Benton County, Washington

Community Wildfire Protection Plan 2018

Benton County Emergency Management
651 Truman Avenue
Richland, WA 99352
(509) 628-2600

Prepared By
Northwest Management, Inc.

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Acknowledgements

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

To obtain copies of this plan contact:

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Forward

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 Community Wildfire Protection Plan (CWPP).

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

*The **Benton County Community Wildfire Protection Plan** expands on the wildfire chapter of the Benton County Hazard Mitigation Plan updated in 2019. This project was funded by the Washington Department of Natural Resources with assistance from Benton County Emergency Management, Benton County Fire Agencies, and Bureau of Land Management.*

RESOLUTION 2018 964

BEFORE THE BOARD OF COMMISSIONERS OF BENTON COUNTY, WASHINGTON:

IN THE MATTER OF COUNTY PLANNING RELATING TO ADOPTION OF THE BENTON COUNTY COMMUNITY WILDFIRE PROTECTION PLAN (BCWPP)

WHEREAS, areas of Benton County are vulnerable to fire hazards and risk to life and economic cost of wildfires; and

WHEREAS, Benton County realizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, Benton County has been an active participant in the Benton County Community Wildfire Protection Planning Committee, which has addressed fire hazards and risks within the county; and

WHEREAS, The Benton County Community Wildfire Protection Plan has been prepared and issued for consideration and adoption by the communities and jurisdictions of Benton County, State and Federal Agencies, and local Fire Districts; and

WHEREAS, The Benton Community Wildfire Protection Plan is compatible 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); **NOW THEREFORE,**

BE IT RESOLVED that Benton County herby concurs with the Benton County Community Wildfire Protection Plan and authorizes the Benton County Board of Commissioners to sign the attached plan.

Dated this 18 day of December 2018.

Chairman of the Board

Member

Member

Constituting the Board of County Commissioners of Benton County Washington

Attest _____
Clerk of the Board

Signature Pages

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

Benton County Board of Commissioners

12-18-2018

James Beaver,
Benton County Commissioner District #3 — Date

12-18-2018

Jerome Delvin,
Benton County Commissioner District #1 — Date

12-8-2018

Shon Small
Benton County Commissioner District #2 — Date

Benton 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.

12/18/18

Ron Duncan, Chief
Benton City - *Benton County Fire Protection District #2*

12/18/2018

Lonnie E. Click, Chief
Kennewick - *Benton County Fire District #1*

12/18/2018

Rolland Watt, Chief
Paterson - *Benton County Fire District #6*

12/18/18

George Moon, Chief
Prosser - *Benton County Fire Protection District #5*

12/19/18

Seth Johnson, Chief
Prosser – *West Benton Fire Rescue*

12/18/2018

Tom Huntington, Chief
Richland - *Richland Fire Department*

12/19/2018

William Whealan, Chief
West Richland - *Benton County Fire Protection District #4*

Vince Beasley, Chief
Kennewick – *Kennewick Fire Department*

12/18/18
Date

Other Committee Representatives

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

12/20/18

Alan Lawson,
Washington Department of Natural Resources — Date

12-18-18

Deanna Davis, Emergency Manager
Benton County Emergency Management — Date

2/1/19

George Geissler, State Forester; Deputy Supervisor for Wildfire
Washington Department of Natural Resources — Date

N/A

Aaron Everett, Deputy Supervisor,
Forest Practices and Federal Relations, State Forester, Washington State Department of Natural Resources — Date

N/A

Lindsey Babcock, Border Resource Manager
Spokane District Bureau of Land Management — Date

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Chapter 1: Plan Overview and Development

In 2017, the Washington Department of Natural Resources contracted with Northwest Management Inc. through Bureau of Land Management grants to conduct an in-depth risk assessment for the hazards of wildland fire. Wildfire events occur almost annually in Benton County; thus, programs and projects that mitigate the impacts of this hazard are a benefit to the local residents, property, infrastructure, and the economy. In October 2017 the Washington Department of Natural Resources met with the newly formed planning committee to introduce their plans to perform a wildland fire risk assessment and incorporate that information into a Community Wildfire Protection Plan.

This Community Wildfire Protection Plan for Benton 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 Benton County.

Agencies and organizations that participated in the planning process include:

- Benton City
- Benton County
- Benton County Emergency Management
- Benton County Fire District #1
- Benton County Fire District #2
- Benton County Fire District #4
- Benton County Fire District #5
- Benton County Fire District #6
- Bureau of Land Management
- City of Kennewick
- City of Prosser
- City of Richland
- City of West Richland
- Irrigation Districts
- Kennewick Fire Department
- Port of Benton
- Richland Fire & Emergency Services
- U.S. Fish and Wildlife Service
- Washington DNR
- West Benton Fire Rescue

Northwest Management, Inc. of Moscow, Idaho was selected to assist the planning committee by facilitating meetings, leading the assessments, and authoring the document. The project lead from Northwest Management, Inc. was Tera King.

Goals and Guiding Principles

This section outlines the underlying themes and commitments, as determined by Benton County, planning committee members, and partnering entities, which serve as the ideological foundation of this document.

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

To make Benton County residents, communities, state agencies, local and federal governments, and businesses less vulnerable to the negative effects of wildland fires through the effective administration of wildfire hazard mitigation grant programs, hazard risk assessments, wise and efficient fuels treatments, and a coordinated approach to mitigation policy through federal, state, regional, Wildland Fire Public Education, and local planning efforts. To also provide a plan that will not diminish the Private Property Rights of land/asset owners within Benton County.

Washington DNR Mission Statement

The Department of Natural Resources endeavors to educate and inform the public to increase wildfire awareness. Cooperatively and in coordination with other agencies, and through public outreach and educational events, the DNR disseminates information to the public regarding wildfire safety and preparedness.

Vision Statement

Our combined focus will be the protection of people, structures, infrastructure, agriculture, state and federally listed species, and unique ecosystems that contribute to our way of life and the growth and sustainability of the local and regional economy through education, training, support, and planning.

Goals

1. Educate citizens about the unique challenges of wildfire preparedness and reclamation in the county through the introduction of the Firewise program and encourage homeowners to manage their property accordingly.

2. To protect people, structures, assets, critical infrastructure, state and federally listed species, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy.
3. Identify and map Wildland Urban Interface (WUI) boundaries.
4. Provide a plan that balances private property rights of landowners in Benton County with personal safety and responsibility
5. Encourage the development of regulatory measures such as state building codes and road standards specifically targeted to reduce the wildland fire potential and reduce the potential for loss of life and property.
6. Determine areas at risk of wildfire and establish/prioritize mitigation projects, without regard to ownership, and recommend both conventional and alternative treatment methods to protect people, homes, infrastructure, state and federal listed species, and natural resources throughout Benton County.
7. Improve county and local fire agency eligibility for funding assistance (National Fire Plan, Healthy Forest Restoration Act, FEMA, and other sources) to reduce wildfire hazards, prepare residents for wildfire situations, and enhance fire agency response capabilities.
8. Improve emergency response times through enhanced radio communications and greater road signage throughout the county.
9. Improve the ability of the Benton County Fire Districts to provide fire protection for the residents of the county through improved resources, recruitment and retention of volunteers, and training.

United States Government Accountability Office (GAO)

Since 1984, wildland fires have burned an average of 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 percent of all insured catastrophic losses from 1983 to 2002, 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) creating and maintaining a buffer, called defensible space, from 30 to 100 feet wide around a structure, where flammable vegetation and other objects are reduced; and (2) using fire-resistant roofs and vents. In addition to roofs and vents, other technologies – such as fire-resistant windows

and building materials, surface treatments, sprinklers, and geographic information systems mapping – can help in protecting structures and communities, but they play a secondary role.

Although protective measures are available, many property owners have not adopted them because of the time or expense involved, competing concerns such as aesthetics or privacy, misperceptions about wildland fire risks, and lack of awareness of their shared responsibility for fire protection. Federal, state, and local governments, as well as other organizations, are attempting to increase property owners' use of protective measures through education, direct 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[1].

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:

- Washington Department of Natural Resources Wildfire Strategic Plan: "The state's future Wildland Fire Protection Strategic Plan will provide a blueprint for effective wildland fire protection in Washington and inform associated policy and resource decisions."
- 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).

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

The objective of combining these complementary guidelines is to facilitate an integrated Community Wildfire Protection Plan, identify pre-hazard mitigation activities, and prioritize activities and efforts to achieve the protection of people, structures, the environment, and significant infrastructure in Benton 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 Benton County Community Wildfire Protection Plan is included in Appendix 1.

Integration with other Local Planning Documents

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

Benton County Hazard Mitigation Plan

As a requirement to receive certain types of federal non-emergency disaster assistance, including funding for hazard mitigation projects, Benton County and the cities and towns of Kennewick, Richland, Prosser, West Richland, and Benton City are required to develop and maintain an up-to-date local hazard mitigation plan. The jointly developed Benton County Hazard Mitigation Plan was is currently under revision with an expected approval date of January 2019. The Federal government requires that hazard mitigation plans be updated every five years.

Benton County Comprehensive Plan

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

This Community Wildfire Protection Plan will “dove-tail” with the county’s Comprehensive Plan during its development and implementation to ensure that the goals and objectives of each are integrated. This planning effort is intended to be compatible with the goals and objectives of the county’s Comprehensive Plan.

Master Mutual Aid Agreement/Tri-County Mutual Aid Agreement

Mutual aid agreements are the means for one jurisdiction to provide resources, facilities, services and other required support to another jurisdiction during an incident. Each jurisdiction should be party to a mutual aid agreement with appropriate jurisdictions they expect to provide assistance to or receive assistance from during an incident. This would normally include all neighboring or nearby jurisdictions, as well as relevant private-sector and non-governmental organizations. States should participate in interstate compacts and look to establish intrastate agreements that encompass all local jurisdictions. Mutual aid agreements are also needed with private organizations, such as the American Red Cross, to facilitate the timely delivery of private assistance at the appropriate jurisdictional level during incidents.

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Chapter 2: Documenting the Planning Process

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

Description of the Planning Process

The Benton 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 Benton 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 planning 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 districts, municipal fire departments, 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:

Benton City	City of Prosser
Benton County	City of Richland
Benton County Emergency Management	City of West Richland
Benton County Fire District #1	Irrigation Districts
Benton County Fire District #2	Kennewick Fire Department
Benton County Fire District #4	Port of Benton
Benton County Fire District #5	Richland Fire & Emergency Services
Benton County Fire District #6	Washington State DNR
City of Kennewick	West Benton Fire Rescue

These jurisdictions were represented on the planning 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 planning committee meetings were the primary venue for authenticating the planning record. However, additional input was gathered from each jurisdiction in the following ways:

- Planning committee leadership visits to local group meetings where planning updates were provided, and information was exchanged.
- One-on-one visits between the planning 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 planning 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, Benton County's human resources have many demands placed on them in terms of time and availability. In Benton 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 planning committee and then report back to the remainder of their organization on the process and serve as a conduit between the planning committee and the jurisdiction.

Planning Committee Meetings

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

Name	**Organization**
Al Lawson	Washington State DNR
Deanna Davis	Benton County Emergency Management
Kyle Kurth	Benton City
Scott Clemenson	Richland Fire Department
Pete Rogalsky	Richland Public Works
Cary Roe	City of Kennewick
Anthony Muri	City of Kennewick
Neil Hines	Kennewick Fire Department
Seth Johnson	West Benton Fire Rescue
Kevin Howard	Port of Benton
Jerrod MacPherson	Benton County
John Janak	United States Fish & Wildlife Service
Lori Ferris	Benton County Emergency Management
Charles Cronk	Bureau of Land Management
Lonnie Click	Benton County Fire District #1
Ron Duncan	Benton County Fire District #2
Bonnie Benitz	Benton County Fire District #4
William Whealan	Benton County Fire District #4
George Moon	Benton County Fire District #5
Rolland Watt	Benton County Fire District #6
Tera King	Northwest Management Inc.
Vaiden Bloch	Northwest Management, Inc.
Eric Nelson	Northwest Management Inc.

Committee Meeting Minutes

Committee meetings were scheduled and held from October 2017 through July 2018. These meetings served to facilitate the sharing of information and to lay the groundwork for the Benton County Community Wildfire Protection Plan. 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. Planning 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 planning committee, periodic press releases were submitted to the various print and online news outlets that serve Benton County residents. Press releases served to inform the public about the plan development process and opportunities for public participation. News releases are located in Appendix 2.

Public Meetings

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

The schedule of public meetings in Benton County included three locations and two different dates. Meeting announcements were sent to local papers and attendance at the three meetings was variable (Appendix 2):

- Richland: April 25th At the Richland Public Library, the meeting was only attended by several committee members.
- Kennewick: April 25th at the Benton PUD auditorium, only one committee member and one member of the general public attended the meeting.
- Prosser: April 26th at West Benton Fire and Rescue, the meeting was attended by both committee members and members of the general public.

Documented Review Process

Opportunities to review and comment on this plan have been provided through multiple means for both committee members as well as members of the general public.

During regularly scheduled committee meetings in the fall of 2017 and spring of 2018, 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 December for a full committee review. The committee was given two weeks to provide comments to the plan.

Public Comment Period

A public comment period was conducted from November 26th through December 7th to allow members of the general public an opportunity to view the full draft plan and submit comments and any other input to the committee for consideration. A press release was submitted to the local media outlets announcing the comment period, the location of the plan for review, and instructions on how to submit comments. Each hardcopy was accompanied by a letter of instruction for submitting comments to the planning committee. The newspaper advertisement for the public comment period is included in Appendix 2.

Hardcopies of the draft were printed and made available at the following locations:

- BCES 651 Truman Ave., Richland, WA
- Richland Library 955 Northgate, Richland, WA

Public comments can also be submitted through email at:

- *Publiccomment@bces.wa.gov*

Continued Public Involvement

Benton County is dedicated to involving the public directly in review and updates of the Community Wildfire Protection Plan. Benton County Emergency Services, working through the planning committee, will be responsible for the review and update of the plan.

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 planning 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 Benton County Emergency Management, who is responsible for keeping track of public comments on the Plan.

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

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Chapter 3: Benton County Characteristics

Benton County is located in south-central Washington in the middle of the Columbia Basin. The Columbia River forms the county's northern, eastern, and southern boundaries, forming an arc some 120 miles long. Benton County is bordered to the west by Yakima and Klickitat counties, to the north by Grant County, to the east by Franklin and Walla Walla counties, and to the south by two Oregon counties, Umatilla and Morrow. Benton County covers an area of 1,722 square miles. The highest elevation in the county is 3,629 feet, located in the Rattlesnake Mountains north of Prosser. The lowest elevation is 265 feet, found near Plymouth along the north bank of the Columbia River. The Yakima River flows from west to east through the middle of the county. The Yakima, Snake, and Walla Walla rivers join the Columbia River within 30 miles of each other along Benton County's eastern border near Sacajawea State Park.

Incorporated cities and towns in Benton County include Benton City, Kennewick, Prosser, Richland, and West Richland. Most of the unincorporated areas of the County are rural areas with low-density agriculture-based land use. However, there are also several distinct unincorporated communities, including Paterson, Plymouth, Finley, and Whitstran. Benton County was created in 1905 from the eastern portions of Yakima and Klickitat Counties. Prosser is the county seat.

Of the county's five incorporated communities, Prosser, Benton City, and West Richland are located adjacent to the Yakima River, Richland is at the confluence of the Yakima and the Columbia Rivers, and Kennewick borders the Columbia River downstream of Richland. Richland and Kennewick, together with Pasco (across the Columbia River in Franklin County) are all located on the banks of Lake Wallula, created after the construction of the McNary Dam. These cities are collectively referred to as the Tri-Cities due to their interlocking economic dependence and their geographic proximity to each other. The unincorporated community of Finley lies to the southeast along the Columbia River, just outside of Kennewick. Elevations for all of the communities are in the 300 to 700 feet above sea level range. The two unincorporated communities of Plymouth and Paterson border the Columbia River at the county's southern border below McNary Dam. Elevations of Plymouth and Paterson are 300 and 400 feet, respectively.

Description

The Columbia River was historically an important fishery and its associated lowlands used as wintering ground by several Native American tribes including the Umatilla, Wallowa, Wanapum, Nez Perce, and Yakama tribes. Permanent settlement of the region accelerated in the 1890s when infrastructure was completed that allowed irrigation of the arid shrub-steppe lands in the area. This, along with the completion of the Dalles-Celilo Canal in 1915, which first connected

the Tri Cities to the Pacific Ocean, turned Benton County into an important agricultural center. The proximity of the Hanford Nuclear Site, which was a key facility for the development of nuclear weapons during World War II, and the construction of three Washington Public Power Supply System (WPPSS) nuclear plants at Hanford in the 1970s, had significant impacts on the economic development of the county.

Benton County is currently one of the top ten agricultural counties in Washington, based on the total value of all agricultural products (crop and livestock). The area produces carrots, onions, potatoes, wheat, barley, oats, apples, grapes, and cherries. In addition to crop production, there is a significant food-processing industry in the Tri-Cities. Area plants produce French fries, grape juice, baby carrot sticks, and other foods. Winter wheat is the dominant crop cover. Washington State University Irrigated Agriculture Research and Extension Center, one of the world's largest irrigated experiment stations, is located in Benton County approximately four miles north of Prosser. In recent years the wine industry has become a rapidly growing segment of the agriculture industry, with many new wineries opening. The state's largest winery, Columbia Crest, is located at Paterson.

The Tri-Cities area of Benton County is a major transportation hub for the Pacific and Inland Northwest. The Tri-Cities are served by Interstate Highway 82, which connects the Tri-Cities directly to the three nearby transcontinental Interstate Highways, I-84, I-90 and I-5. Several Federal Highways and multiple State Highways service the area. Additionally, Tri-Cities offers mainline rail freight service by both Burlington Northern Santa Fe and Union Pacific Railroads and is the only major metropolitan and major manufacturing area between the Cascade and Rocky Mountains offering this level of service by these two major national rail carriers. The Columbia-Snake River System connects the region to the Pacific Ocean and allows the transport of commodities to locations throughout the world. Barge service is available through the Port of Benton.

Climate and Geography

Benton County is located in the central part of the Columbia Basin, which has a landform surrounded by mountain ranges that have a pronounced effect on the region's climate. The following are characteristics of the as summarized in the 2017 Benton County Comprehensive Plan:

Climate

Benton County is located in the central part of the Columbia Basin, which is surrounded by the Cascade and Rocky mountain ranges to the west and east, respectively. These ranges have a pronounced effect on the region's climate, which is dry and arid. The growing season in the

region is approximately 185 days from mid-April to mid-October, with high temperatures exceeding 90 °F during the summer months and as low as 6 °F or colder during the winter months. Mean annual precipitation in the area ranges from 5 to 10 inches, with mean annual precipitation levels ranging from 10 inches or greater in discrete areas in Horse Heaven and Rattlesnake Hills (see Appendix A: Map Folio, Figure 6 – Precipitation Map). Approximately 70 percent of the precipitation in the region occurs between November and April with intermittent thunderstorms and other precipitation events occurring between March and October. Winter season snowfall accumulation ranges between 4 to 21 inches during the winter months, with snow melt and/or river icing during the winter and spring seasons occasionally causing flooding of the Yakima River.

Topography

The topography of Benton County is characterized by basin and valley lowlands, separated by the upland plateaus and ridges of the Yakima Folds Belt. The landscape is the product of seismic upheavals, volcanic eruptions, magmatic flows, glacial epochs, and cataclysmic floods. The legacy of this history is the present geologic landscape that includes the Hanford area, productive soils on the Benton County Comprehensive Plan Update 55 February 2018 flanks of anticlinal ridges, the Horse Heaven plateau, Rattlesnake Hills, Saddle Mountain, water resources of three major rivers, and the basaltic vertical columns and outcrops. A thin layer of biology has adapted to the area's geologic base. The layer is relatively sparse and fragile on the dry uplands of shrub-steppe and bunch grasses, but diverse and resilient along reaches of rivers, tributaries, and creeks that flow throughout the County. From north to south, the major topographic features of Benton County are as follows:

Pasco Basin: A basal plane that comprises most of what is now the Hanford Site. Topography is flat to hilly, with elevations ranging from around 300 feet in the east to nearly 1,000 feet at the base of Rattlesnake Mountain.

Rattlesnake Hills: This segment of the Yakima Folds separates the Pasco Basin from the Yakima Valley. The ridge extends in a southeasterly-northwesterly alignment from its beginning in eastern Yakima County to a point where it merges with the Horse Heaven Hills south of Finley. Rattlesnake Ridge is discontinuous through the middle of the County where it has been perforated by the Yakima River (resulting in Red, Candy, and Badger mountains) and contains Rattlesnake Mountain, the highest unforested “peak” in Washington State. At 3,629 feet, Rattlesnake Mountain is also the highest point in Benton County.

Yakima River: The river bisects the County into north and south portions and is responsible for much of the varied topography of central Benton County. The river has been cutting the valley sediments in this syncline that separates Rattlesnake Ridge from the Horse Heaven Hills for tens of thousands of years. The present valley floor ranges from about 300 feet above sea level, at

its confluence with the Columbia River at the City of Richland, to around 700 feet at the Yakima County line.

Horse Heaven Hills: This plateau constitutes the southern half of Benton County. The elevations of the Horse Heaven Hills rise from the County's low point of 265 feet near Crow Butte to 1,600 to 2,200 feet along the ridgeline which overlooks the Yakima Valley and the Badger Coulee. The Horse Heaven Hills are unique among the Yakima Folds: it is the southern-most and longest running ridge in the system at some 60 miles; it is the most severely "lop-sided" of the ridges, becoming more of a monocline than an anticline in areas; and it takes a definitive, 90 degree turn to the south at Kiona, which is the geographic center of the County. The ridgeline is highest at Jump Off Joe Butte south of Kennewick, and the plateau slides southward toward the Columbia River.

Population and Demographics

Benton County was created by the Washington State Legislature on March 8, 1905. The County government consists of an elected County Commission, consisting of three full time County Commissioners. The Commissioners are elected to four-year terms in a general election. Each commissioner represents a district determined by population boundaries. Other elected county officials include: Assessor, Auditor, Clerk, Coroner, Prosecuting Attorney, Treasurer, Sheriff, and Superior Court and District Court judges.

The U.S. Census Bureau reported that the Benton County population was 175,171 in 2010—a 23 percent increase from 2000. The cities of Kennewick and Richland saw the most significant population increase during this time span. Table 1 shows historical changes in population in Benton County and in selected communities. Table 2 was taken from the most recent Benton County Comprehensive Plan Update (February 2018); it shows total population for Benton County by incorporated and unincorporated areas in Benton County. Of the 193,500 people reported to be in Benton County in 2017, almost 35,100 people live in unincorporated areas.

Table 1) Historical and estimated current populations for communities in Benton County, WA from 1960 to2016.

	1960	1970	1980	1990	2000	2010	2016*
Benton County	62,070	67,540	109,440	112,560	142,475	175,171	193,686
Benton City	1,210	1,070	1,980	1,806	2,624	3,038	3276
Kennewick	14,244	15,212	32,397	42,155	54,693	73,917	80,454
Prosser	2,763	2,954	3,896	4,476	4,838	5,714	6,040
Richland	23,548	26,290	33,587	32,315	38,708	48,054	54,989
West Richland	1,347	1,107	2,935	3,962	8,385	1,181	14,198
***2016 population estimated based on 2010 census**							

The 2016 Benton County population was estimated to be 193,686. The median age was 35.6, with approximately 72.8 percent of the population 18 years and over. Approximately 82.4 percent of the population is White and 18.7 percent is Hispanic or Latino. The Census reports there are 27,726 residents (17.9 percent) who speak a language other than English at home, including 6.4 percent (8,391 people 5 years and over) who speak English less than "very well." Spanish is the language other than English most often spoken at home by 20,551 residents (13.3 percent). Of those speaking Spanish at home, 10,234, or 5.8 percent of Benton County's population, speak English less than "very well."[2]

Table 2) 20 year population estimates for Benton County, WA (OFM 2017).

Year	Population in Unincorporated Benton County	Total Population in Benton County
2017	35,085	193,500
2037 Projection	53,220	280.109
20 Year Increase	**18,135**	**86,609**

Land Ownership

The data used in this section was taken from the 2010 BLM land ownership database. Local government property (i.e. county) is likely included in the Private ownership category. The majority of ownership, approximately 67%, within Benton County is private (Table 3). Federal ownerships account for 27% of the land base with the Hanford Site encompassing the largest portion with over 194,000 acres and the U.S. Fish & Wildlife Service and Bureau of Land Management accounting for the remaining 105,470 acres. Less than 6% of Benton County is owned by the state. Figure 1 shows the distribution of land ownership in Benton County.

Land use in Benton County is predominately for agricultural purposes. According to the 2012 Census of Agriculture, approximately 703,505 acres of privately-owned land is classified as agricultural which is just over 94% of all private land and just over 63% of the total area of Benton County. Of the 703,505 acres classified as agriculture about 74% is cropland and 16% is pastureland.

[2] U.S. Census Bureau. "QuickFacts". https://www.census.gov/quickfacts/fact/table/bentoncountywashington/PST045217. Accessed April 2018.

Table 3) Land ownership in Benton County, WA

Entity	Acres	Percent Coverage
BLM	11,020	1%
COE	54	<1%
Federal (DOD)	194,450	17%
FWS	98,220	9%
Private	746,948	67%
State	45,782	4%
State Fish & WL	5,812	1%
State Parks	612	<1%
Water	10,329	1%
Total	1,113,227	100%

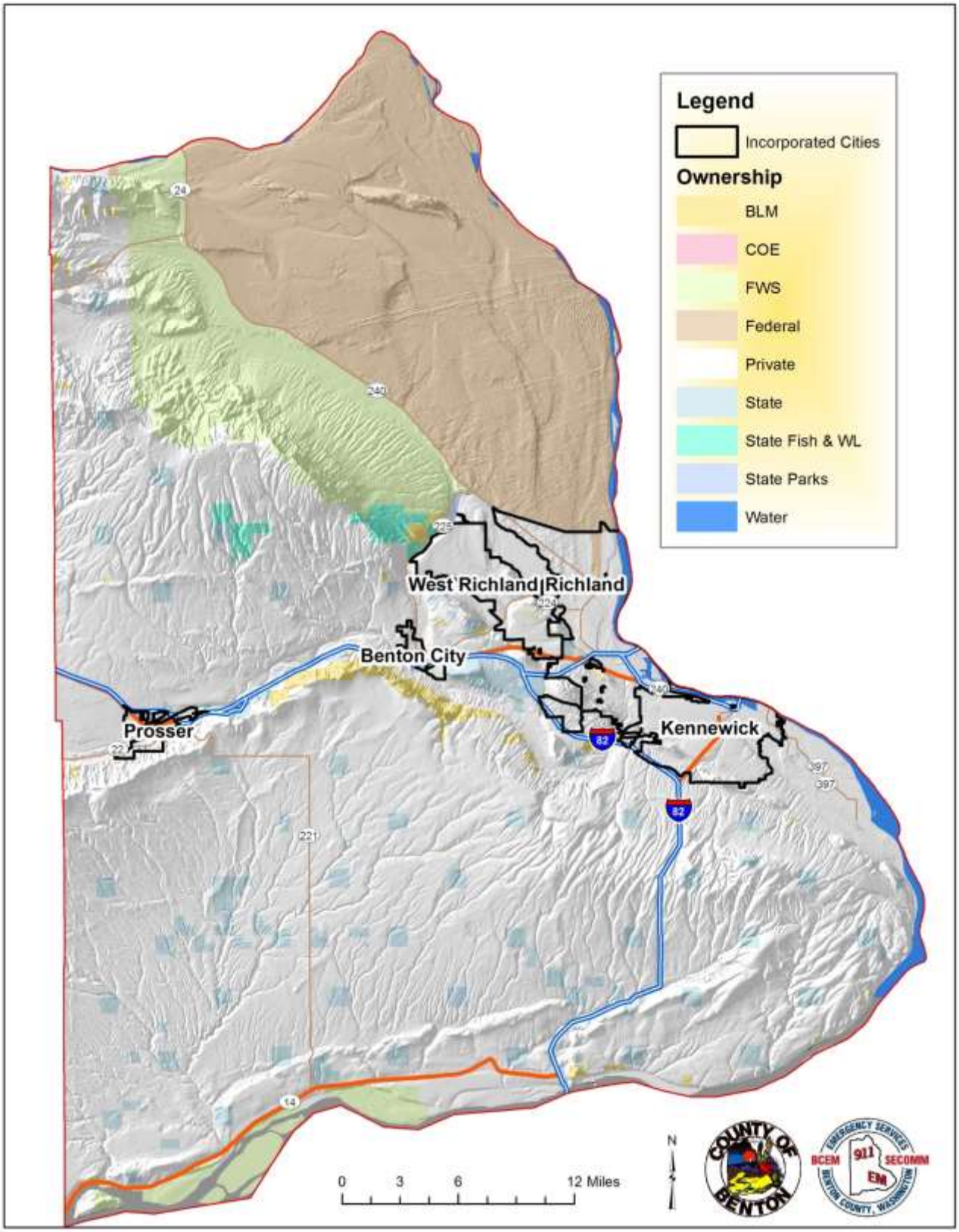

Figure 1) Land ownership in Benton County, WA.

Development Trends

The Following is excerpted from Chapters 3.7 and 3.8 in the 2017 Benton County Comprehensive Plan:

Population growth in Benton County from 2011 to 2016 grew at a rate reflective of the slow growth of the nation's economy; the improved national economy of 2017 has provided a rebound in growth reminiscent of the growth in 2009. Figure 3-2 reflects the population trend in the last 10 years in Benton County.

The latest population projections from OFM, using the "high" series estimates, indicate that Benton County can expect a population increase of 86,609 over the next 20 years. This will result in a year 2037 population of 280,109, which is an increase of 45 percent over the current population of 193,500. The County will review the future growth trends and adjust population projections if necessary.

Approximately 18 percent of the total County population, or 35,085 people (OFM 2017), reside in the unincorporated area of Benton County. The 20-year OFM projection also indicates the unincorporated County population will grow to 53,220 persons in 2037. This will add 18,135 additional people in the next 20 years who are projected to seek housing in unincorporated areas of the County between now and the year 2037. This growth represents a 52 percent increase over the current rural population. Table 2 indicates the population estimates in Benton County and the unincorporated areas of the County.

At an estimated 2.7 residents per household, the increased population in unincorporated Benton County would require approximately 6,716 new homes in the next 20 years. This growth will be accommodated mostly in the Urban lands of the UGAs, Rural Transition areas, and Rural Remote areas. Some growth will also take place in the Rural Community Centers and Rural Resource areas.

There are currently 78,952 acres designated for the rural residential uses within the four rural land use designations of Benton County (outside of Hanford and the agricultural areas).

A land capacity analysis on vacant and existing units in the Rural Transition land (1 du/acre) and Rural Remote land (1 du/5 acre) indicates adequate land supply to accommodate future housing demand. However, additional growth is also anticipated to occur in the Rural Community Centers and Urban areas. Table 4 indicates potential allocation of future population in these two land use categories:

Table 4) Potential allocation of future population per land use category

Land Use	New Units
Urban	134
Rural Transition	1,142
Rural Remote	5,652
Rural Community Centers	34
Total	**6,961**

1) Does not include UGAs

2) Lot size is determined by minimum lot size requirements; i.e., how many units are allowed per given acreage

Natural Resources

Benton 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 Benton County have become more susceptible to large-scale, high-intensity fires posing a threat to life, property, and natural resources including wildlife and plant populations. High-intensity, stand-replacing fires have the potential to seriously damage soils, native vegetation, and fish and wildlife populations. In addition, an increase in the number of large, high-intensity fires throughout the nation's forest and rangelands has resulted in significant safety risks to firefighters and higher costs for fire suppression.

Fish and Wildlife

There are many species of wildlife that inhabit the shrub / steppe region of central Washington. Some of the species present even rely on this type of ecosystem to survive. Sage grouse (*Centrocercus urophasianus*), Ferruginous hawk (*Buteo regalis*), and Burrowing owl (*Athene cunicularia*) once heavily populated this region of Washington; however due to habitat loss (among other reasons); these populations have been drastically reduced in numbers and in some instances genetically isolated from other populations. There has been a significant effort by federal, state, and private landowners in recent years to increase the availability of preferred habitat through the Conservation Reserve Program and incorporating higher grazing standards throughout the region.[3]

[3] Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 174 pp.

Vegetation

The Columbia Basin supports a complex landscape composed of native shrub-steppe vegetation and agriculture or rangeland. Areas that have not been converted to agriculture typically exhibit scattered sagebrush or bitterbrush with a bunchgrass understory. The understory usually consists of bluebunch wheatgrass (*Psuedoroegneria spicata*), Idaho fescue (*Festuca idahoensis*) or various needlegrass (*Achnatherum sp*.) species. Land largely converted to agricultural use or rangeland is often dominated by exotic plants or native vegetation tolerant of persistent land use.[4]

Vegetation in Benton County is a mix of shrubland, grassland, agricultural, and some riparian ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the vegetation of the area. Grasslands compose almost 60% of the vegetative coverage in Benton County with shrublands representing approximately 26% of the total coverage. The remaining land cover consists of riparian areas dominated by shrubs and hardwoods and developed and non-vegetated areas. Figure 2 shows the distribution of existing vegetation types in Benton County and Table 5 shows the percent coverage that each vegetation type represents.

Table 5) Vegetative cover types in Benton County, WA.

Existing Vegetation Type	Acres	Percent of Total Area
Annual Graminoid/Forb	488,839	43%
Deciduous open tree canopy	28,260	3%
Developed	53,667	5%
Evergreen closed tree canopy	18,194	2%
Evergreen dwarf-shrubland	4,999	<1%
Evergreen open tree canopy	353	<1%
Evergreen shrubland	193,487	17%
Herbaceous - grassland	10,565	1%
Mixed evergreen-deciduous open tree canopy	5,531	<1%
Mixed evergreen-deciduous shrubland	90,425	8%
Non-vegetated	40,556	4%
Perennial graminoid grassland	47,523	4%
Perennial graminoid steppe	131,926	12%
Sparsely vegetated	12,076	1%
Total	**1,126,400**	**100%**

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

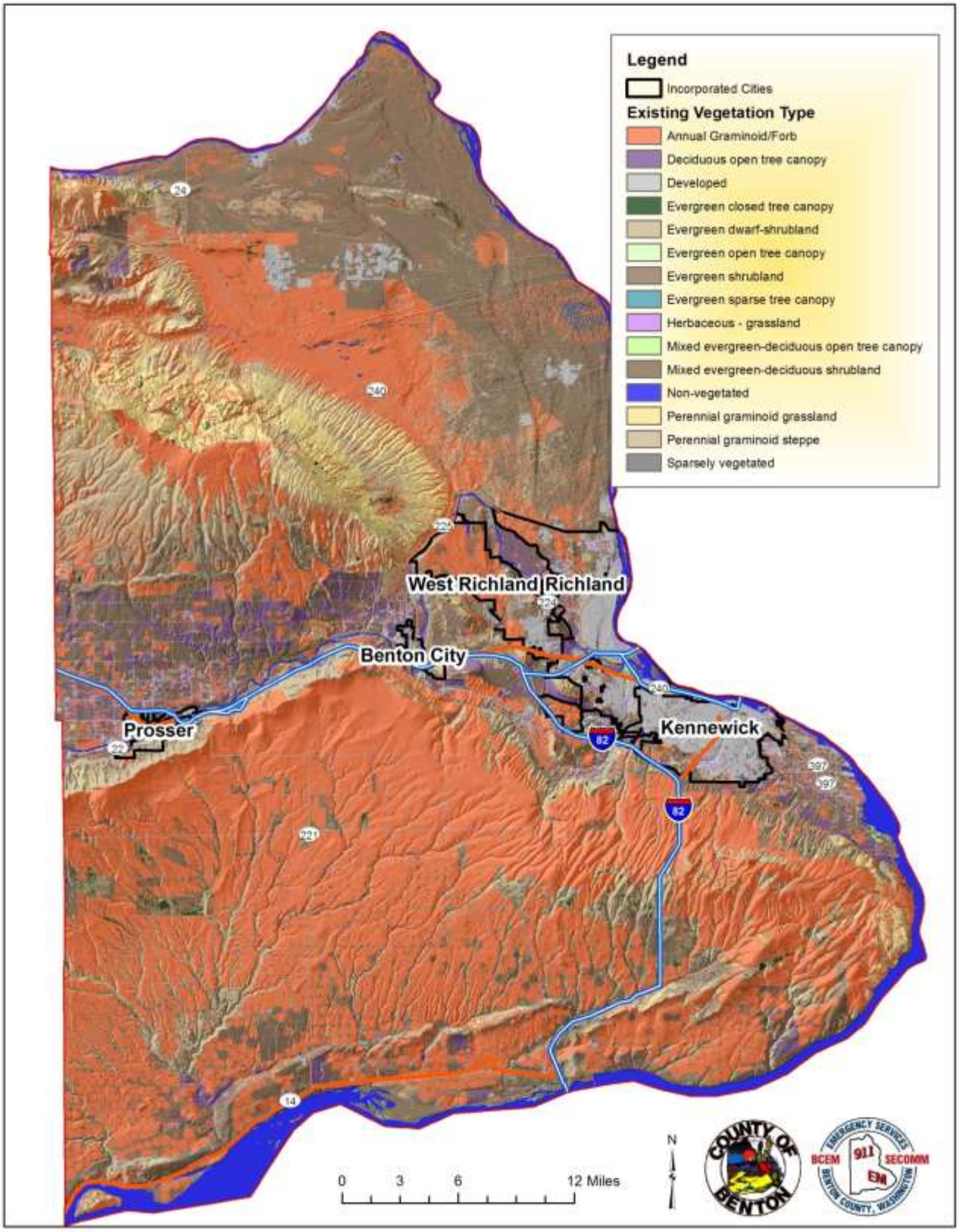

Figure 2) Map of Existing Vegetation Types in Benton County, WA.

Hydrology

The Washington Department of Ecology, Water Resources Program is charged with the development of the Washington State Water Plan. Included in the State Water Plan are the statewide water policy plan and component basin and water body plans, which cover specific geographic areas of the state (WDOE 2005). The Washington Department of Ecology has prepared general lithology 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 Benton County will be the maintenance of the domestic watershed supplies in the Alkali-Squilchuck (WRIA 40), Lower Yakima (WRIA 37), and Rock-Glade (WRIA 31)[5] watersheds.

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.[6]

[5] Washington Department of Ecology, Water Resources Program website. http://www.ecy.wa.gov/watershed/index.html. Accessed August, 2013.

[6] 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.

The Clean Air Act, passed in 1963 and amended in 1977, is the primary legal authority of the U.S. Environmental Protection Agency. The Clean Air Act provides the principal framework for national, state, and local efforts to protect air quality. Under the Clean Air Act, the Organization for Air Quality Protection Standards (OAQPS) is responsible for setting the NAAQS standards for pollutants which are considered harmful to people and the environment. OAQPS is also responsible for ensuring these air quality standards are met, or attained (in cooperation with state, Tribal, and local governments) through national standards and strategies to control pollutant emissions from automobiles, factories, and other sources.[7]

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

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

Benton Clean Air Agency

Benton Clean Air Agency (Benton Clean Air) is one of seven local air pollution control agencies in Washington state. Benton Clean Air is a municipal corporation that is governed by a 5-member Board of Directors. Benton Clean Air is responsible for enforcing Federal and State Clean Air Acts, and BCAA Regulation 1 in Benton County.

Benton Clean Air is dedicated to the preservation of public health as it relates to outdoor air quality. In carrying out this role, the BCAA works with industry, individuals, cities, the county, and other local entities, whose activities potentially affect air quality. The BCAA office in Kennewick, WA can be reached at (509) 783-1304.

Washington State Smoke Management Plan

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

Protection of public health and preservation of the natural attractions of the state are high priorities and can be accomplished along with a limited, but necessary, outdoor burning

[7] 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.

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.

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

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

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Chapter 4: Risk and Preparedness Assessments

Wildland Fire Characteristics

In general, wildland fire behavior describes how fire reacts to available fuels, local topography, and current weather conditions. The relationships between these three components are dynamic; changing one condition can often exacerbate the affects that the other conditions have on fire behavior. As such, fire behavior is often modeled as a triangle with fuels, topography, and weather serving as the three sides (Figure 3). Understanding the relationships between the fire behavior components has important implications for not only managing an active wildfire but also mitigating wildfire risk. Since fuel is the only component that can be managed directly, management decisions regarding fuel types and fuel loading across the landscape need to be made based on characteristics that are inherent of the region; climate and topography. Strategic fuel breaks, conservation and restoration of native species, and prescribed burns are examples of management activities that can reduce wildfire risk and simplify the process of assessing potential wildfire behavior.

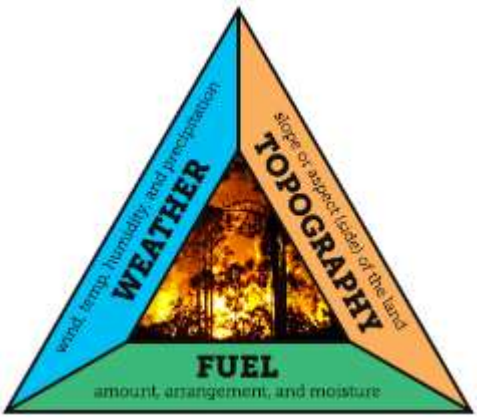

Figure 3) Fire Behavior Triangle (learn.weatherstem.com)

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

Weather

Fire behavior is largely influenced by weather conditions. Wind, moisture levels, temperature, and relative humidity are all factors that determine the rates at which fuels dry and vegetation cures. The ignition potential of fuels is also determined by these factors; weather patterns and trends can be analyzed to determine how likely or easily a certain fuel type will ignite and if a fire will be sustained. Once started, the behavior of a wildfire is further determined by atmospheric stability and local and regional weather. As temperature, wind speed, wind direction, precipitation, storm systems, and prevailing winds all influence fire behavior, weather is the most difficult component of the fire triangle to predict and interpret. As observed in the Yarnell Hill fire in Arizona that killed 19 firefighters, a storm cell can cause a flaming front to change direction abruptly, 90 degrees in the case of the Yarnell Hill fire, and rapidly accelerate up to speeds of 10 to 15 mph.

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. In General, north slopes tend to be cooler, wetter, more productive sites. This typically results in heavy fuel accumulations, high fuel moistures, lower rates of curing for fuels, and lower rates of spread. In contrast, south and west slopes tend to receive more direct sun and therefore 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 which means they tend to be "available to burn" for a greater portion of the year. Slope also plays a significant role in the rate of spread of a fire as fuels upslope from the flaming front are subjected to preheating which means that they readily combust as the fire draws closer. The preheating process is exacerbated as slope increases which results in greater rates of spread and increased flame lengths. Therefore, steep slopes with a south –southwest aspect generally promote intense fire behavior due to dry fuels and the likelihood of predominant, westerly winds.[8]

Fuels

In the context of wildfire, 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 of fuel types. 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. In general, 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. Fine fuels, those with high surface to volume ratios, are considered the primary carriers of surface fire. 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.[9]

Fuels are classified by diameter as that has important implications for fuel moisture retention. The smaller the diameter, the more quickly the moisture content of a given fuel type changes while larger diameter fuels take longer to change. In terms of fire potential on the landscape

[8] Auburn University website https://fp.auburn.edu/fire/topos_effect.htm. Accessed December 2016

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

and fire suppression, the amount of time that is required for a fuel type to become volatile is critical which is why instead of referring to fuels by size, they are referred to as either one-hour, ten-hour, 100 hour, or 1000 hour fuels. This method of classifying fuels describes the amount of time required for a particular fuel's status to change from non-combustible to combustible as a result of altered moisture levels in the surrounding environment.

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. Accounting for the substantial reduction in burned acreage was an increase in fire suppression efforts and development of firefighting equipment and strategy. Since 1970, about 3.5 million acres burn annually in the western U.S. The 2014 wildfire season set a new record for 31 days at Preparedness Level (PL) 5 and had one of the largest wildfires in Washington History, the Carlton Complex at 256,108 acres. There was a total of 425,136 acres consumed in the state of Washington.[10]

The potential volatility of a fire season can be predicted from winter snowfall, snowpack longevity, spring temperatures, and total precipitation. When winter snowfall is limited and snowpack melts early due to warm spring temperatures, conditions begin to favor fire activity as fine fuels dry out and spring storms generate lighting and high winds. Additionally, human activity increases in natural areas and recreation areas in warm weather months; typically, April through October in the Columbia River Basin. This increases the likelihood of a human-caused ignition, particularly in natural areas where fuels are abundant, that could result in a wildfire, threatening both populated areas and natural resources.

Fire History

Historically, most plant communities in the state of Washington were fire-adapted and burned at fairly regular intervals. Frequent, low intensity fires limited fuel accumulation across the landscape and contributed to the distribution of native, fire-adapted plant communities. In contrast to modern day conditions, fire return intervals (the amount of time between fires in a defined area) were shorter but fires burned with less intensity. Shorter return intervals between fire events often resulted in less dramatic changes in plant species composition.[11] Across the landscape, fires typically burned 1 to 50 years apart in a given area with most fire returning between 5 and 20 years.[12] With infrequent return intervals, plant communities

[10] http://www.nwccinfo.blogspot.com. Accessed July 2017.

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

[12] 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.

tended to burn more severely and be replaced by vegetation communities different in composition, structure, and age.[13] Native plant communities in this region developed under the influence of fire. These adaptations to fire are evident at the species, community, and ecosystem levels.

Fire history for Benton County is largely unknown, but large fires that have occurred since the 1980's are well document and have been mapped. Local knowledge suggests that Native Americans did historically perform burns which played an important role in shaping the vegetation throughout the county. The Bureau of Land Management is helping to fund future research to further map fire history in central Washington through fire scars and charcoal deposits. Although this data is not available for the development of this document, it should be available for a future update of this plan.

Since 1980, fire activity has largely been concentrated in the northern third of Benton County as well as the slopes of the Horse Heaven Hills along the south side of I-82 and in the Badger Mountain area. Numerous small fires have also occurred along at the southern end of the county along the Columbia River (Figure 4). Looking at Figure 4, it appears that most of wildfires that have occurred in Benton County were in proximity to road systems or recreational areas which would support that most fires were human-caused. Ignition causes are displayed in Table 7 in the Wildfire Ignition Profile section. Historical fires at least 1000 acres in size that have occurred in Benton County since 1980 are summarized in Table 6. Benton County has had six wildfires between 10,000-99,000 acres and two that were 100,000 acres or larger. The 24 Command fire that occurred in 2000 was the largest wildfire in Benton County since 1980. It burned upwards of 192,000 acres and came within two miles of the radioactive waste storage tanks located at the Hanford Site. Most recently was the Bofer Fire that started on August 8th, 2018. It started along the highway and destroyed five homes and damaged four others.

[13] Johnson, C.G.; Clausnitzer, R.R.; Mehringer, P.J.; Oliver, C.D. 1994. Biotic and Abiotic Processes of Eastside Ecosystems: The Effects of Management on Plant and Community Ecology, and on Stand and Landscape Vegetation Dynamics. Gen. Tech. Report PNW-GTR-322. USDA-Forest Service. PNW Research Station. Portland, Oregon. 722pp.

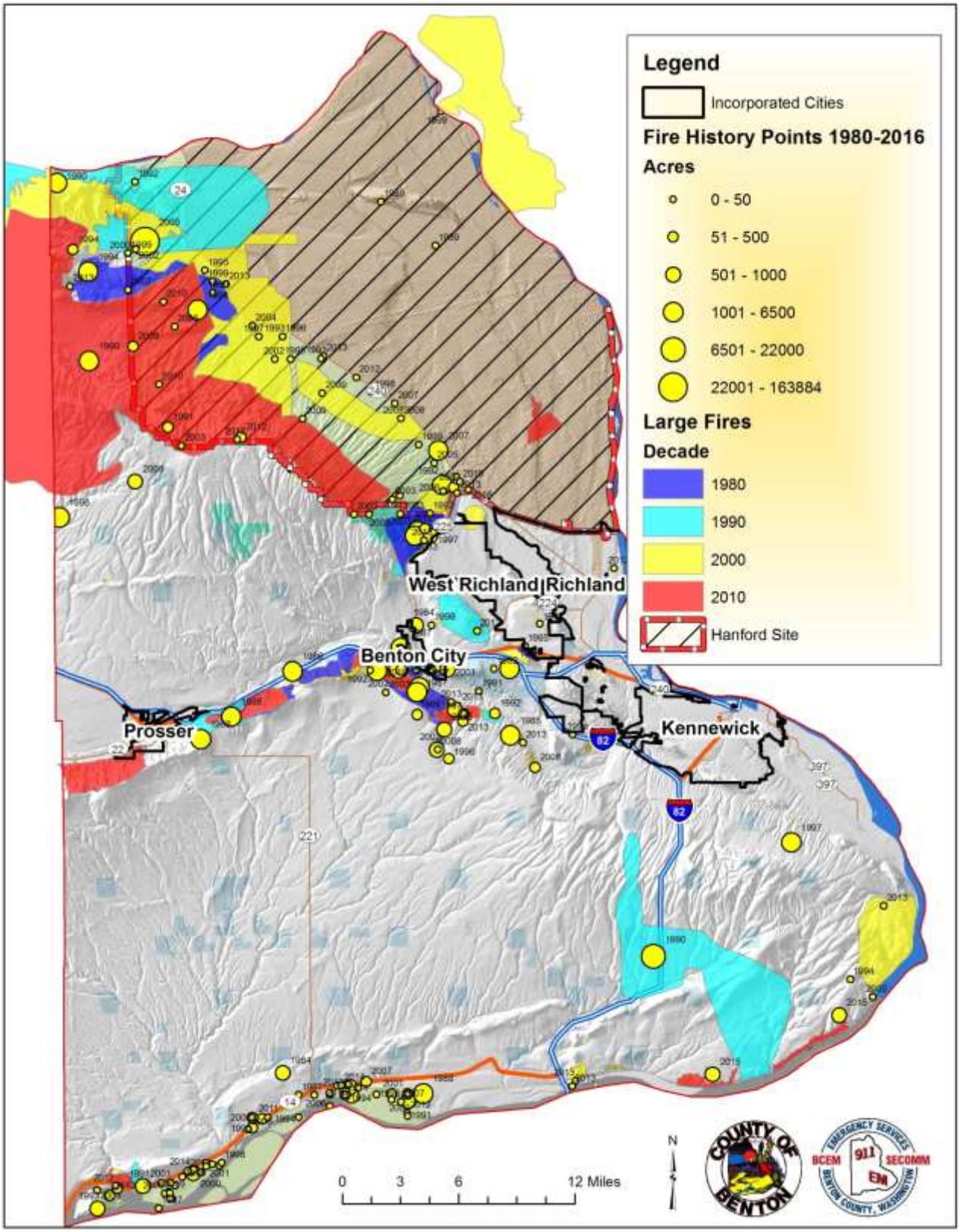

Figure 4) Fires by decade and acreage for Benton County, WA.

Table 6) History of wildfires 300 acres in size or larger for Benton County, WA since 1981. Acres denoted with an asterisk (*) were taken from wildfire GIS layers.

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
Horse Heaven Hills	1981	Unknown	5,440		BLM
SR395 (HWY14/27th)	6/26/1981	Unknown	600	BC#1	Tri City Herald
Rancho Reata	6/27/1981	Unknown	900	BC#1	Tri City Herald
Silver Dollar	7/1/1981	Unknown	25,600	HFD	Tri City Herald
Candy Mountain #1	7/25/1981	Unknown	3000	BC#4	Tri City Herald
Keene (Hwy 12)	7/28/1981	Human	700	BC#4	Tri City Herald
Coyote Canyon (Clodfelter)	8/4/1981	Welder / Grinder	500	BC#1	Tri City Herald
1981 -TOTAL ACRES			**36,740**		
Yakima Ridge	1982	Unknown	26,880		
1982 -TOTAL ACRES			**26,880**		
Meals (Yellepit)	7/9/1985	Unknown	2,000	BC#1	Tri City Herald
Badger Canyon	7/21/1985	Unknown	3,000	BC#1	Tri City Herald
1985 -TOTAL ACRES			**5,000**		
Chandler	1986	Natural	1,207	BC#2 (?)	BLM
Jump Off Joe	8/24/1986	Unknown	500	BC#1	Tri City Herald
Goose Gap (182)	9/4/1986	Controlled Burn	500	BC#1	Tri City Herald
1986 -TOTAL ACRES			**2,207**		
Drilling	1987	Human	3,190		
Benton	1987	Human	2,070		BLM
Trinity & Horne	9/3/1987	Unknown	2,150	BC#2	Tri City Herald
Nine Mile (Lower Blair)	9/1/1987	Human	900	BC#1	Tri City Herald
1987 -TOTAL ACRES			**8,310**		
Gibbon	1988	Human	1,320		BLM
Candy Mountain	7/1/1988	Exhaust Sparks	650	BC#4	Tri City Herald
1988 -TOTAL ACRES			**1970**		
Ely (53rd)	8/19/1989	Lightning	300	KFD	Tri City Herald
1989 -TOTAL ACRES			**300**		
Locust Grove (I-82)	7/30/1990	Lightning	30,000	BC#1	Tri City Herald
Emerson	1990	Natural	3,700		BLM
Nake	1990	Human	1,345		BLM
Wilkerson Ranch	8/1/1990	Unknown	3,500	BC#1	Tri City Herald
1990 -TOTAL ACRES			**38,545**		
Coline	1991	Human	767*		
1991 -TOTAL ACRES			**767***		
Webber 2	1992	Unknown	323*		

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
Edwards (Locust)	6/26/1992	Exhaust Pipe	1,200	BC#1	Tri City Herald
Jump Off Joe	7/4/1992	Fireworks		BC#1	
Flat Top	7/19/1992	Controlled Burn (?)	400	BC#4	Tri City Herald
1992 -TOTAL ACRES			**1,600**		
McNary Dam	6/7/1993	Unknown	400	BC#1/BC#6	Tri City Herald
Ely (53rd; Inspiration Point)	7/11/1993	Unknown	2,000	KFD	Tri City Herald
Candy Mountain	7/21/1993	Unknown	300	BC#4	Tri City Herald
Red Mountain (Ruppert)	11/3/1993	Unknown	2,000	BC#4	Tri City Herald
1993 -TOTAL ACRES			**4,700**		
Cold Creek (Silver Dollar)	7/22/1994	Unknown	11,520	HFD	Tri City Herald
Johnson Butte (Bateman)	7/28/1994	Unknown	1,500	BC#1	Tri City Herald
Badger Canyon (Triple Vista, Clodfelter)	8/15/1994	Unknown	2,000	BC#1	Tri City Herald
1994 -TOTAL ACRES			**15,020**		
North of Plymouth	8/7/1995	Unknown	500	BC#6	Tri City Herald
1995 -TOTAL ACRES			**500**		
Silver Dollar	1996	Unknown	1,094*		BLM
Appaloosa	1996	Unknown	2,687*	RFD (?)	BLM
Ayers Road	1996	Unknown	7,000	BC#1	Ch. Click
Red Mountain	7/30/1996	Unknown	2,000	BC#4	Tri City Herald
Cold Creek	1996	Unknown	58,000	HFD	Tri City Herald
1996 -TOTAL ACRES			**70,781**		
Corral Canyon	1997	Unknown	1,313*	BC#2	BLM
Meals (Hover)	7/31/1997	Lightning (?)	750	BC#1	Tri City Herald
Hover (Ayers)	8/14/1997	Equipment (?)	1,500	BC#1	Tri City Herald
Olympia St. Fire (Oly & 73rd)	8/26/1997	Unknown	6,000	BC#1/KFD	Tri City Herald
1997 -TOTAL ACRES			**9,563**		
Coyote Canyon (Clodfelter)	1998	Unknown	500	BC#1	Tri City Herald
Prosser View Point (SR 221)	7/7/1998	Human	3,880	BC#3(WBFD) / BC#5	Tri City Herald
I-82 (Yakitat)	7/8/1998	Unknown	2,000	WBFR/BC#2	Tri City Herald

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
Rattlesnake Mtn. West of Hanford	7/28/1998	Lightning	6,000	HFD	Tri City Herald
1998 -TOTAL ACRES			**12,380**		
Command 24	2000	Human / Car Accident	192,000	HFD, BC#2, US F&W	BLM
2000 -TOTAL ACRES			**192,000**		
Rt 4 N/Rt 1	6/1/2001	Lightning	1,250	HFD	State Fire Marshal's Office
Candy Mountain	6/18/2001	Unknown	750	BC#4	State Fire Marshal's Office
Ayers Rd	7/12/2001		4,000	BC#1	State Fire Marshal's Office
2001 -TOTAL ACRES			**6,000**		
Hwy 24	2002	Human	4,800		BLM
McBee	2002	Unknown	1,771*		BLM
Nine Canyon (Holtziner Farms	6/12/2002	Debris Burning / Torch	600	BC#1	State Fire Marshal's Office
(Hinzerling N of Prosser (?))	7/13/2002	Lightning	1,200	BC#3 (WBFR)	State Fire Marshal's Office
Johnson Butte	7/16/2002	Unknown	1,200	BC#1	State Fire Marshal's Office
Ayers (Meals)	7/28/2002	Unknown	400	BC#1	State Fire Marshal's Office
2002 -TOTAL ACRES			**9,971**		
Horn Rapids Fire	2003	Unknown	1,227*		BLM
Shooting Range	2003	Human	1,391		BLM
(12510 E Kennedy Rd)	6/30/2003	Equipment	300	BC#2	State Fire Marshal's Office
(MP 9 SR 225)	7/16/2003	Unknown	1,750	BC#2	State Fire Marshal's Office
(32203 Clodfelter Rd)	10/12/2003	Unknown	3,000	BC#1	Fire Marshall
2003 -TOTAL ACRES			**7,668**		

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
(MP 118 I-82)	7/14/2004	Unknown	700	BC#1	State Fire Marshal's Office
(MP 118 I-82)	8/26/2004	Unknown	700	BC#1	State Fire Marshal's Office
2004 -TOTAL ACRES			**1,400**		
Lincoln Grade	5/26/2005	Unknown	300	BC#6	State Fire Marshal's Office
Painted Hills (1415 Scenic)	5/26/2005	Incendiary / Model Rocket	1,000	Prosser FD (WBFR)	State Fire Marshal's Office
Hammer Command	6/17/2005	Incendiary / Blasting Agent	1,270	Hanford FD	State Fire Marshal's Office
Kirk (Meals)	7/25/2005	Unknown	3,500	BC#1	State Fire Marshal's Office
McNary Farms Dr.	8/14/2005 (@1400)	Unknown	500	BC#6	State Fire Marshal's Office
McNary Farms Dr.	8/14/2005 (@2000)	Unknown	500	BC#6	State Fire Marshal's Office
MP 86 I-82	8/15/2005	Unknown	600	BC#4	State Fire Marshal's Office
MP 87 I-82	8/19/2005	Equipment	1500	BC#3 (WBFR)	State Fire Marshal's Office
2005 -TOTAL ACRES			**9,170**		
Les Blair	2007	Unknown	7,038*	BC#1	BLM
Wautoma (SR 241)	8/16/2007	Unknown	67,303*	Hanford FD	BLM
Milepost 17	2007	Unknown	6,453*		BLM
(SR 225)	5/12/2007	Shooting	2,500	BC#2	State Fire Marshal's Office
(Harrington / Twin Bridges / Berto)	6/13/2007	Equipment	400	BC#4	State Fire Marshal's Office
(MP 126 I-82)	6/16/2007	Unknown	3,000	BC#6	State Fire Marshal's

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
					Office
(MP 126 I-82)	6/17/2007	Unknown	2,000	BC#6	State Fire Marshal's Office
(MP 88 I-82)	6/25/2007	Unknown	400	Hanford FD	State Fire Marshal's Office
(Hover Rd)	7/2/2007	Unknown	740	BC#1	State Fire Marshal's Office
McBee	7/13/2007	Natural	4,000	BC#2	State Fire Marshal's Office
(Finley Rd/Lower Les Blair)	7/29/2007	Equipment	3,000	BC#1	State Fire Marshal's Office
(Meals/Gamefarm (?))	8/4/2007	Incendiary	300	BC#1	State Fire Marshal's Office
2007 -TOTAL ACRES			**97,134**		
(I-82 / Beck EB)	6/30/2008	Natural	450	BC#1	State Fire Marshal's Office
(Hammer Training Facility)	8/8/2008	Lightning	549	Hanford FD	State Fire Marshal's Office
(Jump Off Joes Near West Powerlines)	8/15/2008	Unknown	1,200	BC#1	State Fire Marshal's Office
2008 -TOTAL ACRES			**2,199**		
(38714 W Oie)	6/9/2009	Unknown	2,000	BC#2	State Fire Marshal's Office
(SR 397 / Nine Canyon)	6/29/2009	Equipment	586	BC#1	State Fire Marshal's Office
Dry Creek Complex	8/21/2009	Natural	48,931*	HFD / BC#1 (Multiple)	BLM
2009 -TOTAL ACRES			**51,517**		
	8/6/2010		1,164	Hanford FD	State Fire Marshal's Office
FFTF	8/18/2010		1,265	Hanford FD	State Fire

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
					Marshal's Office
(Lower Blair W of Nine Canyon)	8/21/2010	Natural	542	BC#1	State Fire Marshal's Office
(Jump Off Joe?)	8/21/2010	Natural	1,200	Hanford FD	State Fire Marshal's Office
(Ayers/Meals)	8/26/2010	Equipment	500	BC#1	State Fire Marshal's Office
2010 -TOTAL ACRES			**4,671**		State Fire Marshal's Office
(Finley Rd./E. Kirk)	7/20/2011	Other	1300	BC#1	State Fire Marshal's Office
(Finley Rd./Albright)	7/22/2011	Explosives	1300	BC#1	State Fire Marshal's Office
	8/2/2011	Equipment	400	Hanford FD	State Fire Marshal's Office
(Meals/Ayers)	8/6/2011	Equipment	400	BC#1	State Fire Marshal's Office
(Owens/HWY 397)	8/12/2011	Other	400	BC#1	State Fire Marshal's Office
2011 -TOTAL ACRES			**3,800**		
(SR 241 MP 24)	7/19/2012	Human	4,515	Hanford FD	BLM
(56205 E. Badger Rd.)	7/19/2012	Natural	400	BC#1	State Fire Marshal's Office
(38507 E. Ridge Crest Dr.)	8/13/2012	Equipment	300	BC#4	State Fire Marshal's Office
(SR 397)	8/17/2012	Other	305	BC#1	State Fire Marshal's Office
(Beck Rd.)	9/16/2012	Other	400	BC#1	State Fire Marshal's Office

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
2012 -TOTAL ACRES			**5,920**		
(106207 E 297 PR SE / Clodfelter)	6/11/2013	Other	750	BC#1	State Fire Marshal's Office
	6/17/2013	Natural	500	BC#1 (ST 160 Area)	State Fire Marshal's Office
Kelandren Dr.	8/6/2013	Electrical Distribution	350	BC#3 (WBFR)	State Fire Marshal's Office
Les Blair	8/9/2013	Unknown	11,000	BC#1	State Fire Marshal's Office
2013 -TOTAL ACRES			**12,600**		
132016 E. Locust Grove Rd.	5/27/2014	Equipment	310	BC#1	State Fire Marshal's Office
26604 Badger Rd.	7/6/2014	Unknown	600	BC#1	State Fire Marshal's Office
(I82 EB MP 87)	7/15/2014	Other	2,100	BC#3 (WBFR)	State Fire Marshal's Office
(I82 MP 126)	7/23/2014	Unknown	500	BC#1	State Fire Marshal's Office
(ST 62 (?))	8/20/2014	Natural	500	KFD	State Fire Marshal's Office
2014 -TOTAL ACRES			**4,010**		
Clodfelter	2015	Unknown	485	BC#1	CH Click
(Meals/Ayers)	6/5/2018	Undetermined	485	BC#1 & BC#3 (WBFR)	State Fire Marshal's Office
(143504 Finley / Spaw Canyon)	6/27/2015	Other	2800	BC#1	State Fire Marshal's Office
(SR 397/OLY/I-82)	7/12/2015	Undetermined	350	BC#1	State Fire Marshal's Office
(I82 / MP88)	10/10/2015	Other	460	BC#3 (WBFR)	State Fire Marshal's Office

Name of Fire (Street)	Date	Cause	Acres Burned	Agency	Source
2015 -TOTAL ACRES			**4,580**		
McBee Command	7/14/2016	Shooting	5,000	BC#2 & WBFR	State Fire Marshal's Office
327255 E SR 397	7/13/2016	Other	400	BC#1	State Fire Marshal's Office
Bennett Rd.	7/30/2016	Other	12,800	WBFR	State Fire Marshal's Office
Range 12	7/30/2016	Shooting	175,491	Multiple	BLM
South Ward Gap	7/31/2016		7,000	WBFR	State Fire Marshal's Office
2016 -TOTAL ACRES			**198,691**		
Silver Dollar	7/2/2017	Unknown	15,000	HFD (?)	Inciweb
Candy Mountain	9/8/2017	Other	450	BC#4	State Fire Marshal's Office
2017 -TOTAL ACRES			**15,450**		
Rt 4 South	2018	Lightning	2,800	Hanford FD	Hanford FD
Les Blair	6/4/2018	Railroad Maintenance	875	BC#1	BC#1
Easterday	6/22/2018	Power pole malfunction	1,000	BC#1	BC#1
Shooting Range	6/25/2018	Shooting	500	BC#2 / USFWS	BC#2
Montecito Fire (Kelandren)	6/27/2018	Possible Electrical Fire	1,877	WBFR	WBFR
Weber Canyon	7/13/2018	Shooting or fireworks	300	BC#2 & BLM (?)	BC#2
Locust Grove	7/21/2018	Farm Equipment	2,275	BC#1	BC#1
Bofer	8/11/2018	Human	5,000	BC#1 / KFD	BC#1
Wagon Wheel	9/1/2018	Electrical Distribution and Squirrel	4,000	BC#2	BC#2
2018 -TOTAL ACRES			**18,627**		

Wildfire Ignition Profile

Detailed records of wildfire ignitions and extents from the Washington Department of Natural Resources (DNR) and Bureau of Land Management (BLM) have been analyzed. In interpreting these data, it is important to keep in mind that the information represents only the lands protected by the agency specified and may not include all fires in areas covered only by local fire departments or other agencies. Because the data that was used was only a subset and did not contain all ignitions from 1983 to 2016, it seemed reasonable to assume that the ratio of ignition causes could be a fair representation of average annual fire activity in Benton County.

From 1983 to 2016, almost 7,700 acres burned per year in Benton County (Table 7). The majority of fires that occurred were related to human activity, 83% of total ignitions per year on average, while others originated naturally or the source of ignition was unknown (Figure 5). The greatest number of acres burned in a single year in Benton County occurred during the 2000 fire season with just over 164,000 acres burned.

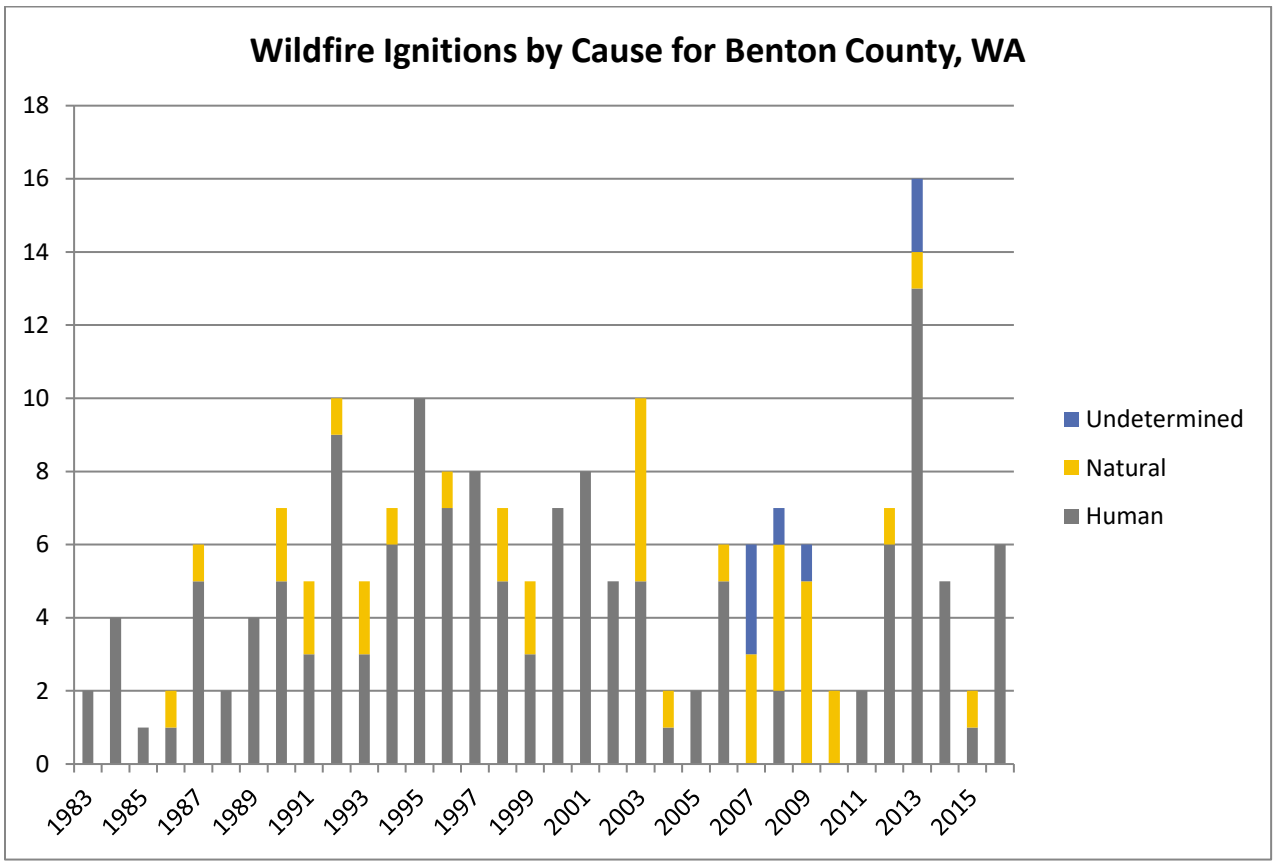

Figure 5) Number of wildfire ignitions by cause for Benton County, Washington from 1983 to 2016.

Table 7) Number and type of ignitions and acreage burned by wildfire from 1983 to 2016 in Benton County, Wa. Due to uncertainty over the dataset, only the ratio of ignition causes is presented in the table while actual ignition count values were omitted.

Cause	Percent of Total Ignitions by Cause	Total Acreage	Avg. Annual Acreage Burned
Human	83%	216,891	6,379
Natural	15%	39,764	1,170
Unknown	2%	5,029	148
Total	**100%**	**261,684**	**7,697**

Based on the agencies' combined datasets specific to Benton County, there has been an increase in the number of ignitions occurring annually within Benton County and, based on data provided by Benton County, an increase in acreage burned annually since 1983.

The increasing trend observed in annual acreage burned by wildfire in Benton County (Figure 6) matches the national trend (Figure 9). One factor that likely explains the trend is the extensive grassland fuel type found throughout most of Benton County and the increasing component of cheat grass and other invasive species found across the landscape. Fuel loading and distribution across the landscape is largely dependent on spring precipitation. Increased fuel loads and greater fuel continuity often mean that the potential for wildfire and more severe fire behavior also increases. Cheat grass and other invasive species have almost certainly spread and become a greater component of grassland landscapes in Benton County since 1983. Cheat grass changes the fire regime of native plant communities by altering fire behavior and reducing fire return intervals. As cheat grass becomes a greater component of grasslands in Benton County, any infested areas will burn more often, and more acreage will likely burn before a fire is suppressed. This may also explain the increase in the number of annual fire starts occurring in Benton County since 1983 (Figure 7) which is the opposite of the national trend which indicates a decrease in the number of fire starts occurring each year (Figure 10). As population, vehicle traffic, and human activity increase in Benton County an increased number of fire-starting events should be expected.

The data reviewed above provides a general picture regarding the level of wildland-urban interface fire risk within Benton 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

Benton County. For smaller 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 WUI 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 WUI 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.

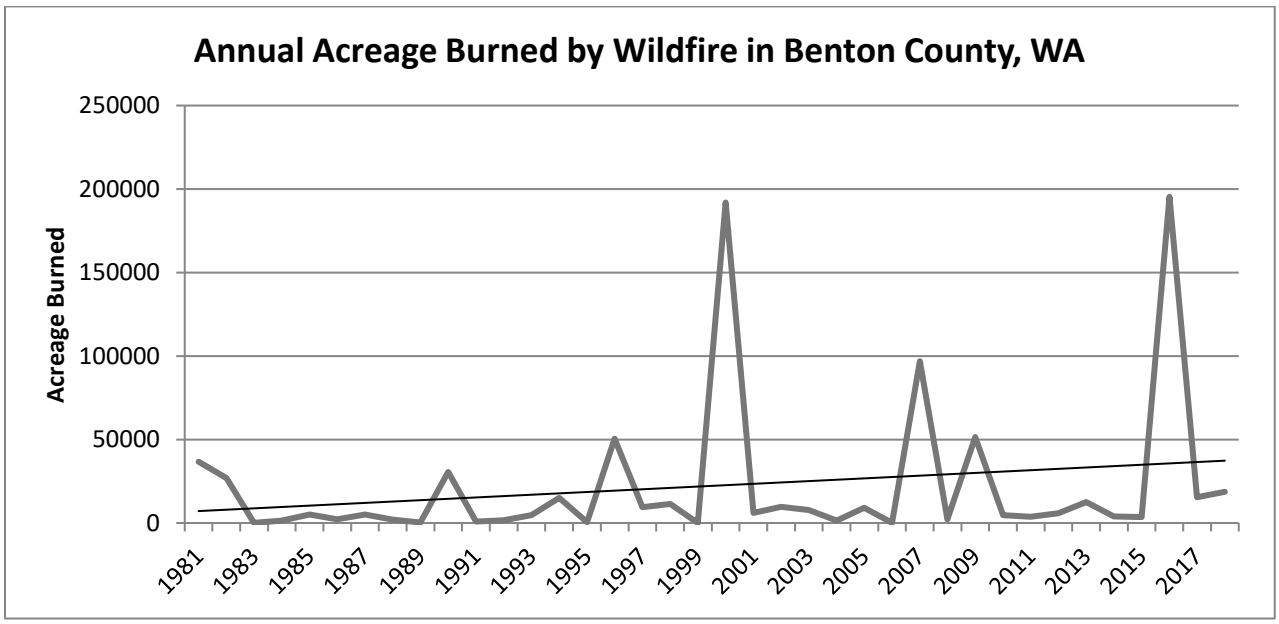

Figure 6) Acreage burned annually by wildfire in Benton County, WA from 1983 to 2016.

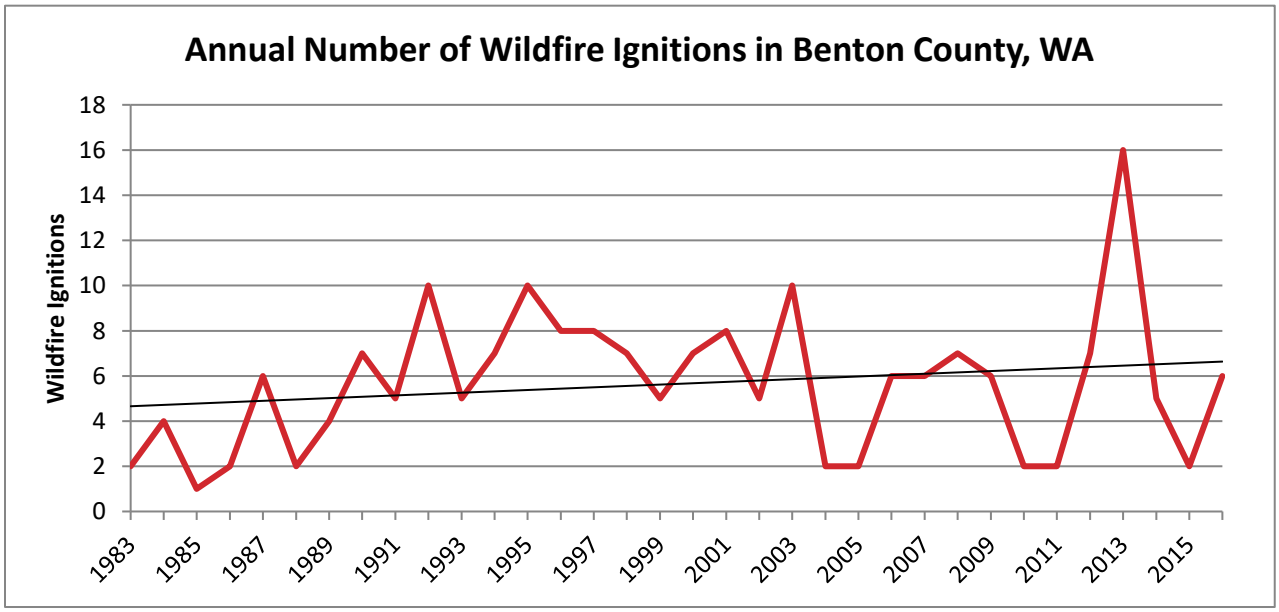

Figure 7) Annual number of wildfire starts in Benton County, WA from 1983 to 2016.

Wildfire Extent Profile

The National Interagency Fire Center and the National Incident Coordination Center maintains records of fire costs, extent, and related data for the entire nation. The number of wildland fire starts, total acreage burned, and annual cost to control figures were created using data from end-of-year reports compiled by all wildland fire agencies after each fire season. The agencies include the Bureau of Land Management, Bureau of Indian Affairs, National Park Service, US Fish and Wildlife Service, Forest Service, and all state agencies.

Across the west, wildfires have been increasing in extent and cost of control (Figure 8). Even though the number of fires that occur annually has decreased since 1990 (Figure 10), the total number of acres burned has increased (Figure 9). Over the last few decades summers have become warmer and drier; this trend has had significant implications for the severity of recent fire seasons, particularly in areas where decades of fire suppression have resulted in overstocked stands and heavy fuel loading. However, the inverse relationship between total number of fires and total acres burned can likely be attributed to a few other factors as well. Fire awareness programs have likely reduced the number of fire starts per season by making the public more cognizant of the impacts of wildfire and therefore more diligent when recreating or working in high risk areas. While in addition to recent climate trends, the increase in acreage burned each year can partially be attributed to changes in wildland firefighting tactics and emphasis on safety. In some situations, fire management teams are electing to intentionally burn additional acreage with a back burn operation or let the fire burn itself out or burn to a point where it can be contained with a greater level of assurance and under safer conditions.

The trends displayed in these figures are likely to continue into future fire seasons. Particularly as fire seasons extend earlier and later into the year and conditions become more volatile at the hottest and driest times of the year. As populations continue to increase and the WUI expands, more people, structures, and infrastructure will be exposed to wildfire risks which continue to increase the value of fire planning and fire mitigation work.

The fire suppression agencies in Benton 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.

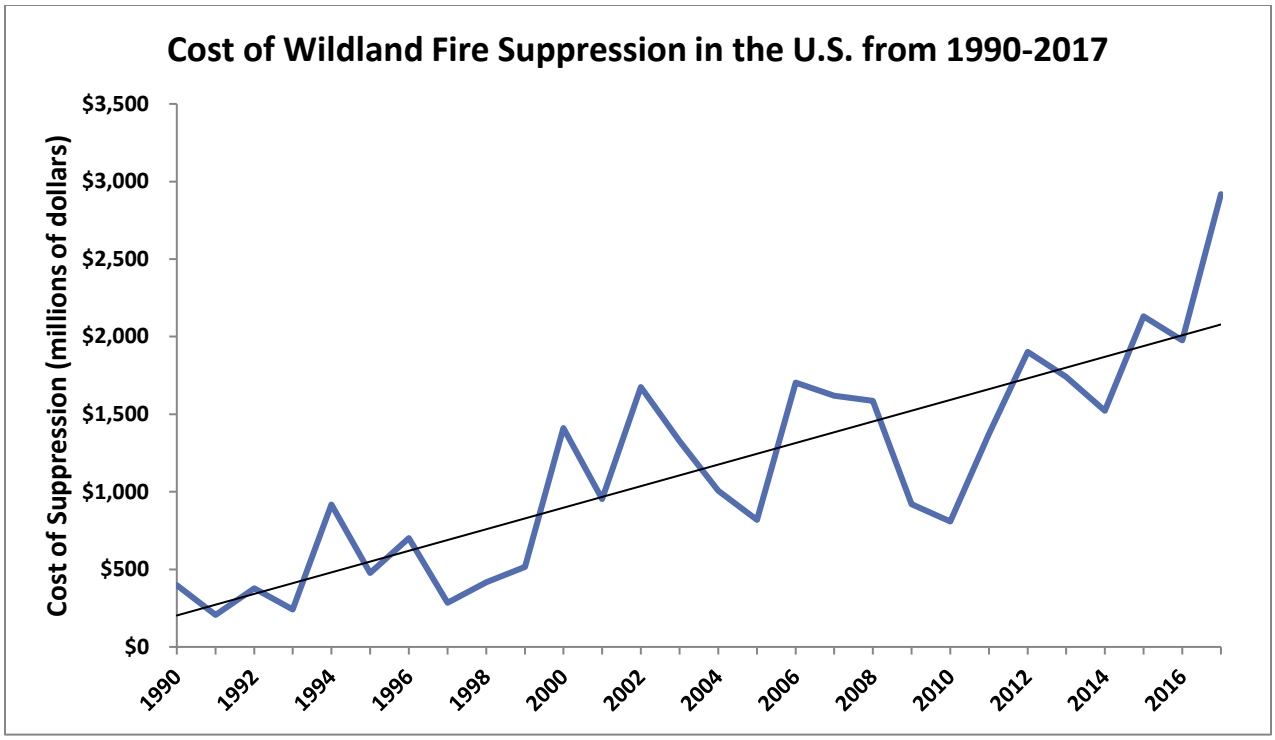

Figure 8) Annual cost of wildland fire suppression in the United States from 1990 to 2017. Values were not adjusted for inflation.

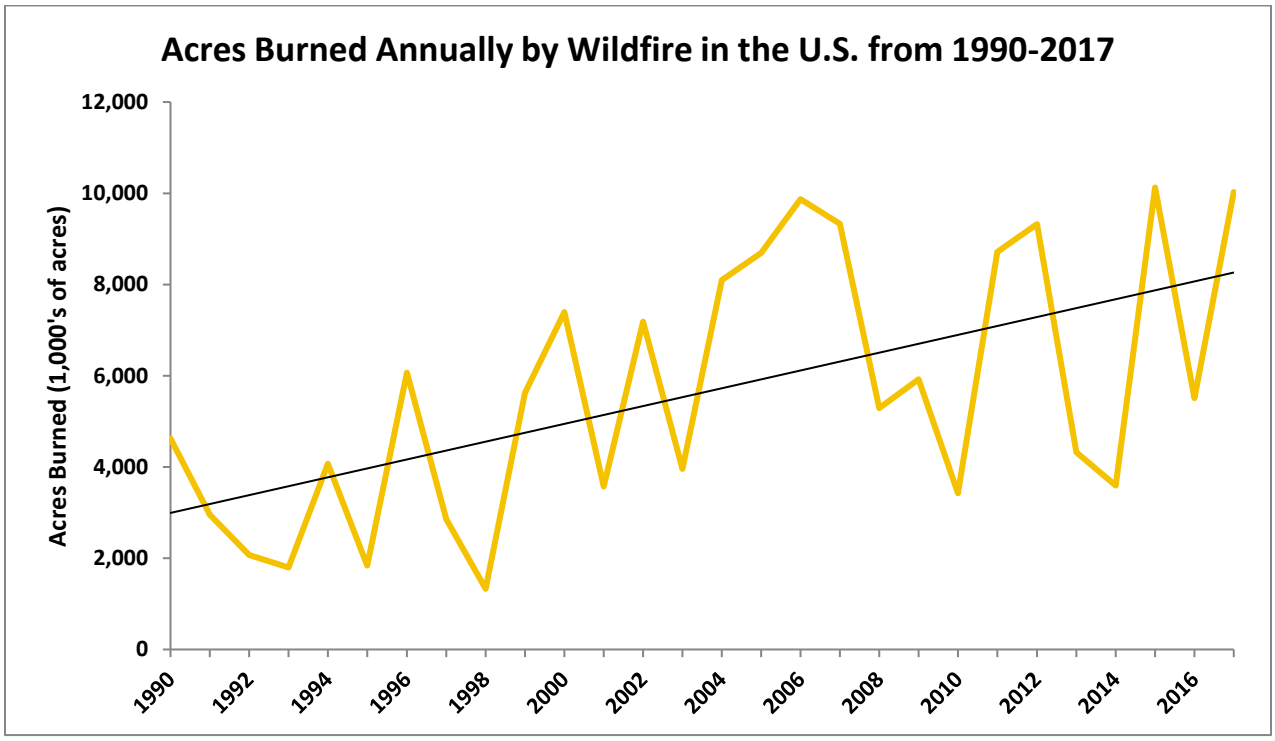

Figure 9) Annual acreage burned as a result of wildfire in the United States from 1990 to 2017.

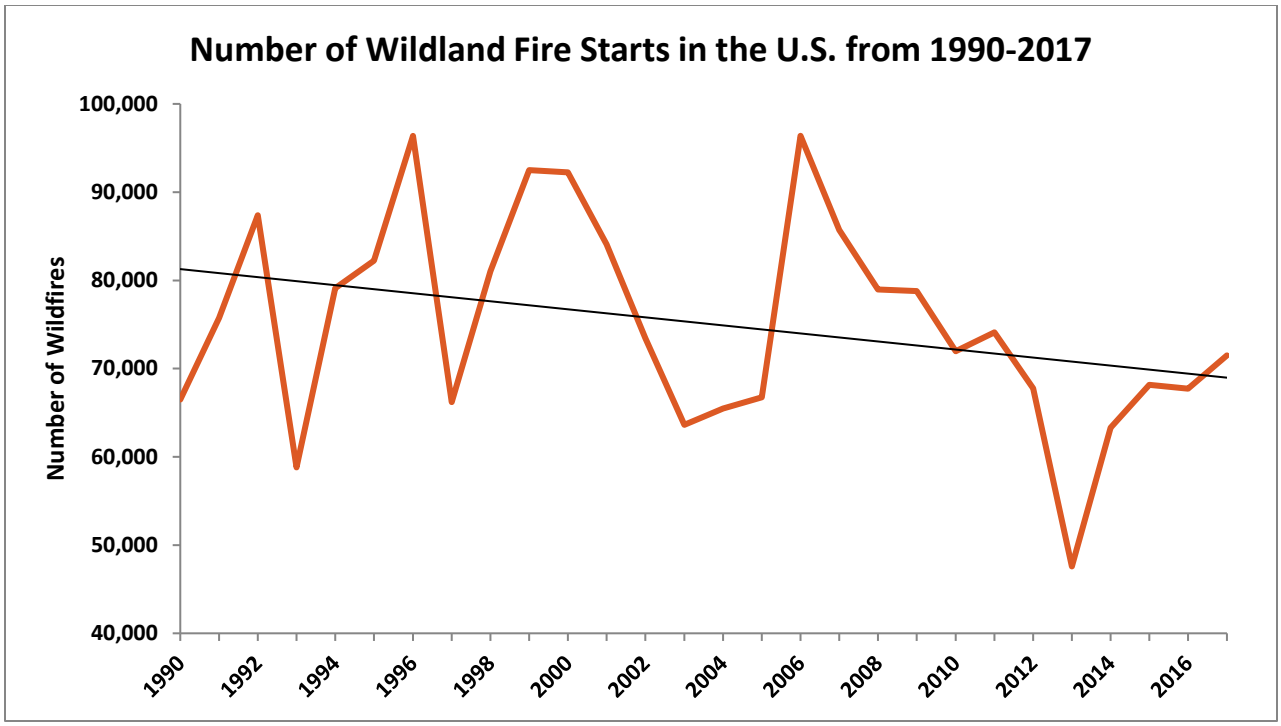

Figure 10) Annual number of wildland fire starts in the United States from 1990 to 2017.

Wildfire Hazard Assessment

Benton 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 Benton County Emergency Management personnel and specialists from Northwest Management, Inc. 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.

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.

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.

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

Using the Fire Regime Group model, fire return intervals and anticipated fire behavior can be mapped for Benton County based on current vegetative cover (Figure 11). Fire return interval describes the amount of time that can be expected to elapse before a given area will burn again and severity describes the duration and intensity at which a fire burns. Just over 93% of Benton County is classified as Fire Regime Groups III and IV which means that most of the county has an expected fire return interval of 35 to 200 years and will burn with low to stand-replacement levels of severity (Table 8). Areas classified as Fire Regime Group III will likely burn with low to mixed severity while areas that are classified as Fire Regime Group IV can be expected to burn with high severity. The remaining area of Benton County either falls into different Fire Regime Groups (2.1% of remaining area) or is non-burnable.

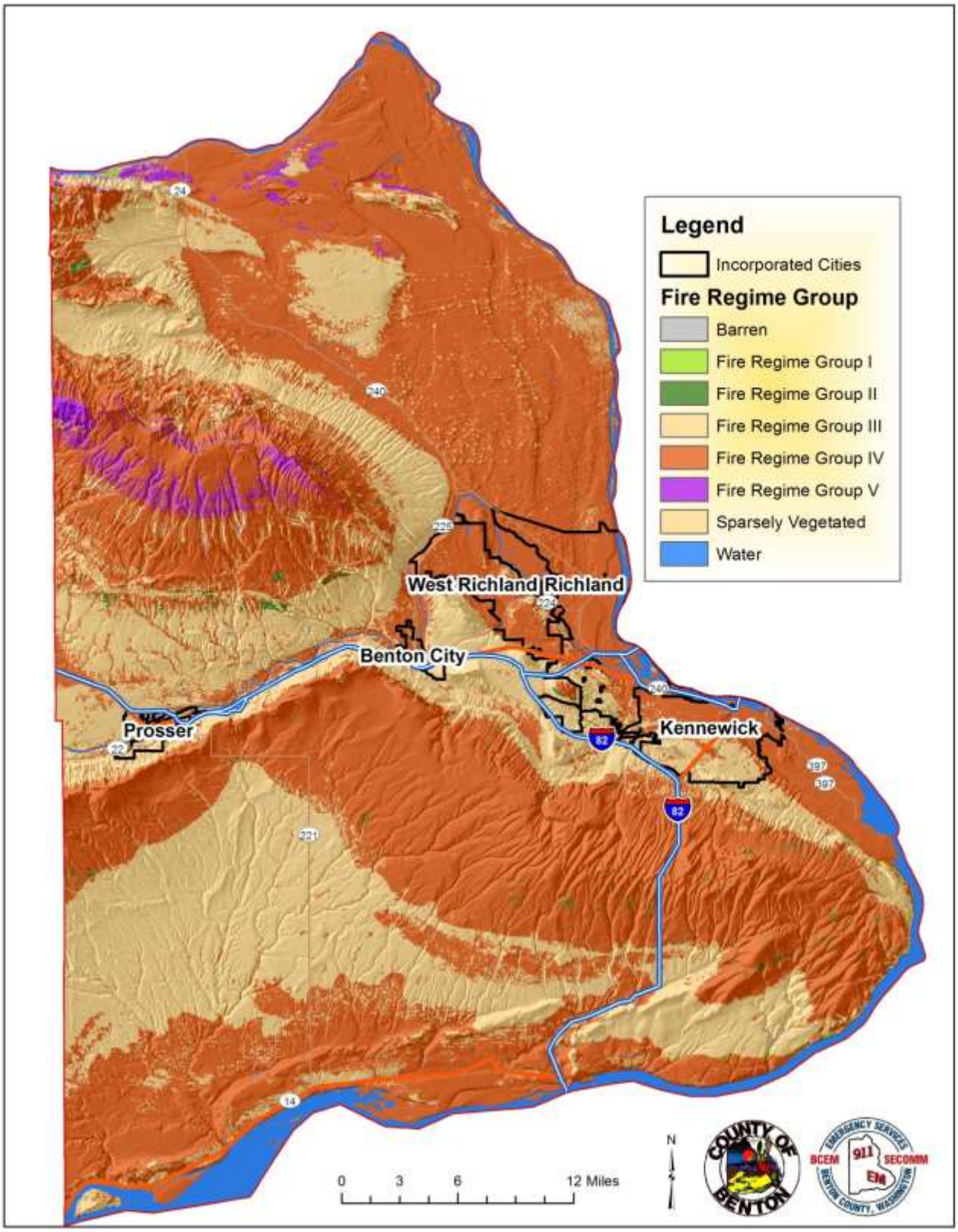

Figure 11) Fire history through the Fire Regime Group dataset. Majority of the County (60%) historically experienced high severity fires on a return interval between 35 and 200 years.

Table 8) Fire Regime Groups for Benton County, WA.

Designation	Description	Acres	% Total
Fire Regime Group I	<= 35 Year Fire Return Interval, Low and Mixed Severity	1,216	0.1%
Fire Regime Group II	<= 35 Year Fire Return Interval, Replacement Severity	8,221	0.7%
Fire Regime Group III	35 - 200 Year Fire Return Interval, Low and Mixed Severity	372,737	33.1%
Fire Regime Group IV	35 - 200 Year Fire Return Interval, Replacement Severity	676,879	60.1%
Fire Regime Group V	> 200 Year Fire Return Interval, Any Severity	14,609	1.3%
Water	Water	40,104	3.6%
Barren	Barren	452	0.0%
Sparsely Vegetated	Sparsely Vegetated	12,183	1.1%
Total		1,126,400	100.0%

Fire Regime 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.[14, 15] Coarse scale definitions for historic fire regimes have been developed by Hardy et al[16] and Schmidt et al[17] and interpreted for fire and fuels management by Hann and Bunnell.

A fire regime condition class (FRCC) is a classification of the amount of vegetative departure from the historic regime. [18] The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historical) regime.[19,20]

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

[15] 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.

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

[17] 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.

[18] 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.

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

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

The 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 Benton County shows that 38% of the land is considered to be highly departed from its historic fire regime and associated vegetation and fuel characteristics (Table 9). Just over 12% of the land is moderately departed while less than 8% is classified as low departure. Almost 30% of the land in the county is in agriculture, half of which is non-burnable.

The current Fire Regime Condition Class model shows that almost 60% of Benton County is considered to be departed, most of which is highly departed (Figure 12). A majority of the county is characterized by various shrub species and grasses which primarily include sagebrush, bluebunch wheatgrass, Idaho fescue, and cheat grass. The current structure and species composition of the shrub-steppe ecosystem increases the likelihood that it will burn with greater severity and burn more frequently, particularly as invasive species become a greater component of the shrub-steppe ecosystem in Benton County.

Table 9) Fire Regime Condition Classes for Benton County, WA.

Fire Regime Condition Class	Description	Acres	Percent of Total
Fire Regime Condition Class I	Low Vegetation Departure	86,275	7.7%
Fire Regime Condition Class II	Moderate Vegetation Departure	136,953	12.2%
Fire Regime Condition Class III	High Vegetation Departure	432,679	38.4%
Water	Water	31,786	2.8%
Urban	Urban	42,535	3.8%
Burnable Urban	Burnable Urban	50,073	4.4%
Barren	Barren	358	<1%
Sparsely Vegetated	Sparsely Vegetated	9,560	<1%
Agriculture	Agriculture	166,960	14.8%
Burnable Agriculture	Burnable Agriculture	169,221	15.0%
Total		1,126,400	100.0%

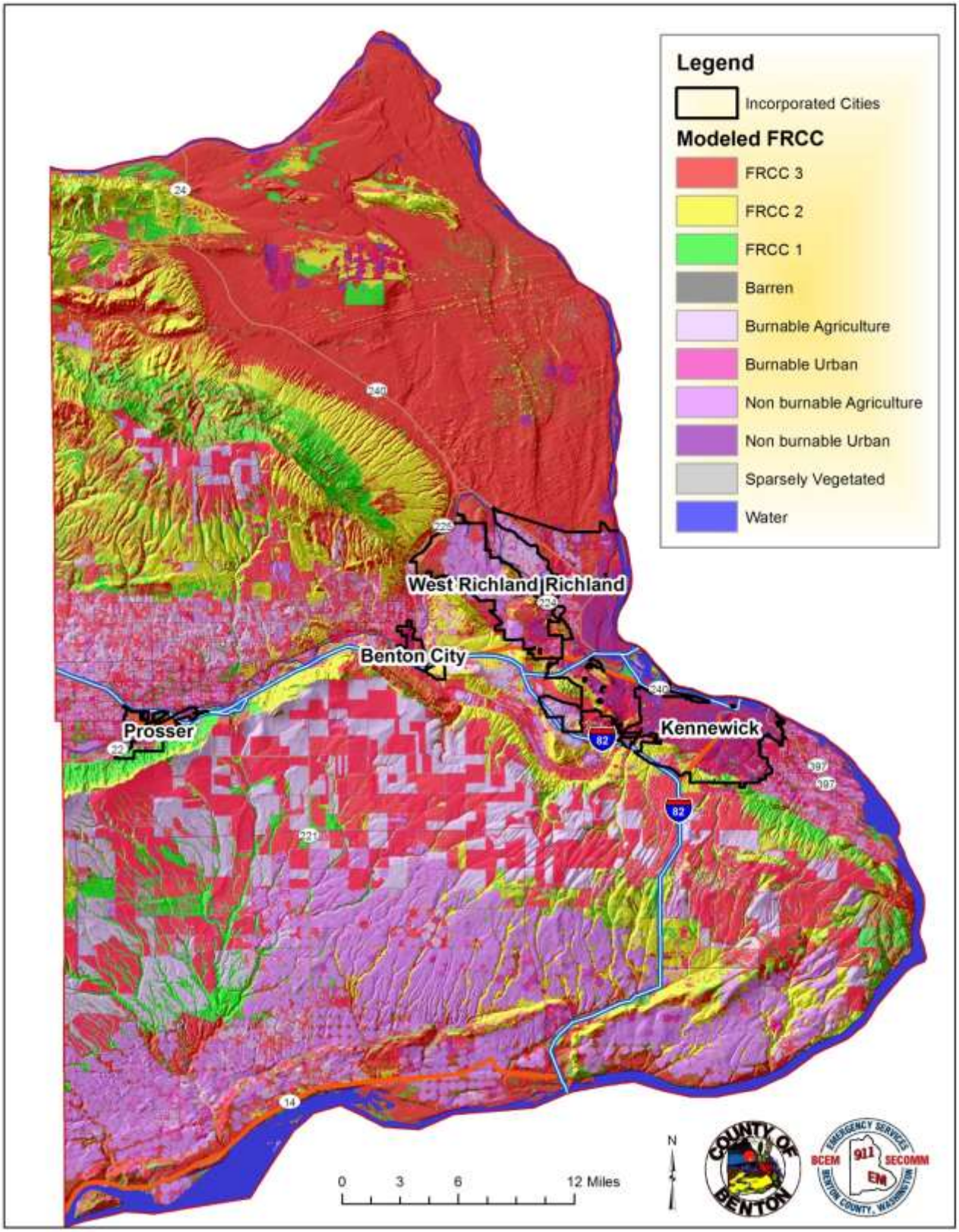

Figure 12) Fire Regime Condition Classes for Benton County, WA.

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 WUI. The WUI 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 WUI requires the efforts of federal, state, and local agencies and private individuals.[21] "The role of [most] federal agencies in the WUI includes wildland firefighting, hazard fuels reduction, cooperative prevention and education, and technical experience. Structural fire protection [during a wildfire] in the WUI is [largely] the responsibility of Tribal, state, and local governments".[22] The role of the federal agencies in Benton 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.[23] With treatment, a WUI can provide firefighters a defensible area from which to suppress wildland fires or defend communities against other hazard risks. In addition, a WUI that is properly treated will be less likely to sustain a fire that enters or originates within it. [24]

By reducing hazardous fuel loads, ladder fuels, and tree densities, and creating new and reinforcing existing defensible space, landowners can protect the WUI, 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

[21] 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.

[22] 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

[23] 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

[24] 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.

(firebrands) from a crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior;[25]

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

Three WUI 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 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, Benton County has included two additional classifications to augment these categories:

- **Low Density Rural Areas** – 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).

In summary, the designation of areas by the Benton County planning committee includes:

- Interface Condition: WUI
- Intermix Condition: WUI
- Occluded Condition: WUI
- Low Density Rural Areas: WUI
- High Density Urban Areas: WUI

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

Benton County's wildland urban interface (WUI) is mostly based on population density (Figure 13). 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 layer (GIS) was used to identify the locations of possible structures. The resulting output identified the extent and level of population density throughout the county.

In addition, the Benton County planning committee determined that the entire county should be classified under WUI designation due to the rapid rates of spread that commonly occur within the county.

By evaluating structure density in this way, WUI areas can be identified on maps by using mathematical formulae and population density indexes. The resulting population density indexes create concentric circles showing high density areas, interface, and intermix condition WUI, as well as low density 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 Benton 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 agencies.

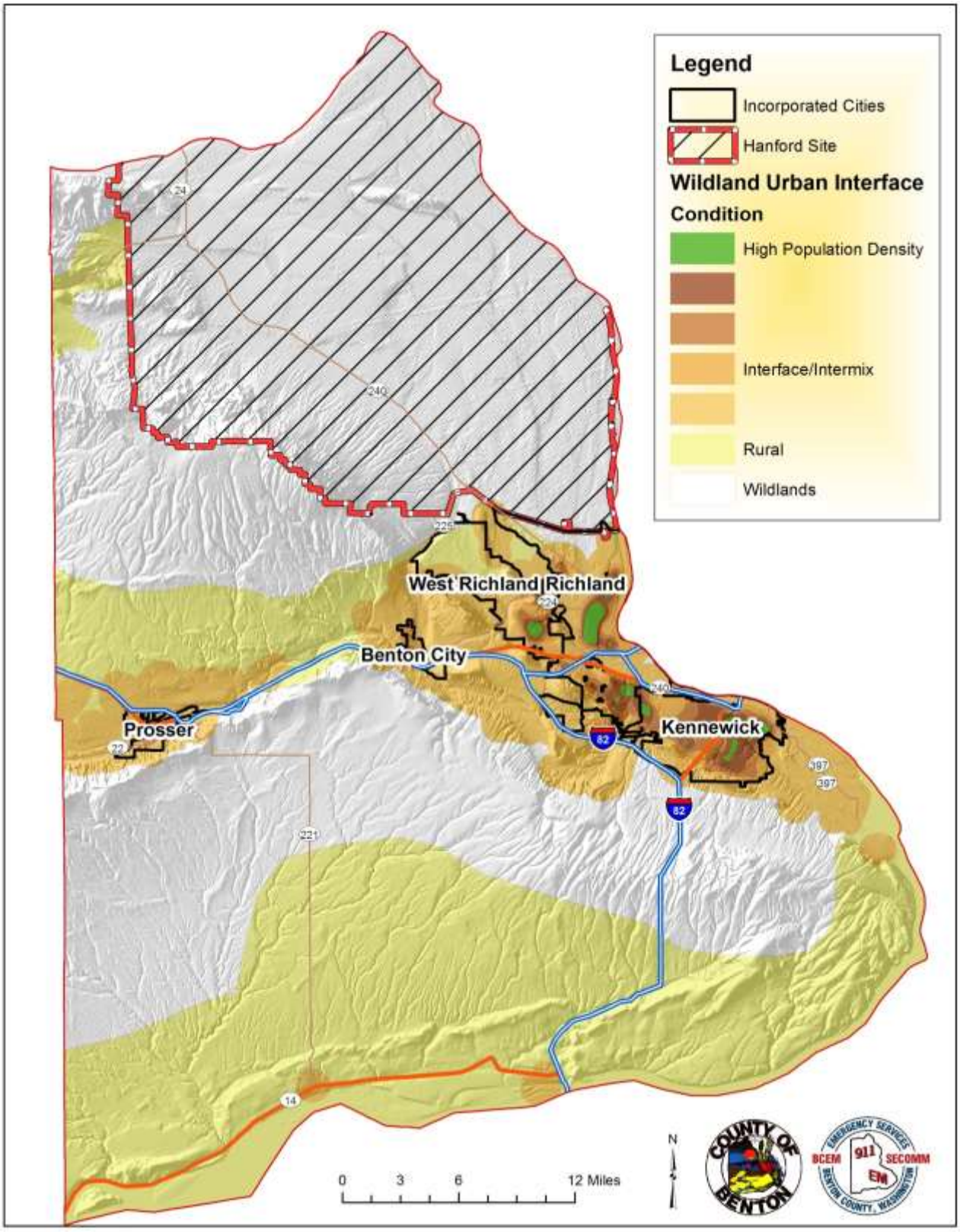

Figure 13) Wildland Urban Interface (WUI) map of Benton County, WA.

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 plans (or other management plans). The adopted forest plan has legal precedence over the WUI designation until such a time as the forest plan is revised to reflect updated priorities.

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

Relative Threat Level Mapping

The predicted Wildland Fire Threat layer shown on the map below (Figure 14) was produced by combining weighted data sets that relate to wildfire risk in an additive model. Datasets considered for the model included; fire behavior fuel models, percent slope, aspect, fire protection capabilities, ignition probability, wildland fire rate of spread, wildland fire intensity, precipitation, and population. Each of these data layers was reviewed by members of the steering committee who confirmed whether or not they fairly represented those characteristics of Benton County. Once the layers were compiled the committee reviewed the final threat level map for accuracy. Consequently, the map was assembled using the Fuel Models, Slope, and Aspect layers as maps produced using the other layers tended to understate potential fire threat across the county. Fuel types across the county are light and are relatively homogenous throughout the County. Because of the low variability in fuel types and the relatively even distribution throughout the county, few variables truly impact the likelihood of ignition in Benton County. Table 10 provides more information about the data layers that were used to create the Benton County Relative Threat Level Map.

Table 10) Parameters for Threat Level Mapping exercise. Bolded layers were included in the final version of the Threat Level Map.

Dataset	Source
Fuel Models	**Scott and Burgen 40 Fire Behavior Fuel Model from LANDFIRE**
Slope	**10 Meter Digital Elevation Model (DEM)**
Aspect	**10 Meter Digital Elevation Model (DEM)**
Fire Protection	Benton County Fire Station Points
Ignition Probability	Density of Fire Occurrences
Wildland Fire Rate of Spread	30 Meter FlamMap Rate of Spread Raster
Wildland Fire Intensity	
Precipitation	PRISM Climate Data from Oregon State University
Population	911 Address Points

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 heavy fuel loads, much of the county could experience extreme wildfire behavior characteristics that result in very intense, replacement-level fires. The agriculture/grassland areas will likely experience lower intensity fires with 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.

Areas with a high potential for extreme fire behavior based on Fire Behavior Analysis Tool modeling and local knowledge were given a higher threat level rating. Based on local knowledge, the grass fuel model was given a higher intensity level than it normally would receive due to the vast amounts of available fuel. Although grass fires can generally be controlled relatively easily, fires burning in this fuel type can spread rapidly. Extreme rates of spread coupled with the remote nature of much of the county, can cause significant control issues for local fire districts.

Suppression Capabilities

Fire protection in Benton County is the responsibility of the local fire agencies. The county has six active fire districts, two municipalities, and the Hanford Fire Department with resources available for fire suppression. However, each agency is limited to the resources at hand until help from other agencies can arrive.

Some parts of the county fall under Washington DNR or BLM fire protection responsibility. The Washington DNR and BLM have cooperative agreements with Benton County Fire Districts to provide initial attack on their respective districts. The response times for the DNR and BLM can be several hours or longer due to the logistical challenge of mobilizing both crews and equipment from their respective duty stations.

Population Centers and Developing Areas

Due to the increased human activity within and surrounding Benton 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 high threat level rating.

High Protection Value

Of the areas and resources at risk to wildfire in Benton County, the planning committee has identified the following areas as *high protection values*. These areas include watersheds, recreation areas, and cultural areas.

- Watersheds: Yakima River Delta Vicinity, Zintel Canyon
- Recreation Areas: Badger Mountain, Rattlesnake Mountain
- Cultural Areas: Rattlesnake Mountain

Field Assessments

In an effort to visually confirm the output of the fuels analyses conducted for this plan, a multi-day field assessment was conducted in Benton County in May of 2018. A natural resource specialist from NMI drove through the county to get a general idea of the prominent fuel types found across Benton County. Select high risk areas, as identified by local fire personnel, featuring different fuel types and fuel loading were also toured. The field assessment started at the north end of Benton County on Highway 24 and continued south to the Tri-Cities area along Highway 240. In the Tri-Cities area, Horn Rapids County Park, W.E. Johnson Park, Bateman Island, and Badger Mountain were assessed as most were considered high risk areas and differed significantly from the rest of the county in regard to fuel types and fuel loading. To complete the overall fuels assessment, the tour of the county included the stretch of Highway 82 from the Tri-Cities to Prosser and then to the western edge of the county on Highway 22. The southern edge of the county was also evaluated by taking Highway 14 from the western most edge of the county to Highway 82 and then traveling north back to the Tri-Cities. See Chapter 5 for more information.

Determination of Relative Threat Level

Following the field assessments, the planning committee began development of the Relative Threat Level model. Risk categories included in the final analysis were fuel models, slope, aspect, wildland fire intensity, precipitation, 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 Benton County as a whole, 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 Benton County, shrub and grass fuel models were given the higher rankings followed by short grass / agriculture, and forest types (shrub understory) fuel models.
- Fire Behavior – areas identified by fire behavior modeling as having high rate of spread potential or high fire intensity were given a higher threat level ranking.
- Populated Areas – these areas were ranked higher due to the presence of human populations, structures, and infrastructure requiring protection from fire.

Each data layer was developed, ranked, and converted to a raster format using ArcGIS 10.x. 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 (dark blue) relative to Benton County.

Relative Threat Level Map

The output of the analysis shows that most of Benton County is at moderate to high risk for wildfire (Figure 14). The northern portion of the county, including the Hanford Site (the area delineated by the purple boundary) and Rattlesnake Mountain, is at high risk of wildfire while the central portion of the county, including the Horse Heaven Hills and the heavily populated urban areas, is at moderate risk. Steeper slopes, south faces, and drainages also received higher threat ratings. Irrigated agricultural areas are at low risk for wildfire.

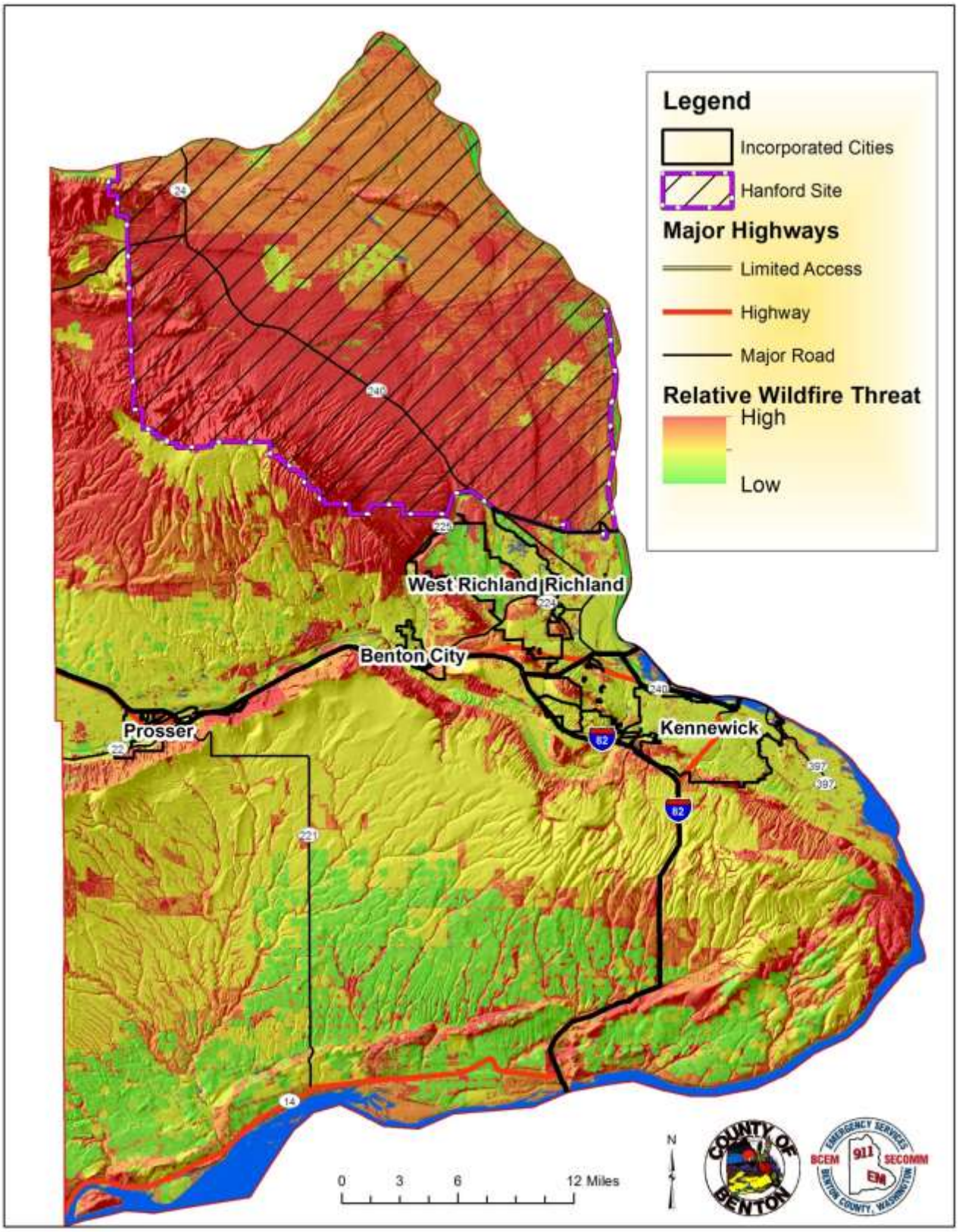

Figure 14) Relative threat level map for Benton County, WA.

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 outside of fire district jurisdictions. Due to the lack of DNR resources in Benton County, the DNR maintains an agreement with Benton County to provide initial attack for the first 12 hours of the operational period.

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 which are summarized here. These synopses indicate their perceptions and information summaries.

Benton County Fire District #1

District Summary

Fire District #1 protects an area of approximately 320 square miles south the cities of Kennewick Richland and West Richland, serving a population of approximately 17,500 residents. Located within the District are heavily populated residential areas, commercial and industrial complexes, educational facilities, agricultural areas, wildland areas, and complex zones of interfaces between urban and wildland/agriculture uses. To provide timely service to this diverse area, there are currently six fire stations strategically located to provide efficient protection. Operating as a combination fire department, District #1 has 13 career staff and 90 dedicated volunteer firefighters, officers, EMT's, First Responders, and support personnel. The equipment utilized by the department is included in the table below. The District average's 1350 calls for service yearly, with 55 percent of those calls for EMS services and the remainder for fire. The District is comprised of a significant wildland urban interface area with many permanent homes and critical infrastructure contained within its boundaries. Additionally, we have large areas of wheat which poses a high fire danger during the summer months. The potential for the District to host a substantial wildland fire is high.

District Concerns

Wildland Urban Interface and Residential Growth: The Fire District has many permanent homes in the WUI and each year the WUI is being expanded in size and complexity as more homes are built. Defensible space and fire adapted community conditions are extremely important for the safety of these homes along with the safety of the residents and our firefighters. However, at times, it is challenging to motivate home and property owners to take the initiative to make their home better prepared to withstand a wildland fire. Creating fire breaks on lands within the Conservation Reserve Program (CRP) and around residential developments are a couple goals for area fire chiefs. We have had several large fires on CRP lands, wildland areas and areas with significant urban interface concerns due to large tracts of continuous fuels with no natural or manmade fire breaks.

Communications: The District is part of a County- wide Dispatch center (SECOMM) that is responsible for dispatching all fire (both city and county) and police (both city and county) personnel as well as City fire department resources. SECOMM has a rather sophisticated, intricate, and somewhat temperamental – repeater simulcast micro wave system. Although the system has gone through a major equipment update and fine tuning, the service area due to topography continues to have areas where radio communications between Dispatch and Fire/EMS responders is difficult or impossible.

Residential and Agricultural Burning: Provide education to County residents on the process of conducting and/or requesting permits for the four types of fires permitted within the County; recreational burns, agricultural burns, tumbleweeds, barbeques and woodstoves. Each burn type has specific requirements with regards to permitting, time, location and with respect to the rights of others. Provide education to agricultural producers on Washington State Department of Ecology regulations and permit requirements required to safely conduct agricultural burns within Benton County.

Other: As with most volunteer agencies, The District continues to seek ways to improve its ability to recruit and retain more firefighters and EMS personnel.

Cooperative Agreements: The District is part of a mutual aid agreement which includes all fire departments and fire districts within Benton, Franklin and Walla Walla Counties that has developed a dispatch matrix that allows us to put a large amount of resources on an incident in a very short period of time. This has proven to be very successful; we are able to control potentially large incidents from getting out of control and additionally reduce the need to call for State Mobilization Assistance. In addition to the previously identified mutual aid agreement, the District also has cooperative agreements or contracts with; Washington State Department of Natural Resources, Bureau of Land Management, U.S. Fish and Wildlife Service, U.S. Forest Service and Washington State Fire Marshal's Office. The District also participates in a County Strike Team that responds as an initial attack team to our neighboring counties, and in the Statewide Fire Mobilization Plan.

District Needs

Wildland Urban Interface Defensible Space: The fire district currently provides residents information on the Community Wildfire Protection Program and Firewise literature. The fire district has no current hazard fuel reduction program within the annual operating budget due to budget priorities. An increase in available grant funds would be beneficial to target some of the high hazard fuels reductions areas identified in the county wildfire plan.

Fire Breaks: Changes in the CRP rules that would allow fire breaks down to the dirt without a negative financial impact to the property owner would be beneficial.

Rural Water Supplies: Continue to seek and develop water supply systems in our rural areas for assistance in fire suppression.

Residential and Agricultural Burning: All open burning within the county, is subject to guidelines concerning, size, time, location and permit requirements. County Residents can find the guidelines for non-agricultural open fires by referring to:

http://bentoncleanair.org/index.php/burning/

Agricultural burning in the County is regulated by the State Department of Ecology. These burns are subject to specific requirements and are limited by air quality management, weather and hazardous fire conditions. For Specific information on the permitting process, fees and restrictions regarding Agricultural burning in the County please refer to:

http://bentoncleanair.org/index.php/burning/agricultural-burning/

Others: As with most volunteer agencies, the District continues to seek ways to improve its ability to recruit and retain good firefighters and EMS personnel.

Apparatus Inventory

Station #	Asset Type	Asset Description
STATION 100	2008 FORD F250	UTILITY, 3/4 TON, EXTENDED CAB, WIDE BOX, 8 FT, PU, 4X4
	2008 FORD F250	UTILITY, STAFF VEHICLE
	2012 FORD F150	UTILITY, STAFF PICKUP 4X4, 3/4 TON
	1989 UTILITY TRAILER	TRAILER, HOSE TESTING, 8'
	2004 FORD F150	UTILITY, STAFF PICKUP 4X4
	1984 UTILITY TRAILER	UTILITY TRAILER, 18 FT.
	1980 WISCONSIN	EQUIPMENT TRAILER, 16 FT. 6 TON, TILT DECK
	2017 RAM 2500	UTILITY, STAFF PICKUP 4X4
	2017 RAM 2500	UTILITY, STAFF PICKUP 4X4
	2017 RAM 2500	UTILITY, STAFF PICKUP 4X4
STATION 110	2000 INTERNATIONAL	WATER TENDER, 500 GPM, 3000 GAL. 6X4
	2005 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X4
	2005 FREIGHT	ENGINE, TYPE 1, 1000 GPM, 750 GAL, 2X4
	1978 CATERPILLAR	DOZER, D5B
	2006 WELLS	CSEPP WELLS UTILITY TRAILER
	1998 WELLS CARGO TRAILER	16 FT. UTILITY TRAILER, CSEPP
STATION 120	2000 INTERNATIONAL	WATER TENDER, 500 GPM, 3000 GAL. 6X4
	1979 GMC	CASCADE/BREATHING AIR, 4X2
	2005 FREIGHTLINER	ENGINE, TYPE 1, 1000 GPM, 750 GAL, 2x4
	2005 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X4
	1984 SHASTA MOTOR HOME	REHABILITATION UNIT, 26 FT.
	1998 ROSEBURY	UTILITY TRAILER, 12 FT, SUPPORT SERVICES
	1998 WELLS CARGO TRAILER	12 FT. UTILITY TRAILER, CSEPP
	2016 RAM 5500, SKEETER	ENGINE, TYPE 5 CREW 4X4, 125 GPM, 400 GAL.
STATION 130	1991 INTERNATIONAL	BRUSH, 125 GPM, 500 GAL. 4X4
	1999 FORD F350	ENGINE, TYPE 6, 125 GPM, 250 GAL 4X4

STATION 140	2000 INTERNATIONAL	WATER TENDER, 500 GPM, 3000 GAL. 6X4
	2005 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X4
	2005 FREIGHTLINER	ENGINE, TYPE 1, 1000 GPM, 750 GAL, 2x4
	1998 WELLS CARGO TRAILER	16 FT. UTILITY TRAILER, PUMP TEST
STATION 150	2005 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X4
	2005 FREIGHT	ENGINE, TYPE 1, 1000 GPM, 750 GAL, 2X4
STATION 160	2008 FORD F350	UTILITY, STATION SQUAD
	2003 FORD	UTLITY, MAINTENANCE, F3PU
	2001 UTILITY TRAILER	TRAILER, HOSE TESTING, 8'
	1999 CHEVROLET	UTILITY, SPARE STAFF VEHICLE
	2005 INTERNATIONAL TRACTOR	TRACTOR, TRANSPORT 860/DS
	1970 SHWTZ LOWBOY TRAILER	DOZER TRANSPORT, ___ TON LOWBOY
	1953 PRESSED STEEL	DOZER TRANSPORT, 25 TON LOWBOY
	1980 M35-A2 CARGO	TRUCK, FUEL, 6X6, 2.5 TON
	2008 INTERNATIONAL	ENGINE, TYPE 3, 500 GPM, 500 GAL, 4X5
	1966 INTERNATIONAL	DOZER, TD 15B
	2015 JOHN DEERE	DOZER 700K LGP
	1993 YAMAHA	ATV, 350, 4X4 BIG BEAR
	1992 PIERCE LANCE	AERIAL, QUINT 105'
	1979 JOHN DEERE	DISK, JOHN DEERE 425
	1993 UTILITY TRAILER	12 FT UTILITY TRAILER
	1994 UTILITY TRAILER	TRAILER, ATV, 10'
	1998 ARCTIC CAT	ATV, 400 CC 4X4
	2000 CHEVROLET	ASTRO MINI VAN
	1999 FREIGHTLINER	TRANSPORT, M915A4, 52000 GVWR
	2006 FREIGHTLINER	THOMAS BUS FS6 REHAB UNIT
	2016 CAN AM, UTV	UTILITY, UTV

Benton County Fire District #2

District Summary

Fire District 2 protects an area of approximately 88 square miles in the City of Benton City and the unincorporated areas surrounding Benton City and lying within Benton County serving a population of approximately 10,000 residents. Located within the district are heavily populated residential areas, some commercial and industrial complexes, educational facilities, agricultural areas, wildland areas, and complex zones of interfaces between urban and wildland/agriculture uses. To provide timely service to this diverse area, there are currently two (2) fire stations strategically located to provide efficient protection. Operating as a combination fire department, District 2 has 5 career staff, 7 residents and 32 dedicated volunteer firefighters, officers, EMT's, Paramedics, and support personnel. The equipment utilized by the department is listed in the table below. The District average's 965 calls for service yearly, with 73 percent of those calls for EMS services and the remainder for fire. The District is comprised of a significant wildland urban interface area with many permanent homes and critical infrastructure contained within its boundaries. Additionally, we have large areas of open fields, mountains and hills which poses a high fire danger during the summer months. The potential for the District to host a substantial wildland fire is high. We have seen numerous large and some catastrophic fires in our district over the years. The largest in 2000 when we lost 53 homes due to a large uncontrolled wildfire that came from the Department of Energy/ALE properties.

District Concerns

Wildland Urban Interface and Residential Growth: The Fire District has many permanent homes in the WUI and each year the WUI is being expanded in size and complexity as more homes are built. Defensible space and fire adapted community conditions are extremely important for the safety of these homes along with the safety of the residents and our firefighters. However, at times, it is challenging to motivate home and property owners to take the initiative to make their home better prepared to withstand a wildland fire despite histories of large fires threatening their homes. Creating fire breaks on lands within the Conservation Reserve Program (CRP) is one goal for area fire chiefs. We have had several large fires on CRP/open wildlands and Department of Energy properties due to large tracts of continuous fuels with no natural or manmade fire breaks.

Communications: The District is currently part of a County- wide Dispatch center that is expanding to incorporate two Counties, Benton/Franklin in 2018. Dispatch center (SECOMM) is responsible for dispatching all FIRE/EMS (both city and county) and police (both city and county) personnel as well as City fire department resources. SECOMM has a rather sophisticated, intricate, and reliable – repeater simulcast micro wave system. The system has

some limitations to cover the entire two counties due to topography despite the multiple channels and repeater sites.

Residential and Agricultural Burning: Provide education to County residents on the process of conducting and/or requesting permits for the four types of fires permitted within the County; recreational burns, agriculture, residential burns and land clearing fires. Each burn type has specific requirements with regards to permitting, time, location and with respect to the rights of others, weather and burn bans. Provide education to agricultural producers on Washington State Department of Ecology regulations and permit requirements required to safely conduct agricultural burns within Benton County.

Other: As with most volunteer agencies, The District continues to seek ways to improve its ability to recruit and retain good firefighters and EMS personnel.

Cooperative Agreements: The District is part of an automatic and mutual aid agreement system with Three counties; Benton, Franklin and Walla Walla. We have developed a dispatch matrix that allows us to put a large amount of resources on an incident in a relatively short period of time in the urban areas, but the rural areas take much longer to deploy resources due to the remote areas. This has proven to be very successful in the urban areas to control small fires before they become too large however; rural areas still are the largest risk and areas which have large areas of urban interface. These areas can have a wildfire start that grows exponentially due to the fast burning fuels, topography and lack of access to control fires quickly. These sometimes often require the requests of State Mobilizations. Resources often are expended and the need for outside help is frequent in our areas. The District also has mutual aid agreements with; WA DNR, USFW, BLM and in some cases and the USFS. The District also participates in a County Strike Team that responds as an initial attack team to our neighboring counties, and in the Statewide Fire Mobilization Plan.

District Needs

Wildland Urban Interface Defensible Space: The fire District has an agreement with the Department of Energy that also provides assistance to these adjacent lands to Federal ALE, DOE and BLM properties in addition to normal mutual aid. This has proven reliable and helps with some federal shared costs however, the defensible space around the urban areas is not in place due to sensitive conservation areas. Our Fire District for the last two years has instituted and developed a FIREWISE program to our district residents. This has proven to offer some reduction to our wildfire-related calls; however, it does not get much participation to the high majority of our community despite our public campaigns and strong community push. We wish to continue to use this program and maximize the use of our staff time to meet with property owners and educate them on the value of defensible space. Funding for staff time is a need of

the fire District to enhance this program and complete structural assessments every two years has proven difficult. We have also teamed up with some local property owners which have receive permission annually to put in fire breaks with our area dozers on areas the butt up against some Urban Interface Areas however, this encompasses a small portion of the exposures.

Fire Breaks: These prove effective in the areas that allow them, many areas restrict fire breaks due to; negative impacts to agriculture, sensitive species, federal properties and private land owners not allowing them on their property. The costs associated with maintaining established fire breaks costs our small fire department thousands of dollars annually and cannot be sustained without some type of financial assistance.

Rural Water Supplies: Continue to seek and develop water supply systems in our rural areas for assistance in fire suppression. We have very few areas where we can draw water from in the rural areas due to remoteness and lack of developed water systems.

Residential and Agricultural Burning: All open burning within the county is subject to guidelines concerning, size, time, location and permit requirements from Benton County Clean Air Authority. Moreover, the BCCAA and the local cities have banned back yard burning except for blown in tumbleweeds. This is a two-fold problem. The first is that getting rid of some of the fuel loads reduces the fire potential to sustain burning. The other issue is that burning incorrectly causes numerous out of control fires.

Apparatus Inventory

Fed ID Number: 91-124-0107								
Address	**Unit #**	**Year**	**Make**	**Tank Size**	**Type**	**GPM**	**Other Information**	**Available for Mob.**
Station 210: 1304 Dale Street Benton City, WA	CH121	2013	CHEVY TAHOE				Command	Yes
	CH122	2010	FORD EXPEDITION				Command	Yes
	CPT 121	2010	F-250				Command	Yes
	UT 121	2008	F-250				Command	Yes
	D/C121	2012	F-250				Command	Yes
	E1211	2017	HME	800	Type 1 Engine	1500	Structure w/ Foam	Yes
	E1213	1997	E-One	1000	Type 1 Engine	1250	Structure w/Foam	Yes
	L1211	1995	Central States	300	Type 1 Ladder	1500	Structure w/Foam	Yes
	E1251	2008	F-450 4x4	400	Type 5 Engine	200	Wildland w/Foam	Yes
	E1252	2008	F-450 4x4	400	Type 5 Engine	200	Wildland w/Foam	Yes
	E1254	2018	F-550 4x4	400	Type 5 Engine	260	Wildland w/Foam	Yes
	Dozer 1221	2010	John Deere 750K		Type 2 Dozer		Tractor/Bulldozer/disc	Limited
	Transport 1211	2010	Freightliner		Type 1		Transport 50T	Limited
	Dozer Trailer/Fuel	1998	Lowboy	300 gal. fuel	Dozer Trailer			Limited
	Tactical Tender 1211	2017	Freedom Fire	3000	Type 1 Tender	500	Pump/Roll/Structure	Yes
	Cascade 121	2012	Scott		Type 1 Air System		High/Low Press	Yes
	Medic 1221	2011	Taylor Made		Type 2 Medic		ALS Transport	Yes
	Medic 1222	2011	Taylor Made		Type 2 Medic		ALS Transport	Yes
	Medic 1223	2009	Road Rescue		Type 2 Medic		ALS Transport	Yes
Station 220: Whitmore	E1212	2017	HME	800	Type 1 Engine	1500	Structure w/Foam	Yes
	Tactical Tender 1212	2008	Freedom Fire	3000	Type 1 Tender	500	Pump/Roll/Structure	Yes
	E1253	2008	F-450 4x4	400	Type 5 Engine	200	Wildland w/Foam	Yes

Benton County Fire District #4

District Summary

Benton County Fire District 4 (BCFD 4) is a combination fire department protecting just over 52 square miles consisting of the City of West Richland and surrounding county area with a population just under 20,000. The district has a variety of property use types, including significant residential, some light industrial, agricultural (with a large vineyard component), and open area. The interfaces between open and agricultural areas result in a complex zone regarding fire protection. As the building within the district continues, some of the interface areas are becoming more important, as the population and overall exposure continues to increase.

Created in 1954, BCFD 4 currently operates out of two staffed stations. Staffing includes 15 full time firefighters (Fire Chief, Captains, Lieutenants, firefighters), 1 administrative assistant, 25 volunteer firefighters and 13 Logistic and Administrative volunteers. A list of current apparatus is included in the table below.

BCFD 4 responded to an average of about 1320 incidents per year (5-year average), with about 75% of those incidents being emergency medical calls. The remainder of the incidents are for fire related incidents or false alarms. The call volume for BCFD 4 has increased 25% over the past 5 years and continues to increase as more people and business move into the District. Over the past two years, BCFD 4 has seen large swaths of open land change to grape vineyards based on the Red Mountain American Viticultural Area (AVA) and success of several wineries in the area. While large parts of the open land in the Red Mountain AVA has been planted in grapes, there remains large areas outside of the AVA that are not as agriculturally valuable and remain undeveloped. The growth of individual housing on the borders of the open area result in the high potential for wildland/urban interface issues and the associated wild fire risk.

The district has experienced several larger wildland fires, mostly along/over the Red Mountain and Candy Mountain areas. The most recent larger fire was on Candy Mountain resulting in a total area burned of 450 acres and threatening approximately 50 to 75 homes. The cause of the fire was from a mechanical failure of a vehicle along Interstate 82, resulting in the fire burning over the top of Candy Mountain and threatening the homes and impacting trails on the mountain. At the time of the fire (12:30 am), there were no hikers on the mountain trails, minimizing a potentially dangerous situation of hikers in the path of a fast moving wildland fire. Fortunately, with help from neighboring mutual aid fire and police agencies, no homes were damaged or destroyed and there was only one minor injury to a firefighter during the extinguishment of the fire.

District Concerns

Wildland Urban Interface and Residential Growth: The Fire District has many permanent homes in the WUI and each year the WUI is being expanded in size and complexity as more homes are built. Defensible space and fire adapted community conditions are extremely important for the safety of these homes along with the safety of the residents and our firefighters. However, at times, it is challenging to motivate home and property owners to take the initiative to make their home better prepared to withstand a wildland fire despite histories of large fires threatening their homes. BCFD 4 has worked with homeowners in some areas of the district in implementing the Firewise program as much as possible. The homeowners have worked with the District, but with limited resources only partial success has been observed. Additional resources could be used to help with more effective and complete implementation of the Firewise program.

Communications: The District is currently part of a County- wide Dispatch center that is expanding to incorporate two Counties, Benton/Franklin in 2018. Dispatch center (SECOMM) is responsible for dispatching all FIRE/EMS (both city and county) and police (both city and county) personnel as well as City fire department resources. SECOMM has a rather sophisticated, intricate, and reliable – repeater simulcast micro wave system. The system has some limitations to cover the entire two counties due to topography despite the multiple channels and repeater sites.

Residential and Agricultural Burning: The District continues to see a high number of controlled burning activities that are not allowed under the current Benton County Clean Air Authority rules. The types of allowed burning depend upon the urban growth boundaries as well as agricultural use of lands. Many of the residents who have lived in the area for longer, still conduct burning of natural vegetation even though they are inside the urban growth boundary, where this type of burning is not allowed. Efforts to educate the public on the rules continues to be a challenge based on the perceived rural nature of large portions of the District.

Other: As with most combination career/volunteer agencies, the District continues to seek ways to improve its ability to recruit and retain reliable personnel to assist with the variety of responses and other administrative activities that must occur to be a progressive and successful organization.

Cooperative Agreements: The District is part of an automatic and mutual aid agreement system with Three counties; Benton, Franklin and Walla Walla. We have developed a dispatch matrix that allows us to put a large amount of resources on an incident in a relatively short period of time in the urban areas, but the rural areas take much longer to deploy resources due to the remote areas. This has proven to be very successful in the urban areas to control small fires

before they become too large however; rural areas still are the largest risk and areas which have large areas of urban interface. These areas can have a wildfire start that grows exponentially due to the fast burning fuels, topography and lack of access to control fires quickly. These often require the requests of State Mobilizations. Resources often are expended and the need for outside help is frequent in our areas. The District also has mutual aid agreements with Washington Department of Natural Resources (WADNR), United States Fish and Wildlife (USFW), Bureau of Land Management (BLM) and the United States Forest Service (USFS). The District also participates in a local County Strike Team that responds as an initial attack team to our neighboring counties, and in the Statewide Fire Mobilization Plan.

District Needs

Wildland Urban Interface Defensible Space: The District attempted to implement the FIREWISE program with some district residents, based on the higher risk areas. This has proven to offer some reduction to our wildfire calls however, participation rates could be much higher with some additional resources. We wish to continue to use this program and maximize the use of our staff time to meet with property owners and educate them on the value of defensible space. Funding for additional staff time is needed by the fire District to enhance this program and complete structural assessments every two years and deliver educational materials to potential participants as the population continues to grow and change.

There are additional areas that abut City of West Richland property (specifically the sewer treatment plant) as well as many private homes that have never had a significant fire resulting in large buildup of fuel. The area also has extremely limited access and does pose a significant hazard if wildfire does gain access to the area. Efforts are needed to coordinate fuel reduction or defensible space around this area. This will be challenging, as there are wetlands in the area as well as being adjacent to the Yakima River and associated fish habitat.

Rural Water Supplies: Continue to seek and develop water supply systems in our rural areas for assistance in fire suppression. The District has worked with some of the vineyards to establish water supply points at their irrigation ponds, but these are not always a reliable source of water depending upon the time of year and required water use for the vineyards. The District has also worked with the Barker Ranch to identify water supply access points to be developed as the ranch makes improvements to the irrigation and wetland management program. These water supplies allow access to water supplies closer to the threat of wildland fires as identified by landowners, users and the District.

Apparatus Inventory:

Fed ID Number: 91-1317376								
Address	**Unit #**	**Year**	**Make**	**Tank Size**	**Type**	**GPM**	**Other Information**	**Available for Mob.**
Station 420: 2604 Bombing Range Road, West Richland, WA 99353	CH141 (UT145)	2013	Ford F-150 Raptor				Command	Yes
	UT141	2017	Chevrolet K2500				Command	Yes
	UT142	2017	Chevrolet Tahoe				Command	Yes
	UT144	2003	Ford Ranger				Command	Yes
	UT146	2014	Ford Explorer				Command	Yes
	DC141 (UT143)	2006	F-250				Command	Yes
	E1412	2001	KME	1000	Type 1 Engine	1250	Structure w/ Foam	Yes
	E1452	2005	F-450 4x4	400	Type 5 Engine	120	Wildland w/Foam	No
	E1461	1997	Ford Super Duty 4X4	300	Type 6 Engine	120	Wildland w/Foam	Yes
	E1431	1997	Freightliner / BME	560	Type 3 Engine	1000	Wildland/Structure w/Foam	Yes
	Tactical Tender 1412	2013	Pierce Hawk	2500	Type 1 Tender	500	Pump/Roll/Structure/CAFS	No
	Medic 1422	2016	Ford E-450 / Braun		Type 2 Medic		ALS Transport	Yes
	Medic 1423	2010	Ford E-450 / Braun		Type 2 Medic		ALS Transport	Yes
	Rehab 141	2006	F-250				Support	n/a
	Decon 143				Trailer		Support	n/a
Station 410: 1400 Harrington Road, West Richland, WA 99353	E1411	2001	KME	1000	Type 1 Engine	1250	Structure w/Foam	Yes
	Water Tender 1412	2015	Freightliner / Pierce	3000	Type 1 Tender	500	Pump/Roll	Yes
	E1451	2011	F-550 4x4	400	Type 5 Engine	120	Wildland w/Foam	No
	BS142	1986	IHC		Type 2 Cascade Air System			No
	Medic 1421	2014	Ford E-450		Type 2 Medic		ALS Transport	Yes
	Rehab 142	2000	Ford E-450				Rehab	n/a

Benton County Fire District #5

District Summary

Benton County Fire District #5 (BCFD#5) is primarily a wildland fire agency with some urban/suburban interface with neighboring agencies. BCFD#5 also responds to vehicle accident and also provides some non-ambulance EMS services. The district operates out of four main stations with approximately twenty volunteers. BCFD#5 personnel are on duty twenty-four hours a day, seven days a week. The district covers an area of approximately 400 square miles.

District Concerns

Residential Growth: BCFD#5 has not seen significant population growth. However, there is growth in the suburban areas on the outer district lines, with housing development expanding into the district.

Communications: BCFD#5 is part of a Bi-County dispatch center (SECOMM) that is responsible for dispatching all fire, ems and police, as well as one fire agency from a third county, Walla Walla County. SECOMM has a VHF simulcast and micro wave system utilized by fire agencies, and law enforcement agencies operate on an 800MHz radio system. The VHF radio system is out dated and will require a major overhaul within the next 2 to 5 years as parts are no longer available.

The merger to one dispatch center was recent. With the addition of Franklin County Fire agencies, Pasco Fire Department and Walla Walla Fire District #5, radio traffic has increased. It seems that the number of dispatch staff needs to be increased to handle the increased radio traffic and calls.

Other: BCFD#5 is reliant on neighboring fire agencies for structure fires as well as for ALS services. There is a need to have access to Water Tenders and Type 1 Engines.

Cooperative Agreements: BCFD#5 has mutual aid agreements with neighboring fire agencies. BCFD#5 will implement or renew needed mutual aid agreements.

District Needs

BCFD#5 is experienced, well versed and trained for wildland firefighting, however, better qualifications and experience is needed for structure fires, especially with the increase of housing in high wildfire risk areas. BCFD#5 is reliant on neighboring agencies for structure firefighting. BCFD#5 has a need for updated/appropriate equipment for structural firefighting and protection.

Benton County Fire District #6

District Summary

Benton County Fire District #6 (BCFD6) is located in South East Washington state approximately thirty miles South of the Tri-Cities (Kennewick, Richland and Pasco) area along the scenic Columbia River. Our department consists of: one paid Chief, three paid firefighters, sixteen active duty volunteers, and approximately 15 paid on call firefighter/EMT's, and two support volunteers. BCFD6 has eight personnel trained as EMT-Basic, two Advanced EMT's and two Paramedics. The career staff works 48/96 shift work. Due to the low resident population many of our volunteers live outside of the Fire District. Most are daytime responders and take up to 35 minutes to respond in the evenings. Only ten volunteers live within the District and cover a majority of the calls.

Our department protects 277 square miles of rural land. Our two ambulances service a response area encompassing approximately 490 square miles in two counties. Eighty percent of our total calls for service are medical related. Many were medical/trauma related. Most of those were motor vehicle accidents. Currently, BCFD6 has exceeded our average call volume, for the same time period, as we begin the busy winter MVA season.

The resident population of BCFD6 is approximately one thousand (1,000). However, due to the nature of the industries and abundant farming in our district, the population during the summer time period is much higher and varies throughout the year. Each year we see a drastic increase of traffic on our roadways and major Interstate highways. Although we are rural, our district contains several key facilities and locations that, if affected, could have wide reaching affects for the Western United States. Some of these key areas are: thirty (30) miles of US Fish and Wildlife scenic wildlife preserve along the Columbia River; the US Corps of Engineers McNary Dam; three Bonneville Power Administration high energy transmission lines; Williams Pipeline bulk storage facility containing 2.5 billion cubic feet of natural gas; four major Williams Pipeline high flow transmission lines serving Spokane, Seattle and the West coast; fifteen miles of Interstate 82; twelve miles of State Route 221; thirty miles of State route 14; and hundreds of square miles of cultivated agricultural property including the sixth largest winery in the world, Columbia Crest.

BCFD6 provides ALS/BLS ambulance coverage to two neighboring Fire Districts through an Automatic Aid Agreement (Klickitat County Fire District 10 and Benton County Fire District 5). Since we have only one Paramedic, we are unable to provide full ALS coverage and must revert to BLS coverage when the Paramedic is unavailable. Therefore, we must work closely with our neighboring ALS agencies as well. Mutual aid is received and given to the Tri-Cities area when advanced life support is needed through a Mutual Aid Agreement.

District Concerns

Benton County Fire Protection District 6 is a very rural area with huge commercial target hazards. It is the perfect storm for major infrastructure loss. In 2013 our district experienced a huge event at the Williams Pipeline bulk storage facility that resulted in a $100 million dollar loss. Our limited budget combined with the State of Washington one percent maximum budget increase law has crippled our small department for many years. As our District valuation increases the tax amount per thousand decreases. Due to our rural location and limited population to draw volunteers, a series of community meetings were held so that the voting public had an opportunity to see, in our current state, we are unable to fight the most basic interior structure fires due to the lack of certified firefighters. BCFD6 also has six seasoned responders that are near retirement age. However, these few volunteers respond to a majority of the calls for service. These precious few members are the "backbone" of our organization and are vital to our continued operation. New volunteers have recently joined our ranks but will require several years of training to be able to take on medical and fire responsibilities.

Benton County Fire Protection District 6 does not enjoy a large donating population. Fundraisers in our economically depressed area do not produce the donations needed to purchase equipment. The tax base and a small amount of ambulance income are all that our Department has to operate on.

The remaining budget priorities are placed on personal protective equipment, maintenance, ensuring apparatus are safe, training firefighters and training EMT's. Several fire stations owned by Benton County Fire District 6 are thirty-five years old and require major repair.

District Needs

The following statements describe the various needs of BCFD #6; some of these items should be considered for future Mitigation Action Items:

- BCFD6 needs weed abatement along the state, federal highways and railways throughout our fire district. The overgrowth and close proximity of combustible vegetation causes multiple large fires every year.
- Personnel need is another issue for BCFD6. The small community to draw from does not provide adequate responders for our area. With our rural location, this can be detrimental to the person in need if we do not have the responders to help.
- Firefighter and EMT training. Due to our rural location it is difficult to get outreach training for firefighter 1, wildland firefighter and Emergency Medical Technician.
- Fire apparatus. With the age of our fleet firefighting apparatus replacement is a concern.

Kennewick Fire Department

Department Summary

The City of Kennewick is fortunate to be situated in an area that offers spectacular views of the Horse Heaven Hills to the south, Rattle Snake Mountain to the west, the Columbia River to the north and the broad plains of the Columbia Basin and Blue Mountains to the east. These natural features are valued because it emphasizes the region's identity with our three rivers (Yakima, Snake and Columbia), the agricultural industry and the desert lying just outside our irrigated boundaries. These features and dry climate provide for wildfire activity throughout a good part of the year. The City of Kennewick Fire Department (KFD) is primarily an urban/suburban fire agency which employs 84 personnel and provides fire suppression, Emergency Medical Services (EMS), fire prevention, investigation and code enforcement, technical rescue, hazardous materials and incident management services to Kennewick citizens as well as to the surrounding community through strong mutual and automatic agreements.

Department Concerns

As stated above KFD is primarily an urban/suburban fire department that deals with all risk incidents. KFD areas of concern are:

Residential Growth: The population of Kennewick has increased significantly since its incorporation as a city in 1904. At the time of the 1910 census, the Kennewick population was 1,219 people. In 2016 the population is 79,120. Using data from the U.S. Census Bureau Kennewick is planning for a population of 112,044 by the year 2037; an increase of nearly 33,000 residents over the next 20 years. This increase in population will increase calls for EMS service which is 80% of the responses that the department handles annually. The additional need for EMS service will have a direct effect on available resources to respond to wildland fires as most fire units are cross staffed with ambulances.

Wildland Urban Interface: The city is boarded to the south by open grass and saga lands. Prevailing winds from the southwest historically push large wildland fire into the city. On August 11th, 2018 one such fire called the Bofer Canyon Fire moved into the City of Kennewick with devastating results. The fire was a result of a road side start off of Highway 82 just south of the Kennewick Exit. Pushed by 30 mph winds the fire hit the Canyon Lakes housing development within minutes making a run to the east through several additional housing developments before being stopped at Olympia Street. The result was the total loss of five homes with four additional damaged homes and several outbuildings lost or damaged. Two citizens sustained minor injuries and the landscape was stripped of all vegetation creating a dust problem throughout the summer and fall months. Additionally, the city has several riparian areas that are wildfire interface problem areas. The city does not have the funding to

provide for a fuels management program for the riparian areas identified as Zintel Canyon, Blackberry Canyon, the riparian area south of 27th & Cascade St., and riparian area 53rd and Washington St., all are Wildland Urban Interface zones.

Communications: KFD is part of a Bi-County dispatch center (SECOMM) that is responsible for dispatching all fire (both city and county) and police (both city and county). SECOMM has a rather complex and somewhat temperamental VHF simulcast and micro wave system utilized by fire agencies, while Law agencies operate on an 800MHz radio system. The VHF radio system is very out dated and will require a major overhaul within the next 2 to 5 years as parts are no longer available.

Cooperative Agreements: KFD is a signatory to Washington State Fire Mobilization Plan and has a cooperative agreement with the Department of Natural Resources. KFD has mutual aid and automatic aid agreements in place with agencies within Benton, Franklin and Walla Walla counties. As of 2018 KFD did not have a federal cooperative agreement in place which would allow for KFD resources to participate on USFS, USFW, BLM or other federal agencies incidents. A federal agreement should be developed for the 2019 fire season.

Residential Burning: Outdoor burning permissions within the City of Kennewick UGA (urban growth area) are determined based upon the Benton County burning regulations. The City of Kennewick does not allow any outdoor burning (other than blown tumbleweeds) within the UGA. The Benton Clean Air Agency is charged with enforcing burning regulations.

Other: The Kennewick Fire Department provides EMS and structural fire suppression assistance to its surrounding neighboring jurisdictions, while relying heavily on neighboring fire districts and department for assistance in wildfire suppression. KFD also, participates in Incident Management Team (IMT) activities for large wildfires occurring locally, state wide and nationally. As the experienced IMT personnel retire out recruiting and training personnel to fill those positions will be critical in the coming years.

Benton County and the City of Kennewick are encouraged to adopt a regulation requiring “defensible space” for all existing and new construction within the WUI. This process will require a two-fold approach. First, public education through a collaborative partnership with the media, fire departments, and emergency management, and second development and adoption of county ordinances requiring the improvement and maintenance of defensible spaces.

The City of Kennewick should explore a fuels management program mainly within the identified WUI and riparian zones to reduce the risk of wildfire to the community while improving and maintaining ecosystem health.

Department Needs

Firewise-Wildland Urban Interface Defensible Space: An integrated and focused public education program dedicated to wildland fire prevention and protection needs to be developed and implemented throughout the county. This program should include consistent and enforceable burning regulations, information on defensible spaces, and outreach programs through the use of all facets of media, including social media.

Riparian Fuels Management Program: The riparian landscape is the interface between bodies of water such as rivers, streams, and lakes and upland ecosystems. The major riparian areas in Benton County lie along the Columbia and Yakima rivers; however, smaller riparian areas are present along many smaller streams, ponds, and irrigation ditches. Most riparian areas produce high densities of shrubs and grass with scattered deciduous trees due to the relative abundance of water. Upslope from the waterway, vegetation generally resorts back to the typical shrub-steppe or grass fuel types that dominate the county, and within the City of Kennewick abut to mostly residential property creating a wildfire interface problem. The City of Kennewick is in need of a fuels mitigation and vegetation management program within these areas. These riparian areas are full of hazardous fuels, live and dead vegetation that has accumulated and increases the likelihood of unusually large wildland fires. When fire encounters areas of heavy fuel loads (continuous brush, downed vegetation or small trees) it can burn these surface and ladder fuels and may quickly move from a ground fire into a crown fire.

Fuel treatments are intended to lower the risk of catastrophic wildfires by managing vegetation to modify/reduce hazardous fuels. The goal of fuel treatment projects is to modify fire behavior to reduce environmental damage and aid in suppressing wildfires. Benefits from fuel treatments include; prevent loss of lives, reduce fire suppression cost, reduce private property losses and protect natural resources (control of unwanted vegetation, including invasive species, improvement of rangeland for livestock grazing, improvement of fish and wildlife habitat, enhancement and protection of riparian areas and wetlands, and improvement of water quality) from devastating wildfire.

Funding for a strategic management and control of wildland vegetation is essential to the safety, health, recreational, and economic wellbeing of Kennewick's citizens.

Pre-Attack or Pre-Incident Planning: The City of Kennewick should begin to employ GIS technology to aid in wildfire pre-incident planning and in the development of pre-attack plans which include zone maps identifying key fire suppression actions. Additionally, dispatch deployment plans should be created to insure rapid deployment of the right type and number of resources to each zone to assist first responders before they arrive on scene and need to request resources.

Contingency Planning: Contingency plans identify high-risk neighborhoods and areas with the potential for large wildland incidents. These plans contain information that may be beneficial to incoming resources, including fuel types, water sources, staging areas and ICP locations.

A map of each high-risk neighborhood also is provided to give users an elevated view of the area and its potential threats.

Richland Fire and Emergency Services

Department Summary

Richland Fire and Emergency Services provide all fire, ambulance, and other emergency services to 54,989 citizens located in 35.72 square miles of Benton County in southeast Washington State. With robust mutual aid agreements, Richland provides and receives assistance during large incidents or times of overwhelming call volumes. Mutual aid partners with automatic aid agreements include Benton County Fire District #4, Hanford Fire Department, Benton County Fire District #1, Kennewick Fire Department, and Pasco Fire Department. In 2016, Richland Fire and Emergency Services responded to 6497 calls for service. As of November 2017, numbers are showing a similar outcome for 2017. Richland currently carries a full-time staff of 63 employees, with 60 of those employees maintaining training and certifications for line firefighting. Response to emergency incidents is carried out from four stations located throughout the city. Each station is staffed 24 hours per day, year-round, with a minimum of three firefighters, including an officer and at least one paramedic. All line personnel trained to NWCG firefighter 2 or above. Each station houses a type 1 structural engine, an advanced life support ambulance, and a specialized apparatus such as wildland engine or aerial apparatus.

City of Richland is a rapidly growing community due in part to its close proximity to the Hanford nuclear reservation where many laboratories and energy related industries provide excellent job and professional growth opportunities. Richland also provides many recreational opportunities, being located at the convergence of the Columbia and Yakima rivers. Over 3 square miles of river are accessible within Richland's boundaries. As Richland continues to grow, homes in the wildland urban interface present additional challenges for fire prevention and suppression. Additionally, many high value laboratories and research facilities are located in north Richland close to Hanford, where there are significant wildland urban interface exposures.

Department Concerns

Richland Fire and Emergency Services has identified several issues which need to be addressed in the immediate future. These issues are serving an aging population, maximizing organizational efficiencies, and serving the growth of the community. Serving the growth of the community requires strengthening wildland urban interface response capabilities.

As Richland grows, more wildland urban interface hazards arise. Additionally, more individuals take part in recreational activities on our local waterways and hiking areas such as Badger Mountain, Amon Canyon, Bateman Island, and the Yakima delta. Improved access for emergency vehicles, in conjunction with identified egress routes from these areas, will help improve safety in the city as well as protect property in the event of wildfire. Plans are being

worked on to achieve these goals, but there will likely be significant expense involved. As with any growth, additional facilities need to be considered, as well as staffing for the facilities. Plans are in place to build additional stations, as well as staff those stations, to ensure the high level of service Richland residents have come to expect. Funding for these additional facilities will be a significant hurdle.

West Benton Fire Rescue

Department Summary

WBFR provides fire, rescue and emergency medical services to an area of 176 square miles located in Western Benton County, including the City of Prosser and Community of Whitstran. This response area is comprised of urban, suburban, rural and wildland is inhabited by 13,300 permanent residents and is split down the middle by the Yakima River. WBFR provides fire protection to the area with 3 paid personnel, 2 seasonal employees and 25 volunteers, answering over 600 calls for service annually.

Department Concerns

Personnel: WBFRs response model relies heavily on Volunteer Firefighters, which make up 85% of our response force. Due to a societal decline in volunteerism and the ever-increasing requirements to be a firefighter, WBFR has found it difficult to increase the depth of the Volunteer ranks. In addition, it is difficult to expand specialized services such as technical rescue and hazardous materials response when so heavily reliant on Volunteer Firefighters.

Rural Property Development: WBFRs response area continues to see development of new single-family residential structures into the Intermix/Interface areas comprised of heavy grass/brush fuels. Many times, fires in the interface/intermix require an extensive amount of resources to provide structure protection as well as being actively engaged in fire suppression. This can cause a large drain on regionally available apparatus.

Communications: With the recent addition of Franklin County and Walla Walla Fire District 5 to our dispatching agency, radio traffic has been extremely busy. Though local repeaters and tactical frequencies used to command individual incidents are plentiful, both the availability of simulcast frequencies to communicate with the dispatcher AND the personnel at the dispatch center to listen to multiple frequencies is lacking.

Vegetation Management: Invasive plant species such as Kocia and Russian thistle, along with cheatgrass, make managing a 5-acre rural residential parcel difficult. Many rural property owners fail to control invasive species which leads to insufficient or non-existent defensible space.

The lack of a State Vegetation Management Program has allowed the cheatgrass and invasive species to grow right up the end edge of Interstate and State Highway road surfaces. Vegetation that has grown up to the edge of a roadway becomes critically dry in the summer months and is easily ignited by discarded smoking material, mechanical problems or traffic accidents and creates traffic hazards due to fire, smoke and responding fire apparatus in the

roadway. WBFR protects thousands of acres of lands that abut under-maintained roadways and spend a considerate amount of time dealing with wildland fires started from roadside ignitions.

Burn Permits: WBFR does not issue burn permits. Burning is limited within the City Limits of Prosser, and surrounding UGA to tumbleweeds. In the rural areas of the response area, Benton County Clean Air Agency sets burning regulations and sets the daily burn decision regarding outdoor burning. Many times, people are unaware about the daily burn decision or the presence of a burn ban.

Fire Inspections: Prosser is home to a vibrant downtown core comprised of 100-year-old multi-story buildings that house restaurants, assembly occupancies, mercantiles, offices and residential units. Fire and Life Safety Inspections came under the authority and responsibility of the City of Prosser in 2015. Proper fire and life safety inspections must be maintained to minimize the occurrences of devastating downtown fire losses.

Other: Relying primarily on Volunteer Firefighters, WBFR sometimes struggles to mount an effective initial response force to incidents, and a large/complex natural cover fire or structure always requires the assistance from neighboring agencies to mitigate. To augment day time response in during the summer months, WBFR hires 2 seasonal employees to complete station tasks and respond on incidents.

The two WBFR fire stations are not staffed around the clock, and calls that occur at night or over the weekend are staffed with personnel responding from home. WBFR must continue to identify ways to decrease “turnout time” to incidents, which includes identifying funding to house responders at the headquarters fires station.

WBFR has begun to identify and install fuel breaks around the WUI to the South of town with our heavy equipment. WBFR will continue to build private landowner relationships and identify areas where fuel breaks will have a positive impact.

Cooperative Agreements: WBFR is a signatory to the Tri-County Master Mutual Aid Agreement which includes all agencies in Benton, Franklin and Walla Walla Counties. Additionally, due to our proximity to Yakima County, WBFR has individual Agreements Yakima County Fire District 5, and with the Cities of Sunnyside, Grandview, Mabton, Toppenish and Yakima when additional apparatus is needed. WBFR also has cooperator agreements with USFWS, DNR and BLM.

Department Needs

- Benton County and the City of Prosser are encouraged to establish and enforce codes requiring defensible space around structures and a concerted effort made to form a County wide community education campaign.

- Additional personnel to staff WBFR with a crew around the clock to reduce turnout time.
- Washington State Department of Transportation reinstatement of a proper vegetation management program to address roadway ignition hazards.
- Identification and implementation of frequencies identified for emergency response and dispatch staffing to support a large multi-county dispatch operation.

Apparatus Inventory

Fed ID #								
Address	**Unit #**	**Year**	**Make**	**Tank Size**	**Type**	**GPM**	**Other Information**	**Available for Mob.**
Station 310: 1200 Grant Ave	CH131	2017	Chevrolet Tahoe				Command	Yes
	CT131	2012	Ford F-250				Command	Yes
	CT132	2016	Ford F150				Command	Yes
	UT131	2009	Chevrolet Tahoe				Utility	Yes
	R1341	2005	Braun		Type 4 Rescue		Hvy Rescue	Yes
	E1311	1994	E-One	750	Type 1 Engine	1500	Structure w/ Foam	Yes
	E1313	1998	H&W	970	Type 1 Engine	1250	Structure w/ Foam	Yes
	T1311	2010	E-One	3000	Type 1 Tender	750	Tactical	Yes
	W1312	1986	Ford LTL9000	4500	Type 1 Tender	1000	Water Tender	Yes
	E1352	2000	Ford F450	450	Type 5 Engine	150	4x4 wildland	Yes
	E1351	2009	Ford F450	450	Type 5 Engine	150	4x4 wildland	Yes
	Transport131	1988	White/GMC		Transport		Tractor/Trailer	Yes
	Dozer 1321	1982	Case 1150C		Type 2 Dozer		With Disc	Yes
	ATV131		Polaris 400 4x4		ATV		Swamper	Yes
Station 320: 15802 Rothrock Rd	E1312	1998	H&W	970	Type 1 Engine	1250	Structure w/ Foam	Yes
	T1313	1989	International	2500	Type 1 Tender	250	Tactical Tender	Yes
	E1353	2004	Ford F450	450	Type 5 Engine	150	4x4 Wildland	Yes
	E1363	1988	Chevrolet 3500	250	Type 6 Engine	150	4x4 Wildland	Yes

Washington Department of Natural Resources

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

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

****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 including 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. Today the Spokane District BLM manages just over 11,000 acres in Benton County 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 are 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.

Fire Protection Issues

The following sections provide a brief overview of the many difficult issues currently challenging Benton County in providing wildland fire safety to citizens. These issues were discussed at length both during the committee process and at the public meetings.

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 of Benton County residents. Currently, there are numerous areas throughout the county lacking road signs, address markers, or both. Updating signage throughout the county will increase the likelihood that first responders will be able to quickly locate and read posted signs in emergency situations.

Coordination with State and Federal Agencies

Efforts are being created to improve communication between local fire departments and the federal agencies through agreements and sharing communication plans. 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 Benton 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. Benton 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.

Rural Fire Protection

People moving from mainland urban areas to the more rural parts of Benton 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 Benton County. Permit burns in Benton County are based on the 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 Benton 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.

Conservation Reserve Program Fields

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

Currently, large blocks of land as well as scattered parcels in Benton County are enrolled in the CRP program. Hundreds of acres of continuous higher fuel concentrations as well as limited access to these areas have significantly increased the potential wildfire risk in these areas. Many CRP landowners are willing to conduct hazardous fuel reduction treatments to lessen the fire risk; however, they are often limited by the regulations of the CRP program.

Due to the difficulties involved with conducting fuel reduction projects on CRP land as well as the enormity of the task in Benton County, the Community Wildfire Protection Plan steering committee has recommended disking fuel breaks adjacent to CRP land wherever possible. The goal is to lower the intensity of a wind-driven CRP fire before it threatens homes and other resources.

Volunteer Firefighter Recruitment and Retention

The rural fire departments in Benton 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 Benton County. Many of the emergency responders have identified areas of poor reception for both radios and cell phones. The lack of communication between responders as well as with central dispatch significantly impairs responders' ability to effectively and efficiently do their job as well as lessens their safety. The conversion to a narrow band communication system exacerbated these issues and will require numerous additional repeaters to be installed. Additionally, the radio system will soon require replacement of the microwave.

For emergency situations, Benton County currently uses CodeRed to keep citizens informed. It is a free program that is an opt-in program that citizens can sign up for if they want to receive notifications.

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

Water Resources

Nearly every fire district involved in this planning process indicated the need to develop additional water resources in several rural areas. Developing water supply resources such as cisterns, dry hydrants, drafting sites, and/or dipping locations ahead of an incident is considered a force multiplier and can be critical for successful suppression of fires. Pre-developed water resources can be strategically located to cut refilling turnaround times in half or more, which saves valuable time for both structural and wildland fire suppression efforts.

Invasive Species

Fire behavior and fire regimes have been altered due to the proliferation of cheatgrass (*Bromus tectorum*) and other invasive species. Cheatgrass has a very fine structure, tends to accumulate litter, and dries completely in early summer, thus becoming a highly flammable, often continuous fuel.[26]

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 planning 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.

The City of Richland Fire Department has contacted homeowners around the Leslie Canyon Area, to educate them about the fire hazard and actions they can take to make their properties more resistant to fire. Some of these residents have completed work needed. Residents in

[26] USDA online database. http://www.fs.fed.us/database/feis/plants/graminoid/brotec/all.html#REFERENCES Accessed December, 2013.

Country Ridge were also contacted and have done work as well. The City of Kennewick is working with residents in the Zintel Canyon area to discuss similar measures. BCFD#1 has made contact with residents in the Triple Vista and Clodfelter areas and the Badger and Dallas Road areas to discuss similar measures.

Firewise

"Over the past century, America's population has nearly tripled, with much of the growth flowing into traditionally natural areas. These natural, unprotected 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 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 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 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."[27]

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

Fire Adapted Communities (FAC)

"Fire Adapted Communities are neighborhoods located in wildfire-prone areas that can survive wildfire with little or no assistance from firefighters. During a wildfire, FACs reduce the potential for loss of human life and injury, minimize damage to homes and infrastructure and reduce firefighting costs. This program offers information, promotional materials and articles that can be customized for your area. This program also offers videos and a display system that is available for use at community events, meetings, etc."[28]

Firebreaks

Fire breaks have been constructed in some areas, such as Rattlesnake Mountain and the Richland Airport. There are fire breaks throughout the county that are maintained on an as-needed basis.

Staff Rides

Some agencies participate in Staff Rides, like to Rattlesnake Mountain, which involve taking agency members to known areas of past fires and reviewing such wildfire factors as terrain and successful tactics, in preparation for future incidents in the same areas.

Public Wildfire Awareness

Some agencies currently post information on social media to teach homeowners about defensible space concepts and strategies.

[28] Living with Fire website available at: http://www.livingwithfire.info/fire-adapted-communities. Accessed May, 2014.

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Chapter 5: Landscape Risk Assessments

Improving wildfire mitigation efforts on a landscape-level is essential to the success of this plan. A landscape-scale approach to management is one that emphasizes sustainability of entire ecosystems, integrates stakeholder collaboration, and addresses the present and possible future conditions of lands across ownerships. Through application of the "All Hands, All Lands" management, increased collaboration among Federal, state, tribal, and local officials, natural resources managers, and the fire community can improve the efficiency and effectiveness of the overall wildland fire management effort.

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

Not every acre can be effectively treated to prevent wildland fires, nor can every acre impacted by fire be restored. Setting priorities for prevention, suppression, and restoration is essential to increase the efficiency of operations and the efficacy of treatments. The use of risk-based, landscape-scale assessments help prioritize treatment areas to reduce fire risk as well as set priorities to strategically guide the allocation and pre-positioning of resources for fire suppression.

In order to facilitate a mutual understanding of wildfire risks specific to commonly known areas in the county, the landscape-level wildfire risk assessments in the following sections are based on four predominant landscapes types that exhibit distinct terrain and wildland fuels. The four landscapes identified for the assessments are: grasslands, shrub-steppe, riparian areas, and non-burnable areas. These landscapes, although intermixed throughout the county, exhibit specific fire behavior, fuel types, suppression challenges, and mitigation recommendations that differentiate them from a planning perspective. For this assessment, the 2014 Fire Behavior Fuel Model 40 (FBFM40) was used. For more information, go to **www.landfire.com**.

Overall Fuels Assessment

The gentle terrain that dominates Benton County facilitates extensive farming and ranching operations. Agricultural fields occasionally serve to fuel a fire after curing; burning in much the same manner as low grassy fuels. Fires in grass and rangeland fuel types tend to burn at relatively low intensities with moderate flame lengths and only short-range spotting. Common suppression techniques and resources are generally quite effective in this fuel type. Homes and

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

Forest and woodland fuels are mostly present in small canyons and river breaks on sloping terrain less favorable to clearing for agricultural development. Wooded areas tend to be on steep terrain intermingled with grass and shrubs providing an abundance of ladder fuels which lead to horizontal and vertical fuel continuity. These factors, combined with arid and windy conditions characteristic of the river valleys in the region, can result in high intensity fires with large flame length and fire brands that may spot long distances. Such fires present significant control problems for suppression resources and often results in large wildland fires.

Almost half of the acreage (44%) in Benton County is characterized by the GR2 cover type which is defined as a moderately coarse continuous grass with an average depth of about 1 foot (Table 11). Fire spread rate is high and flame lengths are moderate. Over 20% of the county is classified as NB3 which is non-burnable agriculture. Almost 15% of the acreage in Benton County is classified as GS2 which consists of shrubs 1 to 3 feet in height and a moderate grass load. Fire spread rate is high and anticipated flame lengths are moderate. Figure 15 shows the distribution of FBFM40 fuel types in Benton County.

Table 11) Fire Behavior Fuel Models for Benton County, WA.

FBFM40	Acres	% Total	FBFM40	Acres	% Total
NB1	53625.6	4.76%	SH3	11.6	0.00%
NB3	**241570.4**	**21.46%**	TU1	985.1	0.09%
NB8	40079.2	3.56%	TU2	16.7	0.00%
NB9	59057.2	5.25%	TU5	26.0	0.00%
GR1	10122.6	0.90%	TL1	0.4	0.00%
GR2	**502432.5**	**44.63%**	TL2	851.2	0.08%
GR3	322.9	0.03%	TL3	4906.3	0.44%
GS1	19698.4	1.75%	TL5	2.7	0.00%
GS2	**166944.2**	**14.83%**	TL6	24791.3	2.20%
SH1	4.7	0.00%	TL8	14.5	0.00%
SH2	235.9	0.02%	TL9	2.7	0.00%
Total Acres: 1,125,702					

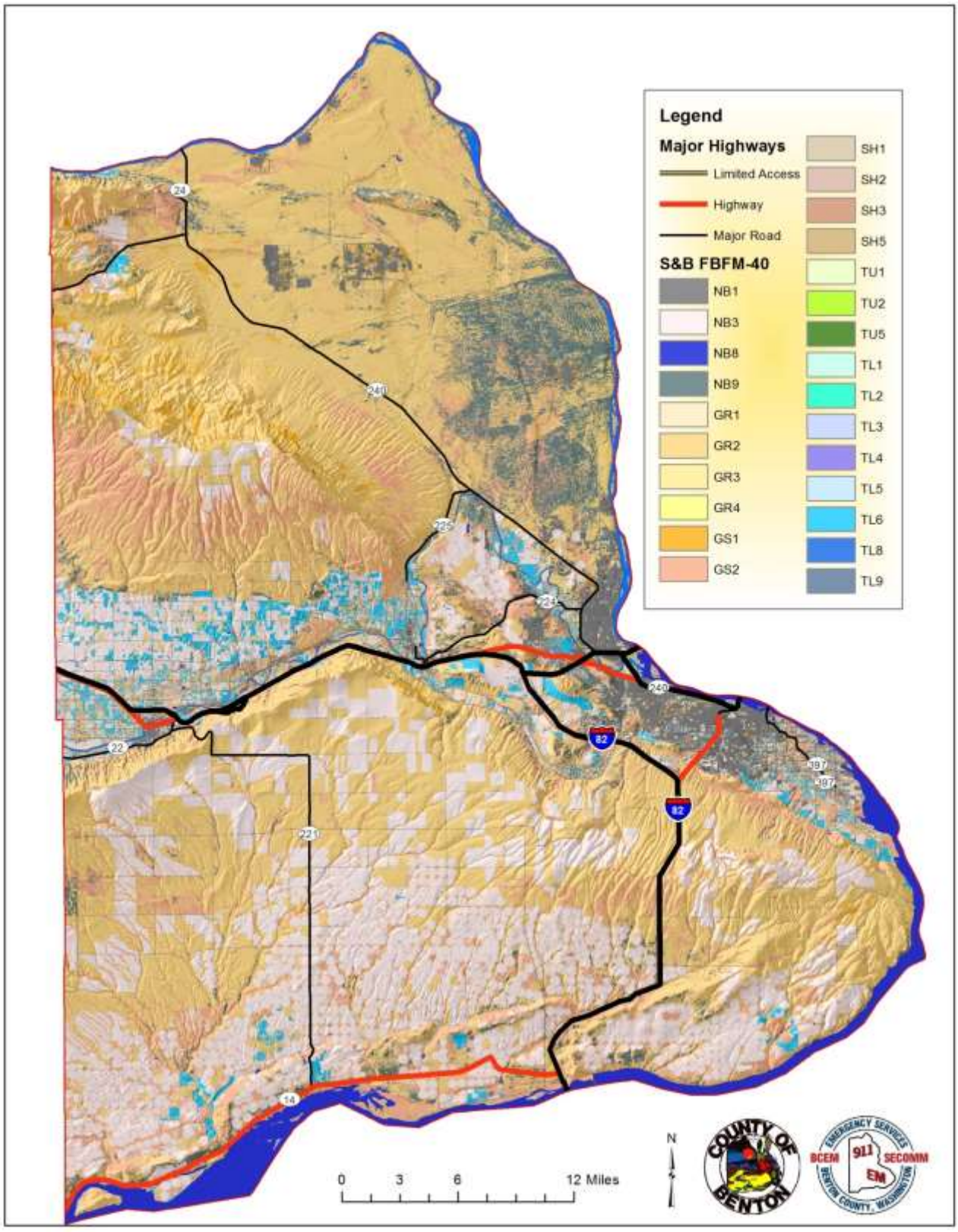

Figure 15) Fire Behavior Fuel Model Map for Benton County, WA.

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 Benton County are discussed below while area-specific mitigation activities are discussed within the individual landscape assessments.

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

***Burn Permits*:** Washington State Department of Natural Resources is the primary agency issuing burn permits in forested areas of the state. 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 Benton 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 Benton 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, creating a turnaround area for large vehicles, and ensuring adequate ingress and egress into developments and private properties.

***Fuels Reduction*:** Recreational facilities such as campgrounds and boat launches along the Yakima and Columbia Rivers 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 shrublands can be kept to a minimum by periodically conducting thinning or clearing, 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, strictly enforcing fire-use regulations, and constructing predesignated fire breaks to the last sentence.

***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. Although the agencies in Benton County work closely together, increasing the capacity of departments through funding and equipment acquisition can improve response times and subsequently reduce the potential for resource loss.

***Other Activities*:** Other specific mitigation activities are likely to include improvement of emergency water supplies, access routes, and management of vegetation along roads and power line right-of-ways. State 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. Furthermore, the Army Corps of Engineers can create predesignated fire breaks.

Grassland Landscape Risk Assessment

The grassland landscape is widespread across Benton County and includes native grasslands, invasive annual grasslands, and non-irrigated agricultural lands. According to data compiled by the LANDFIRE program, these areas represent around 45% of Benton County and are most continuous in the northern half of the county. In the southern half of the county, grass fuel types are intermixed more regularly with non-burnable irrigated areas and shrub-steppe landscapes. Stream channels and rocky scablands are interspersed throughout the grasslands. Landownership in this landscape is predominantly private and Federal. The major population centers in Benton County do not fall within this landscape type. However, many smaller communities and rural development are found throughout the grassland landscape, including individual farms, small subdivisions, railroad sidings and grain elevators. Development is widely distributed. New development occurs primarily near communities and along major roads. In nearly all developed areas, structures are in proximity to vegetation that becomes a significant fire risk at certain times of the year. Most of the Hanford Site is classified as grassland.

Wildfire Potential

Fire behavior in the grassland landscape can be modeled using the grass fuel type models defined by Scott and Burgan[29]. The primary carrier of fire in the grass fuel models is grass. Grass fuels can vary from heavily grazed grass stubble or sparse natural grass to dense grass more than 6 feet tall. Fire behavior varies from moderate spread rate and low flame length in the sparse grass to extreme spread rate and flame length in tall grass. Shrubs, if present, do not affect fire behavior. All grass fuel models are dynamic, meaning that their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and fire intensity is strong.

Wildfire potential in the grassland landscape is high in the rural farmland and moderate to high in the shrubby draws and waterways, pastures, and scattered patches of scrubland. Virtually all of the populated areas within the grassland landscape face similar challenges related to wildfire control and opportunities for fuels mitigation efforts. Farming and ranching activities have the potential to increase the risk of a human-caused ignition. Large expanses of crops, CRP, rangeland or pasture provide areas of continuous fuels that may threaten homes and farmsteads. Under extreme weather conditions, escaped fires in these fuels could threaten individual homes or a town site; however, this type of fire is usually quickly controlled. Clearings and fuel breaks disrupt a slow-moving wildfire enabling suppression before a fire can ignite heavier fuels. High winds increase the rate of fire spread and intensity of crop and

[29] Scott, Joe H. and Burgan, Robert E. Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model. USDA Forest Service Rocky Mountain Research Station General Technical Report RMRS-GTR-153. June 2005.

rangeland fires. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event in these areas.

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

Ingress-Egress

Accessibility is a concern in all fuel types throughout Benton County. Extensive rangeland is characteristic of the county and many of these areas have limited road systems making access difficult. Steep terrain also limits access and hinders wildfire response time for ground-crews.

US Hwy 395, Interstates 182 and 82, and State Routes 14, 221, 225, 240, and 397 the primary emergency access routes traveling through Benton County. County roads as well as rural ranch access roads are well distributed throughout most of the county often following section lines or bordering draws and canyons. In remote rural areas, county roads often change from a paved or maintained gravel surface to unimproved primitive roads making access possible only during certain times of the year. Limited access within remote areas and a lack of maintenance on existing travel routes, increases fire suppression response time and has a direct effect on fire spread leading to increased fire size and destructive potential.

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

Infrastructure

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

Above ground, high voltage transmission lines cross the planning area in many directions in corridors cleared of most vegetation, which provides for a defensible space around the power

line infrastructure and may provide a control point for fire suppression, if well maintained. Local public electrical utility lines are both above and below ground traveling through back yards and along roads and highways. Many of these lines are exposed to damage from falling trees and branches. Power and communications may be cut to some of these during a wildfire event.

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

Potential Mitigation Activities

Mitigation measures needed in the grassland landscape include maintaining a defensible space around structures and access routes that lie adjacent to annual crops and other wildland fuels. Around structures, this includes maintaining a green or plowed space, mowing weeds and other fuels away from outbuildings, pruning and/or thinning larger trees, using fire resistant construction materials, and locating propane tanks, fuel tanks, and firewood away from structures. Roads and driveways accessing rural residents may or may not have adequate road widths and turnouts for firefighting equipment depending on when the residences were constructed. Performing road inventories in high risk areas to document and map their access limitations will improve firefighting response time and identify areas in need of enhancement. Primitive or abandoned roads that provide key access to remote areas should also be maintained in such a way that enables access for emergency equipment so that response times can be minimized. Roads can be made more fire resistant by frequently mowing along the edges or spraying weeds to reduce the fuels. Aggressive initial attack on fires occurring along travel routes will help ensure that these ignitions do not spread to nearby home sites. Designing a plan to help firefighters control fires in CRP lands that lie adjacent to agricultural crops would significantly lessen a fire's potential of escaping to the higher value resource. Mitigation associated with this landscape might include installing fuel breaks or plowing a fire-resistant buffer zone around fields and along predesigned areas to tie into existing natural or manmade barriers or implementing a prescribed burning program during lower risk periods.

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

Shrub-steppe Landscape Risk Assessment

The shrub-steppe landscape is intermixed with the grasslands throughout Benton County, although much of it has been converted to irrigated-farm fields. According to data compiled by the LANDFIRE program, this landscape represents around 16% of Benton County and is most concentrated in the steeper areas north of the Yakima River and along the Columbia River. Typical vegetation found throughout this landscape is grass, mixed shrub and sagebrush with areas of wetlands, cultivated crops, and CRP fields. Landownership is predominantly private. The major population centers in Benton County do not fall within this landscape type. Small communities and rural developments are scattered throughout the shrub-steppe landscape, including individual farms, small subdivisions, railroad sidings and grain elevators. Development is widely distributed. New development occurs primarily near existing communities and along major roads. In nearly all developed areas, structures are in proximity to vegetation that becomes a significant fire risk at certain times of the year.

Wildfire Potential

Fire behavior in the shrub-steppe landscape can be modeled using the grass-shrub and shrub fuel type models defined by Scott and Burgan. The grass-shrub fuel type models represent around 16% of the area in Benton County. The primary carrier of fire in the grass-shrub models is grass and shrubs combined; both components are important in determining fire behavior. All grass-shrub fuel models are dynamic, meaning that their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and intensity is strong and depends on the relative amount of grass and shrub in the fuel model. The grass-shrub models in Benton County are characterized by low to moderate overall fuel loads, shrubs from roughly 1-3 feet high, and grass fuel loads ranging from low to moderate.

Pure shrub fuel type models represent around 0.3% of the area in Benton County. The primary carrier of fire in the shrub fuel models is live and dead shrub twigs and foliage in combination with dead and down shrub litter. A small amount of herbaceous fuel may be present. The shrub fuel types in Benton County are clustered in the southern half of the county north of Paterson.

The shrub-steppe landscape has a moderate to high wildfire potential due to its characteristically high occurrence of shrubby fuels mixed with grass, sloping terrain and somewhat limited access. Large expanses of open shrub-steppe vegetation provide a continuous fuel bed that could, if ignited, threaten structures and infrastructure under extreme weather conditions. A wind-driven fire in dry, native shrub-steppe 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 shrub-steppe landscape is at its highest during late summer and fall when daily temperatures are high, relative humidity is low, herbaceous fuels are cured, and live fuel moistures are at their lowest. Fields enrolled in conservation programs or managed for wildlife habitat are often transitioning from grass-dominated to a shrub-steppe landscape type. Fire intensity in these areas can be high due to increased fuel build-up from previous years' growth. Fires in this fuel type are more difficult to extinguish completely due to a dense layer of organic material at the soil surface. Hot spots can hold-over in this duff layer and may re-ignite at a later date.

Ingress-Egress

Accessibility is a concern in all fuel types throughout Benton County. Extensive rangeland is characteristic of the county and many of these areas have limited road systems making access difficult. Steep terrain also limits access and hinders wildfire response time for ground-crews.

US Hwy 395, Interstates 182 and 82, and State Routes 14, 221, 225, 240, and 397 the primary emergency access routes traveling through Benton County. County roads as well as rural ranch access roads are well distributed throughout most of the county often following section lines or bordering draws and canyons. In remote rural areas, county roads often change from a paved or maintained gravel surface to unimproved primitive roads making access possible only during certain times of the year. Limited access within remote areas and a lack of maintenance on existing travel routes, increases fire suppression response time and has a direct effect on fire spread leading to increased fire size and destructive potential.

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

Infrastructure

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

Public utility lines travel both above and below ground along roads and cross-country to remote facilities. Many irrigation systems and wells rely on above ground power lines for electricity. These power poles pass through areas of dense wildland fuels that could be destroyed or

compromised in the event of a wildfire. Cell phone service is well established in most parts of the county with only limited dead zones.

Potential Mitigation Activities

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

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

Riparian Areas Risk Assessment

The riparian landscape is the interface between bodies of water such as rivers, streams, and lakes and upland ecosystems. The major riparian areas in Benton County lie along the Columbia and Yakima rivers. Smaller riparian areas are present along many smaller streams, ponds, and irrigation ditches. Most riparian areas produce high densities of shrubs and grass with scattered deciduous trees due to the relative abundance of water. Upslope from the waterway, vegetation generally resorts back to the typical shrub-steppe or grass fuel types that dominate the county. Landownership in this area is mostly private. The major population centers in Benton County have developed near the riparian corridors along the Columbia and Yakima rivers to facilitate access to commercial river transportation. Rural riparian areas tend to be unpopulated.

Wildfire Potential

Fire behavior in the riparian landscape in Benton County can be modeled using the timber litter and timber understory fuel type models defined by Scott and Burgan. According to the LANDFIRE program, timber litter fuel type models represent around 2.6% of the area in Benton County. The primary carrier of fire in timber litter fuel models is dead and down woody fuel. Live fuel, if present, has little effect on fire behavior. Flame lengths and rate of spread in timber litter fuel models is typically/ low to moderate. Timber litter fuel types are mostly concentrated in riparian areas along the Yakima and Columbia Rivers.

Timber understory fuel type models represent just under 0.1% of the area in Benton County. The primary carrier of fire in the timber understory fuel models is forest litter in combination with herbaceous or shrub fuels. Some timber understory fuel models contain live herbaceous fuels and are dynamic, meaning that their live herbaceous fuel load is allocated between live and dead as a function of live herbaceous moisture content. The effect of live herbaceous moisture content on spread rate and fire intensity is strong and depends on the relative amount of grass and shrub load in the fuel model. The small areas represented by timber understory fuel types are mixed with timber litter fuels in riparian areas.

The riparian landscape has a moderate to high wildfire potential due to a characteristically high fuel loading, terrain that can produce a chimney effect, high recreation use, and somewhat limited access. Steep walls in narrow draws can contribute to rapid fire spread by funneling wind and fire upstream. Wildfire risk in the riparian area landscape is at its highest during late summer and fall when daily temperatures are high, relative humidity is low, herbaceous fuels are cured, and live fuel moistures are at their lowest.

Ingress-Egress

Accessibility is a concern in all fuel types throughout Benton County. Extensive rangeland is characteristic of the county and many of these areas have limited road systems making access difficult. Steep terrain also limits access and hinders wildfire response time for ground-crews.

US Hwy 395, Interstates 182 and 82, and State Routes 14, 221, 225, 240, and 397 the primary emergency access routes traveling through Benton County. County roads as well as rural ranch access roads are well distributed throughout most of the county often following section lines or bordering draws and canyons. In remote rural areas, county roads often change from a paved or maintained gravel surface to unimproved primitive roads making access possible only during certain times of the year. Limited access within remote areas and a lack of maintenance on existing travel routes, increases fire suppression response time and has a direct effect on fire spread leading to increased fire size and destructive potential.

There are many bridges in the riparian areas of Benton County. The load limits of the bridges in these areas impose access limitations for firefighting equipment. Many have weight restrictions, which are typically posted, and some are in disrepair.

Infrastructure

Recreation activities are often concentrated in riparian areas. Columbia Park, Bateman Island, the Chamna Natural Preserve and the Riverview Natural Preserve are all at least partially in the riparian zone. Educational signs in major recreation areas can assist land managers with educating the public about the risk of wildfire and how to minimize that risk. Providing camp sites and day use areas with fire rings keeps fires contained to specific sites and reduces ignition potential.

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

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

Potential Mitigation Activities

When live-fuel moisture is low, the high fuel loading and often steep terrain in riparian areas can produce rapidly spreading surface fires. During a wildfire event, recreationists may have little time to evacuate. The use of campfires, fireworks, and other potential ignition sources should be highly regulated during the fire season, especially in areas adjacent to structures and development. Using escape-proof fire rings and barbeque pits at recreational areas, limiting off-road vehicle use to designated trails, and restricting fireworks will help reduce the potential for an ignition.

Non-burnable Areas

Non-burnable "fuel models" represent around 36% of the area in Benton County. In all nonburnable fuel models there is no fuel load – wildland fire will not spread. It is important to delineate nonburnable areas both to maintain mapping consistency and because nonburnable areas frequently define the path of a wildfire and are crucial in establishing safety zones for wildfire suppression efforts. The nonburnable areas in Benton County are a combination of urban areas, irrigated agricultural areas, open water, and bare ground. Nonburnable areas are intermixed throughout the county but are most continuous and heavily concentrated in the southern half of the county and along the Yakima and Columbia Rivers.

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Chapter 6: Mitigation Recommendations

Critical to the process of developing a Community Wildfire Protection Plan and reducing wildfire risk in Benton County is the identification of wildfire mitigation action items and development of a schedule for implementation. The purpose of this section is to identify and prioritize mitigation action items based on input from fire, natural resource, and emergency service personnel. As there are multiple public land management agencies, industrial land owners, and thousands of private landowners in Benton County, it is reasonable to expect that differing schedules of adoption will be made and varying degrees of compliance will be observed across ownerships.

The land management agencies in Benton County, including the Washington Department of Natural Resources, US Fish and Wildlife, the Bureau of Land Management, US Army Corps of Engineers, Department of Energy and Bureau of Reclamation, and private industry are participants in the planning process and have contributed to the development of this plan. When possible, land management/treatment schedules were considered in the planning process in an effort to align and/or coordinate management goals with Benton County.

Through the CWPP, land owners and land managers in Benton County will be able to better incorporate fire-mitigation strategies into the scope of work already being performed. Implementation of action items through existing programs should minimize the costs associated with mitigation projects.

All risk assessments were made based on 2018 conditions. Over time it will be necessary to review and make adjustments to the recommendations made in this plan in order to account for changes in risk and risk factors, total population and population distribution, infrastructure additions and modifications, and any other factors that alter Benton County's susceptibility to wildfire.

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

Maintenance and Monitoring

A commitment to monitoring changes in resource conditions to evaluate the effectiveness of different management strategies will improve learning and, through adaptive management, increase the success of wildfire mitigation activities. Monitoring to evaluate the effectiveness of management actions must occur to determine the success of fire prevention, suppression, and

restoration actions. Lessons learned from self-evaluation can be shared and inform changes to correct for ineffective management prescriptions, respond to changes in resource conditions, guide new science and research needs and address changes in management policy and direction. Monitoring and evaluation are an essential part of adaptive management and depends upon timely information, analysis and learning. Strategic application of new management techniques, improved use of risk analysis to set management priorities, and the translation of science and research findings into tools for easy use on the ground to prioritize prevention, suppression, and restoration efforts can help improve the efficacy and efficiency of fire management.

Prioritization of Mitigation Activities

The action items recommended in this chapter were prioritized through a group discussion and voting process. The action items in Tables 6.1 – 6.5 are ranked as "High", "Moderate", or "Low" priorities for the 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 should be supported by a set of policies and regulations 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 12) Action Items in Safety and Policy.

Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.1.a: Distribute Firewise-type educational brochures with occupancy permit.	**CWPP Goal #1, 2, 4, 6, 7, & 9**	**Lead:** KFD Prevention Division **Support:** Kennewick Suppression Crews	

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 Benton County residents.

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

Shrub-steppe Management has a significant impact on the fuel composition and structure in Benton County. The shrub-steppe management programs of the Bureau of Land Management, Bureau of Reclamation, and numerous private landowners in the region have led to a reduction of wildland fuels. Furthermore, shrub-steppe systems are dynamic and will never be completely free from risk. Treated areas will need repeated treatments to reduce the risk to acceptable levels in the long term. Recommended treatments include mechanical thinning of shrubs and/or light prescribed burning to reduce fuel loads. Monitoring invasive species in these areas will also be required.

Table 13) Action Items for Fire Prevention, Education, and Mitigation.

Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.2.a: Implementation of youth and adult wildfire educational programs.	**CWPP Goal #1, 4, 6, & 9**	**Lead:** Richland Fire and Emergency Services	
6.2.b: Distribute educational information regarding construction in high risk wildfire areas.	**CWPP Goal #1, 4, 6, & 9**	**Lead:** Richland Fire and Emergency Services	
6.2.c (Kennewick): Prepare for wildfire events in high risk areas by conducting home site risk assessments and developing area-specific "Response Plans" to include participation by all affected jurisdictions and landowners.	**CWPP Goal #1, 2, 4, 6, & 9**	**Lead:** KFD Prevention Division **Support:** Kennewick suppression crews	
6.2.c (Richland): Prepare for wildfire events in high risk areas by conducting home site risk assessments and developing area-specific "Response Plans" to include participation by all affected jurisdictions and landowners.	**CWPP Goal #1, 2, 4, 6, & 9**	**Lead:** Richland Fire and Emergency Services	

Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.2.d: Work with area homeowner's associations to foster cooperative approach to fire protection and awareness and identify mitigation needs.	**CWPP Goal #1, 2, 4, 6, & 9**	**Lead:** Richland Fire and Emergency Services	
6.2.e: Work with WSU Extension, Master Gardeners, and other existing programs to offer firewise landscaping clinics to assist property owners in maintaining fire-resistant defensible space around structures.	**CWPP Goal #1, 4, 6, & 9**	**Lead:** Richland Fire and Emergency Services	
6.2.f: Develop a range of public education programs to encourage healthy management of natural resources on private property.	**CWPP Goal #1, 4, 6, & 9**	**Lead:** Richland Fire and Emergency Services	
6.2.g: Review State Building Codes and recommend revisions to meet Firewise standards as needed**.**	**CWPP Goal #1, 3, 5, 6, 8, & 9**	**Lead:** Richland Fire and Emergency Services	
6.2.h (BCFD #1): Locate funding for fuel reduction projects throughout BCFD#1's response area, but particularly within the WUI areas of Summitview, Triple Vista, Clodfelter, Badger Canyon and the South Finley area.	**CWPP Goal #1, 6, &7**	**Lead:** BCFD #1 **Support:** Benton County Fire Districts	
6.2.h (Richland): Locate funding for fuel reduction projects throughout BCFD#1's response area, but particularly within the WUI areas of Summitview, Triple Vista, Clodfelter, Badger Canyon and the South Finley area.	**CWPP Goal #1, 6, &7**	**Lead:** Richland Fire and Emergency Services	
6.2 I (Benton Conservation District): Locate funding for fuel reduction projects throughout the City, but particularly within the riparian zones identified.	**CWPP Goal #1, 2, 4, 6, 7, & 9**	**Lead:** Benton Conservation District **Support:** Kennewick Fire Department	
6.2 I (Richland): Locate funding for fuel reduction projects throughout the City, but particularly within the riparian zones identified.	**CWPP Goal #1, 2, 4, 6, 7, & 9**	**Lead:** Richland Fire and Emergency Services	
6.2.j (Kennewick): Fund the existing fire Prevention/Public Education Division to develop a public information campaign addressing wildland fire safety and defensible space.	**CWPP Goal #1, 2, 4, 6, 7, & 9**	**Lead:** KFD Prevention Division **Support:** Kennewick Fire Department	

Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.2.j (Richland): Fund the existing fire Prevention/Public Education Division to develop a public information campaign addressing wildland fire safety and defensible space.	**CWPP Goal #1, 2, 4, 6, 7, & 9**	**Lead:** Richland Fire and Emergency Services	

Infrastructure Enhancements

Critical infrastructure refers to the communications, transportation, power lines, and water supply that service a region. All of these components are important to central Washington and to Benton 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.

NOTE: No infrastructure enhancement mitigation action items were identified for the 2018 version of this plan. The table below serves as a place-holder for action items that may be included during future updates of the Benton County CWPP.

Table 14) Action Items for Infrastructure Enhancement.

Action Item	Goals Addressed (see page 2)	Responsible Organization	Timeline
6.3.a:	**CWPP Goal #**	**Lead:**	
		Support:	

Resource and Capability Enhancements

There are a number of resource and capability enhancements identified by the rural and wildland firefighting districts in Benton 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 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 15) 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 to existing dispatch, improve range within the region, and convert to a consistent standard of radio types.	**CWPP Goal #1, 6, 8, & 9**	**Lead:** Richland Fire and Emergency Services	
6.4.b (Kennewick): Train local firefighters to perform home assessments which will provide home owners with quality advice on how to make their homes defensible.	**CWPP Goal #1, 2, 4, 6, 7, & 9**	**Lead:** KFD Training Division **Support:** Kennewick Fire Department	
6.4.b (Richland): Train local firefighters to perform home assessments which will provide home owners with quality advice on how to make their homes defensible.	**CWPP Goal #1, 2, 4, 6, 7, & 9**	**Lead:** Richland Fire and Emergency Services	

Proposed Project Areas

The following project areas were identified by the CWPP steering committee and from citizens' recommendations during the public meetings (Table 16 and Figure 16). 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 thinning, pruning, brush removal, chipping, noncombustible building materials, noncombustible perimeter around structures, and general range health improvements.

The steering committee does not want to restrict funding to only those projects that are high priority because what may be a high priority at the county or agency level may not be a high priority for a specific community. 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.

During the next 5 years, the CWPP Steering Committee will continue to search for opportunities to complete projects. These projects may include point protection program, chipping programs, educational pamphlets, public relations/education, and Fire Danger Rating System signs for specific communities or fire districts.

The Washington Department of Natural Resources, Bureau of Land Management, 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 on the following page.

Table 16) Completed and proposed fuel mitigation projects for Benton County, WA.

ID	Name	Project Type
1	Maintain Existing Disk Line	Fire Line
2	Tie in Dozer line to ridge across Private	Fire Line
3	Continue Dozer Line Construction	Fire Line
4	USFW Line	Fire Line
5	W.E. Johnson	Fuels Treatment
6	USACE Delta public use area	Fuels Treatment
7	USACE Delta public use area	Fuels Treatment
8	USACE	Fuels Treatment
9	USACE	Fuels Treatment
10	Leslie Canyon & Amon Creek BLM	Fuels Treatment
11	BLM	Fuels Treatment
12	Badger Mtn	Fuels Treatment
13	Country Ridge	Fuels Treatment
14	Goose Gap	Fuels Treatment
15	Summit View	Fuels Treatment
16	Badger Canyon	Fuels Treatment
17	Clodfelter	Fuels Treatment
18	Triple Vista	Fuels Treatment
19	Zintel Canyon	Fuels Treatment
20	Seal Springs	Fuels Treatment
21	Blackberry Canyon	Fuels Treatment
22	Prosser, Painted Hills, Priority Areas	Fire Line, Fuels Treatment
23	Dozer line and fuel mitigation	Fuels Treatment
24	DNR Fuels Treatment	Fuels Treatment
25	DOT Hwy Spray Program	Fuels Treatment

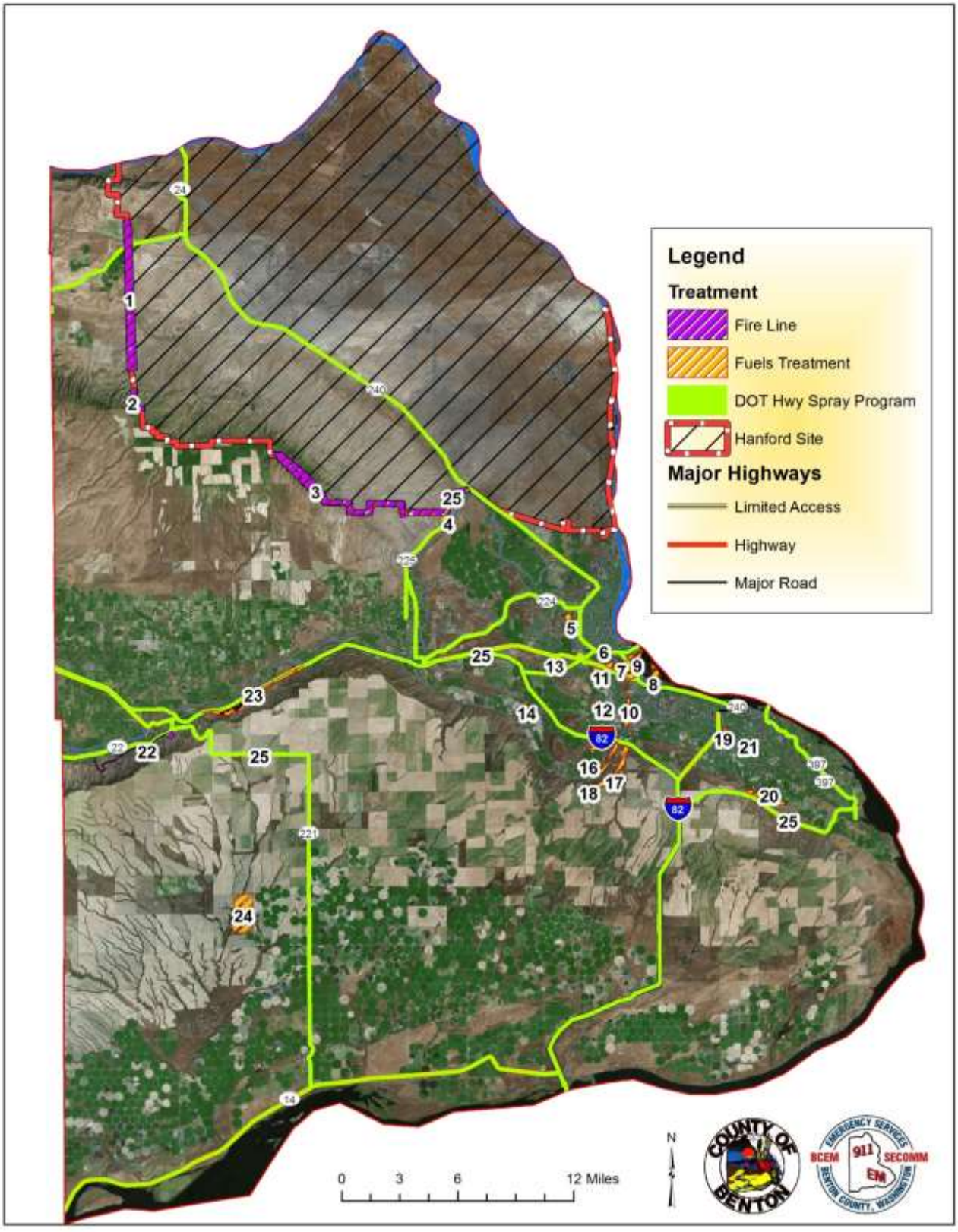

Figure 16) Completed and proposed fuels treatment projects in Benton County, WA.

Representative Fuels Treatment Project Prescriptions

Project Prescription

Homeowners should manage their property with Firewise principles in mind. This means that structures should have a three to five-foot wide strip of non-combustible material around the perimeter of the structure. Shrubs that lie within thirty feet of the structure should be heavily thinned (2.5 times a shrub's height between shrubs or clusters of shrubs). Often, having a trained individual perform assessments throughout a community can help homeowners prioritize fuel treatments around their own residence.

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

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

Select a property to be a 'demo' for other properties to use as guidance can also be a useful tool in educating a community. The demo property will be in a highly visible location and the property owner should be extremely motivated to maintain the property and provide encouragement to neighbors.

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Appendix 1: State and Federal CWPP Guidance

National Fire Plan

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

Healthy Forests Restoration Act

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

The Healthy Forests Restoration Act (HFRA) seeks to:

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

Federal Emergency Management Agency Philosophy

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

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

FEMA only reviews a local hazard mitigation plan submitted through the appropriate State Hazard Mitigation Officer (SHMO). FEMA reviews the final version of a plan prior to local adoption to determine if the plan meets the criteria, but FEMA will not approve it prior to adoption.

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

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

Appendix 2: Documentation of Participation

Documentation of Committee Participation

October 26, 2017 – Committee Meeting Agenda

A G E N D A	**Hazard Mitigation Plan & Community Wildfire Protection Plan Meeting** **Thursday, October 26th, 2017** **1:30 p.m. – 3:30 p.m.** **Location: Benton County Emergency Management** **651 Truman Avenue, Richland WA**	
1:30 pm	**OPEN – Introductions**	Benton Count EM
1:45 pm	**GROUP MEETING** I. Northwest Management Presentation ✓ Planning Process Powerpoint Presentation ✓ Preparing a HMP/CWPP ✓ Question & Answer – Committee Expectations II. Discuss Mission, Vision, and Goals Statement ✓ Present and Review statements III. Resources and Capabilities ✓ Handout form ✓ Equipment List? ✓ Logos IV. Risk Assessments ✓ Assessment Format ✓ Specific Areas of Concern V. Map Products ✓ Review Examples ✓ Data Availability? ✓ Begin Identifying Projects VI. Meeting Schedule ✓ Timeline ✓ Monthly Meeting Dates ✓ Public Meeting Dates	Northwest Management, Inc.
3:20 pm	**OPEN DISCUSSION**	Group

Contact List:

HPM/CWPP Steering Committee Lead: Benton County Emergency Management

Matthew Blackmarr
509-572-8066
m.blackmarr@bces.wa.gov

Deanna Davis
509-628-8092
d.davis@bces.wa.gov

NMI Project Managers: 208-883-4488

Mark Corrao (ext. 129)
mcorrao@nmi2.com

Bill Mathews (ext. 128)
mathews@nmi2.com

Tera King (ext. 133)
king@nmi2.com

October 26, 2017 – Committee Meeting Sign-In Sheet

Benton County Hazard Mitigation Plan
Planning Committee Meting
10/26/17

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail	Phone #
Patrick Purcell	WWEMD	ppurcell@co.walla-walla.wa.us	509 524 2902
~~Liz Hesse~~	~~WWEMD~~	~~lhesse@co.walla-walla.wa.us~~	~~509 524 2907~~
Edward Dunbar	BCFD 4	edunbar@bcfd4.org	509-578-8061
Kyle Kurth	Benton City	KKurth@CI.Benton-City.WA.US	509 366-5467
Bill Mathews	Northwest Manageant	mathews@nmiz.com	208-941-6409
Scott Clemenson	Richland Fire	sclemenson@ci.richland.wa.us	509-999-3574
Pete Rogalsky	Richland Public Works	progalsky@ci.richland.wa.us	942 7558
Cary Roe	City of Kennewick	Cary.Roe@ci.kennewick.wa	585-4797
Anthony Muai	City of Kennewick	anthony.muai@ci.kennewick.wa.us	5854386
Kevin Howard	Port of Benton	kevinh@portofbenton.com	375-3060
Jerrod MacPherson	Benton County	jerrod.macpherson@co.benton.wa.us	786-5612
Matt Blackman	BCEM	m.blackman@bces.wa.gov	

Hazard Mitigation Plan Meeting with
WA-EMD
10/26/17

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail	Phone #
Matt Blackman	BCEM	m.blackman@bces.wa.gov	
Derrick Hiebert	WA EMD	derrick.hiebert@mil.wa.gov	253-370-5432
Bill Mathews	North West Manageant	Mathews@nmiz.com	208-883-4488
Patrick Purcell	WWEMD	ppurcell@co.walla-walla.wa.us	509 524 2902
Liz Hesse	WWEMD	lhesse@co.walla-walla.wa.us	509 524 2902
Sean Davis	FCEM	sdavis@co.franklin.wa.us	509.545-3546
Deena Davis	BCEM	ddavis@bces.wa.gov	509 628-8092
Ron Duncan	BEFPD2/RFD		

December 12, 2017 –Committee Meeting Agenda

A G E N D A	**Hazard Mitigation & Community Wildfire Protection Plan Meeting** **Tuesday, December 12th, 2017** **11:00 p.m. – 1:00 p.m.** **Location: Benton County Emergency Management** **651 Truman Ave, Richland WA**	
11:00 am	**OPEN – Introductions**	Deanna Davis, Matthew Blackmarr
11:15 am	**GROUP MEETING** I. Discuss Agenda, and Non-meeting hours ✓ Additional Stakeholders or Committee Members II. Document: ✓ Proposed Outline ✓ Capabilities Assessments ✓ Review Hazard Profiles (Previous Plan & State) ✓ Status report III. Press Release IV. Risk Assessments ✓ Review Countywide Wildfire Risk Assessment ✓ Data Needs ✓ HAZUS Data for Flood Analysis V. Public Meetings ✓ Potential Outreach Methods ✓ Dates and Venues ✓ Press Release	Northwest Management, Inc.
12:30 pm	**OPEN DISCUSSION**	Group

December 12, 2017 – Committee Meeting Sign-In Sheet

Benton County Hazard Mitigation Plan
Planning Committee Meeting

December 12, 2017

Name (Please print)	Company/Agency	E-Mail	Phone #
Matthew Blackmarr	BCEM	m.blackmarr@bces.wa.gov	509-572-8066
Deanna Davis	BCEM	d.davis@bces.wa.gov	509-628-8092
Bill Mathews	Northwest Management	mathews@nmi2.com	208-741-6409
Mark Corrao	Northwest Management	mcorrao@nmi2.com	208-310-6732
Chuck Freeman	Kennewick Irr. Dist	cfreeman@kid.org	509 460-5422
Charlie Cronk	BLM	cpcronk@blm.gov	(509) 699-3337
Kyle Kurth	Benton City	KKurth@ci.Benton-City.wa.us	509-366-3467
Scott Clemenson	Richland Fire	sclemenson@ci.richland.wa.us	509-999-3574
Aaron Lambert	City of West Richland	alambert@westrichland.org	509-967-7113
SHANE O'NEILL	CITY OF RICHLAND	SONEILL@CI.RICHLAND.WA.US	942.7567
Jerrod MacPherson	Benton County	jerrod.macpherson@co.benton.wa.us	
Michelle Cooke	Benton County	michelle.cooke@co.benton.wa.us	

Benton County Hazard Mitigation Plan
Planning Committee Meeting

December 12, 2017

Name (Please print)	Company/Agency	E-Mail	Phone #
Lonnie Click	BCFD #1	Lonnie@Bentonfire.org	509-737-0911
Anthony Muai	COK	anthony.muai@ci.kennewick.wa.us	509 585 4336
Neil Hines	Kenn Fire Dept.	neil.hines@ci.Kennewick.wa.us	509 585-4453

December 12, 2017 –Committee Meeting Notes

1) Prefer the document organized by jurisdiction.
2) Capabilities assessment to follow: how each jurisdiction can respond to hazards, what plans are available, and their resources.

3) NMI will only focus on the natural hazards and the County will add in their manmade hazards of interest following the document completion to not infringe on FEMA's direction.
4) Is there a way to add flash flooding from localized storms? (also debris that enter irrigation canals and cause overtopping and damage)
5) When the wind exceeds 20mph the irrigation district deploys vegetation clearing crews to canals.
6) Ice storms and freezing rains impacting powerlines and grid supply throughout the region.
7) KID (Kennewick Irrigation Dist.) levy failure and canal lining to mitigate flood hazards for communities and residents. Also, semantics for inclusion of flooding that may occur from dam failure.
8) FEMA is completing the HAZUS runs for earthquake hazards for Benton County.
9) There are some 9-foot in diameter syphons for Kennewick that would be susceptible to earthquakes and should be included in the FEMA HAZUS modeling.
10) LiDAR flood estimation mapping for Benton at 25, 100 and 500-year event elevation levels for county risk discussions only.
11) California Ground squirrel or gophers are natural hazards that impact the irrigation canal infrastructure and have led to damage of private property and safety concerns in the past.
12) Drought challenges impact the irrigation district curtailment because people begin to use potable water for irrigation when they start getting reduced and then the officers need to be dispatched to uphold the ordinance. If the ordinance is upheld during a drought there is a risk of increased wildfire.
13) Need to add some project language for a FIREWISE program funding as they currently do not have an official program and work on an as-available business.
14) Fire map has a lot of green area and most of the county that doesn't get irrigation will indeed burn. Comment: the old plan suggested longer fire return intervals because they assumed sagebrush ecosystems….now much of the county area is cheat grass so the return interval is more like 3-5 years.
15) Condense the fire section to something simple that says "there is grass there and the wind blows a lot…so when we have a wet spring there is a greater fire danger because the fuels grow, when there is a drought there is often a less critical fire risk because the grass grows less." More of a narrative that supports the graphics that show grass and wind are the main drivers in their risk areas. Have the narrative align with the need for fuel reduction needs and infrastructure, human safety concerns. There are really only localized pockets of sage brush and then Russian Olive along water ways, everything else is grass.

16) Identify some “high priority” fuel breaks (roads, tilling, retardant etc.) as these may have a greater value and better importance to the County than just the vegetation condition. There are some areas of the County that need fuel reduction practices as well as identifying the fuel break locations. The “Rattlesnake area” is not a place they are able to treat and currently in the fire modeling we have completed it is skewing the whole heat map. We asked for a general identification of area where risk is the greatest in their experience and for them to make a “fat crayon” map.

17) Local TV network to advertise the plan public outreach meeting dates, times and locations. Kelly Mackhart is the contact. Meeting in Prosser, Richland, and Kennewick for the public meeting locations. Use the Utility bill flyers for helping to notice people.

Matt will setup an email, Facebook announcement, and link to the document on the EM webpage. NMI will develop a flyer in .PDF form to post along with the draft document for the public to view in case folks don’t want to read the document and would rather just read an overview and see the times, dates and locations of the three public meeting locations.

December 21, 2017 - Chiefs Meeting Sign-In Sheet

Fire Chiefs Meeting (CWPP/HMP)
12/21/2017

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail	Phone #
Matthew Blackmarr	BCES	m.blackmarr@bces.wa.gov	509-572-8066
Deanna Davis	BCES	d.davis@bces.wa.gov	509-628-8092
Neil Hines	KFD	neil.hines@ci.Kennewick.wa.us	509 585- 4453
Seth Johnson	WBFR	sjohnson@westbentonfirerescue.org	509-830-9532
Paul Hiebert	USFWS		
John Janak	USFWS	john_janak@fws.gov	5093785391
Tom Huntington	RF&ES	thuntington@ci.richland.wa.us	509-942-7795
Scott Clemenson	RF+ES	sclemenson@ci.richland.wa.us	509-999-3574
Lonnie Chcb	BCFD#1	Lonnie@Benton.org	509-737-0911
William Wheeler	BCFD4	wwheeler@bcfd4.org	509 430.7993

- Discussion of wildfire risks w/ local chiefs
- Reviewed maps left by Northwest Management

March 8, 2018 - Committee Meeting Agenda

AGENDA	**Hazard Mitigation & Community Wildfire Protection Plan Meeting** **Thursday, March 8th, 2018** **11:00 p.m. – 1:00 p.m.** **Location: Benton County Emergency Management** **651 Truman Ave, Richland WA**	
11:00 am	**OPEN – Introductions**	Deanna Davis,
11:15 am	**GROUP MEETING** I. Risk Assessment Workshop ✓ Review prior plans Mitigation Action Items ✓ Work through risk assessment maps to determine new Mitigation Action Items II. Public Meetings ✓ Solidify Outreach Methods ✓ Dates and Venues	Northwest Management, Inc.
12:30 pm	**OPEN DISCUSSION**	Group

District Summaries received: BCFD #2 and West Benton Fire Rescue

March 8, 2018 – Committee Sign-In Sheet

Benton County Hazard Mitigation Plan Meeting
March 8, 2018

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail	Phone #
Ken Buechler	RFD		578-9321
Bill Mathews	Northwest Management	mathews@nmi2.com	208-941-6409
Adam Herrenbruck	Northwest Management	herrenbruck@nmi2.com	(509) 520-0240
Deanna Davis	BCDM	d.davis@bces.wa.gov	628-8092
Edward Dunbar	BCFD 4	edunbar@bcfd4.org	575-8061
Neil Hines	KFD	neil.hines@ci.kennewick.wa.us	585-4536
Lonnie Click	BCFD #1	Lonnie@Bcfd1.org	737-0911
Michelle Cooke	Benton County	michelle.cooke@co.benton.wa.us	786-5612
AL LAWSON	WADNR	adam.lawson@dnr.wa.gov	509 859 2604
Kevin Howard	Port of Benton	kevinh@portofbenton.com	375-3060
Charles Freeman	KID	cfreeman@kid.org	460-5422

Benton County Hazard Mitigation Plan Meeting
March 8, 2018

Sign-In Sheet

Name (Please print)	Company/Agency	E-Mail	Phone #
Tia Burdon			509-619-5415
Kyle Kuehn	City of Benton City	KKuehn@CI.Benton-City.WA.US	509-366-3467
Jerrod MacPherson	Benton County	jerrod.macpherson@co.benton.wa.us	786-5612
Anthony Muni	City of Kennewick	Anthony.muni@ci.kennewick.wa.us	(509)585-4386
Scott Clemenson	Richland Fire + Emergency Services	SClemenson@ci.richland.wa.us	509-999-3574
William Wheelon	BCFD4	wwheelon@bcfd4.org	509.430.7487
Seth Johnson	WSDFR	sjohnson@westernfire.wa.org	509-850-9532

March 8, 2018 –Committee Meeting Minutes

Agenda Item #1 – Introductions

Deanna Davis opened the meeting by introducing Bill Mathews and Adam Herrenbruck, both with NMI. Bill briefly discussed where the plan stands in the update process. He plans to start sending out portions of the plan out, 1-2 chapters at a time, for the committee to review and give feedback.

Another topic Bill brought up was the location of the flood map data. So far NMI has seen the earthquake data sent by the state but has not seen the new flood hazard data. Some members of the committee noted that the data needed might be found at the Army Corps of Engineers or the irrigation district.

Agenda Item #2 – Risk Assessment Workshop

Bill led a review of the mitigation action items that were expressed in previous plans. Using a handout that summarized previous mitigation projects, the committee discussed: 1) are the action items still current (have they been completed or are they still necessary); 2) is there a more specific timeframe for implementation of each action item; and 3) are the details regarding each action item still applicable or specific enough.

Many changes were made to the past action items due to vague language, completed initiatives, or shifts in objectives. The changes recommended by the committee were recorded so they could be incorporated into the updated HMP. Details of some action items were unknown by those present at the meeting. These action items will need to be discussed by the appropriate parties and then the feedback will be sent to Deanna Davis and NMI.

Bill asked the committee members present to consider any new action items they might want to incorporate into the HMP update. The committee discussed adding some initiatives, particularly ones that address landslide and earthquake mitigation. No specific action items were raised by the committee, but some suggestions might be raised over the next few weeks.

Agenda Item #3 – Plan for moving forward (public meetings)

Bill asked the committee how they would like to proceed with the HMP update process, specifically regarding the public meeting portion. It was suggested and agreed upon to hold the public meetings in three different locations throughout the county, on two different days. The locations chosen were Kennewick, Richland and Prosser, but specific venues have not yet been determined. Tentative dates for these meetings are April 25, at 4:00 in Richland and 6:00 in Kennewick and April 26 in Prosser. The exact times and dates will be finalized when venue

availability is determined by Deanna. There will also be a planning committee meeting prior to the first meeting on April 25, at Benton County Emergency Management.

Agenda Item #4 – CWPP Discussion

Bill led the area fire chiefs in a review of the fire hazard risk map, seeking their feedback and corrections. Many recommendations were made and noted and will be incorporated into an updated hazard risk map and hazard vulnerability assessments.

Bill asked if water sources were necessary for inclusion in the hazard risk map. It was determined that the sources should be included in case the information is needed for any future funding.

The next CWPP meeting was scheduled for Wednesday, April 18 from 9:00 a.m. to 11:00 a.m. at Benton County Emergency Management.

March 18, 2018 – Chiefs Meeting Sign-In Sheet

Benton County Hazard Mitigation Plan
Meeting- CWPP Specific
April 18, 2018

Name (Please print)	Company/Agency	E-Mail	Phone #
Alan Lawson	WADNR	alan.lawson@dnr.wa.gov	509 859 2641
Lonnie Click	BCFD#1	Lonnie@Bentonfire.org	509-737-0911
Seth Johnson	WBFR	sjohnson@westbentonfire.wsfca.org	509-786-3873
Bonnie Benitz	BCFD4	bbenitz@bcfd4.org	509-713-9107
Scott Clemenson	RFES	sclemenson@ci.richland.wa.us	509-999-3574
Kyle Kuerth	Benton City	KKuerth@CI.Benton-City.WA.US	509-366-3467
Anthony Muai	City of Kennewick	anthony.muai@ci.kennewick.wa.us	509-585-4386
Neil Humes	City of Kennewick FD	neil.humes@ci.kennewick.wa.us	509-585-4611

July 19th, 2018 –Committee Meeting Agenda

A G E N D A	**Hazard Mitigation & Community Wildfire Protection Plan Meeting** **Thursday, July 19, 2018** **11:30 p.m. – 1:30 p.m.** **Location: Benton County Emergency Management** **651 Truman Ave, Richland WA**	
11:30 am	**OPEN – Introductions**	Deanna Davis,
11:40 am	**GROUP MEETING** I. Quick Status Update II. Hazard Mitigation Plan ✓ Review draft ✓ Discuss missing pieces and committee comments III. Community Wildfire Protection Plan ✓ Review committee draft ✓ Discuss missing components ✓ Threat Level Mapping ✓ Project map review IV. Next Steps ✓ Public comment periods ✓ Review process for state and federal review ✓ Timelines for completion	Northwest Management, Inc.
1:30 pm	**OPEN DISCUSSION**	Group

July 19th, 2018 –Committee Meeting Sign-In Sheet

Benton County Hazard Mitigation Plan Meeting
July 19th 2018

Sign-In Sheet

	Name (Please print)	Company/Agency	E-Mail	Phone #
★	Deanna Davis	BCEM	d.davis@bces.wa.gov	380-4522
	Kyle Kurth	Benton City	KKurth@ci.Benton-City.WA.us	588-3322
★	Scott Clemenson	RF+ES	sclemenson@ci.richland.wa.us	509-999-3574
	Aaron Lambert	City of W. Richland	alambert@westrichland.org	967-5902
	SHANE O'NEILL	CITY OF RICHLAND	SONEILL@CI.RICHLAND.WA.US	942-7557
★	Lori Ferris	BCEM	l.ferris@bcesWA.gov	572-8066
	Anthony Muai	Kennewick	anthony.muai@ci.kennewick.wa.us	585-4386
	Michelle Cooke	Benton Co.	michelle.cooke@co.benton.wa.us	509-786-5612
	Tera R. King	NMI	tking@nmi2.com	208-818-3411
★	William Wheelan	BCFD4	wwheelan@bcfd4.org	509.430.7993
★	Neil Hines	KFD	neil.hines@ci.KennewickWA.us	585-4453

★ Stayed for CWPP specific planning mtg.

Documentation of Public Involvement

November 15th, 2017 -Press Release to Public

Benton County

Media Release

From: **Deanna Davis, Emergency Manager**
Date: **November 15, 2017**
RE: **Benton County Natural Hazard Mitigation Plan & Community Wildfire Protection Plan Update**

Benton County Set to Update Hazard Risk Plans

Richland, WA. Benton County has launched a project to update the Benton County Natural Hazard Mitigation Plan. This update will include an update of the Benton County Community Wildfire Protection Plan as well. Local agencies and organizations in Benton County have created a committee to complete the required 5-year updates of these documents as part of the FEMA Pre-Disaster Mitigation program and National Fire Plan and Healthy Forests Restoration Act. The project is being funded through a grant from FEMA.

The planning update will include risk analyses, vulnerability assessments, and mitigation recommendations for the hazards of flood, landslide, earthquake, severe weather, wildland fire, and others.

Northwest Management, Inc. has been retained by Benton County to provide risk assessments, hazard mapping, field inspections, interviews, and to collaborate with the planning committee to update the Plans. The committee includes representatives from local communities, rural and wildland fire districts, Washington DNR, Bureau of Land Management, highway districts, area businesses, various Benton County and City departments, and others.

One of the goals of the planning process will be to increase the participating jurisdictions' eligibility for additional grants that will help minimize the risk and potential impact of disaster events. The planning team will be conducting public meetings to discuss preliminary findings and to seek public input on the Plans' recommendations. A notice of the dates and locations of these meetings will be posted in local newspapers. Once completed, the updated draft Plans will also be available for public review and comment.

The first meeting was held on October 26th, located at the Benton County Emergency Management Office at 651 Truman Ave, Richland, Wa 99352. For more information on the Benton County Natural Hazard Mitigation Plan update contact Deanna Davis, Emergency Manager at (509)628-8092, email d.davis@bces.wa.gov

April 18th, 2018 – Press Release: Schedule of Public Meetings

Public meeting comments on Benton County Hazard Mitigation plan:

Wednesday April 25th 4:00 P.M.
Richland Public Library Conference Rm A&B
955 Northgate, Richland WA 99352

Wednesday April 25th 5:00 P.M.
West Benton Fire & Rescue
1200 Grant, Prosser WA 99350

Wednesday April 25th 6:00 P.M.
Benton PUD Auditorium
2721 W. 10th Kennewick WA 99336

For more information call 509-628-8092

ADD TO BEGIN ON APRIL 18TH AND END ON APRIL 26TH – ADD CAN RUN IN THE MISC ANNOUCMENTS SECTION.

Contact: Deanna Davis, EM Manager
Benton County Emergency Services
509-628-8092 or cell: 509-380-4522
d.davis@bces.wa.gov

April 18th, 2018 – Newspaper Advertisement for Public Meetings


Public meeting comments on Benton County Hazard Mitigation plan:
Wednesday April 25th 4:00 P.M.
Richland Public Library Conference Rm A&B 955 Northgate, Richland WA 99352
Thursday April 26th 5:00 P.M.
West Benton Fire & Rescue 1200 Grant, Prosser WA 99350
Wednesday April 25th 6:00 P.M.
Benton PUD Auditorium 2721 W. 10th Kennewick WA 99336
For more information call 509-628-8092

April 25th and 26th, 2018 - Public Meeting Presentation

1

2

3

4

5

6


Tornado events in Washington state
Severe Weather

7


Wildfire

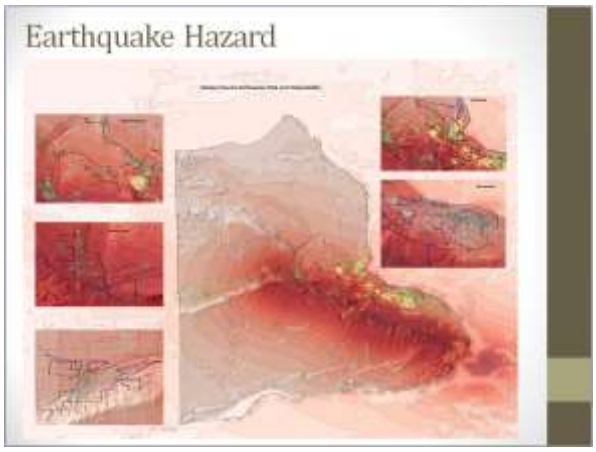
8


Flood
City Herald
Kennewick Hit Hard

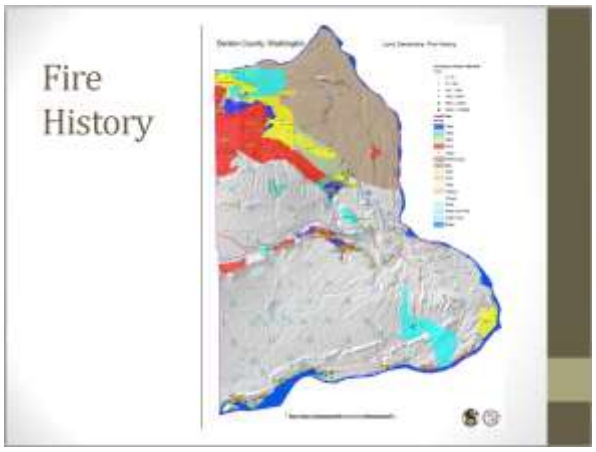
9


Landslide
Prone
Landscapes

10


Earthquake Hazard

11


Fire
History

12

Wildland Urban Interface

13

Preparedness

- Emergency Services
- Fire Protection
- Weather Impacts
- Flood Protection/Programs
- Earthquake, Landslide, & Storm Readiness
- Hospital Protection
- Public Works/Highway District Readiness
- Communications

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Types of Projects

- Defensible Space and Fuels Treatments
- Floodplain Management and Infrastructure Upgrades
- Slope Stabilization
- Studies (e.g. watershed) and Evaluations (e.g. culvert capacity)
- Access Improvements
- Emergency Response Needs
- Policy Issues
- Infrastructure Hardening and Communication Upgrades
- Public Education

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Public Involvement

- Press Releases and Social Media
- Public Meetings x3
- Public Review of the DRAFT Plan
- Open public adoption hearings

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Your Input

- Maps on the walls – Mark them up!
- Talk to one of the planning committee members.
- Let us know your ideas and concerns.
- Make this YOUR Plan!

Thank you for attending and participating!
Please visit with us.

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Benton County, Washington
Multi-Hazard Mitigation Plan Update and Community Wildfire Protection Plan

18

Reciept for Public Comment Press Release

Tri-City Herald
tricityherald.com
VOICE OF THE MID-COLUMBIA
WINE PRESS

Order Confirmation

Customer
RICHLAND CITY OF

Customer Account
[redacted]

Customer Address
505 SWIFT BLVD., MS-09
RICHLAND WA 993523510 USA

Customer Phone
509-942-7547

Customer Fax
509-942-7397

Sales Rep
ccortez@tricityherald.com

Payor Customer
RICHLAND CITY OF

Payor Account
[redacted]

Payor Address
505 SWIFT BLVD., MS-09
RICHLAND WA 993523510 USA

Payor Phone
509-942-7547

Customer EMail

Order Taker
ccortez@tricityherald.com

PO Number	Payment Method	Blind Box	Tear Sheets	Proofs	Affidavits
	Invoice		0	0	0

Net Amount	Tax Amount	Total Amount	Payment Amount	Amount Due
$110.37	$0.00	$110.37	$0.00	$110.37

Ad Order Number
0003971913

Order Source

Ordered By
Deanna Davis

Special Pricing

Invoice Text

Promo Type

Package Buy

Materials

Ad Order Information

Ad Number	Ad Type	Production Method	Production Notes
0003971913-01	TRI-Class Liner	AdBooker	

External Ad Number	Ad Attributes	Ad Released	Pick Up
		No	

Ad Size	Color
1 X 10 li	

Product	Placement	Times Run	Schedule Cost
TRI- Tri-City Herald	0200 - Announcements	7	$72.45

Run Schedule Invoice Text
Benton County Emergency Service is solic

Position
0275 - Misc. Announcements

Run Dates
11/27/2018, 11/28/2018, 11/29/2018, 11/30/2018, 12/02/2018, 12/03/2018, 12/04/2018

Product	Placement	Times Run	Schedule Cost
TRI-upsell.tricityherald.com	0200 - Announcements	7	$31.92

Run Schedule Invoice Text
Benton County Emergency Service is solic

Position
0275 - Misc. Announcements

Run Dates
11/27/2018, 11/28/2018, 11/29/2018, 11/30/2018, 12/02/2018, 12/03/2018, 12/04/2018

Product	Placement	Times Run	Schedule Cost
TRI- Tri-City Herald	Just In - Just In	1	$6.00

Run Schedule Invoice Text
Benton County Emergency Service is solic

Position
Just In - Just In

Run Dates
11/27/2018

Benton County Emergency Service is soliciting Public Comment on the Benton County Community Wildfire Protection Plan, from Nov 26th – Dec 7th.Please visit **www.bces.wa.gov** to find a copy of the plan or view a hard copy at the Richland Public Library. Comments can be sent to ***publiccomment@bces.wa.gov*** . Questions please call 628-2600.

How to Cite this Document:

This plan was developed by Northwest Management, Inc. under contract with the Bureau of Land Management and Benton County Emergency Management.

Citations:

Nelson, Eric. *Lead Authors.* 2018 Benton County, Washington Community Wildfire Protection Plan. Northwest Management, Inc., Moscow, Idaho. Pp ##.

Nelson, Eric. *Lead Authors.* 2018 Benton County, Washington Community Wildfire Protection Plan Appendices. Northwest Management, Inc., Moscow, Idaho. Pp ##.

Northwest Management, Inc.
233 East Palouse River Drive
PO Box 9748
Moscow ID 83843

208-883-4488 Telephone
208-883-1098 Fax
NWManage@consulting-foresters.com
http://www.Consulting-Foresters.com/

Signature Pages

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

Benton County Board of Commissioners

12-18-2018

James Beaver,
Benton County Commissioner District #3 — Date

12-18-2018

Jerome Delvin,
Benton County Commissioner District #1 — Date

12-18-2018

Shon Small
Benton County Commissioner District #2 — Date

Vince Beasley, Chief
Kennewick – *Kennewick Fire Department*

12/18/18
Date