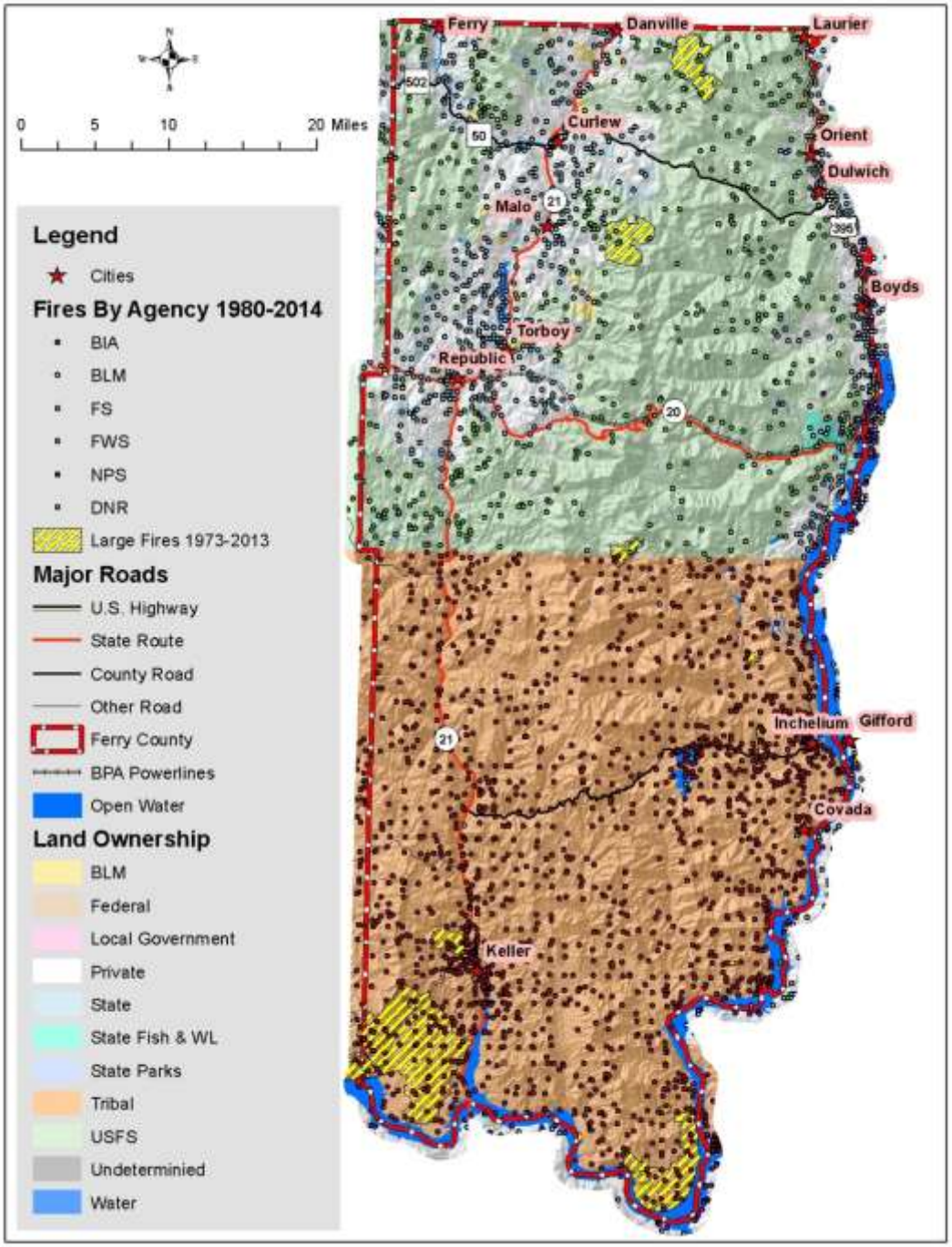
The severity of a fire season can usually be determined in the spring by how much precipitation is received, which in turn determines how much fine fuel growth there is and how long it takes

[15] Auburn University website https://fp.auburn.edu/fire/topos_effect.htm. Accessed on July 30,2012.

[16] Gorte, R. 2009. Congressional Research Service, Wildfire Fuels and Fuel Reduction.

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.

Figure 4.1. Ignition History in Ferry County from 1980-2014.



This map shows both state and federally reported fires (1980-2014) as well as **some** of the larger wildfires on record from 1973-2013. Two large wildfires that shapefiles were not provided at the time of document preparation are the White Mountain Fire (1988) and the Copper Butte Fire (1994). The Forest Service and Washington DNR appear to respond to the majority of wildland fires that occur within the northern half of the county. The Bureau of Indian Affairs responds to nearly all of the wildland fires that occur in the southern half of the county. The ignitions that occur near communities are likely human caused ignitions resulting from the high amount of use 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 reality a large majority of wildland fires may occur on private land.

Fire History

Fire was once an integral function within the majority of ecosystems in Washington. The seasonal cycling of fire across most landscapes was as regular as the July, August and September lightning storms plying across western Washington. Depending on the plant community composition, structural configuration, and buildup of plant biomass, fire resulted from ignitions with varying intensities and extent across the landscape. Shorter return intervals between fire events often resulted in less dramatic changes in plant composition.[17] These fires burned from 1 to 47 years apart, with most at 5- to 20-year intervals.[18] With infrequent return intervals, plant communities tended to burn more severely and be replaced by vegetation different in composition, structure, and age.[19] 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.

Fire history data for Ferry County is largely unknown. Local knowledge suggests that Native Americans did frequently burn which played an important role in shaping the vegetation throughout County.

Recently, the Fish Hatchery Fire that started on August 26, 2010 burned 650 acres and was located about 2 miles southeast of Curlew Lake in Ferry County. The Slide Creek Fire started on the same day, August 26, 2010, and burned 989 acres. It was located near Arden, approximately 6 miles south of Colville, Washington.[20]

[17] Johnson, C.G. 1998. Vegetation Response after Wildfires in National Forests of Northeastern Oregon. 128 pp.

[18] 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.

[19] 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.

[20] Washington Deparment of Natural Resources "ear to the ground" website found at: https://washingtondnr.wordpress.com/category/wildfire/page/21/ accessed June, 2014.

Wildfire Ignition Profile

Detailed records of wildfire ignitions and extents from the DNR and 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 DNR (1970-2012) and BLM (1980-2011) database of wildfire ignitions used in this analysis includes ignition and extent data within their jurisdictions. During this period, the agencies recorded an average of less than 84 wildfire ignition per year resulting in an average total burn area of 5,924 acres per year. According to this dataset, the human caused and natural/unknown ignitions account for the same number of wildland fires occurring in Ferry County. However, the highest amount of acres burned (71%) is attributed to the human caused ignitions.

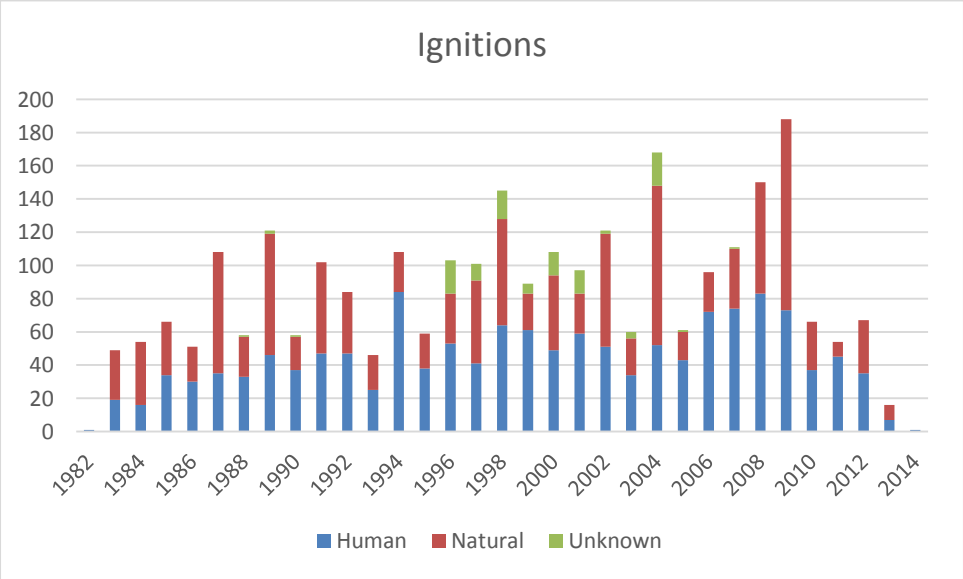
The highest number of ignitions in Ferry County was witnessed in 2009 with 188 separate ignitions. The largest amount of area burned in Ferry County occurred in 1988 with over 39,000 acres being burned in a single year.

Table 4.1. Summary of Cause from State and BLM databases 1972-2012.

General Cause	Number of Ignitions	Percent of Total Ignitions	Acres Burned	Percent of Total Acres
Human-Caused	1,426	52%	131,013	71%
Natural Ignition	1,228	44%	52,828	29%
Unknown	113	4%	<1	<1%
Total	**2,767**	**100%**	**183,841**	**100%**

During this 40 year span, wildland fires burned over 180,000 acres in Ferry County. The human caused ignitions account for just over half of all ignitions reported by state and federal agencies, while natural ignitions make up all but 4% of the other half of ignitions that occur in Ferry County. Human caused ignitions burned over 40% more, or nearly 80,000 acres more than naturally ignited fires.

Figure 4.6. Summary of Ferry 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 Ferry 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 Ferry 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 2012 are provided and demonstrate the variability of the frequency and extent of wildfires nationally.

Table 4.2. National Fire Summary.

Statistical Highlights	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of Fires	77,534	66,753	96,385	85,705	78,979	78,792	71,971	74,126	67,315	47,579
10-year Average ending with indicated year	100,466	89,859	87,788	80,125	79,918	78,549	76,521	80,465	74,912	74,514
Acres Burned (million acres)	6.8	8.7	9.9	9.3	5.3	5.9	3.4	8.7	9.2	4.3
10-year Average ending with indicated year (million acres)	4.9	6.1	6.5	7.0	6.9	6.9	6.5	7.0	7.3	7.2
Estimated Cost of Fire Suppression (Federal agencies only)	$1.0 billion	$1.0 billion	$1.93 billion	$1.84 billion	$1.85 billion	$1.24 billion	$1.13 billion	$1.73 billion	$1.9 billion	$1.7 billion

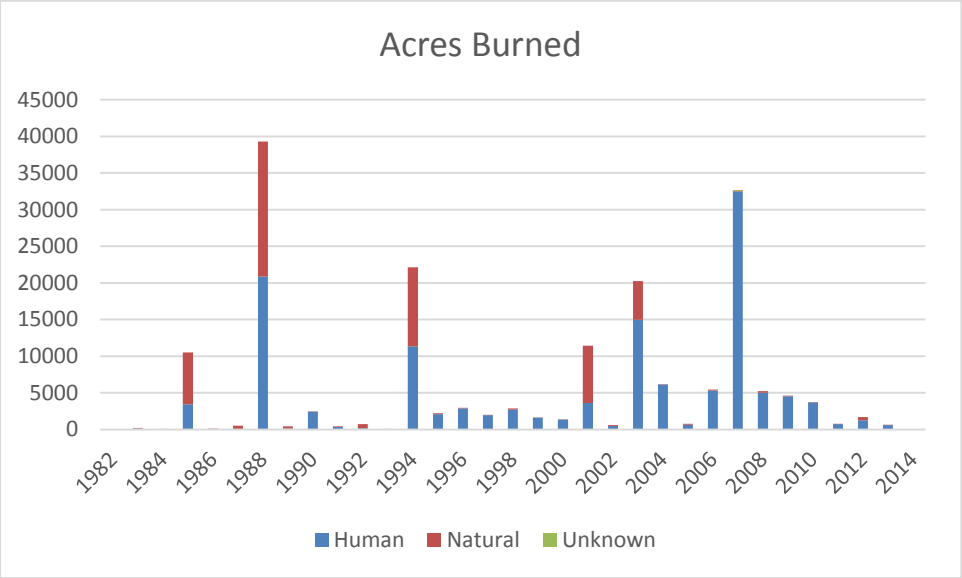
The National Interagency Fire Center maintains records of fire costs, extent, and related data for the entire nation. Tables 4.2 and 4.3 summarize some of the relevant wildland fire data for the nation and some trends that are likely to continue into the future unless targeted fire mitigation efforts 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.[21]

[21] National Interagency Fire Center. 2008. Available online at http://www.nifc.gov/.

Table 4.3. Total Fires and Acres 1980 - 2010 Nationally.					
Year	**Fires**	**Acres**	**Year**	**Fires**	**Acres**
2013	47,579	4,319,546	**1996**	115,025	6,701,390
2012	67,774	9,326,238	**1995**	130,019	2,315,730
2011	74,126	8,711,367	**1994**	114,049	4,724,014
2010	71,971	3,422,724	**1993**	97,031	2,310,420
2009	78,792	5,921,786	**1992**	103,830	2,457,665
2008	68,594	4,723,810	**1991**	116,953	2,237,714
2007	85,822	9,321,326	**1990**	122,763	5,452,874
2006	96,385	9,873,745	**1989**	121,714	3,261,732
2005	66,753	8,689,389	**1988**	154,573	7,398,889
2004	77,534	6,790,692	**1987**	143,877	4,152,575
2003	85,943	4,918,088	**1986**	139,980	3,308,133
2002	88,458	6,937,584	**1985**	133,840	4,434,748
2001	84,079	3,555,138	**1984**	118,636	2,266,134
2000	122,827	8,422,237	**1983**	161,649	5,080,553
1999	93,702	5,661,976	**1982**	174,755	2,382,036
1998	81,043	2,329,709	**1981**	249,370	4,814,206
1997	89,517	3,672,616	**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: BLM, Bureau of Indian Affairs, NPS, USFWS, USFS, and all state agencies.

Figure 4.8. Summary of Ferry County State and Federal Acres Burned by Cause.



The fire suppression agencies in Ferry 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.

Ferry County has experienced high impact wildland fires that have burned structures or infrastructure within their wildland urban interface. Based on field assessments by experts, the

fuels for further potentially catastrophic fires remain however, and given an extremely dry summer it is not unimaginable to believe that significant fires will continue to happen in Ferry County. It is essential that regional planners and especially local residents fully understand that threat in order to more effectively prepare for potential wildfire events.

Wildfire Hazard Assessment

Ferry 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 Ferry 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 Ferry 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.

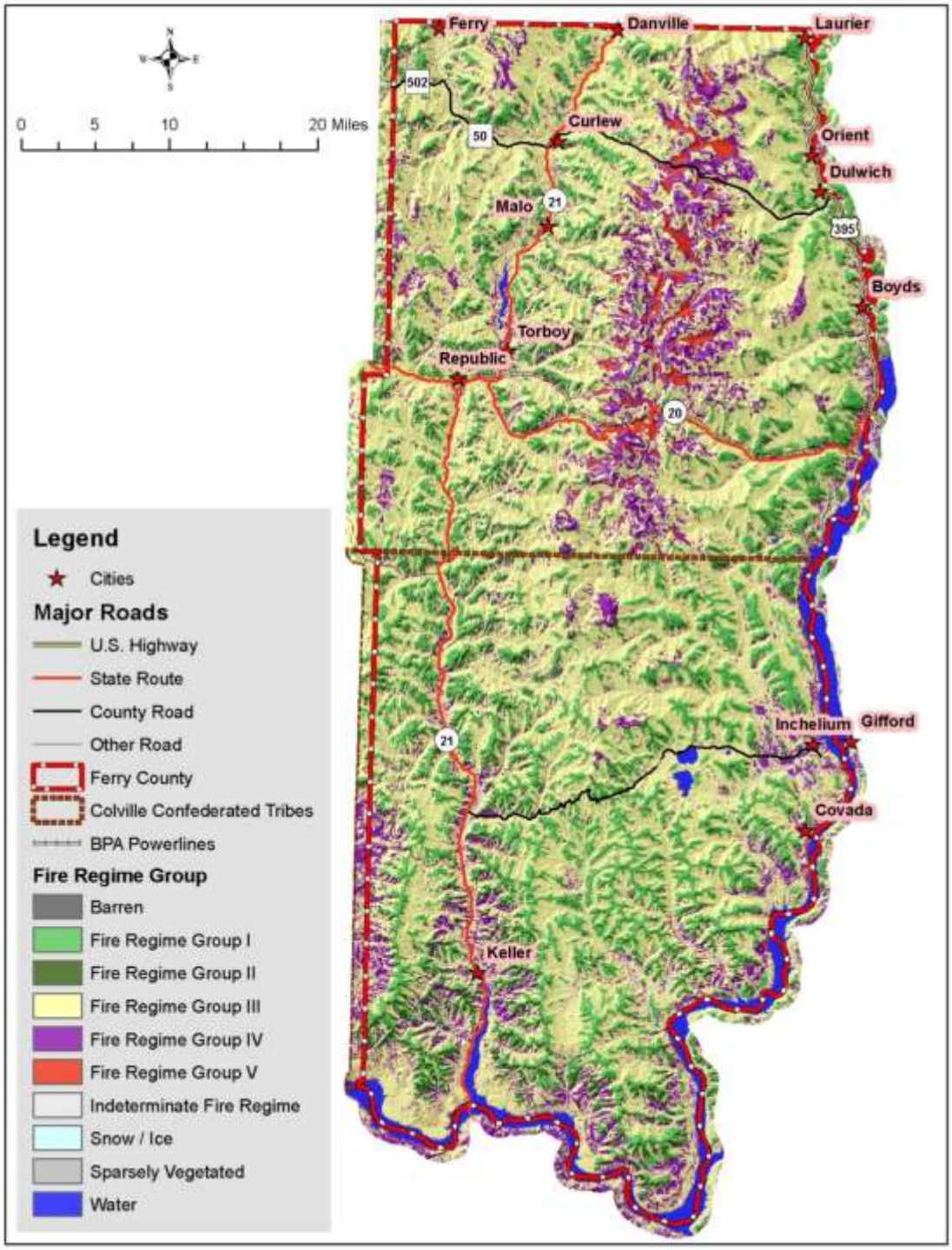
Table 4.4. Historic Fire Regimes in Ferry County.

Historic Fire Regime	Description	Acres	Percent of Total
Fire Regime Group I	<= 35 Year Fire Return Interval, Low and Mixed Severity	258,429	18%
Fire Regime Group II	<= 35 Year Fire Return Interval, Replacement Severity	61,356	4%
Fire Regime Group III	35 - 200 Year Fire Return Interval, Low and Mixed Severity	872,949	60%
Fire Regime Group IV	35 - 200 Year Fire Return Interval, Replacement Severity	179,671	12%
Fire Regime Group V	> 200 Year Fire Return Interval, Any Severity	20,641	1%
Water	Water	34,436	2%
Snow / Ice	Snow / Ice	1	<1%
Barren	Barren	927	<1%
Sparsely Vegetated	Sparsely Vegetated	410	<1%
Indeterminate Fire Regime Characteristics	Indeterminate Fire Regime Characteristics	15,144	1%
	Total	**1,443,965**	**100%**

This model only uses the current vegetation types to determine the historic fire regime. Native Americans reportedly burned throughout the county on a regular basis. The vegetation types were much different pre Euro-American settlement than they are today and believed to be a more grassland dominated landscape. The Historic Fire Regime model suggests that fires in Ferry County historically burned with mixed severity fires on a longer return interval. The longer time between fires allows fuel to build-up, which can burn very intensely when conditions are dry. For this reason, it may be reasonable to assume that a majority of the areas in the County that have been categorized as having a 35 to 200 year return interval with mixed severity fires, could likely be stand replacing fires with the current accumulation of fuels.

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 4.10. Historic Fire Regime for Ferry 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.[22, 23] Coarse scale definitions for historic fire regimes have been developed by Hardy et al[24] and Schmidt et al[25] 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. [26] 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.[27,28] 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 Ferry County shows that the majority land in the county is considered moderately departed (64%) from its historic fire regime and associated vegetation and fuel characteristics. Approximately 17% has a low departure and less than 16% is considered highly departed.

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

[23] 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.

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

[25] 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.

[26] 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.

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

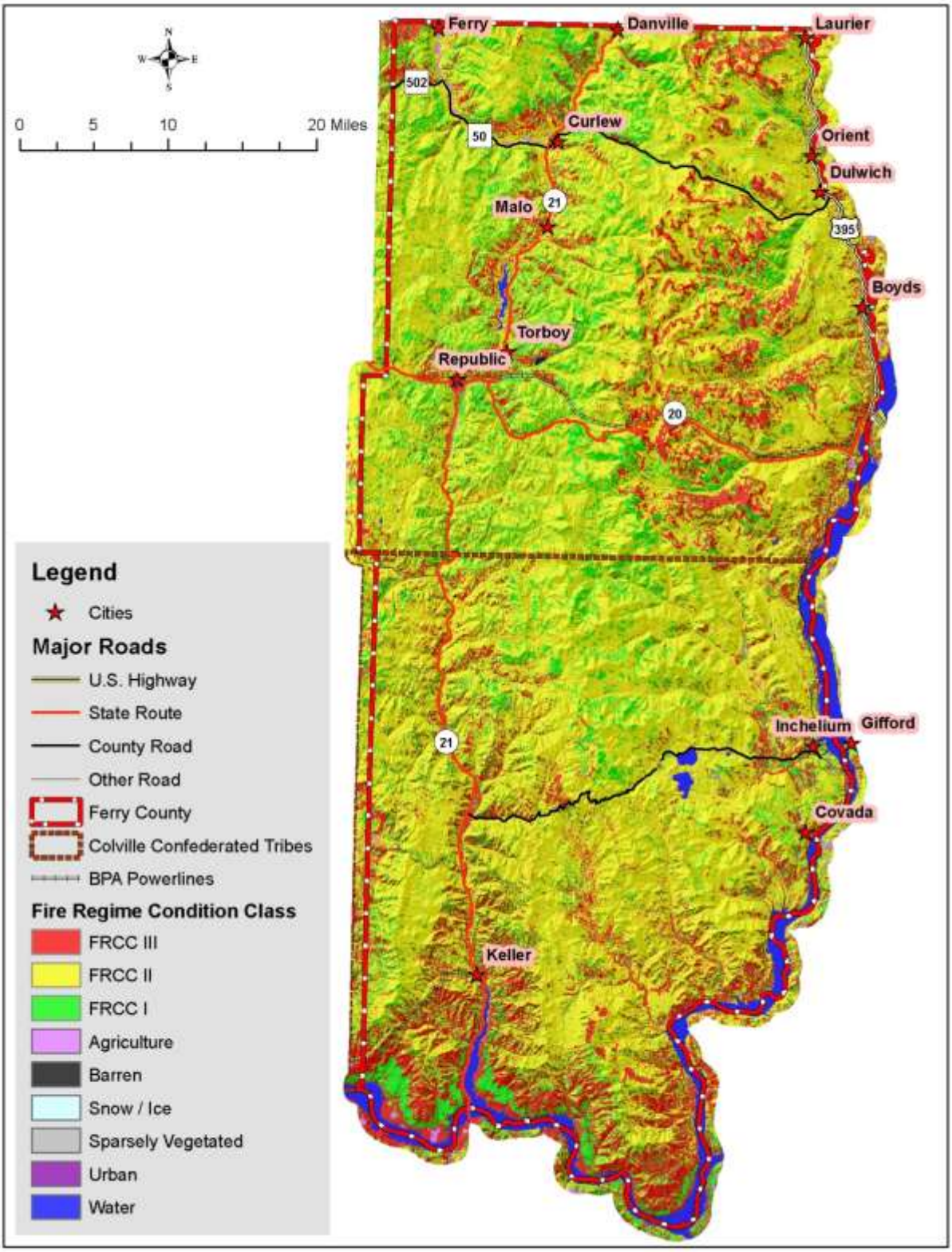
[28] Schmidt, K. M., et al. *"Development of coarse scale spatial data for wildland fire and fuel management."* General Technical Report, RMRS-GTR-87. U.S. Department of Agriculture, Forest Service. Rocky Mountain Research Station. Fort Collins, Colorado. 2002.

Table 4.5. Vegetation Condition Class in Ferry County.			
Vegetation Condition Class	**Description**	**Acres**	**Percent of Total**
Vegetation Condition Class I	Low Vegetation Departure	242,813	17%
Vegetation Condition Class II	Moderate Vegetation Departure	924,190	64%
Vegetation Condition Class III	High Vegetation Departure	230,238	16%
Agriculture	Agriculture	6,959	<1%
Water	Water	34,436	2%
Snow / Ice	Snow / Ice	1	<1%
Urban	Urban	3,991	<1%
Barren	Barren	927	<1%
Sparsely Vegetated	Sparsely Vegetated	410	<1%
	Total	1,443,965	100%

The current Vegetation Condition Class model shows that much of Ferry County is considered to be moderately departed. A concentration of the highly departed vegetation appears to occur in the southern portion of the county along the Columbia River as well as some slopes within the Kettle Range. The combination of invasive grasses (eg. Cheatgrass), steep slopes, dry climate, and various shrub species in the southern portion of the county can create extreme fire behavior in those areas. In addition, a majority of the county is dominated by various tree species with a shrub understory consisting of ninebark, snowberry, and other shrub species. The current structure and density of the forested areas 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 4.11. Vegetation Condition Class.



Ferry 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.[29] "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".[30] The role of the federal agencies in Ferry 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.[31] 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. [32]

By reducing hazardous fuel loads, ladder fuels, and tree densities, 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 ground or crown fires entering or leaving the area;*
- *Reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI. Research indicates that flying sparks and embers (firebrands) from a crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior;*[33]
- *Improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.*

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[29] 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.

[30] 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

[31] 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

[32] 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.

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

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

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

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

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

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

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

Ferry County's wildland urban interface (WUI) is mostly 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. The County's 911 address

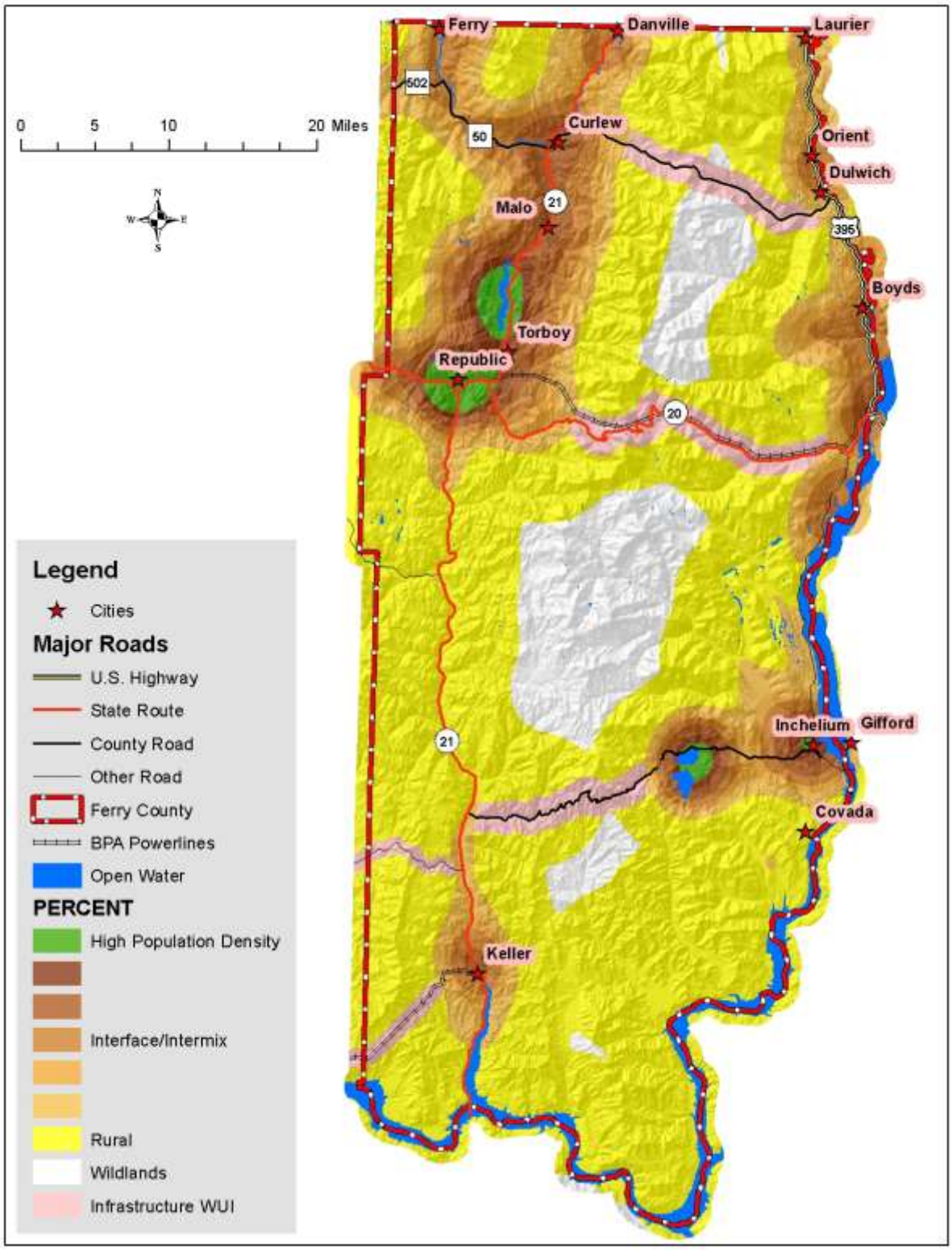
location database was used to identify structure locations (see Figure 4.1) for the updated WUI designation. The resulting output identified the extent and level of population density throughout the county. The updated map, as seen in Figure 4.12, has an expanded "Rural" delineation when compared to the original WUI designation. This is because the original WUI designation was determined using aerial imagery to mark the location of individual structures by hand using GIS.

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 Ferry 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 Ferry County WUI is included in Appendix 1.

Figure 4.12. Wildland Urban Interface in Ferry 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 mitigative 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.

Funding for these types of projects can come from a variety of avenues. Title III funds are often used by counties to conduct fire education and fuel reduction projects. Federal grants can be awarded to counties through various state agencies to perform forest health and fuel reduction projects.

Relative Threat Level Mapping

Ferry 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 Ferry 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.[34]

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.

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

Suppression Capabilities

Fire protection in each district in Ferry County is essentially the responsibility of the local fire district. The County has four 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.

One concern for the Fire Protection Districts is a fire starting on a steep slope which allows it to gain momentum on an upslope run before firefighters can engage due to inaccessibility. Therefore, steeper slopes were weighted higher to account for the more inaccessible parts of the County.

Population Centers and Developing Areas

Due to the increased human activity within and surrounding Ferry 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 Ferry 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, travel corridors, 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 knowledge of local experts and using the fire models, high risk areas were identified. Field assessments of these areas were conducted in July 2014 and included the West Curlew Lake area, Lone Ranch Creek area, Big Goosemus Creek area, Boulder Creek road, Highway 20, Storm King Mountain, and some of the small communities that have ingress/egress issues. Fire control and mitigation specialists conducted thorough field assessments 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, U.S. Forest Service, and the Washington DNR were consulted in order to address specific areas of concern and document local wildfire suppression operational tactics.

Determination of Relative Threat Level

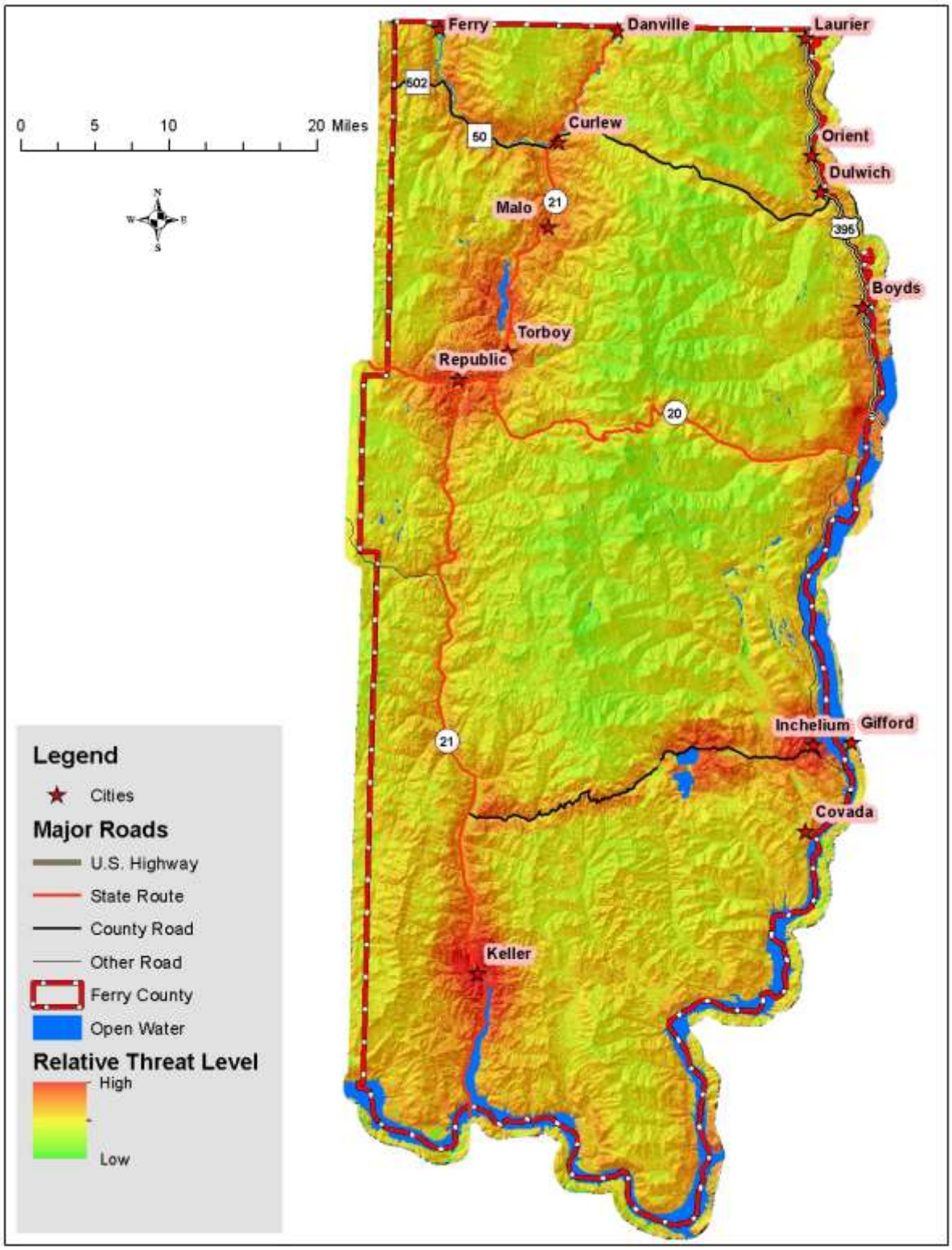
Following the field assessments, the steering committee began development of the Relative Threat Level model. Risk categories included in the final analysis were slope, aspect, precipitation, fuel models, rate of spread, fire intensity, and population density. The various categories, or layers, were 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 Ferry 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 Ferry County, forest fuel models were given the higher rankings followed by shrub and grass fuel models, and short grass / agriculture.
- 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 Ferry County. A map showing the identified Ferry County Relative Threat Level is included in Appendix 1.

Figure 4.13. Relative Threat Level Map for Ferry County.



Overview of Fire Protection System

A majority of the County has a local fire protection district that covers both structural and wildland fire response. The Washington DNR is responsible for wildland fire protection on assessed timbered areas that do not have acceptable fire protection. The USFS and BLM are responsible for wildland fire protection on their respective ownerships.

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.

Ferry/Okanogan County Fire Protection District #13

District Summary:

The Ferry/Okanogan Fire Protection District #13 is authorized and guided by Title 52 of the Revised Code of Washington for Fire Protection Districts. Its primary responsibility is the protection of structural improvements and developments on lands within its district. It also has joint protection responsibilities with the Washington State Department of Natural Resources for protection from wildland fires.

The fire district boundary generally coincides with that of the Republic School District #309, with the addition of an annexed portion extending westward from Ferry County into Okanogan County along the state highway route 20 corridor. The district area is approximately 140 square miles with a population of approximately 3,300 residents.

Fire district staffing consists of:

- 35 - Firefighters (volunteer)
- 3 - Fire Commissioners (volunteer)
- 1 - District Secretary (part-time paid)
- 1 - Maintenance Worker (part-time paid)

The fire district is generally situated within the wooded valleys of the San Poil River and the Curlew Lake valley, including their tributaries. The valley bottoms are typically open and grassy where agriculture and development has cleared the forests and the uplands are generally wooded. Natural vegetation throughout the district creates a widespread Wildland/urban interface fire threat potential.

Approximately 1/3 of fire district values lie within the city limits of Republic, WA, with remaining values existing in the rural areas of the district.

The local area has an active fire history. Large wildfires have been documented throughout Ferry County. When large fires occur, citizens are reminded of the threat to their homes, and awareness of hazard fuels peaks for a time. However, the mental vividness of evacuations, warning

bulletins, and firefighters and equipment pouring into the community to render assistance dulls with time. It is essential for residents to fully understand the vulnerability of living within dense vegetation where dry summers create the potential for catastrophic fire events.

Issues of Concern:

Residential Growth: Development continues to occur in fire-prone landscapes such as; communities in Curlew Lake and surrounding tributary creek drainages as well as north of the City of Republic on Klondike Mountain.

Communications: Establish another repeater for fire/ems to cover the dead spots around the boundary area between Curlew Lake and Malo.

Burn Permit Regulations: The fire district does not administer a burn permit system. The fire district has relied upon a system established by the Washington State Department of Natural Resources (DNR) that allows outdoor burning under certain times of the year according to particular rules.

During times of the year when DNR burning rules are relaxed, usually early spring and late fall, the fire district is frequently called out to suppress escaped fires started by homeowners burning grass and debris. Escape fire incidents have a negative impact upon the time and patience of volunteer firefighters. The volunteers are willing to help those in genuine need when fire threatens the community due to accidental reasons, but their enthusiasm wanes when their personal lives are interrupted by fires that have escaped due to poor planning or carelessness. Because of escaped burning incidents, there is a need to develop further cooperation and education between local law enforcement and Fire Chiefs to cooperatively enforce current laws regarding reckless and negligent fire use.

Other: The trend of dwindling industrial activity in the fire district will degrade the tax revenues over time. Poor economics will continue to be a limiting factor in providing adequate fire protection unless business and industry can be attracted to the area.

Cooperative Agreements:

The fire district has agreements in place with the following agencies:

- USDA- Forest Service, Colville National Forest
- Ferry/Okanogan Fire Protection District #14
- Ferry 3/Steven 8 Joint Fire Protection District
- Okanogan County Fire Districts Mutual Aid Agreement
- City of Republic

The fire district could benefit from agreements to clarify the relationships with the following agencies:

- Ferry County Sheriff
- Ferry County Public Utility District #1
- Republic Ambulance District
- Confederated Tribes of the Colville Reservation
- Bureau of Indian Affairs

The fire district would benefit from fire protection service contracts with the following agencies whose facilities are protected by the fire district without providing tax support:

- Republic School District #309
- Ferry County Public Utility District #1
- Ferry County
- City of Republic
- State of Washington Department of Transportation

The fire district had entered into an Emergency Forestland Response Agreement in the past with the Washington State Department of Natural Resources, but it has not been re-signed.

District Needs/Wish List: The fire district is on a measured expansion program to realign facilities and equipment to the changing distribution of development within a wildland/urban interface fire environment. A "measured" expansion translates into a decided policy of avoiding debt if at all possible. Since the area is considered an economically depressed area, the fire district desires to build and expand only as the funds are accumulated from annual tax revenues.

Ferry/Okanogan County Fire Protection District #14

District Summary:

Ferry/Okanogan County F.P.D. #14 covers northwest Ferry County and northeast Okanogan County of Washington State and includes 79,953 private acres (124 square miles; 77,733 acres FY CO, 2,220 acres OK CO), and approximately 1,700 citizens with an estimated 800 structures. The topography of F.P.D. #14 is considered mountainous with three primary, narrow valleys and many steep drainages. Unchecked development of interface neighborhoods occur in narrow, mountainous valleys with small ranches and farms in larger valley bottoms and some uplands and isolated mountain homes and cabins.

Approximately 80% of land in the 'north-half' of Ferry County is under governmental management of Forest Service, Washington Department of Natural Resources or the Bureau of Land Management.

Issues of Concern:

Residential Growth: Development continues to occur throughout the county but particularly within the wildland interface which makes fire protection difficult for many reasons.

Communications: Communications can always be improved. There are substantial 'dead spots' throughout the district both radio and cellular.

Burn Permit Regulations: The fire district does not administer a burn permit system. The fire district has relied upon a system established by the Washington State Department of Natural Resources (DNR) that allows outdoor burning under certain times of the year according to particular rules.

Cooperative Agreements: Formal Mutual-aid agreements exist between FPD #14 and WA DNR and FPD #13. Currently Mutual-aid agreements are in draft stages with local USFS Job Corps compound, Grand Forks British Columbia, Canada and FPD #3. Between 2000 and 2004 FY/OK FPD #14 responded to 34 calls for assistance from Washington State DNR.

FPD #14 is a founding member of NE-WA-CO (Northeast Washington Coalition of fire suppression agencies). Two of the seven initial attack engines are non-tax based allowing FPD #14 a history of responding to mobilization calls outside jurisdictional boundaries; some examples of which are 1991 Firestorm, 1994 Tyee & Rat Creek Complex fires, 1994 Copper Butte, 1994 Palmer Complex fires, 1994 Spokane Riverside fire, 1996 Bowie Road, 1999 Lemansky Pines fire, 2000 Cayuse Cooker and Rocky Hull, 2001 Mount Leona, Tonasket Complex, 2003 Togo fire. Additionally numerous minor responses have occurred supporting the WA DNR during lightning bust ignitions.

FPD #14 is active on a regional basis with members serving on various emergency management boards, i.e. Chair of FY CO E-911 Governing Board, Chair and Secretary of FY CO Trauma Care Council, Alternate representative to East Region Trauma Care Council, Chair and Secretary of FY CO Fire Prevention Cooperative, Coordinator of NE-WA-CO, Regional EMS trainer, representative on Five Star Enterprise Community, representative to regional disaster preparedness committee.

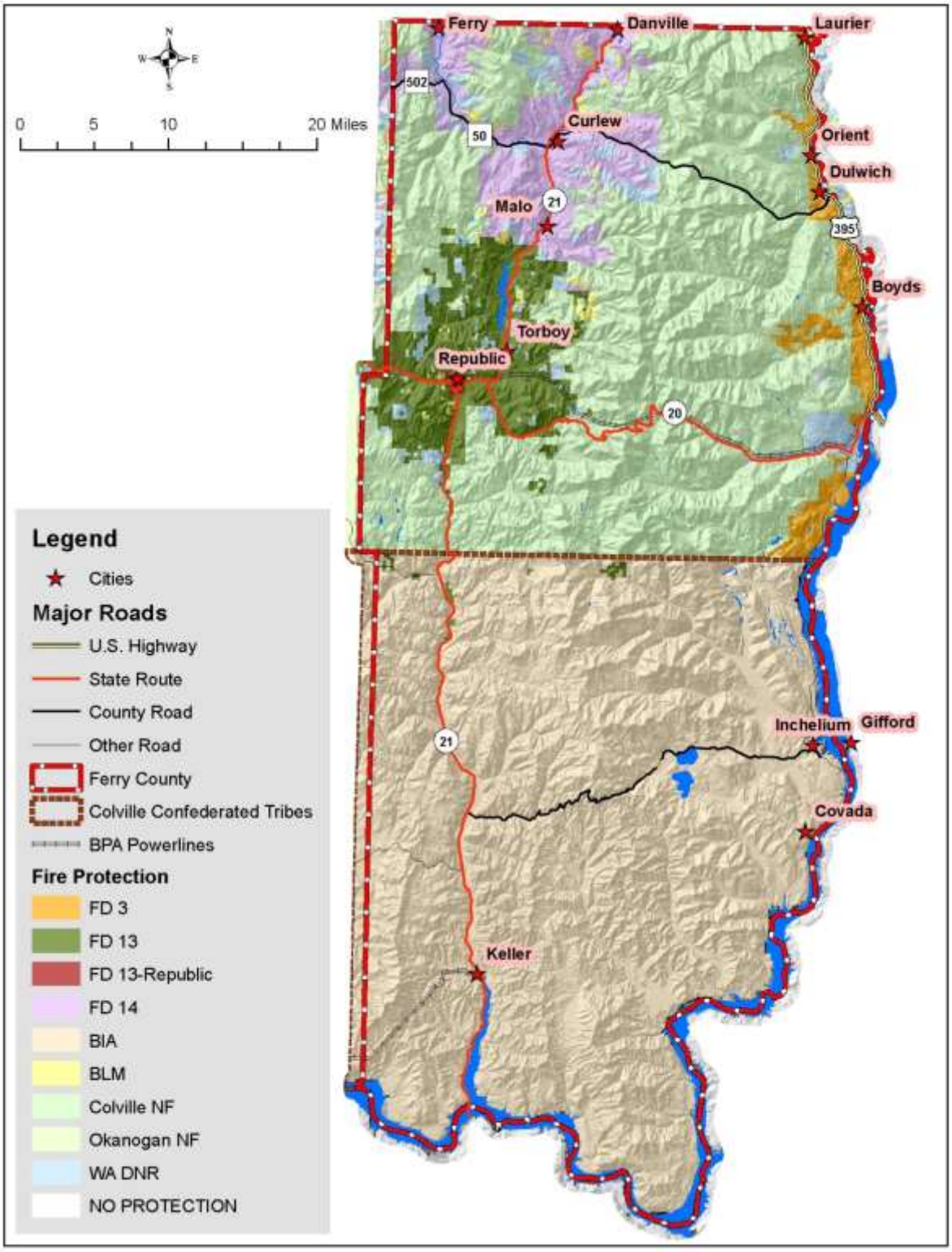
District Needs/Wish List: While only one member who is certified in a line rated position for wildland fire, the District has many long term members who have skills, knowledge, and abilities at Resource Boss, Strike Team Leader, and other advanced levels. The primary obstacle for obtaining this training is unpaid time commitments for the several weeks of required training at the ISC 230, 231, & 232 plus ISC 290 and leadership courses.

An aging fleet of apparatus is the district's primary limitation. The newest vehicle of the fleet is a 1999 F-450 Ford which came to the District surplus from the USFS Colville National Forest in 2005. Much of the District's heavy rolling stock is late 1960 vintage and up for replacement.

Additionally, the District currently has no water tenders on inventory. This is a gaping hole in the water transport and portable hydrant ability. The District has recently acquired one surplus Kenworth tractor truck for building a tender but has not yet amassed the funding to do so.

While the primary station of the District is new (2004/05) five bay facility located in the town of Curlew, the District is still in need of additional development of stations. The two bay, three apparatus station in Toroda (1998) is adequate for current needs. The single bay, single apparatus stations in Malo and Danville are much less than adequate for current needs. Stations similar to the Toroda station need to be built in both the Danville and Malo locations.

Figure 4.14. Wildfire Protection Responsibility Map.



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

Washington Department of Natural Resources

Washington State Department of Natural Resources is the state's largest on-call fire department with employees who fight fire on about 12.7 million acres of non-federal (private, state and tribal) forest land. The DNR has the primary protection responsibilities on private and state forest land throughout Northeast Region in the State of Washington. The DNR may also respond to fires outside of DNR jurisdiction that threaten DNR protection. The DNR provides wildland fire prevention and regulation on private and state forestland. The DNR works cooperatively during suppression operations with the private sector, local protection entities, and other State and Federal agencies. The DNR does not provide formal EMT services. Most DNR employees have first-aid training and some, individually may have had EMT and/or first-responder training.

The Northeast Region Interagency Communications Center (NEWICC) maintains lists of "call when needed" Faller Agreements and Dozer Agreements. Operators are equipped and trained for fire suppression throughout the local districts. Dozer sizes can range from D-4 to D-8.

DNR helicopter(s) are staged at the Omak Airport initially, and later at Colville throughout fire season for initial attack. The helicopter staged at the Omak Airport is usually a Bell 205 with helitack crew.

The Fire Boss (SEAT on pontoons) water scooper is generally staged at Deer Park.

The BIA SEAT has been available to DNR at the Omak Airport for initial attack during recent fire seasons.

Canadian air tankers and lead plane are requested for initial attack when needed.

North Columbia District Summary: North Columbia District provides fire suppression, fire prevention, burning regulation and enforcement on approximately 1.35 million acres of private and state trust land in portions of Stevens, Ferry and Pend Oreille counties. While most of this district lies within Stevens County, a portion of the district encompasses eastern Ferry County as shown in figure 4.14. Due to the fact that most state trust land lies within Stevens County, the majority of fire personnel spend most of their time working on projects in Stevens County. They do, however, have an engine crew that is based in Ferry County. On most summer days, other resources are nearby and can respond to Ferry County in 15 minutes or less. In order to ensure adequate fire response, this district has a large staff of seasonal employees and the equipment necessary to support our firefighters.

North Columbia District has eight full time employees. Two of these employees work primarily in the fire program. The district also has 33 seasonal employees that support the fire program. The majority of these individuals are only employed from June 16 to September 15 of any given year. A handful of employees, currently five, are employed for a longer period of time. This period of employment averages April 1 to November 15. Most employees are qualified as wildland firefighters only but a handful of others hold a variety of NWCG qualifications such as single resource boss, task force leader and division supervisor.

The North Columbia work center is located with the region office in Colville, which enables this district to pull permanent staff from the main office to assist with fire as needed.

Highlands District Summary: The DNR Highlands District is located in the northwest quadrant of the Northeast Region of the State of Washington; and spans a 1,330,000 acre mosaic of ownerships and jurisdictions. Highlands District is located in the northern portions of both Okanogan and Ferry Counties; and is bordered on the north by Canada, on the south by the boundaries of the Colville Confederated Tribes, on the west by the foothills of the Cascade Range, and on the East by the Kettle Range. The district is comprised of private, county, state, federal and tribal ownerships with numerous jurisdictions and interests. Within Highlands district in Okanogan County there are about 178,711 acres of WA DNR managed land, about 25,811 acres of WDFD managed land and about 601,193 acres of private land. Highlands district also has about 26,785 acres of WA DNR managed land located in Ferry county. Topographic variations range from 900' to 8,000'. Uplands are a mixture of very rugged, often rocky slopes giving way to either rolling highlands or partially timbered rounded mountains.

The Highlands district fire program has one work center at Highlands Fire Camp (HFC), two miles south of Loomis. There is a memo of understanding with two Fire Protection Dictricts (Tonasket and Curlew) for minimal office use. Highlands state lands staff use a work center in downtown Loomis. The Highlands District Fire Control staff totals 42 individuals at the peak of fire season of which includes 2 permanent employees, 7 career-seasonal employees who work from about April to October, and 33 seasonal fire fighter employees on staff from roughly June to September. The Highlands 20 Person Hand Crew resides and trains at Highlands Fire Camp, until they are needed for fire response anywhere in the District, or across the state. HFC also has a permanent Heli-spot and Fire Base Camp location. When needed, additional fire resources, such as Incident Management Teams and Strike Teams are brought in for peak workloads. Highlands State Lands staff has 8 additional staff that participate in the fire program, when needed, with a variety of fire line certifications:

- The Fire Control Unit Forester is a certified Division/Group Supervisor; Incident Commander Type 3 and 4; Wildland Fire Investigator; Safety Officer Type 2 and Type 1; TFL and STL etc.
- The Assistant Fire Control Unit Forester is a certified Division/Group Supervisor; Incident Commander Type 3 and 4; Wildland Fire Investigator & Safety Officer Type 2 In-Training.

The Highlands District seasonally staffs six Type 6 Brush Engines, with a three-person firefighting crew in each engine. Engine staffing is on a varied schedule that provides seven days per week coverage June through September. The DNR utilizes a "home guard" approach in that the seasonal engine drivers park their assigned engines at their residence within their assigned geographic area of the district.

Inside the DNR Highlands District are portions of Ferry and Okanogan counties with two E-911 Dispatching Centers and Emergency Service Operations. Three incorporated cities; Oroville, Tonasket and Republic, all have WUI neighborhoods developing outside their city boundaries. Additionally six towns and numerous communities provide a multiplex of rural/urban interface neighborhoods developing in mountainous drainages within perennial fire ecology with a history of complex, costly wildfires.

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

Bureau of Land Management

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

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

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

The Spokane District Fire Management Program currently consists of two type six wildland engines (300 gallons) with two full time Engine Captains, four engine crew members, one ten person hand crew, one Fuels Technician, Seasonal Dispatcher, Assistant Fire Management Officer (AFMO), and a Fire Management Officer (FMO). The hand crew and one engine is stationed in Spokane at the District office and the other 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.

USDA Forest Service Colville National Forest

District Summary: The Republic Ranger District manages national forest lands in northwestern Ferry County between the Colville Indian Reservation and the Canadian Border, and between the Ferry/Okanogan County Boundary and the crest of the Kettle Range.

The district is managed by a District Ranger in Republic with a staff of 12 permanent employees and 6 part-time employees. Approximately 15 additional seasonal employees are hired during the summer months at the peak of field season.

The Three Rivers Ranger District manages national forest lands in northeastern Ferry County between the Colville Indian Reservation and the Canadian Border, and between the crest of the Kettle Range to the Columbia River.

The district is managed by a District Ranger in Kettle Falls with a staff of 20 permanent employees and 10 part-time employees. Approximately 25 additional seasonal employees are hired during the summer months at the peak of field season.

The national forest is managed according to a multiple-use mandate which attempts to balance a number of land uses, including timber harvest, grazing, recreational pursuits, and mining; while simultaneously maintaining suitable wildlife habitat, clean water, and visually appealing vistas in a sustainable way.

Issues of Concern:

Residential Growth: The national forests are experiencing rural development along the national forest boundary in areas that were previously managed as private grazing or timber land. This is impacting management on the national forest since more residents are resistant to change in their "backyards" when forest activities are planned that may represent a change.

A priority for the Forest Service is doing vegetation management treatments on national forest where natural fuels may threaten private improvement if a wildfire occurs. Working with private landowners to resolve issues of road access in order to do hazard fuel treatments will be a critical step to achieve hazard fuel treatment activities.

Communications: The Colville National Forest is served by a network of solar/propane-powered mountaintop radio repeaters through which field coordination and fire dispatching is accomplished. However, interagency fire responses require shared radio frequencies to facilitate a coordinated fire response. Maintaining cooperative frequency agreements between all the fire-fighting agencies; local, state, and federal; could use additional planning and coordination.

Burn Permit Regulations: The Colville National Forest uses prescribed fire for reduction of logging slash and natural fuels, as well as enhancement of grazing conditions and wildlife habitat. Burning permits are issued by the Washington State Department of Natural Resources.

Cooperative Agreements: The Pacific Northwest Region of the Forest Service has entered into an agreement with the Washington State Department of Natural Resources for cooperative fire control efforts. This agreement states that the DNR will be the primary administrative contact when incidents involve a mix of agencies that include local fire districts when situations of pay

and reimbursement develop. The Colville National Forest does not have any contracts or agreements directly with any local fire districts.

The Colville National Forest has an agreement with the Spokane District of the Bureau of Land Management to provide fire suppression on BLM lands within predetermined areas in the vicinity of national forest lands.

As part of their working agreement, the Colville National Forest and the DNR have drawn up what is known as the Reciprocal Agreement. The "Recip Agreement" defines a protocol for closest-forces dispatching to areas where each agency may mutually respond to fires, and outlines how to share the benefits from weather forecasting services, fire detection flights, air tankers and helicopters.

Needs: The Republic Ranger District has had difficulty with adequate storage space for its fire equipment and fire engines. Damage from freezing has been a regular problem in spite of thorough winterization routines. Fire cache remodeling has been approved and designed. The Forest Service needs a budget allocation to accomplish the fire cache remodeling job.

Fire Protection Issues

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

Address Signage

The ability to quickly locate a physical address is critical in providing services in any type of emergency response. Accurate road address and address signage is fundamental to ensuring the safety and security Ferry County residents. Currently, there are numerous areas throughout the county lacking road signs, address markers, or both. Signage throughout the County needs to be updated in order to assure visibility and quick location by emergency responders.

Coordination with State and Federal Agencies

There is currently little to no communication between local fire departments and the federal agencies. This presents a problem when there is confusion on who has initial attack responsibilities on federal lands and what restrictions are imposed by the jurisdictional agency responsible for fire protection.

Urban and Suburban Growth

One challenge Ferry 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 rural 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. Ferry County has a low number of Firewise Communities; therefore, there are many property owners within the interface that are not aware of the problems and threats they face. Furthermore, human activities increase the incidence of fire ignition and potential damage.

It is one of the goals of the Ferry 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 urban areas to the more rural parts of Ferry County, frequently have high expectations for structural fire protection services. Often, new residents do not realize that the

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

Debris Burning

Local burning of yard debris is highly regulated in Ferry County. Permit burns in Ferry County are based on DNR cycle, while burn bans are a locally based decision determined by fuel moistures (see Fire District Summaries for more information on burning). Some people still burn outside of the designated time frame, and escaped debris fires impose a very high fire risk to neighboring properties and residents. It is likely that regulating this type of burning will always be a challenge for local authorities and fire departments; however, improved public education regarding the County's burning regulations and permit system as well as potential risk factors would be beneficial.

Pre-planning in High Risk Areas

Although conducting home, community, and road defensible space projects is a very effective way to reduce the fire risk to communities in Ferry 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. All of these plans should be available to the local fire departments as well as dispatch personnel.

Volunteer Firefighter Recruitment

The rural fire departments in Ferry County are predominantly dependent on volunteer firefighters. 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. In particular, many departments have difficulty maintaining volunteers available during regular work day hours (8am to 5pm).

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

Communication

There are several communication issues being addressed in Ferry 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.

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.

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

One issue that is common, is 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.

Invasive Species

Fire behavior and fire regimes have been altered due to the proliferation of cheatgrass (*Bromus tectorum*) 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.[35] According to some statistical analysis, cheatgrass dominated ranges are about 500 times more likely to burn than a native species dominated

[35] Pellant, Mike. 1996. Cheatgrass: The Invader That Won the West. Idaho State Office: Bureau of Land Management. 23p.

range.[36] Fire return intervals in steppe and shrub-steppe fuel types, pre-European settlement was typically between 32 and 70 years.[37] In certain Great Basin rangelands, the fire return interval is now less than 5 years on rangelands dominated by cheatgrass.[38]

Public Wildfire Awareness

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

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

Current Wildfire Mitigation Activities

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

Firewise

"Over the past century, America's population has nearly tripled, with much of the growth flowing into traditionally natural areas. These serene, beautiful settings are attracting more residents every year. This trend has created an extremely complex landscape that has come to be known as the wildland/ urban interface: a set of conditions under which a wildland fire reaches beyond trees, brush, and other natural fuels to ignite homes and their immediate surroundings. Consequently, in nearly all areas of the country, the wildland/urban interface can provide conditions favorable for the spread of wildfires and ongoing threats to homes and people. Many individuals move into these picturesque landscapes with urban expectations. They may not recognize wildfire hazards or might assume that the fire department will be able to save their home if a wildfire ignites. However, when an extreme wildfire spreads, it can simultaneously expose dozens — sometimes hundreds — of homes to potential ignition. In cases such as this, firefighters do not have the resources to defend every home. Homeowners who take proactive

[36] Platt, K.; Jackman, E.R. 1946. The cheatgrass problem in Oregon. Extension Bull. 668. Corvallis, OR: Oregon State College. 48 p.

[37] 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.

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

steps to reduce their homes' vulnerability have a far greater chance of having their homes withstand a wildfire. The nation's federal and state land management agencies and local fire departments have joined together to empower homeowners with the knowledge and tools to protect their homes through the National Firewise Communities Program. Firewise Communities is designed to encourage local solutions for wildfire safety by involving firefighters, homeowners, community leaders, planners, developers, and others in efforts to design, build, and maintain homes and properties that are safely compatible with the natural environment. The best Firewise approach involves a series of practical steps that help individuals and community groups to work together to protect themselves and their properties from the hazard of wildfire. Using at least one element of a Firewise program and adding other elements over time will reduce a homeowner's and a community's vulnerability to fire in the wildland/urban interface. Wildland fires are a natural process. Making your home compatible with nature can help save your home and, ultimately, your entire community during a wildfire."[39]

[39] http://www.firewise.org/Information/Who-is-this-or/Homeowners/~/media/Firewise/Files/Pdfs/Booklets%20and%20Brochures/BrochureCommunitiesCompatibleNature.pdf. Accessed June, 2012.

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Chapter 5

Landscape Risk Assessments

Ferry County is located in northeastern Washington. The county encompasses approximately 2,257 square miles and has an elevation range of about 1,300 feet to well over 7,000 feet above sea level. Land is owned primarily by the Colville Tribe (50%) and other federal (34%) agencies. Private land ownership accounts for approximately 14% of the land in Ferry County. Federal lands are managed by the U.S. Forest Service, National Park Service, Bureau of Land Management, and the Bureau of Reclamation. Ferry, the ninth largest county in the state, is bordered on the west by Okanogan County, to the south by Lincoln County, to the east by Stevens County, and to the north by Canada. Ferry County lies within the mountainous area on the fringe of the Okanogan Highlands, a region formed by great ice sheets during the Pleistocene Epoch. As the ice sheets retreated to the north, lakes formed in the valleys of the Columbia and Pend Oreille Rivers. Along the Canadian boundary, terrace deposits indicate lake levels 2,000 feet above current sea level. Melt waters filled these lakes with sand, silt, and clay.[40] Forested areas and areas with steppe vegetation provide diverse wildlife habitat in the county. The rugged Kettle River Range covers much of the county. The Columbia and Kettle Rivers run along much of the eastern boundary and the entire southern boundary. The high fuel loads, steep slopes, and low summer precipitation results in an environment that is potentially very prone to wildland fire.

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.

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 two predominant landscapes types that exhibit distinct terrain and wildland fuels. The two landscapes identified for the assessments are: rangelands and forestlands. 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 Okanogan Highlands are a patch-work of dry Douglas-fir and ponderosa pine forests that, in many areas, have become overstocked, resulting in multistoried conditions with abundant ladder fuels. During pre-settlement times, much of this area was characterized by low intensity fires due to the relatively light fuel loading, which mostly consisted of small diameter fuels. Frequent, low intensity fires generally kept stands open; free of fire intolerant species and maintained seral species such as ponderosa pine as well as larger diameter fire resistant Douglas-fir. In some

[40] Washington State Department of Natural Resources website found at: http://www.dnr.wa.gov/researchscience/topics/geologyofwashington/pages/okanogan.aspx. Accessed July 1, 2014.

areas, low intensity fires stimulated shrubs and grasses, maintaining vigorous browse and forage. The shrub layer could either inhibit or contribute to potential fire behavior, depending on weather and live fuel moisture conditions at the time of the burn.

In general, large fires that start in the Okanogan Highlands start high in elevation and move downhill. As fires move down in elevation, they encounter drier and flashier fuels in the lower elevations. Rolling embers and spot fires are a common method of downhill fire spread. Spot fires ignited on slopes trigger uphill runs that throw more spot fires, expanding the downward fire progression. Modifying fuels to reduce the likelihood of torching and crowning trees will in turn reduce the likelihood of spot fires.

Increased activities by pathogens will continue to increase levels of dead and down fuel, as host trees succumb to insect attack and stand level mortality increases. Overstocked, multi-layered stands and the abundance of ladder fuels lead to horizontal and vertical fuel continuity. These conditions, combined with an arid and often windy environment, can encourage the development of a stand replacing fire. These fires can burn with very high intensities and generate large flame lengths and fire brands that can be lofted long distances. Such fires present significant control problems for suppression resources, often developing into large, destructive wildland fires.

A probability that needs to be planned for is the likelihood of extended spot fires. Large fires may easily produce spot fires from ½ to 2 miles away from the main fire. How fire suppression forces respond to spot fires is largely dependent upon the fuels in which they ignite. Stands of timber that are managed for fire resilience are much less likely to sustain torching and crowning behavior that produces more spot fires. The objective of fuel reduction thinning is to change the fuels in a way that will moderate potential fire behavior. If fire intensity can be moderated by vegetation treatments, then ground and air firefighting resources can be much more effective.

Areas that have recently burned, such as the Fish Hatchery, will be at low risk of wildfires starting and spreading for several years because fine fuels were consumed. However, the overall reduction in hazardous fuels in these areas is minimal, particularly in dry Douglas-fir and ponderosa pine forests which were dense, multi-storied stands prior to wildfire. Dense stands of snags will become heavy dead and down branches and logs within 10-20 years. Fine fuels will return to these sites as understory species re-establish and these fuels combined with the accumulated large fuels will provide the opportunity for severe fire in 20-30 years after the initial wildfire.

Ingress-Egress

U.S. Highway 395 and State Route 20 enter Ferry County from the east. Once these two roads cross the Columbia River west of Kettle Falls, they split. U.S. Highway 395 travels north along the eastern boundary of the county paralleling the Kettle River before entering into Canada. State Route 20 is the main east/west access through the county. This route travels west across the Kettle River Mountains before passing through the County Seat of Republic and continuing west into Okanogan County. State Route 21 is the main north/south travel corridor through the county. Route 21 enters the county from the south (via ferry) near the community of Keller. This route travels north through the Sanpoil River valley. This route takes a ‘dog-leg’ to the east at its junction with State Route 20 for several miles before turning north again and traveling parallel to the eastern shore of Curlew Lake and ultimately following the Kettle River back into Canada.

There are several secondary roads that provide ingress and egress throughout the county including; Kettle River road, Boulder Creek road, Toroda Creek road, Inchelium Highway, Twin Lakes road, Cache Creek road, and Manilla Creek road. These roads provide critical ingress/egress routes for citizens throughout the county. County roads as well as Forest Service roads are well distributed throughout most of the county. 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 numerous bridges throughout Ferry County. Bridge load rating signs are mostly in place for the existing bridges and do not impose a limitation to access for firefighting equipment. There are two Ferries operated by WSDOT that access Ferry County, one crosses Lake Roosevelt near Inchelium and the other crosses Lake Roosevelt near Keller.

Infrastructure

Residents who live in population centers have municipal water systems, which include 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. There are two major power supply lines that provide electricity to the entire county. One follows State Route 20 from Kettle Falls over Sherman Pass where it soon diverges from the State Route but continues west towards Republic. The second line enters the county from Grand Coulee.

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.

Cell phone service is well-established in the more populated parts of the county; however there are significant dead zones throughout much of the county. There are several communication sites throughout the county. These sites can be extremely vulnerable to wildland fire due to the need to be located on high points.

Fire Protection

All of the private lands within the three fire protection districts of Ferry County have joint jurisdiction with the Washington Department of Natural Resources (DNR). Under joint jurisdiction, it is recognized that the fire district has primary responsibility for structure protection and the DNR will have primary responsibility for wildland fire suppression on state and private lands. The DNR provides wildfire protection during fire season between April and October with varying degrees of available resources in the early spring and late autumn months. U.S. Forest Service and Bureau of Land Management will respond to all wildland fires on their respective jurisdictions and may also respond to wildland fires on private or state lands based on a closest forces, reciprocal agreement with the DNR when resources are available.

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 Ferry 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 throughout Ferry 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 Ferry 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 Ferry 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: Recreational facilities near communities, along the Kettle River, Sanpoil River, Franklin D. Roosevelt Lake, and Curlew Lake, or in the surrounding forest lands 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. Surface fuel accumulations in forests and shrubland can be kept to a minimum by periodically conducting pre-commercial thinning, clearing, pruning and limbing, and possibly controlled burns. Other actions that would reduce the fire hazard would be creating a fire resistant buffer along roads and power line corridors and strictly enforcing fire-use regulations.

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.

Rural Addressing: In order to assure a quick and efficient response to an event, emergency responders need to know specifically where emergency services are needed. Continued improvement and updating of the rural addressing system is necessary to maximize the effectiveness of a response.

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

Steppe Landscape Risk Assessment

The steppe landscape is intermittent throughout the forested areas of Ferry County, however, steppe dominates the lower elevations and many south facing aspects. Landownership in the steppe landscape is mixed with private, Bureau of Land Management, Forest Service, and scattered Washington Department of Natural Resources. Virtually all of the major population centers in the county fall within this landscape type. Other rural development found throughout the steppe landscape includes individual homes and ranches, and small subdivisions. New development occurs primarily near communities, along major roads, and around Curlew Lake. Recently, most of the pressure for multi-housing subdivisions has occurred in close proximity to Curlew Lake. 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 steep topography and relatively low moisture availability across much of lower elevations of Ferry County does not permit extensive farming operations; however, there are some areas within the Kettle River Valley, Curlew Valley and Sanpoil Valley that are flat enough to make small scale farming operations feasible. Agricultural fields infrequently serve to fuel a fire after curing, burning in much the same manner as consistent 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. Suppression resources are generally quite effective in such fuels. Homes and other improvements can be easily protected from the direct flame contact and radiant heat through adoption of precautionary measures around the structure. Although fires in these fuels may not present the same control problems as those associated with large, high intensity fires in timber fuel types, they can cause significant damage if precautionary measures have not taken place prior to a fire event. Wind driven fires in these short grass fuel types spread rapidly and can be difficult to control. During extreme drought and pushed by high winds, fires in grassland fuel types can exhibit extreme rates of spread, thwarting suppression efforts.

Wildfire risk in the steppe landscape is at its highest during late summer and fall when grasses are cured and daily temperatures are at their highest. Wet years can be misleading in that it can lead the public to believe the fire danger is low, when in-fact grass and forbs will become more robust due to the abundance of moisture than in dry years and when these fuels do dry, there is more fuel available to burn. Fuel types associated with the steppe landscape are generally easier to extinguish, given that firefighting crews can access the fire front. However, a wind-driven fire in steppe fuels would produce a rapidly advancing, but variable intensity fire that could provide landowners in the fire's path little warning.

Potential Mitigation Activities

Mitigation measures needed in the steppe landscape include maintaining a defensible space around structures and access routes that lie adjacent to wildland fuels. Around structures, this includes maintaining a green 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 wildlands that lie adjacent to communities would significantly lessen a fire's potential of destruction of homes. Mitigation associated with this situation might include installing fuel breaks or plowing a fire resistant buffer zone around communities 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.

Forest Landscape Risk Assessment

The forest landscape is dominant throughout Ferry County, especially the higher elevations and draws where moisture is more abundant. Landownership in the forest landscape is primarily U.S. Forest Service with a mix of Bureau of Land Management, Washington Department of Natural Resources, and scattered private ownership. Although there are no major population centers that occur within this landscape, there are other rural developments and individual homes found throughout the forest landscape. Recently, new development has primarily occurred near Curlew Lake. 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 forest landscape has a moderate to high wildfire potential due to a characteristically high occurrence of ground fuels mixed with ladder fuels, sloping terrain and somewhat limited precipitation during summer months. Large expanses of forests provide a continuous fuel bed that could, if ignited, 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, which enables spotting ahead of the fire front.

Wildfire risk in the forest landscape is at its highest during summer and fall when daily temperatures are high and relative humidity is low. Fires burning in fuel types associated with this landscape would be expected to burn more intensely with larger flame lengths due to the greater availability of fuels. Fires in this fuel type are harder to extinguish completely due to the dense duff layer and heavier fuels (100 and 1000 hour fuels) which often leads to hold-over fires that may reemerge at a later date causing additional fire starts. Insect and disease has affected some areas within Ferry County, particularly pine beetle, which increases the amount of dead and down material available to burn. Additionally, there is a large number of forested acres throughout the county that have been affected by a general lack of management. Lack of management can lead to overcrowding of trees, which causes the trees to be stressed and leaves them susceptible to disease, drought, and insects. Overcrowding (or overstocking) can also make the forests prone to canopy (or crown) fires.

Potential Mitigation Activities

Mitigation measures needed in the forest landscape include maintaining a defensible space around structures and access routes that lie adjacent to wildland fuels. 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. Conducting 'firewise' or 'fire adapted communities' (FAC) workshops would enable landowners' to be proactive with wildland fire mitigation on their own properties as well as in their communities. Roads and driveways that access rural development need to be kept clear of encroaching fuels to allow escape and access by emergency equipment. Performing road inventories and home assessments 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. It is important that private landowners work in conjunction with each other

and public land agencies (e.g. USFS, BLM, and DNR) when conducting forest health and fuel reduction projects to achieve the greatest benefit.

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 Ferry 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 Ferry County, it is reasonable to expect that differing schedules of adoption will be made and varying degrees of compliance will be observed across various ownerships.

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

Ferry 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 2014. 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

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

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, as well as the specific project areas that are listed in Table 6.6, are ranked as "High", "Moderate", or "Low" priorities for Ferry 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 page 4)	Responsible Organization	Timeline
6.1.a: Continue to distribute Firewise-type educational brochures with building permit applications.	**CWPP Goal #1, 2, 3** Medium	**Lead:** County Commissioner's Office **Support:** Ferry County Fire Protection Districts.	On-going
6.1.b: Encourage City and County officials to include fire protection districts in decision-making process when road and alley vacancy requests are submitted.	**CWPP Goal #1, 2, 4** High	**Lead:** City of Republic and County Commissioners **Support:** Ferry County Fire Protection Districts.	On-going
6.1.c: Rural signage (road signs & house numbers) improvements across the county.	**CWPP Goal #1, 2, 4** Medium	**Lead:** E911 **Support:** County Commissioners, Ferry County Fire Protection Districts, County Road Department.	2 years
6.1.d: Continue to implement burning restrictions in accord with the DNR on all lands in the county.	**CWPP Goal #1, 4** High	**Lead:** County Commissioners **Support:** City and County Planning Departments, Ferry County Sheriff's Department, DNR, City of Republic, and local communities.	On-going

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 Ferry County residents.

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

Forest and Shrub/Steppe Management has a significant impact on the fuel composition and structure in Ferry County. The forest and shrub/steppe management programs of the BLM, USFS, WADNR and numerous private landowners in the region have led to a reduction of wildland fuels. Furthermore, forest and 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 page 4)	Responsible Organization	Timeline
6.2.a: Revitalize the role of the Fire Prevention Co-op to champion wildland fire prevention topics.	**CWPP Goal #1, 2, 4** High	**Lead:** Fire Prevention Co-op **Support:** All local fire agencies. DNR Highlands District, DNR North Columbia District, USFS Republic Ranger Station, USFS Three Rivers Ranger Station, County Fire Protection Districts, Bureau of Indian Affairs, WSU Extension, BLM	Year 1 activity: Pool members of all the local fire agencies to develop a plan to present a unified voice to the County regarding fire prevention and local fire issues / On-going
6.2.b: Implementation of Youth and Adult Wildfire Educational Programs.	**CWPP Goal #1, 2, 3** High	**Lead:** Fire Prevention Co-op **Support:** Cooperative effort including: Washington Department of Natural Resources, State and Private Forestry Offices, Bureau of Land Management, Bureau of Indian Affairs, USDA Forest Service, Local School Districts, WSU Extension, 4-H, City of Republic and Communities of Ferry County	On-going

Table 6.2. Action Items for Fire Prevention, Education, and Mitigation.			
Action Item	**Goals Addressed (see page 4)**	**Responsible Organization**	**Timeline**
6.2.c: Wildfire risk assessments of homes in identified neighborhoods and reassessments for properties conducted over 10 years ago.	**CWPP Goal #1, 2, 3, 4, 5** High	**Lead:** Fire Prevention Co-op **Support:** County Commissioners, City of Republic, Ferry County Fire Protection Districts, DNR, USFS, BLM, and BIA.	On-going
6.2.d: Home site WUI Treatments.	**CWPP Goal #1, 2, 3, 4, 5, 6** High	**Lead:** CWPP Committee **Support:** County Commissioners, City of Republic, Ferry County Fire Protection Districts, DNR, USFS, BLM, and BIA.	On-going
6.2.e: Community Defensible Zone WUI Treatments.	**CWPP Goal #1, 2, 3, 4, 5, 6** Medium	**Lead:** CWPP Committee **Support:** County Commissioners, City of Republic, Ferry County Fire Protection Districts, DNR, USFS, BLM, and BIA.	On-going
6.2.f: Maintenance of Home site WUI Treatments.	**CWPP Goal #1, 2, 3, 4, 5, 6** High	**Lead:** CWPP Committee **Support:** County Commissioners, City of Republic, Ferry County Fire Protection Districts, DNR, USFS, BLM, and BIA.	On-going
6.2.g: Re-entry of Home site WUI Treatments.	**CWPP Goal #1, 2, 3, 4, 5, 6** High	**Lead:** CWPP Committee **Support:** County Commissioners, City of Republic, Ferry County Fire Protection Districts, DNR, USFS, BLM, and BIA.	On-going
6.2.h: Development of community evacuation plans and alternate safety zones for the communities that have one way in/out throughout the county.	**CWPP Goal #1, 2, 3, 4, 5, 6** High	**Lead:** Ferry County Sheriff **Support:** Ferry County Sheriff, Ferry/Okanogan County Fire Protection District #13, Ferry/Okanogan County Fire Protection District #14, and Stevens/Ferry County Fire Protection District #3 in cooperation with community residents, USFS, DNR, BIA, and BLM.	5 years

Table 6.2. Action Items for Fire Prevention, Education, and Mitigation.			
Action Item	**Goals Addressed (see page 4)**	**Responsible Organization**	**Timeline**
6.2.i: Continue to conduct hazardous fuel reduction projects in area affected by White Mountain Fire and Togo Fire.	**CWPP Goal #2, 4, 5** High	**Lead:** U.S. Forest Service **Support:** County Commissioner's Office and City of Republic.	On-going
6.2.j: Implement proposed home defensible space projects.	**CWPP Goal #1, 2, 4, 5, 6** High	**Lead:** CWPP Committee **Support:** County Commissioners, City of Republic, Ferry County Fire Protection Districts, DNR, USFS, BLM, and BIA.	5 years

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 northeastern Washington and to Ferry 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 page 4)**	**Responsible Organization**	**Timeline**
6.3.a: Thin trees and widen Bonneville Power Transmission Line and main Ferry County Public Utilities District 34.4 kva transmission lines.	**CWPP Goal #2, 4, 5, 6** Medium	**Lead:** Ferry County Public Utilities District and Bonneville Power **Support:** County Commissioner's Office	On-going
6.3.b: Create and maintain defensible space around critical infrastructure including communication sites, petroleum storage sites, water storage sites, and Ferry County PUD Service Stations (e.g. Klondike Mountain, Gold Hill, Chevron bulk plant, City of Republic water storage tank, and Pine Grove water storage reservoir, Curlew High School, Orient Elementary School, and Ferry County Memorial Hospital).	**CWPP Goal #1, 2, 5, & 6** High	**Lead:** Ferry County Commissioner's Office **Support:** City of Republic, Pine Grove Water Association, Ferry County Public Utilities District, and various facility/utility owners.	3 years

Table 6.3. Action Items for Infrastructure Enhancement.			
Action Item	**Goals Addressed (see page 4)**	**Responsible Organization**	**Timeline**
6.3.c: Maintain existing loop roads throughout the county that mitigate one-way-in/one-way out to prevent entrapment including but not limited to; Sheridan road, Day Creek road, Tonasket Creek road, Aeneas Creek road, Hall Creek road, and Forest Service road numbers 2113, 6120, 9576, 300, 2154, 2030, 9565, 6110, 6113, 2014, and 2020. *See paragraph following this table for descriptions of loops.	**CWPP Goal #1, 2** High	**Lead:** County Road Department **Support:** BLM, DNR, BIA, US Forest Service, and private landowners.	On-going
6.3.d: Access improvements of bridges, cattle guards, culverts, and limiting road surfaces (e.g. McMann Creek Bridge, McMann Creek Road, Herron Creek Road, Lambert Creek Road, Customs Road, Gold Mountain Road, Gun Club Road, and Kettle River Road).	**CWPP Goal #1, 2** High	**Lead:** County Roads Department **Support:** County Commissioner's Office, BLM, State of Washington (Lands and Transportation), USFS, BIA, and industrial forestland owners (e.g., Hancock Forest Management.).	On-going
6.3.e: Fuels mitigation of the "Emergency Evacuation Routes" in the county to insure these routes can be maintained in the case of an emergency.	**CWPP Goal #1, 2, 4, 5** High	**Lead:** County Road Department **Support:** State DOT, DNR, Ferry County Fire Protection Districts.	5 years
6.3.f: Watershed Management Plan development for the Orient Watershed.	**CWPP Goal #1, 2, 6** Medium	**Lead:** Orient Water District **Support:** Orient Community, USFS, and private landowners.	3 years
6.3.g: Post "Emergency Evacuation Route" signs along the identified primary and secondary access routes in the county.	**CWPP Goal #2** High	**Lead:** County Commissioner's Office **Support:** Ferry County Fire Protection Districts, and County Roads Department.	5 years
6.3.h: Connect dead end roads in one-way in, one-way out drainages to provide an additional escape route (e.g. South Fork St. Peters Creek Road, Empire Creek Road, and Rose Valley Road).	**CWPP Goal #1, 2** Low	**Lead:** County Road Department and US Forest Service **Support:** BLM, DNR, BIA, and private landowners.	5 years

There are many roads throughout the county that are important to keep open to allow for alternate escape routes for citizens and firefighting personnel. The following list is not necessarily all inclusive but does include roads that connect through large areas and provide alternate escape routes. These are needed by the County to assist in the County's role of providing for public safety.

- Sheridan County road number 253 connects to West Fork Trout Creek County road number 514. West Fork Trout Creek County road number 514 connects to Cougar Creek Rd in Okanogan County.
- Vulcan Mountain Forest Service road number 2113 connects Catherine Creek road to County Vulcan Mountain road number 615.
- County Lone Ranch Creek road number 666 is connected to County Little Boulder Creek road number 595 by using Forest Service roads number 6120, 9576 and number 300.
- County Day Creek road number 651 connects Boulder Creek road to Lone Ranch Creek rd.
- County Tonasket Creek road number 580 connects to County Aeneas Creek road number 566.
- County Lambert Creek road number 546 connects to County Herron Creek road number 290 by using Forest Service road number 2154.
- County Hall Creek road number 99 connects State Route 20 to the Inchelium/Kettle Falls road.
- County Deadman Creek road number 460 is connected to the Forest Service road number 2030 (aka, Albion Hill road) by using Forest Service road number 9565.
- State Route 20 is connected to County Boulder Creek road number 602 by using Forest Service road numbers 2030, 6110 and 6113.
- County Lake Ellen road number 412 is connected to State route 20 by using Forest Service road numbers 2014 and 2020.

Resource and Capability Enhancements

There are a number of resource and capability enhancements identified by the rural and wildland firefighting districts in Ferry 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 page 4)	Responsible Organization	Timeline
6.4.a: Enhance radio availability in each district, link into existing dispatch, improve range within the region, and conversion to consistent standard of radio types.	**CWPP Goal #2, 4, 6** High	**Lead:** Homeland Security Coordinator **Support:** Ferry County Fire Protection Districts, wildland fire agencies, and Ferry County Commissioners.	On-going
6.4.b: Recruitment and retention of volunteer firefighters.	**CWPP Goal #1, 2** High	**Lead:** Ferry County Fire Protection Districts **Support:** Washington DNR, BLM, and USFS.	On-going
6.4.c: Establish and map onsite water sources such as hydrants or underground storage tanks and drafting or dipping sites.	**CWPP Goal #1, 2** High	**Lead:** County Commissioner's Office **Support:** Ferry County Fire Protection Districts, DNR, USFS	3 years
6.4.d: Develop e911 map capabilities to provide travel directions to specific addresses and maintain system.	**CWPP Goal #1, 2** High	**Lead:** Ferry County Sheriff's and e911 System **Support:** County Commissioner's Office	Completed / On-going
6.4.e: Expand Ferry County's ability to support wildland fire incidents of greater severity and extended attack through logistical support and infrastructure improvements.	**CWPP Goal #1, 2, 4** High	**Lead:** Ferry County Homeland Security Coordinator **Support:** Ferry County Sheriff's Office, e911 System, TriCo Economic Development District, Ferry County Chamber of Commerce, Ferry County Fire Protection Districts, USFS, DNR, BIA, and BLM.	On-going

Table 6.4 Action Items for Resource and Capability Enhancements			
Action Item	**Goals Addressed (see page 4)**	**Responsible Organization**	**Timeline**
6.4.f: Increased training and capabilities of firefighters.	**CWPP Goal #1, 2, 4** High	**Lead:** Ferry County Fire Protection Districts **Support:** BLM, BIA, DNR, USFS, and State Fire Marshall's Office.	1 year / On-going
6.4.g: Facility, land, and basic equipment for a satellite station in West Lake neighborhood.	**CWPP Goal # N/A** N/A	**Lead:** Ferry County Fire Protection Districts **Support:**	Completed
6.4.h: Establish a Fire/EMS Repeater to cover dead spots between Curlew and Malo.	**CWPP Goal #1, 2, 4** High	**Lead:** Ferry County Homeland Security Coordinator **Support:** County Commissioner's Office, Ferry County Fire Protection Districts, Ferry County Sheriff's Office, and Ferry County Dispatch.	5 years
6.4.i: Obtain newer rolling stock to replace aging equipment for all Ferry County Fire Protection District stations.	**CWPP Goal N/A** Medium	**Lead:** Ferry County Fire Protection Districts. **Support:** DNR and USFS	On-going
6.4.j: Obtain a 3,000 gallon water tender for Ferry/Okanogan Fire District #14.	**CWPP Goal N/A** N/A	**Lead:** Ferry/Okanogan County Fire Protection District #14. **Support:**	Completed
6.4.k: Annex private lands in the Deadman/Matsen areas into local fire district. This will require a new station, rolling stock, and additional volunteers.	**CWPP Goal N/A** N/A	**Lead:** Stevens/Ferry County Joint Fire Protection Districts #8 and #3 **Support:** County Commissioner's Office and local residents.	Completed
6.4.l: Improve safety equipment and Personal Protective Equipment for all Fire Protection Districts in Ferry County.	**CWPP Goal #1, 2, 4** High	**Lead:** Ferry County Fire Protection Districts **Support:** DNR, USFS.	On-going

Table 6.4 Action Items for Resource and Capability Enhancements			
Action Item	**Goals Addressed (see page 4)**	**Responsible Organization**	**Timeline**
6.4.m: Enable local fire districts to record consistent fire statistics by providing them with an efficient reporting system (eg. through dispatch) to merge with wildfire data reported from all agencies in the County.	**CWPP Goal #1, 2, 4** Medium	**Lead:** Ferry County Commissioners and E911 **Support:** Ferry County Fire Protection Districts, Dispatch, USFS, BLM, DNR, NEWICC Dispatch, and Colville Agency BIA.	1 year / On-going
6.4.n: Facility, land, and basic equipment for a satellite station in Malo.	**CWPP Goal # 1, 2, 4** High	**Lead:** Ferry/Okanogan County Fire Protection District #14 **Support:** Ferry County Commissioners	3 years
6.4.o: Establish formal MOUs between Ferry County Fire Districts, County Sheriff, Public Utility District, Republic Ambulance District, Confederated Tribes of the Colville Reservation, Bureau of Indian Affairs, and others.	**CWPP Goal # 1, 2, 4** High	**Lead:** Ferry County Fire Protection Districts **Support:** County Sheriff, Public Utility District, Republic Ambulance District, Confederated Tribes of the Colville Reservation, and Bureau of Indian Affairs	2 years
6.4.p: Ferry/Okanogan County Fire Protection District would like to have fire protection service contracts with the following entities; Republic School District #309, Ferry County Public Utility District #1, Ferry County, Washington DOT, and the City of Republic. These entities do not provide tax support to the Fire District but rely on them to protect facilities.	**CWPP Goal # 1, 2, 4** High	**Lead:** Ferry County Fire Protection Districts **Support:** Republic School District #309, Ferry County Public Utility District #1, Ferry County Commissioners, WSDOT, and the City of Republic	3 years

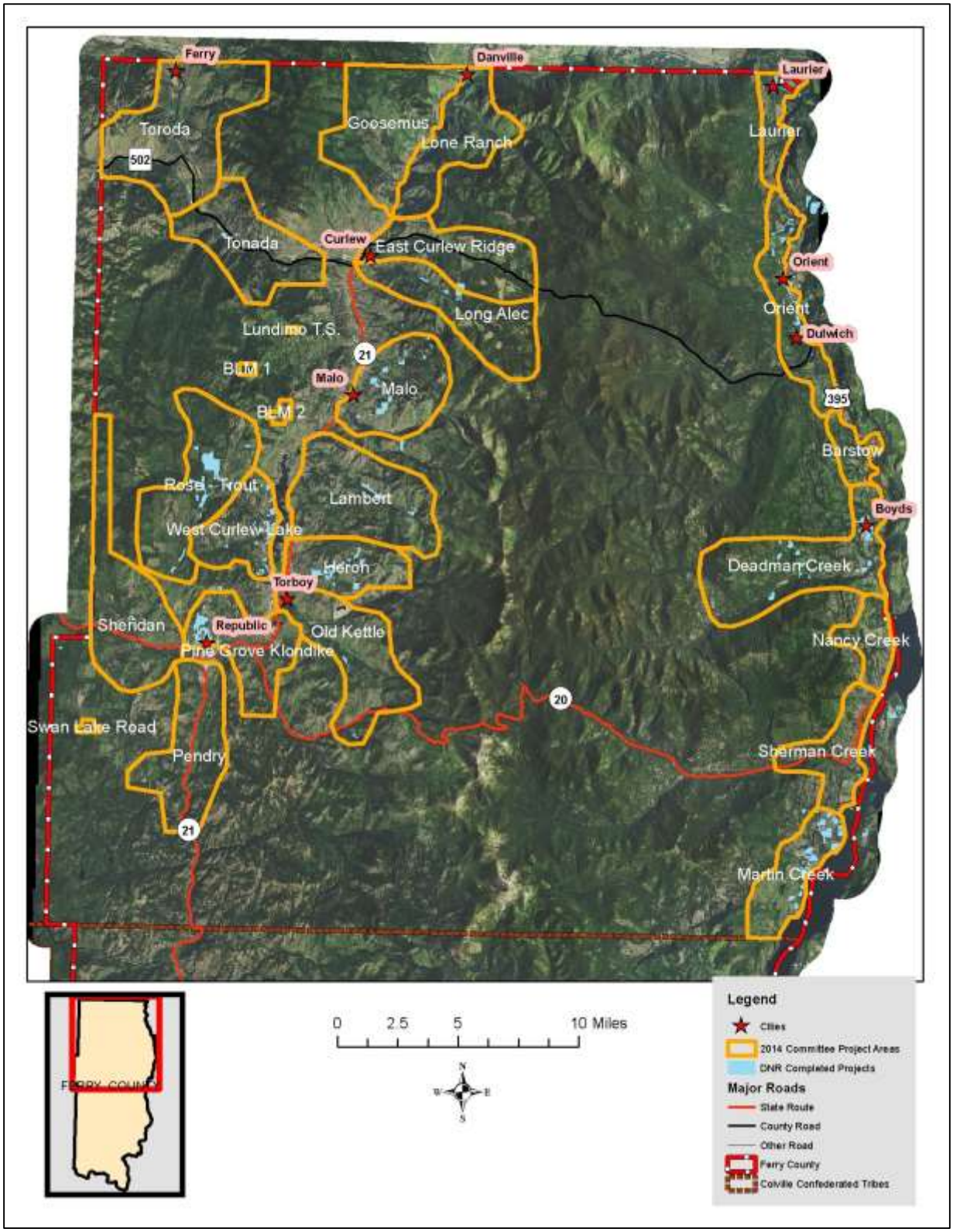
Proposed Project Areas

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

Table 6.5 Project Areas.

Project Name	# of Acres	Parcels	Priority
Barstow	2,383	65	High
BLM 1	217	0	High
BLM 2	398	1	High
Deadman Creek	14,196	205	High
East Curlew Ridge	9,716	104	High
Goosemus	13,088	107	High
Heron	6,716	124	High
Lambert	13,682	135	High
Laurier	2,383	44	High
Lone Ranch	8,629	87	High
Long Alec	9,604	64	High
Lundimo T.S.	74	0	High
Malo	9,139	137	High
Martin Creek	6,483	152	High
Nancy Creek	3,500	114	High
Old Kettle	11,094	113	High
Orient	7,053	159	High
Pendry	10,565	108	High
Pine Grove Klondike	8,329	377	High
Rose - Trout	12,999	126	High
Sheridan	12,902	131	High
Sherman Creek	6,086	91	High
Swan Lake Road	232	0	High
Tonada	10,371	132	High
Toroda	16,155	184	High
West Curlew Lake	6,356	224	High

Figure 6.1. Map of Proposed Projects.



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, United States Forest Service, Conservation District, and/or individual Fire Protection Districts 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.

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 grassland and forestland 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 as well as forest health.

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.

Mechanically Thin Forests

Many of the forests 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.

Individual trees are marked for harvest by a professional forester in stands of timber that have been identified as overstocked. The trees are cut by hand or with a machine and then they are processed and hauled to a mill. The slash created from the logging activity is often piled and burned or chipped and taken to a biomass facility. The result is a stand of timber that is less dense which allows the remaining trees to have access to more resources (water, sunlight, and nutrients) than there was pre-harvest, creating a healthier forest 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.[41] 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.[42] 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

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

[42] 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]

30 years, this practice has been limited due to liability issues, environmental concerns, and litigation. Additionally, where federal grazing allotments are still available, the restrictions on timing are often inappropriate and/or too inflexible for the objectives of reducing fuel loads (i.e. wildfire risk), eradicating noxious and invasive species, and restoring native grass and sagebrush communities.

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

Targeted grazing can indeed reduce the amount, height, and distribution of fuel on a specific rangeland area, potentially decreasing the spread and size of wildfires under normal burning conditions. By definition, "Targeted grazing is the application of a specific kind of livestock at a determined season, duration, and intensity to accomplish defined vegetation or landscape goals."[43]

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 following spring. Fall/winter

[43] 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.

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.[44]

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.[45] While the exact details of how the perennials benefit from dormant season grazing are not fully understood, Agricultural Research Service research in Nevada has reported success in decreasing annual grass dominance.

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

"The role of grazing as a tool for fuel management is generally supported, but it should be cautiously evaluated on a case-by-case basis because fire potential is influenced by interactions among several ecosystem variables."[46] Targeted grazing can reduce wildfire risk in specific areas. The targeted grazing strategies discussed above all require a very flexible adaptive management approach by both land management agencies and targeted grazing providers. Managers must determine objectives, then select and implement the appropriate livestock grazing prescription, monitor accomplishments, and make adjustments as needed.[47]

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[44] 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.

[45] 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.

[46] 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.

[47] 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.

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

Chapter 7

Supporting Information

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Signature Pages

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

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Brad Miller Ferry County Commissioner District #1	11/3/14 **Date**
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Signatures of Participation by Ferry 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 Ferry County Commissioners.

Chief: Neil Tupper

Ferry County Fire Protection District #3 / Barstow

6-19-15

Date

Ferry County Fire Protection District #13 / Republic

Date

Ferry County Fire Protection District #14

3-11-2015

Date

Signatures of Participation by other Ferry 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 adopted by the Ferry County Commissioners.

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Aaron Everett, Deputy Supervisor,

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

Lindsey Babcock — 4/8/2015

Lindsey Babcock, Border Resource Manager — Date

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Colville National Forest

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