ASOTIN COUNTY

MULTI-HAZARD MITIGATION PLAN

2021 UPDATE

ASOTIN COUNTY, WASHINGTON

Prepared By

Northwest Management, Inc.

FORWARD

"Hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. Mitigation activities may be implemented prior to, during, or after an incident. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs."[1]

The **Asotin County Multi - Hazard Mitigation Plan** was developed throughout 2019-2020 by the Asotin County planning team led by Asotin County Emergency Services, in cooperation with Northwest Management, Inc. of Moscow, Idaho.

This Plan satisfies the requirements for a local multi-hazard mitigation plan and a flood mitigation plan under 44 CFR Part 201.

[1] Federal Emergency Management Agency. "Local Multi-Hazard Mitigation Planning Guidance." July 1, 2008.

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CHAPTER 1 – OVERVIEW OF THE PLAN AND ITS DEVELOPMENT

Introduction

The previous version of this plan – the 2011 Southeast Washington Multi-Hazard Mitigation Plan – was a regional plan completed in collaboration and professional cooperation between Asotin County, Columbia County, and Garfield County. Planning teams were led by the Emergency Managers of each county and the agencies and organizations from Asotin County that participated in the original plan included the Asotin County Commissioners and county departments, Asotin County Fire District #1, the city of Asotin, and the city of Clarkston. The planning team used analysis, assessments of natural hazards, and other factors focused on reducing threats to people, structures, infrastructure, and unique ecosystems of the area.

In 2019, Asotin County Emergency Services contracted with Northwest Management, Inc. (NMI) to facilitate an update of the Southeast Washington Multi-Hazard Mitigation Plan for Asotin County. This document contains an updated identification and assessment of various potential hazards and helps maintain Asotin County's eligibility for grants and other funding. This MHMP will integrate the Asotin County Community Wildfire Protection Plan through the Wildland Fire hazard section.

The planning team responsible for implementing this update project was led by Asotin County Emergency Services with assistance from NMI. Several individuals and organizations from the public and private sector were invited to participate in the plan update. At various stages in the process, the following agencies/organizations were invited to collaborate in some way: Umatilla National Forest, U.S. Army Corps of Engineers, Washington Department of Fish and Wildlife, Avista Corporation, Idaho Power, and Clearwater Power. Asotin County was also in discussion initially with neighbors Columbia County and Garfield County when deciding on the plan update process because they were partners in the 2011 MHMP (Garfield County also opted to update their plan at this time). Nez Perce County, Idaho Emergency Management was also contacted early in the planning process as a neighboring planning partner.

Table 1: Organizations and departments that participated in the Asotin County Multi-Hazard Mitigation Plan, 2021 update

Asotin County Emergency Management	**Asotin County Sheriff's Office**
Asotin County Commissioners	**Asotin County Fire District #1**
Asotin County Assessor's Office	**Asotin County Public Works/GIS**
City of Clarkston	**City of Asotin**
Asotin County Conservation District	**Blue Mountain Fire District**
Asotin County Public Utility District	**Asotin County Health District**
Washington Emergency Management Division	

Planning Philosophy and Goals

Asotin County Planning Philosophy

This effort will utilize the best and most appropriate science, gather input from all partners, and integrate local and regional knowledge about natural hazards while considering the needs of local citizens, stakeholders, and the regional economy. Through partnerships, the planning effort will reduce the vulnerability to natural hazards and protect the health, safety, welfare and economy of the communities within Asotin County.

Mission Statement

The mission of the Asotin County Hazard Mitigation Plan is to protect the health, safety, property, environment, and economy of the communities within Asotin County, and to increase resiliency by partnering to identify and reduce future vulnerabilities to natural hazards through cost-effective and sustainable efforts.

Jurisdictional Planning and Mitigation Goals

For the 2019-20 planning process, each adopting jurisdiction in Asotin County was asked to review and update its own set of planning and mitigation goals that were established for the 2011 MHMP. During one of the earlier planning advisory group meetings, the group discussed the planning philosophy and mission statement and revised them to better reflect the needs and expectations of Asotin County. The group also reexamined the goals specified for each adopting jurisdiction and these goals were discussed by each organization's representatives outside of the planning team meetings. The goals for the 2021 update, submitted by each jurisdiction, are summarized as follows:

Asotin County

1. Planning Goal – Identify all hazards that may affect life and property in Asotin County and develop solutions to effectively mitigate their risks.
2. Planning Goal – Continue to work with the cities, fire districts, and other partners, through current mutual aid agreements, to reduce losses.
3. Planning Goal – Work with all jurisdictions and local organizations to improve sheltering capacity in case of severe hazard events.
4. Planning Goal – Strengthen emergency operations plans and procedures by increasing collaboration among public agencies, non-profit organizations, businesses, and industry through an Asotin County all-hazard LEPC (Local Emergency Planning Committee).
5. Planning Goal – Improve interoperable emergency communications and develop a communications interoperability plan.
6. Planning Goal – Identify hazardous material flow through the county.
7. Mitigation Goal – Enhance Asotin County's ability to respond to and notify the public about hazard situations using some kind of mass notification system ("reverse 911", social media, and other media).

8. Mitigation Goal – Identify areas of potential flooding and work with Emergency Services to establish and action plan for future events.
9. Mitigation Goal – Protect infrastructure, reduce damage to property, and improve public awareness regarding wildland fire.
10. Mitigation Goal – Reduce damage to power supplies, infrastructure, and property from severe storm damage.
11. Mitigation Goal – Develop a county-wide evacuation plan.

Asotin County Fire District #1

1. Planning Goal – Improve all risk preparedness to protect life, property and environment.
2. Planning Goal – Help educate public on hazard/disaster preparedness.
3. Planning Goal – Seek opportunities to strengthen hazard and rescue response on the rivers.
4. Planning Goal – Strengthen Emergency Operations Center and plans with the County.
5. Mitigation Goal – Improve fire hazards in the urban interface.
6. Mitigation Goal – Increase County participation to alleviate hazard risks with future development.
7. Mitigation Goal – Identify high risk areas for natural or manmade hazards.
8. Planning Goal – Identify funding sources for mandatory equipment and personal protective gear upgrades and work on recruitment and retention of firefighters.

City of Asotin

1. Planning Goal – Identify funding sources for mandatory equipment and personal protective gear upgrades, building upgrades, and work on recruitment and retention of first responders and critical staff.
2. Mitigation Goal – Reestablish the marina as a functional resource and asset for Asotin.
3. Mitigation Goal – Lessen the impact of flooding on the community to better protect life and property.
4. Mitigation Goal – Identify high risk areas for natural or manmade hazards.
5. Mitigation Goal – Work with the Asotin County Public Health Department on preventing septic tank failures along Asotin Creek above Asotin.
6. Mitigation Goal – Enhance the City's ability to respond to and notify the public about hazard situations. (Mass notification systems, "reverse 911", social media, and other media)
7. Planning Goal – Identify all hazards that may affect life and property in Asotin, develop solutions to effectively mitigate those risks, and work with emergency management to establish an action plan for future events.
8. Mitigation Goal – Reduce damage to power supplies, infrastructure, and structures from severe storm damage.
9. Mitigation Goal – Assist with elderly and vulnerable adults during times of concern (heavy smoke, extreme heat, snow)
10. Planning Goal – Open dialog and educate the public on all hazard events (floods, storms, fires, power outages, heavy smoke conditions) for their own planning, prevention, and preparedness.

City of Clarkston

1. Planning Goal – Strive for improved fire protection through beneficial mutual aid agreements that benefit all jurisdictions involved.
2. Planning Goal – Provide an educational process that identifies simple measures citizens can accomplish to help prevent personal property flooding and other damages from severe storms.
3. Mitigation Goal – Provide proper enforcement of applicable codes to assure protection of properties during severe storms or other natural disasters.
4. Mitigation Goal – Participate in the National Flood Insurance Program.
5. Mitigation Goal – Identify and protect critical infrastructure through proper operations and maintenance.

Asotin County Conservation District

1. Planning Goal – Work collaboratively with local, state and federal agencies to ensure a coordinated approach for hazard mitigation in Asotin County.
2. Mitigation Goal – Secure funding for hazard risk assessments and mitigation project development and implementation.
3. Planning Goal – Educate communities about the importance of natural hazard preparedness.
4. Planning Goal – Help educate public on hazard/disaster impacts and natural resource management.
5. Planning Goal – Promote conservation practices and best management practices that will protect and enhance the natural resources of Asotin County.
6. Mitigation Goal – Provide landowners of Asotin County with technical and financial assistance to conserve, protect, and enhance the natural resources.
7. Planning Goal – Conduct Asotin County Floodplain study to document areas for potential flood hazard and identify projects to reduce flood impacts while improving floodplain utilization.
8. Mitigation Goal – Reduce flood hazards to protect natural resources and land uses.
9. Mitigation Goal – Reduce fire hazards and fuel loads in the urban interface and critical areas.

Blue Mountain Fire District #1

1. Planning Goal – Strengthen communication with neighboring agencies.
2. Planning Goal – Streamline process for requesting\sending mutual aid with neighboring agencies.
3. Planning Goal – Identify and document State Mobilization process.
4. Planning Goal – Identify and update the GIS system for Emergency Medical personnel and other first responders to locate addresses in the rural areas.
5. Planning Goal – Identify routes for evacuation and verify that all addresses are clearly visible from the road.
6. Mitigation Goal – Identify high risk areas for natural or manmade hazards.
7. Mitigation Goal – Strengthen public awareness to reduce the potential for wildfire risks and other factors considered with the intent to reduce the potential for wildfires to threaten people, structures, and infrastructures.

Integration with Other Local Planning Mechanisms

During the development of this Hazard Mitigation 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 hazard mitigation objectives outlined in this document. The following narratives help identify and briefly describe some of the existing planning documents and ordinances considered during the development of this plan. This list does not necessarily reflect every plan, ordinance, or other guidance document within each jurisdiction; however, this is a summary of the guidance documents known to and recommended for review by members of the planning advisory group.

Emergency Action Plan for the Hells Canyon Dam and Power Plant

The purpose of the Emergency Action Plan is to provide a detailed plan of operations and a notification flowchart in the event of a hazardous or an emergency condition existing at the Hells Canyon Dam. Following the guidelines and notification flowcharts described in the Emergency Action Plan will provide maximum early warning of a potentially hazardous condition at the Hells Canyon Dam to persons downstream. The document includes contact information, inundation maps, and predicted timeframes for flood waves in the event of a dam break.

Flood Emergency Subplans for Notification and Inundation Maps – Dworshak Dam and Reservoir

The document provides flood emergency planning and guidance for implementing flood control procedures and evacuation of flood areas in case of flood emergencies. The document includes inundation maps and predicted timeframes for floodwaves in the event of a dambreak.

Asotin County Comprehensive Emergency Management Plan (CEMP)

In 2009, Asotin County Emergency Management completed an Emergency Operations Plan and this plan is currently being rewritten as a comprehensive emergency management plan. This project was started before the COVID-19 pandemic sidetracked it and the project will recommence when possible. Planning priorities and hazard mitigation objectives defined in this 2021 multi-hazard mitigation plan update will be considered and implemented where applicable so that all planning efforts mesh well and do not create conflict or confusion.

Asotin County Hazard Identification and Vulnerability Assessment

The Asotin County Hazard Identification and Vulnerability Assessment (HIVA) was adopted by the Asotin County Commissioners in 2003. A hazard by hazard risk and vulnerability assessment has since been conducted via the multi-hazard mitigation plan. Therefore, much of the information in the HIVA has and will be updated, expanded on, or replaced whenever an update to the MHMP is conducted. The following highlights some details and aspects of the HIVA.

“The HIVA provides information on potential natural and technological (man-made) hazards, which can adversely impact the people, economy, environment, and property of Asotin County It serves as a basis for City/County-level emergency management programs and assists political subdivisions in the development of similar documents focused on local hazards. It is the foundation of effective emergency management and identifies the hazards that organizations must mitigate against, prepare for, respond

to, and recover from in order to minimize the effects of disasters and emergencies. The information is extracted from various publications with contributions from technical experts. The HIVA is not a detailed study, but a general overview of hazards that can cause emergencies and disasters."

"State law requires all political subdivisions to be part of an emergency management organization and to have an emergency management plan. Washington Administrative Code 118-30 requires that the emergency management plans be based on a written assessment and listing of the hazards to which the political subdivision is vulnerable. This document achieves that requirement for the Asotin County Comprehensive Emergency Management Plan (CEMP)."

Asotin County Flood Damage Prevention Ordinance

The Flood Damage Prevention Ordinance was adopted to promote public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas through participation in the National Flood Insurance Program (NFIP). The ordinance includes standards and provisions that encourage sound floodplain management and when implemented allows property owners to obtain flood insurance at a more affordable rate. In order to accomplish its purposes, the ordinance includes methods and provisions for:

1. Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;
2. Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
3. Controlling the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel flood water;
4. Controlling filling, grading, dredging, and other development which may increase flood damage; and
5. Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or may increase flood hazards in other areas.

Asotin County Community Wildfire Protection Plan, 2008

This Community Wildfire Protection Plan (CWPP) for Asotin County is the result of analyses, professional cooperation and collaboration, assessments of wildfire risks and other factors considered with the intent to reduce the potential for wildfires to threaten people, structures, infrastructure, and unique ecosystems in Asotin County, Washington. The Plan details the Asotin County's response capabilities as well as lists a mitigation strategy and proposed projects recommended to lessen the impacts of wildland fire. Asotin County has made it a priority to update this plan as part of its mitigation and planning strategy and components of the 2021 MHMP update will incorporated into any future updates to the CWPP.

Other Plans and Ordinances Also Considered During the Planning Process

- Subdivision Ordinance
- Zoning Ordinance
- Burning Ordinance
- Controlled Burning Policy
- Solid Waste Management Plan
- Stormwater construction ordinance
- Southeast Washington Economic Development Plan
- Clarkston & Asotin Co. Transportation Plan

Incorporating the MHMP into Existing Planning Mechanisms

Asotin County

Past iterations of this plan have been incorporated into other county-level planning mechanisms in various ways. The 2011 Southeast Washington Multi-Hazard Mitigation Plan provided guidance for various hazard mitigation actions, some of which were explicitly implemented. The construction of a new station for the Asotin County Fire District #1 was a key mitigation action item in the 2011 plan and since the last update that project has been completed. The construction of the fire station required collaboration and planning between the county, the fire district, and other planning partners. The new fire station does and will provide additional functions for the county and other entities. The station will be used as the Asotin County Emergency Operations Center and two nearby schools will use it for an evacuation location. The state of Washington DNR is another planning partner to benefit from the new station as some DNR fire crews will be working out of the station as well. The areas that the Asotin County Multi-Hazard Mitigation Plan is incorporated into existing planning mechanisms can and should be expanded to include more county-wide plans and planning efforts.

Asotin County will utilize the 2021 MHMP update for all hazard mitigation planning and mitigation strategy. Future planning efforts will be conducted in consultation with the research and conclusions identified in this plan. Any county-led development, project implementation, or policy decisions will have this MHMP as a reference tool and guiding document. The county can and should consider the mitigation action items of all adopting jurisdictions, as defined in chapter 5, whenever studying budgets, funding allocations, or project priorities.

Asotin County Fire District #1

The most significant way that the 2011 MHMP was integrated into other planning mechanisms for the fire district was in the implementation of projects. The construction of a new fire station was a mitigation action item in the 2011 plan and since the last update that project has been completed. The construction of the fire station required collaboration and planning between the county, the fire district, and other planning partners. The 2011 plan played a key role in the fire district securing a $750,000 Community Development Block Grant. The station will also be used as the Asotin County Emergency Operations Center and two nearby schools will use it for an evacuation location. This highlights the importance the 2011 MHMP had regarding planning and collaboration between different partners.

Asotin County Fire District #1 will utilize the 2021 MHMP update for all hazard mitigation planning and mitigation strategy. The fire district will use this MHMP as a reference tool and guiding document for future planning efforts and project decisions. The fire district can and should consider both theirs and the county's mitigation action items defined in chapter 5 whenever studying budgets, funding allocations, or project priorities.

City of Asotin

The 2011 MHMP was not explicitly incorporated into planning mechanisms for the city of Asotin after the plan was adopted. There were some unrealized mitigation action items identified in 2011 that were carried over for the 2021 plan as key projects, as well as new projects. These mitigation actions will be prioritized to be incorporated into planning mechanisms in the future.

The city of Asotin will utilize the 2021 MHMP update for all hazard mitigation planning and mitigation strategy. Asotin will use this MHMP as a reference tool and guiding document for future planning efforts and project decisions. The city can and should consider both the Asotin County and the city of Asotin mitigation action items defined in chapter 5 whenever studying budgets, funding allocations, or project priorities.

City of Clarkston

The most significant way that the 2011 MHMP was integrated into other planning mechanisms for the city of Clarkston was in the implementation of a key project. The city continued the remodeling of the public safety building to create a "campus". This also included the expansion of the fire station. This required the city to prioritize mitigation strategy from the 2011 plan while conducting regular planning and project implementation by the city and its planning partners.

The city of Clarkston will utilize the 2021 MHMP update for all hazard mitigation planning and mitigation strategy. Clarkston will use this MHMP as a reference tool and guiding document for future planning efforts and project decisions. The city can and should consider both the Asotin County and the Clarkston mitigation action items defined in chapter 5 whenever studying budgets, funding allocations, or project priorities.

Asotin County Conservation District

The conservation district is a new adopting jurisdiction for the 2021 plan update. However, the district has incorporated certain components of the 2011 MHMP in its own planning efforts as a planning partner and as a partner in various hazard mitigation projects. The watershed assessment project was originally a county project taken on my various planning partners and funding partners. Implementation of this project has required collaboration between groups with an emphasis on prioritizing this project as identified in the 2011 plan. The project is in an advanced phase and will continue to require the various partners to incorporate and prioritize the project for further implementation.

Asotin County Conservation District will utilize the 2021 MHMP update for all hazard mitigation planning and mitigation strategy. The conservation district will use this MHMP as a reference tool and guiding document for future planning efforts and project decisions. The district can and should consider both

theirs and the county's mitigation action items defined in chapter 5 whenever studying budgets, funding allocations, or project priorities.

Blue Mountain Fire District #1

The Blue Mountain Fire District #1 is a new adopting jurisdiction for the 2021 plan update. The fire district has contributed to planning efforts in Asotin County as a partner and collaborator and will play a key role in the development and update of the community wildfire protection plan.

Blue Mountain Fire District #1 will utilize the 2021 MHMP update for all hazard mitigation planning and mitigation strategy. The fire district will use this MHMP as a reference tool and guiding document for future planning efforts and project decisions. The fire district can and should consider both theirs and the county's mitigation action items defined in chapter 5 whenever studying budgets, funding allocations, or project priorities.

Guiding Principles

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 new local Natural Hazard Mitigation Plan requirements for HMGP and PDM eligibility are based on the Disaster Mitigation Act of 2000, which amended the Stafford Disaster Relief Act to promote an integrated, cost effective approach to mitigation. Local Natural 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.

To be eligible for project funds under the Flood Mitigation Assistance (FMA) program, communities are required under 44 CFR Part 79.6(d)(1) to have a mitigation plan that addresses flood hazards. On October 31st, 2007, FEMA published amendments to the 44 CFR Part 201 at 72 Federal Reg. to incorporate mitigation planning requirements for the FMA program (44 CFR Part 201.6). The revised Local Mitigation Plan Review Crosswalk (October 2011) used by FEMA to evaluate local hazard mitigation plans is consistent with the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended by Section 322 of the Disaster Mitigation Act of 2000, the National Flood Insurance Act of 1968, as amended by the National Flood Insurance Reform Act of 2004 and 44 Code of Federal Regulations (CFR) Part 201 – Mitigation Planning, inclusive of all amendments through July 1, 2008, was used as the official guide for development of a FEMA-compatible Asotin County, Washington Multi-Hazard Mitigation Plan.

FEMA will only review a local Multi-Hazard Mitigation Plan submitted through the appropriate State Hazard Mitigation Officer (SHMO). Draft versions of local Natural Hazard Mitigation Plans will not be

reviewed by FEMA. FEMA will review the final version of a plan prior to local adoption to determine if the plan meets the criteria, but FEMA will be unable to approve it prior to adoption.

A FEMA designed plan will be evaluated on its adherence to a variety of criteria, including:

- Adoption by local governing bodies and multi-jurisdictional plan adoption
- Multi-jurisdictional planning participation and documentation of the planning process Identifying hazards and profiling hazard events
- Assessing vulnerability by identifying assets, estimating potential losses, and analyzing development trends
- Multi-jurisdictional risk assessment
- Local hazard mitigation goals and identification, analysis, and implementation of mitigation measures
- Multi-jurisdictional mitigation strategy
- Monitoring, evaluating, and updating the plan
- Implementation through existing programs
- Continued public involvement

State and Federal CWPP Guidelines

The Community Wildfire Protection Plan integrated into this document 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). The Community Wildfire Protection Plan has been prepared in compliance with:

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

Update and Review Guidelines

Deadlines and Requirements for Regular Plan Reviews and Updates: In order to apply for a FEMA PDM project grant, Tribal and local governments must have a FEMA-approved mitigation plan. Tribal and local governments must have a FEMA-approved mitigation plan in order to receive HMGP project funding for disasters declared on or after November 1, 2004. States and Tribes must have a FEMA-approved Standard or Enhanced Mitigation Plan in order to receive non-emergency Stafford Act assistance (i.e., Public Assistance Categories C-G, HMGP, and Fire Management Assistance Grants) for disasters declared

on or after November 1, 2004. State mitigation plans must be reviewed and reapproved by FEMA every three years. Local Mitigation Plans must be reviewed and reapproved by FEMA every five years.

Plan updates. In addition to the timelines referenced above, the Rule includes the following paragraphs that pertain directly to the update of State and local plans:

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

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

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

CHAPTER 2 – THE PLANNING PROCESS

Documenting the Planning Process

Documentation of the planning process, including public involvement, is required to meet FEMA's DMA 2000 (44CFR§201.6(b) and §201.6(c)(1)) for an updated local mitigation plan. This section includes a description of the planning process used to produce this plan, including how it was prepared, who was involved in the process, and how all the involved agencies participated.

Description of the Planning Process

2011: Southeast Washington Multi-Hazard Mitigation Plan (SEWA MHMP)

The 2011 plan, hereafter referred to as the SEWA MHMP, was developed through a collaborative process led by the emergency managers of each county through regional group meetings. The planning philosophy employed in this project included the open and free sharing of information with interested parties. Information from federal and state 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 cooperators.

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 hazards in each County to ensure a robust dataset for making inferences about hazards in Asotin, Columbia, and Garfield Counties specifically.

2. **Field Observations and Estimations** about risks, juxtaposition of structures and infrastructure to risk areas, access, and potential mitigation projects.

3. **Mapping** of data relevant to pre-disaster mitigation control and mitigation, 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, providing ample review and integration of committee and public input, followed by signing of the final document.

2021 Asotin County Multi-Hazard Mitigation Plan

The 2021 Multi-Hazard Mitigation Plan update will be specific to Asotin County to better identify specific hazards and mitigation planning efforts. The county applied for and was awarded a Pre-Disaster Mitigation grant from FEMA, selected Northwest Management, Inc. as contractor, and formed the planning team based on the adopting jurisdictions in the original plan. After some initial meetings and consultation with NMI, more groups and individuals were invited to take part in the planning process. Relevant aspects and pertinent information in the SEWA MHMP have been retained, reviewed and updated to satisfy FEMA requirements.

The Planning Team

Asotin County Emergency Services led the planning efforts during the 2019-2020 update process, alongside the consultants from NMI. The planning team consisted of a group of resource professionals including county and city staff, fire protection districts, local organizations, and state and federal agencies. The table below lists the official planning team members and the group they represent. Many of those listed were the official representatives of an adopting jurisdiction.

Table 2: Planning team members for the Asotin County Multi-Hazard Mitigation Plan, 2021 update

Name	Representative of	Title/Department
Mark Janowski	Asotin County Emergency Services	Emergency Manager
Chris Seubert	Asotin County Board of Commissioners	Commissioner
John Hilderbrand	Asotin County Sheriff's Office	Sheriff
Noel Hardin	Asotin County Fire District #1	Fire Chief
Monte Renzelman	City of Asotin	Police Chief
Ryan Baskett	City of Clarkston	Interim Fire Chief
Darren White	City of Clarkston	Fire Chief
Kevin Poole	City of Clarkston	Public Works Director
Justin Moss	Blue Mountain Fire District	Fire Commissioner
Susie Appleford	Blue Mountain Fire District	Secretary
Megan Stewart	Asotin County Conservation District	Programs and Operations Coordinator
Karst Riggers	Asotin County Building and Planning	
Dustin Johnson	Asotin County Public Works	Director/County Engineer
John Guillotte	Asotin County Public Works	GIS Coordinator
Craig Riehle	Asotin County Public Utilities District	Director of Operations

Throughout the planning process there were times that different stakeholders or groups were mentioned as potential planning partners. These organizations or individuals would then be included in planning discussions, sometimes invited to planning meetings, or asked to contribute in some other way. The planning philosophy employed in this project included the open and free sharing of information with interested parties. Information from federal and state agencies was integrated into the

database of knowledge used in this project. Meetings with the planning team were held throughout the planning process to facilitate a sharing of information between members.

Multi-Jurisdictional Participation

CFR requirement §201.6(a)(4) calls for multi-jurisdictional planning in the development of Hazard Mitigation Plans that impact multiple jurisdictions. To be included as an adopting jurisdiction in the updated Asotin County Multi-Hazard Mitigation Plan, jurisdictions were required to participate in the following ways:

- Attend planning meetings or meet with planning team leadership individually
- Complete a hazard summary worksheet
- Approve already existing mitigation and planning goals or provide new goals
- Submit mitigation action items
- Adopt the final Plan by resolution

The following is a list of jurisdictions that participated in the 2021 update as adopting jurisdictions:

Asotin County	City of Asotin
City of Clarkston	Asotin County Fire District #1
Blue Mountain Fire District #1*	Asotin County Conservation District*

***new adopting jurisdiction for the 2021 plan update**

The 2011 SEWA MHMP included Asotin County, the two cities, and Asotin County Fire District #1 as adopting jurisdictions. During the 2019-2020 planning process, Blue Mountain Fire District #1 and the Asotin County Conservation District opted to adopt the plan as well. All these jurisdictions were represented at monthly planning meetings where they participated in updating and approving community profiles, hazard profiles, risk assessments, and mitigation strategies. Each group was represented by one or more individuals who served on the planning team and contributed to the creation, review, and revision of the final document. Besides planning team meetings, input was gathered from each jurisdiction in a combination of the following ways:

- Planning team members reached out to colleagues for assistance and other kinds of involvement to help with updates, revisions and review of the HMP
- Planning team members periodically reported back to their respective advisory boards or governing bodies on the progress of the planning process.
- Public meetings were conducted in the form of presentations at city council meetings in the cities of Asotin and Clarkston. The presentation informed people of the plan update project, identified members of the planning team, and encouraged public participation in the update project.
- A public outreach campaign was conducted in the form of a survey. The survey was released to the public through various websites and social media platforms and the data collected was incorporated into the plan.

- One-on-one correspondence and discussions between NMI, Emergency Services, and the representatives of the adopting jurisdictions was facilitated as needed to ensure understanding of the process, collect data and other information, and develop specific mitigation strategies.
- NMI representatives emailed and/or called each jurisdiction individually at least once during the planning process to answer questions and request additional information.
- NMI consultants used an email distribution list of all the stakeholders to announce meetings, distribute draft sections for review, and request information. All participating jurisdictions provided comments to the draft document during the data gathering phase as well as during the various review phases.

Planning Team Meetings

During planning team meetings, NMI led the planning team through a systematic review and update process in which the pertinent Asotin County information was retrieved from the SEWA MHMP and developed into this updated plan. Items addressed during planning team meetings included, examination and discussion of the hazards, review and development of planning philosophies and goals, risk and vulnerability analysis, a dialogue on public outreach efforts, and developing the best mitigation strategies for each jurisdiction. The planning kickoff meeting was held in July of 2019 with regular meetings held through February 2020. Meetings were abruptly suspended in the spring of 2020 due to restrictions and concerns caused by the COVID-19 pandemic. Meetings resumed in July and were held virtually on regular intervals throughout the rest of the summer and fall of 2020.

Asotin County Emergency Services solicited participation from each adopting jurisdiction, state and federal agencies, as well as local stakeholders and interested parties. With the full integration of the Community Wildfire Protection Plan and the HMP processes, local fire districts were also asked to participate in planning team meetings. For full documentation of these meetings, please refer to the Chapter 6 Appendix.

Public Involvement

Public involvement in this plan was made a priority during the creation of the SEWA MHMP, and that attitude of informing and including the public was assumed for Asotin County's update. There were several ways that public involvement was sought and facilitated during the planning process. In some cases, this led to members of the public providing information and seeking an active role in protecting their communities, while in other cases it led to the public becoming more aware of the process without becoming directly involved in the planning.

Media

Under the auspices of Asotin County Emergency Services, a press release was submitted to local news outlets and posted on the Asotin County website. Additional media releases provided information regarding the public meetings and the public comment period, including how to find electronic versions of the draft on the Asotin County website for review and how to submit comments.

A public outreach campaign was conducted during the drafting of the plan. A survey was released on various websites and social media platforms and members of the general public were encouraged to participate in the survey. The purpose of the survey was to collect general information about how members of the public view the various hazards covered in the plan and hazard mitigation in general. The results of the survey were documented and are included in the Chapter 6 Appendix.

Social gathering restrictions and health precautions brought on by the COVID-19 pandemic forced the planning team to rethink outreach strategy. Originally, town hall-style meetings were to be hosted by the Asotin County Board of Commissioners. These were initially postponed, possibly to be held later in the year. However, after it became clear that a public, in-person meeting would not be possible for several months, the planning team changed the outreach strategy and developed the survey campaign instead.

Public Meetings

Public meetings were conducted in the form of presentations at city council meetings in the cities of Asotin and Clarkston. Each presentation was presented by Asotin County Emergency Services and NMI and these city council meetings were attended by representatives from the planning team. Details can be found in the Chapter 6 Appendix.

Documented Review Process

Review and comment on this plan has been provided through a number of avenues for the planning team as well as for members of the general public. A record of this review process has been established through email correspondence, press releases, published articles, meeting notes, and meeting sign-in sheets.

During regularly scheduled planning meetings in 2019-2020, the team members met to discuss findings, review mapping analysis, and provide written comments on draft sections of the document. During the public meetings, attendees observed map analyses, discussed general findings from the risk assessments, and made recommendations on potential project areas.

Sections of the draft plan were delivered to the planning team during the regularly scheduled planning meetings. The planning Team spent the course of the planning process reading and editing sections of the draft, chapter by chapter. Many jurisdictions met individually to review and revise their specific risk assessment and mitigation strategy including the prioritization of action items. The planning team reviewed final drafts of each chapter of the plan in November 2020. Once the group's review was completed, the draft document was released for public review and comment. The public review period remained open from November 30 to December 30.

Plan Maintenance

Evaluating and Updating the Plan

The Multi-Hazard Mitigation Plan should be reviewed annually (from date of adoption). The annual review will occur at a special meeting of the planning team, open to the public and involving all jurisdictions, where action items, priorities, budgets, and modifications can be made or confirmed.

The Asotin County Emergency Manager (or designee) is responsible for the scheduling, publicizing, and leadership of the annual review meeting. During this meeting, participating jurisdictions will report on their respective projects and identify needed changes and updates to the existing plan. Maintenance to the plan should be detailed at this meeting, documented, and attached to the formal plan as an amendment to the Multi-Hazard Mitigation Plan.

Re-evaluation of this plan should be made every five years during a plan update process. The five-year update process should include a new series of planning team meetings, updates to the hazard risk assessment, a full review of the mitigation strategy, and a public review and comment period. The updated MHMP will then be submitted to the Washington State Emergency Management Division and FEMA for approval. The governing body of each adopting jurisdiction would then need to officially recognize the updated plan via formal resolution.

Annual Review Agenda

At the annual review, the planning team should strive to include the following topics:

- Update historical events record based on any events in the past year.
- Review county profile and individual community assessments for each hazard and note any major changes or mitigation projects that have altered the vulnerability of each entity.
- Update the Emergency Resources information as necessary for each emergency response organization.
- Add a section to note accomplishments or current mitigation projects.
- All action items in the Mitigation Strategy will need updated as projects are completed and as new needs or issues are identified.
- Address Emergency Operations Plans – how can we dovetail the two plans to make them work for each other? Specifically, how do we incorporate the Asotin County Comprehensive Emergency Management Plan into the action items for the MHMP?
- Address Updated County Comprehensive Land Use Plans – how can we dovetail the two plans to make them work for each other? Specifically, how do we incorporate Asotin County's Comprehensive Plan into the action items for the MHMP?
- Incorporate additional hazard chapters as funding allows.

All meeting notes, media releases, and other documentation of revisions should be kept on record by Asotin County Emergency Services.

Five-Year Plan Update

For the five-year update of the Asotin County Multi-Hazard Mitigation Plan, proactive steps must be taken to secure a grant in advance of the plan's expiration date. Asotin County Emergency Services should begin the grant process during the fourth year after the most recent adoption date. This will allow time for the county to secure grant funding, request bids, select a contractor, and assemble the planning team for the update process. If county representatives do not wish to utilize a contractor for

the five-year plan update, beginning the update process during the fourth year can give Emergency Services time to assemble the planning team and prepare for the plan update process.

The focus of the planning team during the five-year plan update process should include all of the topics suggested for the annual review in addition to the following items:

- Review the current planning team and discuss what other planning partners, stakeholders or interested parties should be included in the planning process.
- Update County demographic and socioeconomic data.
- Address any new planning documents, ordinances, codes, etc. that have been developed by the county or cities.
- Review listed communication sites.
- Discuss current and potential partnerships, mutual aid agreements, and shared responsibilities with neighboring counties, cities, organizations, or agencies.
- Review municipal water sources, particularly those in the floodplain or landslide impact areas.
- Redo all risk analysis models incorporating new information such as an updated county parcel master database, new construction projects, development trends, population vulnerabilities, changing risk potential, etc.
- Update county risk profiles and individual community assessments based on new information reflected in the updated models.

All meeting notes, media releases, and other documentation of revisions should be kept on record by Asotin County Emergency Services.

Continued Public Involvement

All participating entities are dedicated to the continued involvement of the public in the hazard mitigation process. The plan will be available on the Asotin County website with the understanding that questions or comments can be directed to Asotin County Emergency Services at any time. Any formal meetings to discuss the plan will be announced on the website also.

The public will have the opportunity to provide feedback about the plan annually on the anniversary of the adoption at a meeting of the County Board of Commissioners. A public meeting can also be held as part of each annual review process, if deemed necessary by the planning team. The Asotin County Emergency Manager, or a designee, is responsible for requesting the commissioners meeting and for initiating the public meeting if it is deemed necessary.

Hard-copies of the Asotin County Hazard Mitigation Plan will be kept and made available for public review at the following locations:

- Asotin County Emergency Services
- Asotin County Annex Building

- Clarkston City Hall
- Asotin City Hall
- www.co.asotin.wa.us/emergency-services/hazard-mitigation/

The Asotin County Emergency Manager shall be responsible for receiving, tracking, and filing public comments regarding the Hazard Mitigation Plan. Contact information is listed below:

Asotin County Emergency Services: **(509) 243 – 2088**
PO Box 250, Asotin, WA 99402
LEPC@co.asotin.wa.us

CHAPTER 3 – COMMUNITY PROFILES

The purpose of this chapter is to link the unique qualities, features, and characteristics of each jurisdiction to local and regional natural hazards. Each community profile includes relevant information about demographics, infrastructure, commerce, industry, natural resources, and geography and identifies any community-components that are of interest, especially as they relate to natural hazards. Following the community profile is a risk and vulnerability assessment that summarizes the probability of a given natural hazard event affecting a jurisdiction, the potential impacts that a natural hazard event could have on a jurisdiction, and which community-components are at risk.

Asotin County Profile

Description of the Region

Asotin County is situated in the southeastern corner of Washington State, bordering the state of Oregon to the south and the state of Idaho to the east. Garfield and Whitman counties make up the west and north borders respectively. The Snake River is a major waterway in the region. The Snake forms the northeast border between Asotin County and Whitman County, and it runs along the entire north and east edge of Asotin County, also forming the state boundary on the east. The regional economy is directly tied to dryland farming, with major crops being wheat, barley, and hay. Water recreation and river transportation for commerce are also important regional industries.

Regional History

In 1805-1806, Lewis and Clark passed through the region as well as Captain Bonneville in 1834. A ferry was established on the Snake River in 1855 to accommodate thousands of miners rushing to the goldfields. A stage route established in 1862 between Walla Walla and Lewiston brought many settlers to the area. Settlers continued to pour into the region in the latter 1870's and early 1880's. In 1881, a ferry was established at Asotin. The railroad arrived in 1886 and provided an outlet for wheat shipment that replaced movement by steamship. Asotin County was partitioned from Garfield County in 1883 and has retained the same land boundaries since. The county derives its name from a Nez Perce word meaning "Eel Creek".

Geography and Land Use

Asotin County and the southeast Washington region is comprised of a geologically diverse landscape that ranges from a rather arid four-season climate to mountainous slopes covered with evergreen forests. The Snake River connects southeast Washington to the world with barge access to ports from as far east as Lewiston, Idaho, and as far west as the mouth of the Columbia River. In the southern part of the county, near the border with Oregon, rise the Blue Mountains. These mountains vary in elevation from 3,000 feet in the valleys to over 6,300 feet at the highest peaks. The Blue Mountain Range is characterized by steep, rugged terrain, deeply dissected by streams. Most of the forested lands in Asotin County and the region are found within the Umatilla National Forest. These forested lands are primarily

drained by the Grande Ronde, Walla Walla, Tucannon and Touchet River systems. At lower elevations, in the central and northern extents of the region, rolling hills with steep slopes and narrow valleys characterize the topography. The hills and valleys generally exhibit good agricultural soil, which is highly conducive for wheat production.

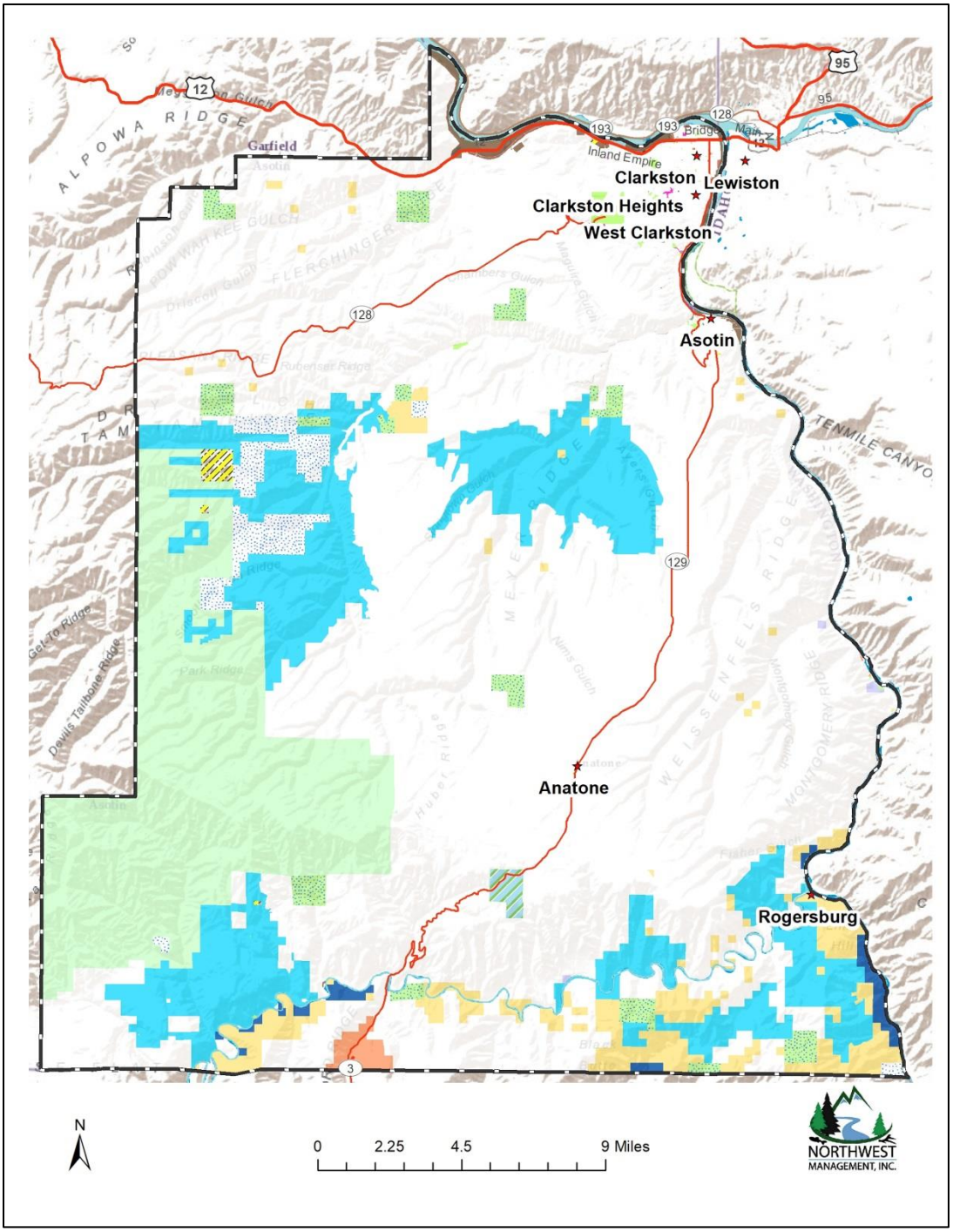
Asotin County owns about .2% of the total land owned in the county. The city of Asotin and Clarkston together own about 46 acres of property. The city limits of Asotin limits contain about 1.3 square miles and the Clarkston city limits cover about 2.2 square miles. The two census-designated places (CDPs) in the Clarkston area, Clarkston Heights-Vineland and West Clarkston-Highland cover an area roughly 9 square miles in size.

The table below expresses the distribution of land ownership within Asotin County by using 2020 Asotin County parcel data. Since the previous plan update, Asotin county land owned by the Washington State Department of Fish and Wildlife increased from 5% to 14%. This is the most significant change, though Private ownership, Washington DNR ownership and BLM ownership have all decreased slightly since the last plan update.

Table 3: Land Ownership Distribution in Asotin County (using 2020 Asotin County parcel data)

Land Owner	Approximate Percent
Private	67.3%
City of Asotin	<.01%
City of Clarkston	.01%
Asotin County	0.2%
Public Utilities	.02%
US Army Corps of Engineers	0.4%
US Forest Service	12.8%
Washington Department of Natural Resources	1.5%
Washington Department of Fish and Wildlife	14%
Washington State School Land	1.4%
Washington State Department of Transportation	0.01%
Other Washington State Owned	0.2%
U.S. Bureau of Land Management	1.2%
U.S. Department of Energy	0.4%
U.S. National Park Service	0.04%
U.S. Postal Service	<0.01%
Field Springs State Park	0.2%
Nez Perce Tribe	0.3%
Total	100%

Figure 1: Land Ownership Distribution in Asotin County (using 2020 Asotin County parcel data)



Climate, Vegetation, and Soils

The Cascade Mountain Range helps protect this region from the damp coastal weather that is often associated with the Northwest, particularly the Puget Sound area. The Rocky Mountains to the east of this region help keep winters relatively mild. As a result, the climate in southeast Washington is typical of eastern Washington. The summers are warm and dry with temperatures approaching 100 degrees and winters are cold with temperatures reaching below zero. The annual average temperature is about 51 degrees Fahrenheit. The annual precipitation ranges from 13 inches near Central Ferry to 20 inches in parts of the Umatilla National Forest.

The prevailing winds are generally from the southwest. During spring and fall seasons, rapidly moving weather systems result in considerable blowing dust. Wind speeds may reach 50 mph once in two years and 80 mph winds are expected once in 50 years. In severe winters with light snow cover, frost may penetrate the soil at depths between 20 and 30 inches.

Vegetation in this region is a mix of forestland and agricultural ecosystems. Vegetative communities within this region follow the strong moisture and temperature gradients related to the major drainages. As moisture availability increases, so does the abundance of conifer species, with subalpine forest communities present in the highest elevations where precipitation and elevation provide more moisture during the growing season.

Generally, the soils located within this region present no limitations for conventional development except when combined with the steeper topography. The Soil Survey conducted by the US Soil Conservation Service includes detailed soil maps which can be used for examining a particular site's suitability for specific land uses.

More specifically, the soils on the valley floors typically consist of well-drained bottom lands. These soils formed under bunchgrass in alluvium mixed with wind-laid deposits and some volcanic ash. The permeability of these soils is moderate, run-off is slow, and hazards for water and wind erosion are slight.

Climbing out of the valley bottom soils, a variety of soil series are encountered. These typically consist of well-drained soils in the uplands, which were formed under bunchgrass and sagebrush in calcareous loess. There is a high potential for erosion of this soil, especially on the steeper slopes. In areas where slopes often exceed 50%, soil types resulting from soil formed under rabbitbrush and bunchgrass in a mixture of wind-laid silty material and material weathered from basalt are quiet common. Generally, the basalt can be found at 10-20 inches below the soil surface. In these areas, the erosion hazard is severe.

Population

The most current set of population data available for Asotin County is the July 2019 population estimates published by the U.S. Census Bureau[2]. Asotin County had an estimated population in 2019 of

[2] United States Census Bureau. "Population and Housing Unit Estimates Tables." Available online at https://www.census.gov/programs-surveys/popest/data/tables.html.

22,582. Asotin County contains two cities and several unincorporated communities. Clarkston, located in the northeast corner of the county, is the largest city and had a 2019 estimated population of 7,375. The county-seat, Asotin, is located six miles south of Clarkston. The 2019 estimate for Asotin reported the population was 1,289. Table 2 uses the same dataset to compare population growth or decline in Asotin County and its cities.

Table 4: Yearly growth or decline of Asotin County compared to its cities over the past decade (using yearly estimates)

Jurisdiction	2010 Census	2011 Est.	2012 Est.	2013 Est.	2014 Est.	2015 Est.	2016 Est.	2017 Est.	2018 Est.	2019 Est.
City of Asotin	1,251	1,266	1,265	1,278	1,283	1,279	1,286	1,294	1,296	1,289
City of Clarkston	7,229	7,329	7,296	7,356	7,359	7,318	7,351	7,403	7,408	7,375
Asotin County	21,623	21,971	21,909	22,129	22,190	22,113	22,286	22,509	22,616	22,582

Examining the yearly estimates, the general trend observed for both cities and the county, is an overall growth in population. This is also true when looking at historical census data. The table below expresses the ten-year census reports for the cities and the county.

Table 5: Changes in U.S. Census findings from 1930 to 2010; and the 2019 population estimates for Asotin County and cities

Jurisdiction	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 Est.
City of Asotin	697	986	740	745	637	943	981	1,095	1,251	1,289
City of Clarkston	2,870	3,116	5,617	6,209	6,312	6,903	6,753	7,337	7,229	7,375
Asotin County	8,136	8,365	10,878	12,909	13,799	16,823	17,605	20,551	21,623	22,582

The county saw a population increase of 30% between 1940 and 1950 and an increase of almost 22% between 1970 and 1980. More recently, growth appears to be less dramatic as the increase between the 2010 census and the 2019 estimate is about 4%. Asotin's population fluctuated historically until 1980 when it grew by 48% and has increased since. Clarkston's historical population has also fluctuated. After rapid growth in the first half of the 20th century, the population increased less dramatically and, as recently as 2000, actually decreased. The area around Clarkston has grown significantly in population as areas outside city limits see ever-increasing development. However, data from over the past decade of estimates show that the Clarkston city population is back on a slowly upward trend.

Two "census-designated places" (CDPs) are located just outside of Clarkston and these are significant population centers for the region as well. West Clarkston-Highland, and Clarkston Heights-Vineland are located west and southwest of Clarkston, respectively. The southern CDP boundary of Clarkston Heights-Vineland spreads to within a few miles of the western boundary of the city of Asotin and residences are located almost continuously between the communities.

The 2018 American Community Survey[3] published by the U.S. Census Bureau found that these CDP communities had a combined estimated population of 12,484 in 2008. West Clarkston-Highland had a population of 6,081 and Clarkston Heights-Vineland was 6,403. The 2018 estimate (shown above in Table 1) found the two cities had a combined total population of 8,704. All total, the estimated population of this northeast corner of Asotin County was estimated to be 21,188 in 2018. This is more than 93% of the estimated total county population that year.

Demographics

The U.S. Census Bureau's American Community Survey (ACS) is the "premier source for information about America's changing population, housing, and workforce". This plan will use data from the 2018 ACS as a general outlook on demographics, housing unit information, and socioeconomics.

Table 6: Demographic data for Asotin County and communities using the 2018 American Community Survey

2018 ACS Statistic	Asotin County	City of Asotin	City of Clarkston	West Clarkston-Highland	Clarkston Heights-Vineland
Median Age (years)	45	43.7	35.2	45.4	49.9
% of population under 18 years	20.8%	22.7%	24.4%	20.6%	17.3%
% of population 65 years and over	22.2%	22.3%	14.2%	21.5%	27.9%
% Male	48%	48.0%	47.5%	46.2%	48.6%
% Female	52%	52.0%	52.5%	53.8%	51.4%
Race	-	-	-	-	-
White	92.8%	94.1%	92.9%	92.3%	92.9%
Black or African American	0.4%	0.7%	0.1%	1.4%	0.1%
American Indian and Alaska Native	1.6%	0.0%	2.9%	0.3%	2.0%
Asian	1.3%	0.5%	0.7%	0.1%	2.2%
Native Hawaiian, Pacific Islander	0.9%	0.4%	0.0%	0.0%	0.3%
Some other race	0.2%	0.0%	0.7%	0.0%	0.4%
Two or more races	3.8%	4.2%	2.6%	5.9%	2.0%
Hispanic or Latino (of any race)	3.8%	1.6%	6.3%	3.1%	2.1%

[3] United States Census Bureau. "American Community Survey (ACS)." Available online at https://www.census.gov/programs-surveys/acs.

Socioeconomics

At the time of this plan update, only partial ACS data was available for each jurisdiction and community in Asotin County. The 2018 ACS did not provide the same statistics for each community. For a more direct comparison, the 2017 ACS was used to analyze housing data between each community in Asotin County.

The 2017 ACS reports that Asotin County contains an estimated total of 9,984 housing units with the majority of those located in the city of Clarkston. However, roughly 54% of the county's housing units are located in either West Clarkston-Highland or Clarkston Heights-Vineland. The study also reports that more than 92% of the housing units are occupied and more than 70% are owner-occupied. The median value of owner-occupied housing units in Asotin County is $176,700, and nearly half of owner-occupied homes (47.5%) are valued between $150,000 and $299,999.

Table 7: Housing data for Asotin County and communities using the 2017 American Community Survey

2017 ACS Statistic	Asotin County	City of Asotin	City of Clarkston	West Clarkston-Highland	Clarkston Heights-Vineland
Total housing units	9,984	543	3,284	2,647	2,752
% of total housing units occupied	92.5%	88.8%	91.3%	95.1%	95.5%
% of owner-occupied housing units	70.7%	73.7%	54.2%	66.9%	89%
Median value of owner-occupied housing units	$176,700	$207,700	$139,700	$172,000	$219,000
Median rent	$739	$743	$666	$738	$1,120

This plan examined data pertaining to poverty, income, employment and industry statistics for Asotin County using the 2018 ACS. Selected poverty statistics were compared to 2018 ACS data for the state of Washington overall.

Table 8: Poverty statistics and unemployment rate for Asotin County compared to the state of Washington (2018 ACS data)

Poverty status statistics	Asotin County	State of Washington
% of all families below the poverty level	7.4%	7.4%
% of families below the poverty level with related children of the household under 18 years	14.4%	11.9%
% of Individuals below poverty level	13%	11.5%
Unemployment rate	6.9%	5.3%

Using 2018 inflation-adjusted dollars, the following table breaks down the income groups in Asotin County.

Table 9: Income data for Asotin County using data from the 2018 American Community Survey

2018 Income Statistic	Asotin County Estimate
Number of households	9,171
Less than $10,000	528 (5.8%)
$10,000-$14,999	480 (5.2%)
$15,000-$24,999	1,027 (11.2%)
$25,000-$34,999	1,141 (12.4%)
$35,000-$49,999	1,350 (14.7%)
$50,000-$74,999	1,698 (18.5%)
$75,000-$99,999	1,276 (13.9%)
$100,000-$149,999	1,022 (11.1%)
$150,000-$199,999	423 (4.6%)
$200,000 or more	226 (2.5%)
Median household income	$50,423
Mean household income	$65,079

Employment within Asotin County leans heavily toward private wage and salary workers which together, comprise 79% of the county's workforce. Government workers represent roughly 16% of the work force and about 5% are classified as workers self-employed in their own unincorporated business.

Table 10: Occupation and Industry statistics for Asotin County using the 2018 American Community Survey

Employment and Industry Statistics	
OCCUPATION	**Asotin County total (%)**
Management, business, science, and arts occupations	2,987 (31.0%)
Service occupations	1,832 (19.0%)
Sales and office occupations	2,512 (26.0%)
Natural resources, construction, and maintenance occupations	1,141 (11.8%)
Production, transportation, and material moving occupations	1,171 (12.1%)
INDUSTRY	
Agriculture, forestry, fishing and hunting, and mining	246 (2.6%)
Construction	697 (7.2%)
Manufacturing	1,445 (15.0%)
Wholesale trade	288 (3.0%)

Retail trade	1,374 (14.2%)
Transportation and warehouse, and utilities	224 (2.3%)
Information	128 (1.3%)
Finance, insurance, real estate, and rental and leasing	391 (4.1%)
Professional, scientific, management, administrative, and waste management services	634 (6.6%)
Educational services, healthcare and social assistance	2,673 (27.7%)
Arts, entertainment, recreation, accommodation and food services	736 (7.6%)
Other services (except public administration)	397 (4.1%)
Public administration	410 (4.3%)

Tourism and Recreation

Popular recreation opportunities throughout rural Asotin County include boating, camping, hunting, fishing, snowmobiling, and other outdoor recreation activities. Tourists are especially attracted to the various parks, the Umatilla National Forest, the Snake River, and the Grande Ronde River. These attractions bring in numerous visitors and travelers from outside Asotin County during certain times and seasons.

Hazard Management Capabilities

Currently, Asotin County Fire District #1 covers the majority of the population in the unincorporated areas around the communities of Clarkston and Asotin. These cities each have their own fire department that works within the city limits. Blue Mountain Fire District #1 covers the greater Anatone area. Due to limited capabilities at this time, Blue Mountain Fire District #1 will respond only to wildland fire events. Lewiston Ambulance currently provides EMS service in the areas south of Asotin County Fire District. Much of the Snake River canyon and the Cloverland area still do not have structural or wildland fire protection as they fall in an area outside any fire protection district.

Development Trends

Southeast Washington is largely a rural, agricultural area with a handful of thriving communities. Development and growth in these areas has been relatively slow and often decreasing for more than 100 years. Parts of the region that have seen steady growth are in the northeast corner of Asotin County. Business and industry in the Lewiston, Idaho-Clarkston, Washington area have remained strong and continue to grow in some sectors.

A relatively large percentage of the region is privately owned. Private parcels are becoming more and more expensive as the population grows and properties close to communities or in desirable recreation areas are developed. Additionally, new jobs associated with the establishment of the numerous wind turbines may bring additional population growth and a higher demand for land.

The Clarkston area is growing and changing with increased opportunities for employment, industry, shopping, and services. As a part of the greater Lewiston, Idaho and Clarkston, Washington area, Asotin County continues to have significant potential for growth in population. The relative comfort of the mild "banana belt" climate, employment opportunities, and nearby recreation access has encouraged people to settle in the Lewiston-Clarkston Valley in ever increasing numbers.

Another area seeing growth and potential growth is the rural areas outside the cities of Clarkston and Asotin, even beyond the wildland-urban interface. These areas are farther south and west of the unincorporated residential areas outside the two cities. Larger developments in these areas, and proposed future developments, could cause a strain on water resources for fire suppression because these areas will likely not be on a public water system. An increase in private water wells could also put a strain on the water table.

Descriptions of the Other Adopting Jurisdictions

City of Asotin

Asotin is the county seat of Asotin County, housing the Superior Court, District Court, Sheriff's Office, Asotin County departments, and County Commissioners. Asotin sits at the mouth of Asotin Creek on the Snake River and is the Gateway to Hells Canyon, the last incorporated city before entering the deepest river gorge in North America. Large numbers of travelers pass through Asotin on their way to many popular tourist destinations. This is also the location for locals to use the river for boating, swimming, and fishing. Asotin is also one of the entry points for the Blue Mountains. State Route 129 travels through Asotin to Enterprise, Oregon. The traffic during the warm months of the year can triple or quadruple. The city of Asotin is part of the Lewiston, ID–WA Metropolitan Statistical Area. Asotin's mild winters makes it a travel destination year round. The Asotin Anatone School District is within the city of Asotin, maintaining a High School, Middle School, and Elementary School and housing more than 600 students. It also supports many school activities that are a big part of the community.

Asotin has its own police department, volunteer fire department, Public Works department, city parks, Municipal Court, Waste Water Treatment facility, and provides many other services. Asotin has two city-managed recreational areas, Asotin City Park and Chief Looking Glass Park. Chief Looking Glass Park saw 60,000 visitors in 2018. The Asotin County Housing authority has several housing complexes in the City of Asotin. A regional transportation service provides public bus transportation throughout the city and links with the transit systems for Clarkston and Lewiston, making any location in the Lewis-Clark valley attainable. Asotin has business and office space in its downtown area; gas station/convenience store, bank, coffee shop, Insurance agent, attorney office, architect office, contractor, Lions and Masons buildings, and restaurant. Asotin continues to grow with new homes being built in the Appleford addition and throughout the city.

City of Clarkston

Named for William Clark of the historical Lewis and Clark expedition, near the confluence of the Clearwater and Snake Rivers, at a bend in the Snake River, is the flat which today is the site of the city of Clarkston. The city is best known as the gateway to North America's deepest gorge, Hells Canyon.

While downtown Clarkston offers fine dining and shopping for all, the Walla Walla Community College and local ports provide inhabitants with a lot of economic growth potential. The valley's warm climate enables the residents and visitors to enjoy year-around outdoor activities such as golf, fishing, biking and the trails along the beautiful Snake River. These sparkling rivers and creeks beckon you to the outdoors where cruise ships, jet boat rides, boating, water skiing, rafting, and world class fishing await. The nearby forest lands with deer, elk and game birds provide hunters abundant natural bounty with a warm small town atmosphere.

Clarkston is located in the northeast corner of Asotin County and the city is serviced by U.S. Highway 12 and U.S. Highway 129. Clarkston is located on the banks of the Snake River. The river's elevation is approximately 730 feet above sea level. There is a steep embankment rising approximately 20 feet on the northern edge of the city and increasing elevations on the south east banks. There are a variety of mixed residential, commercial, industrial and public facilities such as schools, parks and utility substations located throughout the city. Within the city, 389 acres are residential; 261 acres are commercial; 185 acres are industrial; 290 acres are roads; 20 acres are parks; and 100 acres are vacant or underdeveloped land.

The Clarkston area is located within a large geological region known as the Columbia Intermountain Province, an area consisting primarily of lava flows of basalt. Within this large geological region there is a sub-region known as the Lewiston Basin. The Lewiston Basin is approximately 12 miles in length in the east/west direction, and 4 miles in width in a north/south direction.

Clarkston's climate is relatively mild for its latitude. This is due to the effect of Pacific air masses from the west and the sheltering effects from the mountains surrounding the valley. Mean average monthly temperatures range from a low of 31.3 degrees Fahrenheit to a high of 73.8 degrees in July. Summer temperatures range from a daytime high averaging in the 90's and occasionally exceeding 100 degrees Fahrenheit, and evening lows in the 60's. Winter temperatures average around 35 degrees with extreme lows dropping slightly above zero. Precipitation averages 13 inches per year. July through September are usually the driest months with less than one inch of precipitation per month. Precipitation is generally evenly distributed through the rest of the year. Annual snowfall averages approximately 11 inches per year with most of the snow falling in January and February.

Asotin County Fire District #1

The following is summarized from the Asotin County Fire District's website:

Asotin County Fire District #1 provides emergency response services to 14,000 people and is the only fire district in the county to guarantee a fire and EMS response 24-hours per day. The district includes 32 volunteer firefighters, 28 emergency medical technicians (EMTs), and 35 paramedics who respond to an average of 2,600 calls per year – 90% of which are EMS-related.

The district was formed in 1951 and covers a large part of northern Asotin County. The district currently has eight mutual aid agreements with four cities, two counties, the Washington DNR, and the U.S. Forest Service. The district is governed by a three-person Board of Fire Commissioners elected by the community. Each commissioner serves a six-year term and Board meetings are open to the public.

Asotin County Fire District #1 provides the following emergency services:

- Fire Suppression and Prevention
- Emergency Medical Service
- Wildland Fire
- River Rescue
- Fire/Rescue Medical Boat
- Oil Spill Response

Blue Mountain Fire District #1

The Blue Mountain Fire District #1 is a wildland-only, volunteer fire district that was formed in 2009 to cover the greater unincorporated Anatone area. The district protects 105,650 acres of mainly agricultural land which includes some parcels of timbered land scattered throughout the district. Blue Mountain Fire District staff includes three fire commissioners, a fire chief, an assistant fire chief, and a secretary.

The community of Anatone is located 18 miles south of Asotin on State Route 129. The infrastructure located in Anatone includes a post office, an Asotin County Road Department shop, and the Washington Department of Transportation Anatone Maintenance Facility.

There are many permanent homes and seasonal cabins located in the wildland urban interface (WUI) to the west of Anatone. This area continues to grow and is a popular area for hunting, camping, and snowmobiling. Fields Springs State Park is located to the south of Anatone and is popular for its camping, sledding, snowshoeing, and cross-country skiing. The Grande Ronde River is located at the bottom of Shumaker Grade. This is a popular recreation site that attracts visitors for hunting, fishing, and camping.

Asotin County Conservation District

The following information can be found on the Asotin County Conservation District (ACCD) website:

The ACCD has the stated mission to “provide voluntary, incentive-based options that support working landscapes while protecting and enhancing our natural resources”. Some priorities and goals of the district include:

- Protection and improvement of surface and groundwater quality
- Watershed planning and implementation
- Riparian restoration and enhancement
- Forest stewardship
- Community wildfire prevention & protection
- Fish and wildlife habitat enhancement
- Conservation education

A volunteer board of supervisors guides and administers district programs to provide education and “on-the-ground assistance” to cooperators. The district is self-governed by a five-member, volunteer board, made up of local farmers, landowners, and concerned citizens.

"ACCD staff works with private partners, local, state and federal government agencies, agricultural and environmental organizations, and other conservation districts. The ACCD is funded through grants, an annual native plant sale, and state general fund money requiring a dollar-for-dollar match."

CHAPTER 4 – HAZARD PROFILES & RISK ASSESSMENTS

The purpose of this section is to link the unique qualities, features, and characteristics of Asotin County and each adopting jurisdiction to the identified natural hazards. Each adopting jurisdiction has a risk and vulnerability assessment that summarizes the probability of a given natural hazard event affecting a jurisdiction, the potential impacts that a natural hazard event could have on a jurisdiction, and summarizes values of resources at risk.

Each hazard will be described and discussed in this chapter so there is common understanding of terms and definitions used throughout the risk assessment. The following hazards were identified in the 2011 Southeast Washington MHMP and reexamined during the 2019/2020 update process.

- Flood
- Earthquake
- Landslide
- Severe Weather
- Wildland Fire
- Avalanche
- Tsunami
- Volcano
- Drought

A hazard summary worksheet was facilitated with the planning team to determine the relative frequency of a hazard's occurrence and the potential impact a hazard event could have on people, property, infrastructure, and the economy based on local knowledge of past occurrences. The results of the hazard summary can be found in Table 2 and Table 3. An example of the hazard summary worksheet used can be found in the Chapter 6 Appendix.

Jurisdictional Risk and Vulnerability Rating

The Planning Team utilized a hazard summary worksheet to classify each hazard that was identified as potentially having an impact on Asotin County residents, businesses and/or economy. A definition for each classification is listed below. The Overall Significance rating is a combination of extent, severity and probability associated with the hazard.

Table 11: Criteria used for FEMA Worksheet 5.1, Hazard Summary Worksheet

Location (Geographic Area Affected)	
Negligible	Less than 10% of planning area or isolated single-point occurrences
Limited	10 to 25% of the planning area or limited single-point occurrences
Significant	25 to 75% of the planning area or frequent single-point occurrences
Extensive	75 to 100% of the planning area or consistent single-point occurrences
Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)	
Weak	Limited classification on scientific scale, moderate speed of onset or moderate duration, resulting in little to no damage
Moderate	Moderate classification on scientific scale, moderate speed of onset or moderate duration, resulting in some damage and loss of services for days
Severe	Severe classification on scientific scale, fast speed of onset or long duration, resulting in devastating damage and loss of services for weeks or months
Extreme	Extreme classification on scientific scale, immediate onset or extended duration, resulting in catastrophic damage and uninhabitable conditions
Probability of Future Events (Occurrence in the next 50 years)	
Unlikely	Less than 1% probability of occurrence in the next year or a recurrence interval of greater than every 100 years
Occasional	1 to 10% probability of occurrence in the next year or a recurrence interval of 11 to 100 years
Likely	10 to 90% probability of occurrence in the next year or a recurrence interval of 1 to 10 years
Highly Likely	90 to 100% probability of occurrence in the next year or a recurrence interval of less than 1 year
Overall Significance	
Low	Two or more criteria fall in lower classifications or the event has a minimal impact on the planning area.
Medium	The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating
High	The criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area

The criteria shown above was used to classify the geographic area affected (location), relative magnitude (max probable extent) and the probability of future events that each hazard may have on a community. The classifications were then given a numerical value and then totaled to show the overall significance ranking for each hazard.[4] This process was conducted for each adopting jurisdiction. Table 2 summarizes the results of the Hazard Summary exercise for Asotin County overall and Table 3 shows the totals (overall significance value) for each adopting jurisdiction within the plan.

[4] Hazard Summary Worksheet. Local Mitigation Planning Handbook. 2013. Pp A-29, A-30.

Table 12: Hazard Summary Worksheet results for Asotin County overall

Hazard	Location (Geographic Area Affected)	Maximum Probable Extent (Magnitude/Strength)	Probability of Future Events	Overall Significance Ranking
Flood	2 – Limited	2 – Moderate	3 – Likely	7 – Medium
Earthquake	1 – Negligible	1 – Weak	1 – Unlikely	3 – Low
Landslide	2 – Limited	2 – Moderate	1 – Unlikely	5 – Low
Severe Weather	3 – Significant	2 – Moderate	4 – Highly Likely	9 – High
Wildland Fire	3 – Significant	3 – Severe	4 – Highly Likely	10 – High
Avalanche	1 – Negligible	1 – Weak	1 – Unlikely	3 – Low
Tsunami	1 – Negligible	1 – Weak	1 – Unlikely	3 – Low
Volcano	3 – Significant	1 – Weak	1 – Unlikely	5 – Low
Drought	3 – Significant	3 – Severe	3 – Likely	9 – High
Ranking Values	1 – Negligible 2 – Limited 3 – Significant 4 – Extensive	1 – Weak 2 – Moderate 3 – Severe 4 – Extreme	1 – Unlikely 2 – Occasional 3 – Likely 4 – Highly Likely	3 to 5 – Low 6 to 8 – Medium 9 to 12 – High

Table 13: Hazard Summary Worksheet results for individual jurisdictions in Asotin County

Hazard	Asotin County	City of Asotin	City of Clarkston	Asotin County Fire District #1	Blue Mountain Fire District	Asotin County Conservation District
Flood	Medium	Medium	Low	Medium	Medium	Low
Earthquake	Low	Low	Low	Low	Low	Low
Landslide	Low	Low	Low	Medium	Medium	Low
Severe Weather	High	Medium	Medium	High	High	High
Wildland Fire	High	Low	Low	High	High	High
Avalanche	Low	Low	Low	Low	Low	Low
Tsunami	Low	Low	Low	Low	Low	Low
Volcano	Low	Low	Low	Low	Low	Medium
Drought	High	Low	Low	High	High	High

Flood Hazard Profile

Floods have been a serious and costly natural hazard affecting Washington. Floods damage roads, agricultural lands, and structures, often disrupting lives and businesses. Simply put, flooding occurs when water leaves the river channels, lakes, ponds, and other confinements where we expect it to stay. Flood-related disasters occur when human property and lives are impacted by flood waters. An understanding of the role of weather, runoff, landscape, and human development in the floodplain is therefore the key to understanding and controlling flood-related disasters. Washington has had many major disaster declarations related to flooding over the last several decades, and every county has received a Presidential Disaster Declaration since 1970. Since the previous MHMP was adopted, declarations were made in every year but two.

Riverine flooding includes those events that are classically thought of as flooding; i.e., a gradual rise of volume of a stream until that stream exceeds its normal channel and spills onto adjacent lands. Such events are generally associated with major meteorological events: spring runoff, winter rain/snowmelt events, and ice jams. Riverine floods typically have low velocities, affect large land areas, and persist for a prolonged period. According to the USGS, "River flooding is generally more common for larger rivers in areas with a wetter climate, when excessive runoff from longer-lasting rainstorms and sometimes from melting snow causes a slower water-level rise over a larger area."[5]

Flash floods may have a higher velocity in a smaller area and may recede relatively quickly. Such floods are caused by the introduction of a large amount of water into a limited area (e.g., extreme precipitation events in watersheds less than 50 square miles), crest quickly (e.g., eight hours or less), and generally occur in hilly or otherwise confined terrain. Steep mountainous terrain is particularly susceptible to flash floods and debris flows which can occur within thirty (30) minutes of the onset of heavy rain. Flash floods occur in both urban and rural settings, principally along smaller rivers and drainage ways that do not typically carry large amounts of water. According to the National Weather Service, "Flash floods are usually characterized by raging torrents after heavy rains that rip through river beds, urban streets, or mountain canyons sweeping everything before them. They can occur within minutes or a few hours of excessive rainfall."[6]

Occasionally, floating ice or debris can accumulate at a natural or man-made obstruction and restrict the flow of water. **Ice and debris jams**[7] can result in two types of flooding:

- Water held back by the ice jam or debris dam can cause flooding upstream, inundating a large area and often depositing ice or other debris which remains after the waters have receded. This inundation may occur well outside of the normal floodplain.

[5] USGS. "What are the two types of floods?" Available online at https://www.usgs.gov/faqs/what-are-two-types-floods?qt-news_science_products=0#qt-news_science_products.

[6] National Weather Service. "Flood and flash flood definitions". Available online at https://www.weather.gov/mrx/flood_and_flash.

[7] National Weather Service. "Flood Related Hazards". Available online at https://www.weather.gov/safety/flood-hazards.

- High velocity flooding can occur downstream when the jam breaks. These flood waters can have additional destructive potential due to the ice and debris load that they may carry.

The most commonly reported flood magnitude measure is the "base flood." This is the magnitude of a flood having a one-percent chance of being equaled or exceeded in any given year. Although unlikely, "base floods" can occur in any year, even successive ones. This magnitude is also referred to as the "100-year Flood" or "Regulatory Flood" by State government. Floods are usually described in terms of their statistical frequency. A "100-year flood" or "100-year floodplain" describes an event or an area subject to a 1% probability of a certain size flood occurring in any given year. This concept does not mean such a flood will occur only once in one hundred years. Whether or not it occurs in a given year has no bearing on the fact that there is still a 1% chance of a similar occurrence in the following year. Since floodplains can be mapped, the boundary of the 100-year flood is commonly used in floodplain mitigation programs to identify areas where the risk of flooding is significant. Any other statistical frequency of a flood event may be chosen depending on the degree of risk that is selected for evaluation, e.g., 5-year, 20-year, 50-year, 500-year floodplain.

The areas adjacent to the channel that normally carry water are referred to as the floodplain. In practical terms, the floodplain is the area that is inundated by flood waters. In regulatory terms, the floodplain is the area that is under the control of floodplain regulations and programs (such as the National Flood Insurance Program which publishes the FIRM maps). The floodplain is often defined as:

"That land that has been or may be covered by floodwaters, or is surrounded by floodwater and inaccessible, during the occurrence of the regulatory flood."[8]

Winter weather conditions are the main driving force in determining where and when base floods will occur. The type of precipitation that a winter storm produces is dependent on the vertical temperature profile of the atmosphere over a given area. Southeast Washington experiences riverine flooding from two distinct types of meteorological events: spring runoff and winter rain-on-snow events.

The major source of flood waters in Washington is normal spring snow melt. As spring melt is a "natural" condition, the stream channel is defined by the features established during the average spring high flow (bank-full width). Small flow peaks exceeding this level and the stream's occupation of the floodplain are common events.

Unusually heavy snow packs or unusual spring temperature regimes (e.g., prolonged warmth) may result in the generation of runoff volumes significantly greater than can be conveyed by the confines of the stream and river channels. Such floods are often the ones that lead to widespread damage and disasters. Floods caused by spring snow melt tend to last for a period of several days to several weeks, longer than the floods caused by other meteorological sources.

Floods that result from rainfall on frozen ground in the winter, or rainfall associated with a warm, regional frontal system that rapidly melts snow at low and intermediate altitudes (rain-on-snow) can be

[8] FEMA. Federal Emergency Management Agency. National Flood Insurance Program. Washington D.C. Available online at www.fema.gov.

the most severe. Both of these situations quickly introduce large quantities of water into the stream channel system, easily overloading its capacity.

On small drainages, the most severe floods are usually a result of rainfall on frozen ground but moderate quantities of warm rainfall on a snow pack, especially for one or more days, can also result in rapid runoff and flooding in streams and small rivers. Although meteorological conditions favorable for short-duration warm rainfall are common, conditions for long-duration warm rainfall are relatively rare. Occasionally, however, the polar front becomes situated along a line from Hawaii through Oregon, and warm, moist, unstable air moves into the region.

The nature and extent of a flood event is the result of the hydrologic response of the landscape. Factors that affect this hydrologic response include soil texture and permeability, land cover and vegetation, land use and land management practices. Precipitation and snow melt, known collectively as runoff, follow one of three paths, or a combination of these paths, from the point of origin to a stream or depression: overland flow, shallow subsurface flow, or deep subsurface ("ground water") flow. Each of these paths delivers water in differing quantities and rates. The character of the landscape will influence the relative allocation of the runoff and will, accordingly, affect the hydrologic response.

There are three types of flash flooding:

- Extreme precipitation and runoff events
- Inadequate urban drainage systems overwhelmed by small intense rainstorms
- Dam failures

Debris flows are hazards that are closely related to flash floods, triggered by heavy rainfall, are more commonly considered as a type of earth movement (a geological hazard).

Extreme Precipitation and Runoff Events: Events that may lead to flash flooding include:

- Significant rainfall and/or snowmelt on frozen ground in the winter and early spring months.
- High intensity thunderstorms, usually during the summer months.
- Rainfall onto burn areas (such as those affected by wildfire) where high heat has caused the soil to become hydrophobic or water repellent which dramatically increases runoff potential during rain.

Flash floods from thunderstorms do not occur as frequently as those from general rain and snowmelt conditions but are far more severe. The onset of these flash floods varies from slow to very quick and is dependent on the intensity and duration of the precipitation and the soil types, vegetation, topography, and slope of the basin. When intensive rainfall occurs immediately above developed areas, the flooding may occur in a matter of minutes. Sandy soils and sparse vegetation, especially recently burned areas, are conducive to flash flooding. Mountainous areas are especially susceptible to damaging flash floods, as steep topography may stall thunderstorms in a limited area and may also funnel runoff into narrow canyons, intensifying flow. A flash flood can, however, occur on any terrain when extreme amounts of precipitation accumulate more rapidly than the terrain can allow runoff.

Flooding from ice jams is relatively common in southeastern Washington. Ice jam formation depends on air temperature and physical conditions in the river channel. Ice cover on a river (a precursor to the ice

jam) is formed when water reaches the freezing point and air temperature is sub-freezing; large quantities of ice are produced, flow downstream, and consolidate.

An ice jam is a stationary accumulation of ice that restricts flow. Ice jams can cause considerable increases in upstream water levels, while at the same time downstream water levels may drop, exposing water intakes for power plants or municipal water supplies. Types of ice jams include freeze-up jams, made primarily of frazil ice; breakup jams, made primarily of fragmented ice pieces; and combinations of both.

River geometries, weather characteristics, and floodplain land-use practices contribute to the ice jam flooding threat at a particular location. Ice jams initiate at a location in the river where the ice transport capacity or ice conveyance of the river is exceeded by the ice transported to that location by the river's flow.

The magnitude of most floods in southeast Washington depend on the particular combinations of intensity and duration of rainfall, pre-existing soil conditions, area of a basin, elevation of the rain or snow level, and amount of snow pack. Man-made changes to a basin also can affect the size of floods. Although floods can happen at any time during the year, there are typical seasonal patterns for flooding in southeast Washington, based on the variety of natural processes that cause floods:

- Heavy rainfall on wet or frozen ground, before a snow pack has accumulated, typically cause fall and early winter floods
- Rainfall combined with melting of the low elevation snow pack typically cause winter and early spring floods
- Late spring floods in southeast Washington result primarily from melting of the snow pack

Flooding on rivers east of the Cascades usually results from periods of heavy rainfall on wet or frozen ground, mild temperatures, and from the spring runoff of mountain snow pack. Southeast Washington is also prone to flash flooding. Thunderstorms, combined with steep ravines, alluvial fans, dry or frozen ground, and lightly vegetated ground that does not absorb water, can cause flooding.

Occasionally, communities experience surface water flooding due to high groundwater tables or inadequate urban storm drainage. This occurred during the 1996-97 winter storms. In many communities, residents outside the flood plain had several inches of water in basements due to groundwater seepage. These floods contaminated domestic water supplies, fouled septic systems, and inundated electrical and heating systems. Firefighting access was restricted, leaving homes vulnerable to fire. Lake levels were the highest in recent history, and virtually every county had areas of ponding not previously seen.

In general, the meteorological factors leading to flooding are well understood. They are also out of human control, so flood mitigation must address the other contributing factors. Unlike precipitation and ice formation, steps can be taken to mitigate flooding through manipulation or maintenance of the floodplain. Insufficient natural water storage capacity and changes to the landscape can be offset

through water storage and conveyance systems that run the gamut from highly engineered structures to constructed wetlands.

Careful planning of land use can build on the natural strengths of the hydrologic response. Re-vegetation of burned slopes diverts overland flow (fast and flood producing) to subsurface flow (slower and flood moderating). Details on rehabilitating burned areas to reduce flash floods, debris flows and landslides can be found in the Landslide chapter of this document.

Floods generally come with warnings and flood waters rarely go where they are totally unexpected by experts. Those warnings are not always heeded, though, and despite the predictability, flood damage continues.

The failure to recognize or acknowledge the extent of the natural hydrologic forces in an area has led to development and occupation of areas that can clearly be expected to flood on a regular basis. Despite this, communities are often surprised when the stream leaves its channel to occupy its floodplain. A past reliance on structural means to control floodwaters and "reclaim" portions of the floodplain has also contributed to inappropriate development and continued flood-related damages.

Development in or near floodplains increases the likelihood of flood damage in two ways. First, new developments near a floodplain add structures and people in flood areas. Secondly, new construction alters surface water flows by diverting water to new courses or increases the amount of water that runs off impervious pavement and roof surfaces. This second effect diverts waters to places previously safe from flooding. Unlike the weather and the landscape, this flood-contributing factor can be controlled. Development and occupation of the floodplain places individuals and property at risk. Such use can also increase the probability and severity of flood events (and consequent damage) downstream by reducing the water storage capacity of the floodplain, or by pushing the water further from the channel or in larger quantities downstream.

Dam Failure

The Snake River defines both the northern and eastern borders of Asotin County. Because this major watershed is regulated by upstream dams, potential flooding as a result of a malfunction or dam break is a serious, but unlikely concern.

There are two upstream dams that could impact the Snake River in this area; the Hells Canyon Dam on the Snake River approximately 106 miles upstream from Clarkston, and Dworshak Dam on the Clearwater River approximately 43 miles upstream from Clarkston. According to the inundation maps included in the Emergency Action Plan for the Hells Canyon Dam[9], the community of Rogersburg, homes and structures along the Snake River, the city of Asotin, and the City of Clarkston would be heavily impacted by a floodwave within 9 hours of a Hells Canyon Dam breach. The river is expected to rise approximately 4 feet at Clarkston under probable maximum flood conditions. Shorelines in Asotin County are likely to be affected by floodwaters from a breach at Hells Canyon Dam. While this type of

[9] Idaho Power. Emergency Action Plan for the Hells Canyon Dam and Power Plant. Idaho Power Company. Boise, Idaho. September 2009.

event is expected to cause considerable property damages in the form of erosion and land use changes, there are relatively few structures, critical infrastructure, or other improvements in the areas likely to be affected by this type of flood water.

According to the inundations maps included in the Dworshak Dam Flood Emergency Subplans[10], a breach of Dworshak Dam would heavily impact the city of Asotin and the city of Clarkston as well as the Snake River shorelines in Asotin County. The Corps of Engineers anticipates that the initial floodwave from a complete Dworshak Dam breach would arrive in Clarkston within approximately 3 hours and that the peak flood would occur within 9.5 hours of failure. The peak water surface elevation at Clarkston is expected to reach 793 feet under the assumed conditions of the study.

The Emergency Action Plan for the Hells Canyon Dam and Power Plant developed by the Idaho Power Company and the Flood Emergency Subplans for Notification and Inundation Maps – Dworshak Dam and Reservoir North Fork Clearwater River developed by the US Army Corps of Engineers provide detailed emergency operational information including protocols, authorities, contact information, maps, and timelines. There is very little that residents of Asotin County can do to mitigate risk or lessen the impacts of a dam break flood event; however, all jurisdictions in this area should be prepared to deal with this type of disaster as much as possible.

Flood Risk Assessment

The three major drainages in Asotin County include the Snake River, which forms the county's northern and eastern border; the Grande Ronde River in the remote southern extent of the county, and Asotin Creek, which drains a large section of the interior of the county. Asotin County has a Flood Risk Index (WaSRI-F) of Low according to the Washington State Enhanced Hazard Mitigation Plan, 2018.[11] The WaSRI-F looks at likelihood, hazard area, population, built environment, critical facilities, consequences, and other factors to produce a "Low", "Medium", or "High" rating. There have been 2 federally declared disasters resulting from flood events affecting Asotin County since 1980. These are DR-1100 and DR-1159 and are discussed under the *Local Event History* section. There have not been any federal disaster assistance declarations for Asotin County due to flooding since the 2011 Hazard Mitigation Plan was published but there have been flood events that have affected Asotin County. The Snake River, the Grande Ronde River, and Asotin Creek flood every two to five years as a result of heavy rainfall, mild temperatures, and/or spring runoff.

Flooding does not typically occur on the Snake River due to flood control capacity of both upstream and downstream dams. The water level of Snake River reservoirs are monitored and highly regulated for the purposes of providing not only irrigation water to the surrounding agricultural developments and hydroelectric power, but also to provide flood control for communities along this major drainage. In the

[10] USACE. Flood Emergency Subplans for Notification and Inundations Maps – Dworshak Dam and Reservoir North Fork Clearwater River, Idaho. US Army Corps of Engineers Walla Walla District. Envirecord, Inc. Walla Walla, Washington. August 1982.

[11] Washington Military Department Emergency Management Division. Washington State Enhanced Hazard Mitigation Plan. Available online at https://mil.wa.gov/asset/5d1626c2229c8.

event of a major flood on the Snake River, State Highway 129 and the Snake River Road from Asotin to Rogersburg are the most vulnerable. Residents along these access roads would likely be isolated if either of these access routes were to become impassable.

The Grande Ronde River flows in an easterly direction on the south end of Asotin County to its confluence with the Snake River at Rogersburg. The Grande Ronde River is not heavily populated; thus the flood risk is primarily associated with the bridge crossing on State Route 129 and the Joseph Creek Road Bridge.

Local Event History

February 1996 (DR-1100) - Heavy rains caused flooding in the counties of Adams, Asotin, Benton, Clark, Columbia, Cowlitz, Garfield, Grays Harbor, King, Kitsap, Kittitas, Klickitat, Lewis, Lincoln, Pierce, Skagit, Skamania, Snohomish, Spokane, Thurston, Wahkiakum, Walla Walla, Whitman, and Yakima and the Yakima Indian Reservation. Snowfall beginning January 26, 1996, followed by heavy rain in February, mild temperatures, and mountain snow melt caused severe flooding throughout the entire northwest. Three people died in Washington. Record flooding occurred on the Columbia, Snoqualmie, Cedar, Chehelis, Nisqually, Skookumchuck, Klickitat, Skokomish, Cowlitz, Yakima, Naches, Palouse, Walla Walla Rivers, and Latah Creek. During the 1996-97 winter storms, areas not prone to river flooding experienced surface water flooding due to high groundwater tables or inadequate urban storm sewer drainage systems. Floods contaminated domestic water supplies, fouled septic systems, and inundated electrical and heating systems.

December 1996 thru January 1997 - Rain, ice, and snow caused flooding. Federal disaster number 1159 was assigned for counties of Adams, Asotin, Benton, Chelan, Clallam, Clark, Columbia, Cowlitz, Douglas, Ferry, Franklin, Garfield, Grant, Grays Harbor, Island, Jefferson, King, Kitsap, Kittitas, Klickitat, Lewis, Lincoln, Mason, Okanogan, Pacific, Pend Oreille, Pierce, San Juan, Skagit, Skamania, Snohomish, Spokane, Stevens, Thurston, Walla Walla, Whatcom, and Yakima.

Following the 1996-97 and the 1999 flooding of Asotin Creek, there was found to be 18 abandoned vehicles in or alongside the creek bed. Asotin County, collaborating with the city of Asotin, the Department of Ecology, the Conservation District, and local landowners, applied for and were awarded a grant to not only remove the cars, but also implement some stream bank protection measures at the Asotin City Park. Using the grant funds, all 18 vehicles were removed and disposed of and 4 J-hook vanes and some large woody debris was installed in Asotin Creek to slow stream flows near the Park. Additionally, new trees and shrubs were planted at the disturbed sites. Since Asotin Creek has been designated as a reserve for wild steelhead and salmon, this stream restoration project reduced stream bank degradation and improved water quality and fish spawning habitat while reducing the potential for future flooding due to stream flow obstructions.

February 7, 2017 Flooding of Grande Ronde River – News outlet KLEW reported that melting ice caused flooding in southeastern Asotin County on SR 129 south of Anatone. “Witnesses say homes were damaged from rising water levels and cars were completely submerged.” Local authorities attributed

the flood event to an ice buildup on the river causing and ice dam and "…with snow melt, the ice dam broke and flooded the surrounding area downstream".[12]

Probability of Future Events

Each year some kind of spring flooding is expected and does occur in Asotin County. This flooding is not typically viewed as individual flood events but is instead viewed as inevitable seasonal conditions. Asotin County Public Works repairs these typically minor damages, as they are factored into the yearly budget.

Asotin County participates in the National Flood Insurance Program and has developed local ordinances to better regulate and direct development in flood plain areas. These local ordinances regulate planning, construction, operation, and maintenance of any works, structures, and improvements. Asotin County's ordinances also help ensure that activities in the floodplain are properly planned, constructed, and maintained to avoid adversely influencing the stream or other body of water and the security of life, health, and property against damage by floodwater. There are no repetitive loss properties in Asotin County.

Participation in the National Flood Insurance Program (NFIP) and subsequent adoption of the Uniform Building Codes, or more stringent local building codes, provide basic guidelines to communities on how to regulate development. When a county participates in the NFIP it enables property owners in the county to insure against flood losses. By employing wise floodplain management, a participating county can protect its citizens against much of the devastating financial loss resulting from flood disasters. Careful local management of development in the floodplains results in construction practices that can reduce flood losses and the high costs associated with flood disasters to all levels of government.

Table 14: National Flood Insurance Program policy information for Asotin County and cities[13]

Community Name	Policies in Force	Total Coverage	Total Written Premium + FPF	FIRM Effective Date	Floodplain Ordinance/ Manager	CRS Ranking
Asotin County (unincorporated)	22	$5,199,500	$18,896	1/06/1988	Yes/Yes	**NA**
Clarkston	-	-	-	-	No/No	**NA**
Asotin	**1**	**$150,000**	**$1,517**	**1/06/1988**	**Yes/Yes**	**NA**

Description definitions

Policies in Force *– The number of policies in force for a given state and combination of attributes.*
Total Coverage *– The total building and contents coverage for the policies in force.*
Total Written Premium + FPF *– This represents the sum of the premium and FPF (federal policy fee) for the policies in force.*

[12] Lafferty, Kaila. KLEW. "Grande Ronde River melting snow causes flooding near Boggan's Oasis". https://klewtv.com/news/local/grande-ronde-river-melting-snow-causes-flooding-near-boggans-oasis.
[13] National Flood Insurance Program. "Reports". Accessed on September 1, 2020: https://nfipservices.floodsmart.gov/home/reports.

An important part of being an NFIP community is the availability of low cost flood insurance for those homes and businesses within designated flood plains, or in areas that are subject to flooding, but that are not designated as Special Flood Hazard Areas.
Overall participation by individuals and business in the NFIP appears to be low. Potential reasons are:

- Highly populated areas of the county are not at high or moderate risk to flood
- A lack of knowledge about the existence of the availability of low cost flood insurance.
- Home and business owners unaware of their vulnerability to flood events.
- Current cost of insurance is prohibitive.

All communities in the county have the option of participating in the Community Rating System (CRS). To qualify for CRS, communities can do things like make building codes more rigorous, maintain drainage systems, and inform residents of flood risk. In exchange for becoming more flood-ready, the CRS community's residents are offered discounted premium rates. Based on a community's CRS ratings, they can qualify for up to a 45% discount of their annual flood insurance premium.

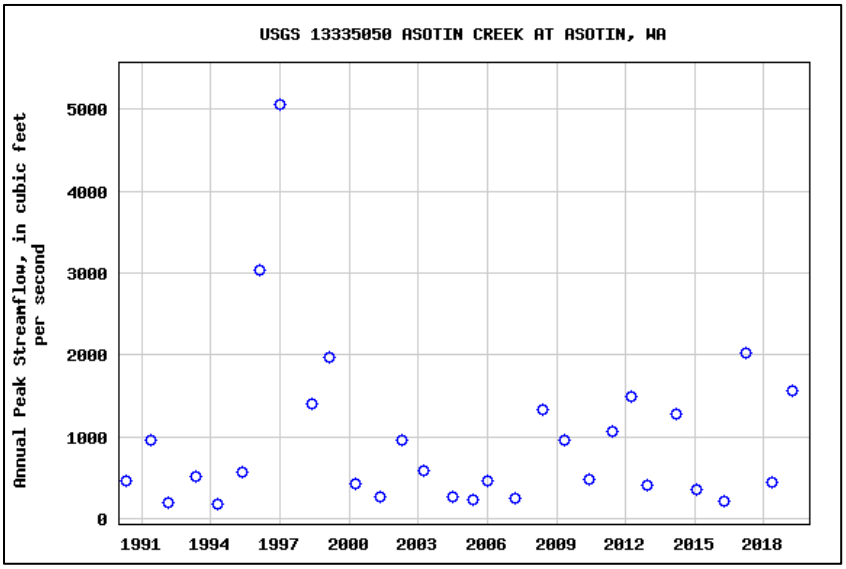
Impacts of Flood Events by Jurisdiction

Asotin County

Most of the structures in the FEMA-identified floodplain for all of Asotin County are located along Asotin Creek. Asotin Creek is a collector watershed for numerous tributaries in a large area originating in the Smoothing Iron and Hogback Ridge areas of the Umatilla National Forest. Some of these tributaries include George Creek, Pintler Creek, Kelly Creek Rockpile Creek, Charley Creek, Lick Creek, and Ayers Gulch. Asotin Creek is most heavily influenced by rain-on-snow events due to its large drainage area and relatively narrow channel; however, several flash floods have also been recorded.

The stream gauge at Asotin Creek has been maintained by the USGS for many years but will be discontinued in the fall of 2020. The cost to maintain the site is prohibitive for local agencies and organizations and so they will need to use other sources for monitoring the streamflow at Asotin Creek.

Figure 2: Peak Streamflow of Asotin Creek[14]



Areas that have been affected by ice dams include Fisher Gulch and areas on the Grande Ronde River. The 2017 ice dam flooding mentioned under *Local Event History* is an example of impacts from ice dam flooding.

A high level of sediment is prevalent during periods of runoff. This sediment tends to cause a deteriorating condition in channel beds through erosion and deposition. Natural obstructions to flood waters include trees, brush, and other vegetation along the stream banks in the floodplain area. Debris can plug culverts and accumulate on bridge abutments at several locations throughout the town. Several streets and road shoulders are prone to erosion during flood events. Many secondary routes are not paved, which results in gravel washing down-slope potentially clogging drainage systems or directing water to places that were not intended. Sedimentation and accumulated debris and vegetation are significantly increasing the flood risk associated with Asotin Creek. Debris jams during high water events have caused considerable flood damage to adjacent properties. The Anatone area has 16 bridges that have been identified by Asotin County Road and Bridge that are susceptible to scouring during any given spring runoff period. About 60% of Asotin County residents are on septic systems. These can be significantly impacted by both flood events and normal wet springs. The "failed designation" in the Washington state code needs to change to more appropriately reflect the situation in Asotin County.

Value of Resources at Risk

Using current parcel data provided by Asotin County, there are 162 assessed improvements within the FEMA-identified floodplains (100- and 500-year) in unincorporated areas of Asotin County, yielding a total improvement value of more than $29.2 million. The estimated value of contents is ½ the value of the improvements equating to an additional $14.6 million in potential losses. In reality, the damages will

[14] USGS. U.S. Department of Interior. "Peak Streamflow for Washington". Available online at https://nwis.waterdata.usgs.gov/wa/nwis/peak/?site_no=13335050&agency_cd=USGS. October 2020.

most likely not be equally distributed between buildings based on building materials, building location, and flood location. However, these estimates provide a basic approximation.

Critical infrastructure located within the identified floodplain for the unincorporated areas of the county include U.S. Highway 12, the Southway Bridge, and the Grande Ronde Bridge at Joseph Creek.

Figure 3 shows the areas within Asotin County that were highlighted during past planning efforts. These areas have been designated for a more detailed examination because they have typically flooded in the past, they are likely to experience flood events in the future, and/or they have higher concentrations of residents and structures.

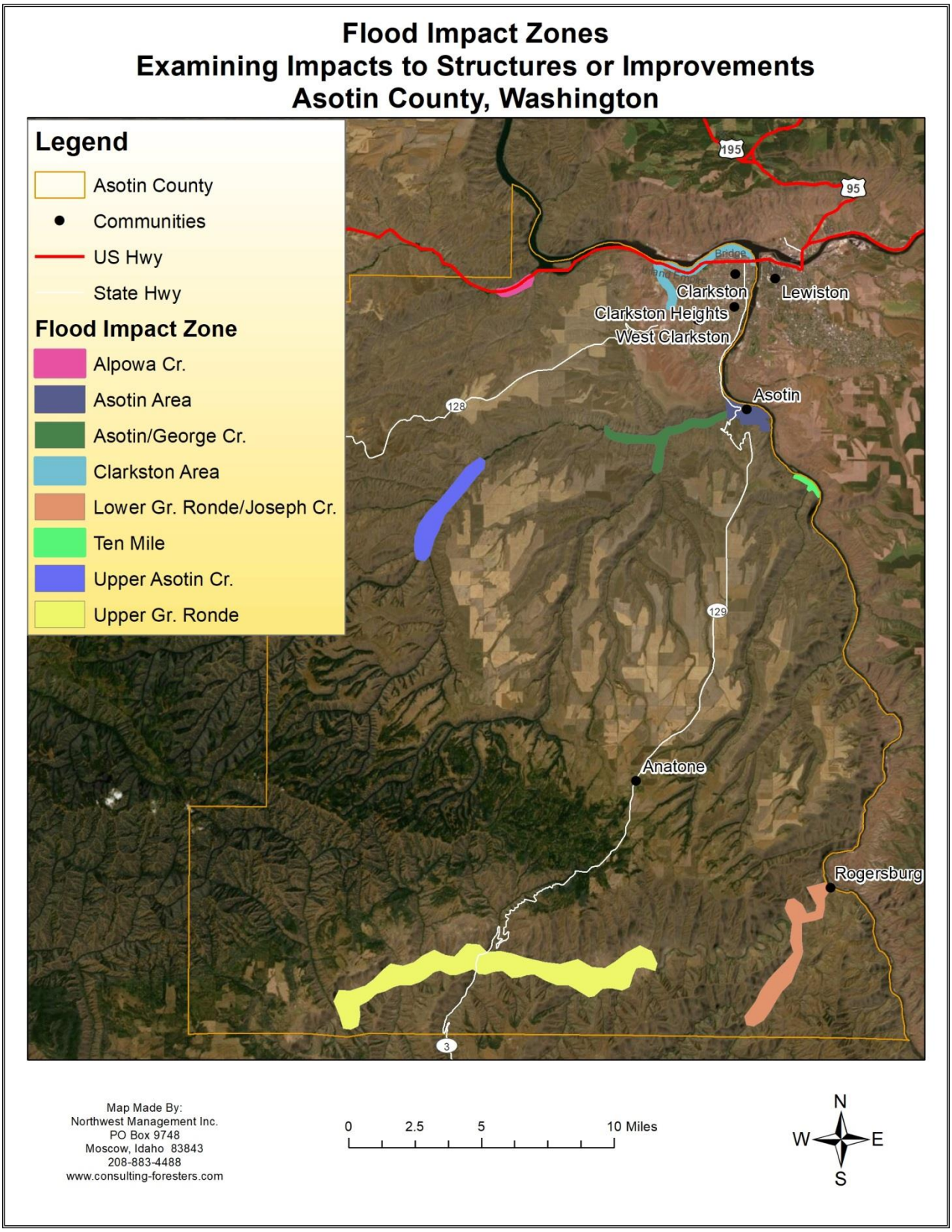
Six areas in unincorporated Asotin County were previously designated as flood impact zones: Asotin/George Creek, Alpowa Creek, Ten Mile, Upper Asotin Creek, Upper Grande Ronde River, and Lower Grande Ronde River/Joseph Creek. Table 5 expresses the amount of structures, parcels and improvements within the flood zones in each flood impact area, and the improvement values located within the flood zones also. Parcel and improvement numbers are derived from Asotin County parcel data. Individual maps of each impact zone are presented on subsequent pages.

Table 15: Improvement Values in Flood Impact Areas. Number of parcels, number of improvements, and improvement values are calculated from Asotin County parcel data (2019). Number of structures is derived from a Microsoft building footprint data layer (2018).[15]

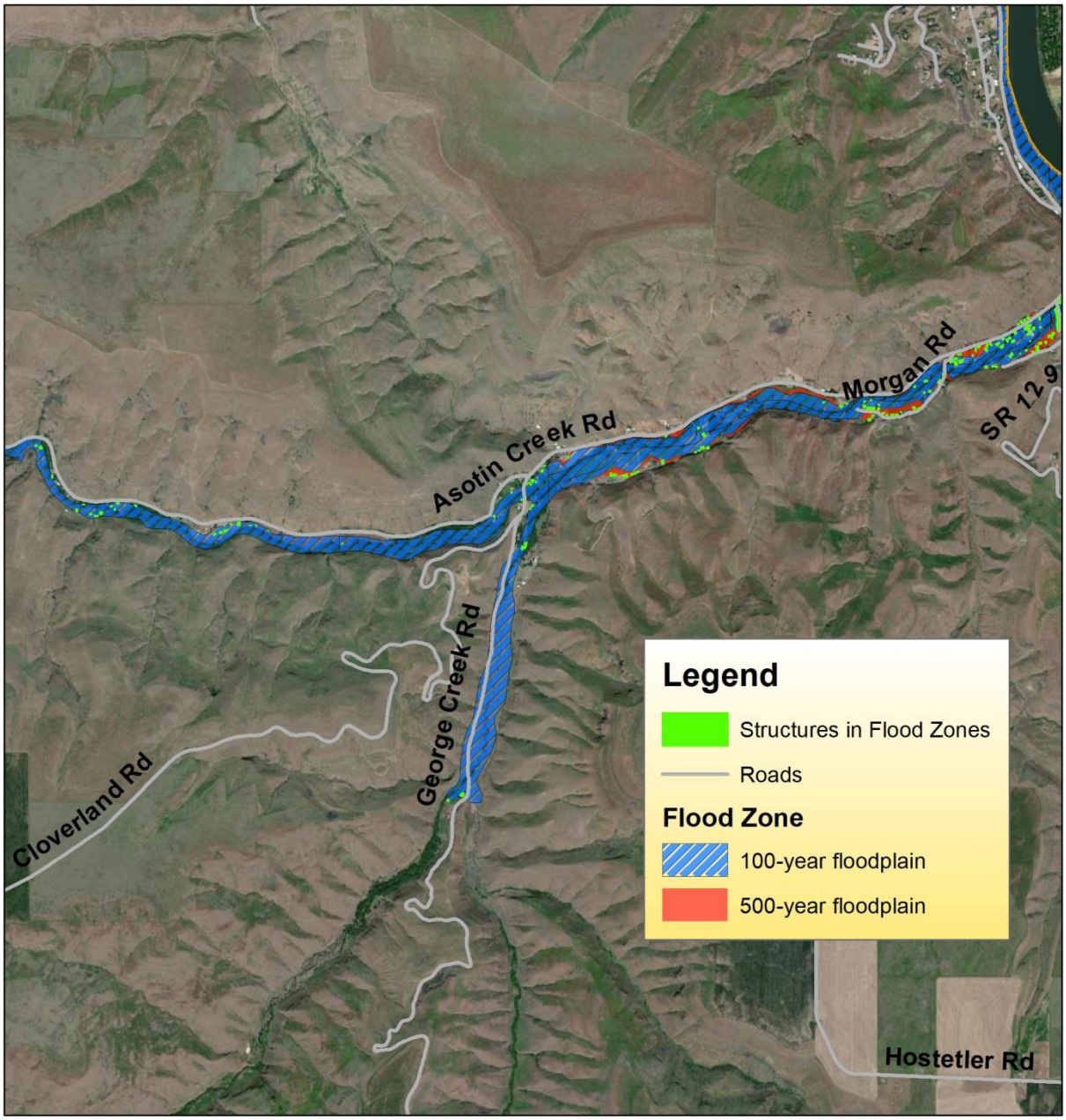
Flood Impact Zone	No. of Structures	No. of Parcels	No. of Improvements	Improvement Value
Asotin/George Creek FZ	143	100	71	$9,281,700
Alpowa Creek FZ	10	11	6	$797,100
Ten Mile FZ	5	12	6	$5,067,400
Upper Asotin Creek FZ	4	20	5	$810,600
Upper Grande Ronde River FZ	20	100	16	$2,255,800
Lower Grande Ronde/Joseph Creek FZ	22	74	26	$2,766,000

[15] Microsoft. "US Building Footprints." Available online at https://github.com/microsoft/USBuildingFootprints.

Figure 3: Flood Impact Zones (pre-determined areas highlighted due to potential impacts to structures and improvements from flooding)



Asotin Creek/George Creek Flood Zone
Asotin County, Washington



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PO Box 9748
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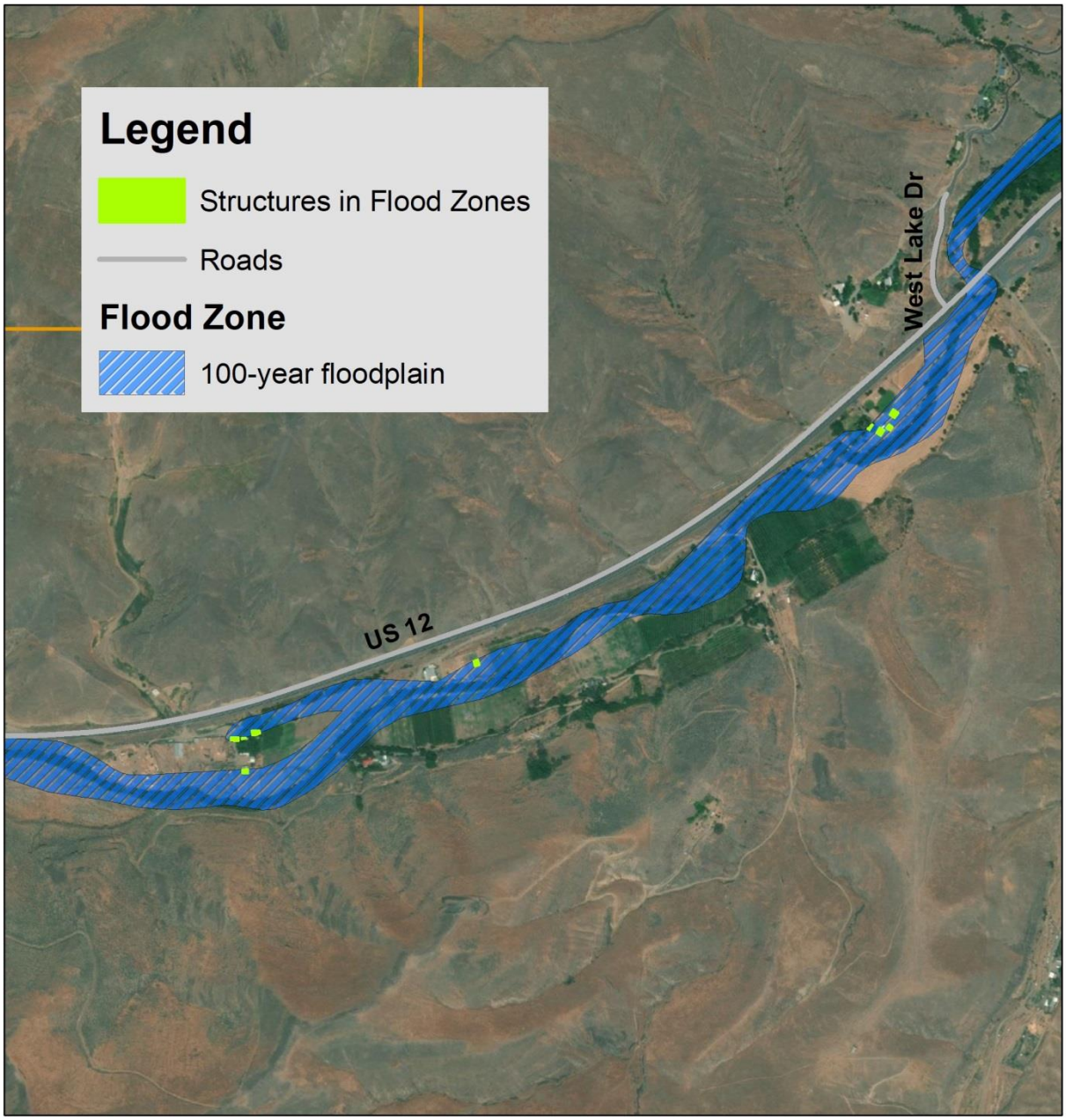
Alpowa Creek Flood Zone
Asotin County, Washington



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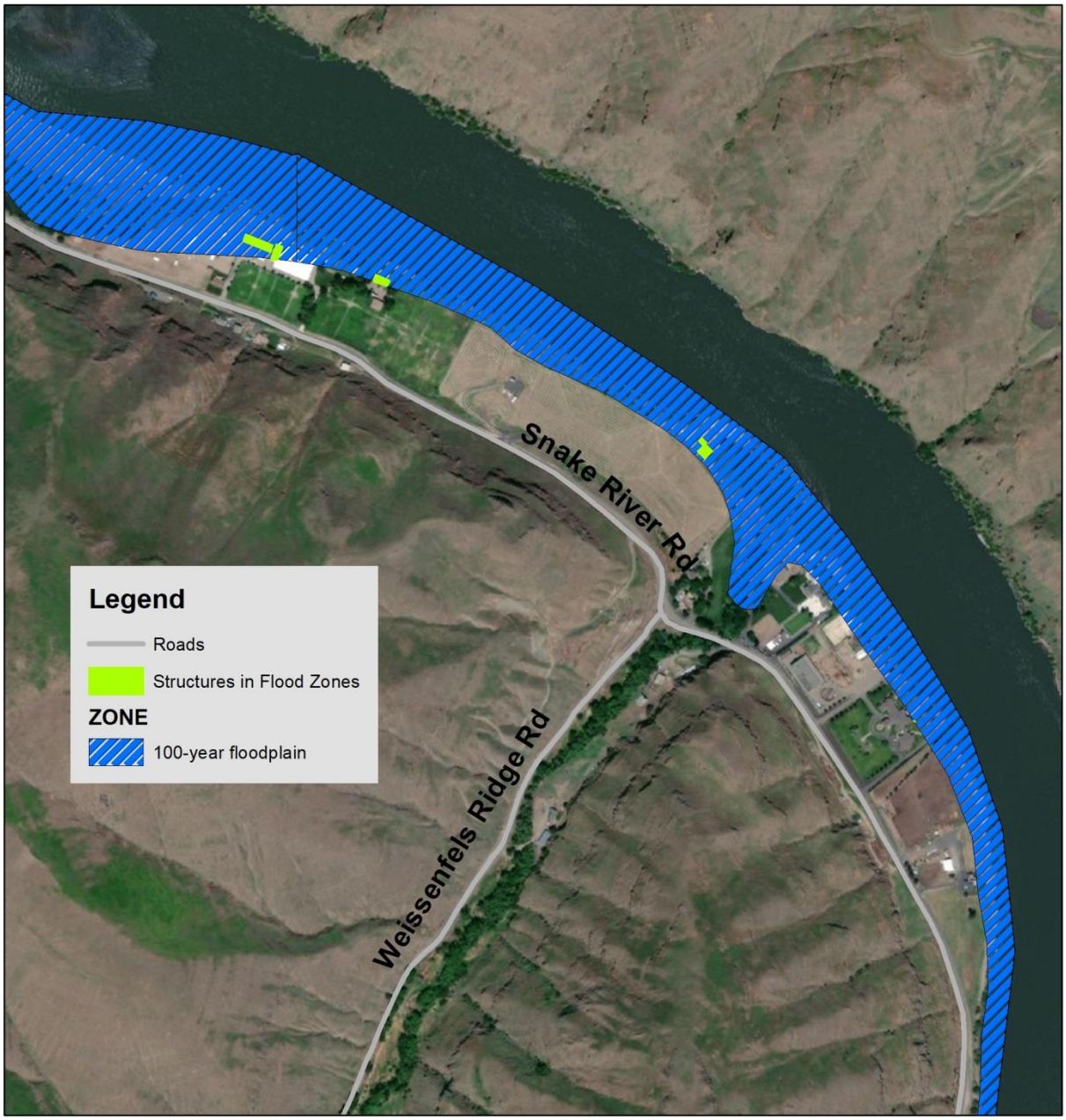
Ten Mile Flood Zone
Asotin County, Washington



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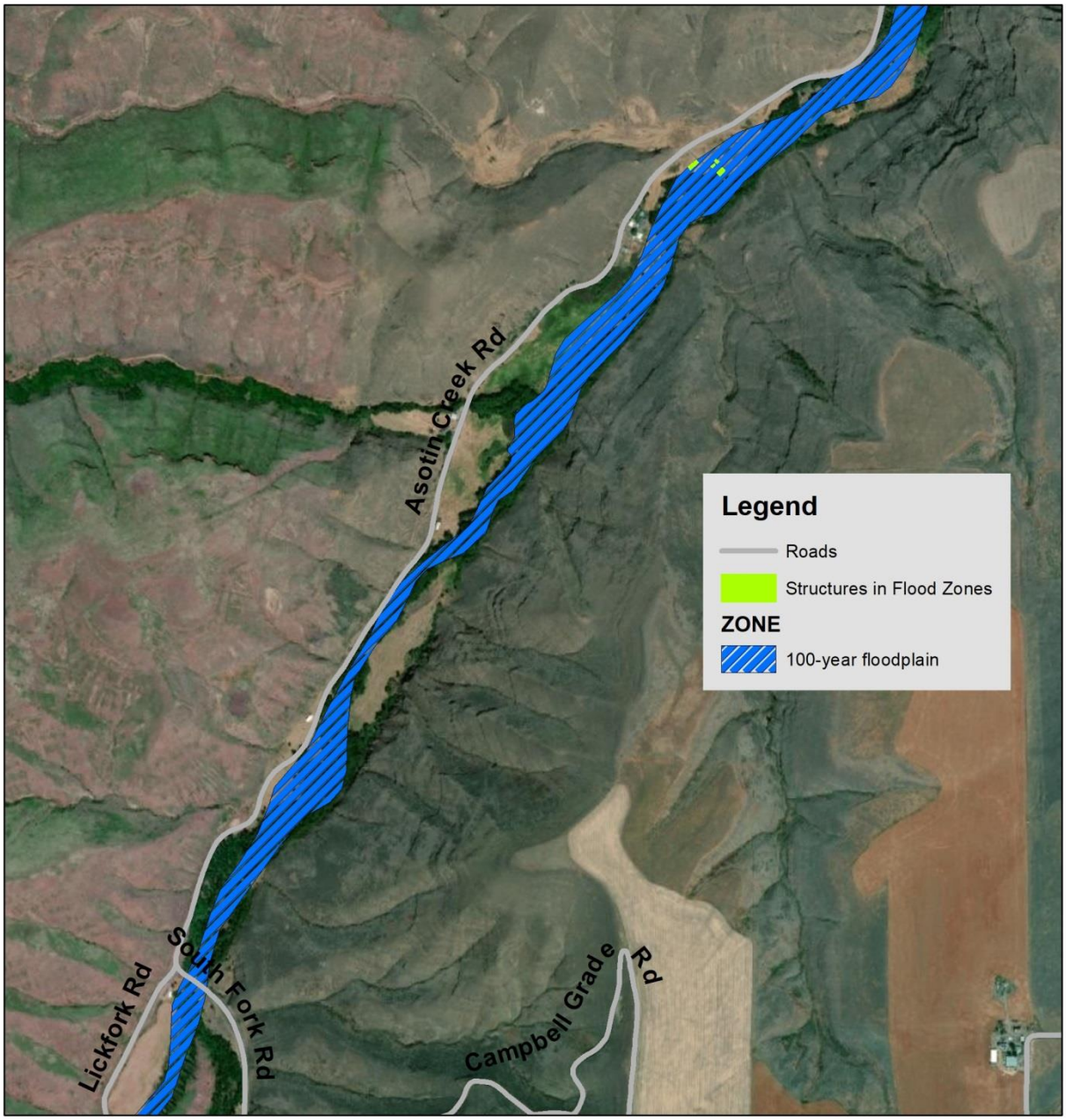
Focused View of Structures
Upper Asotin Creek Flood Zone
Asotin County, Washington



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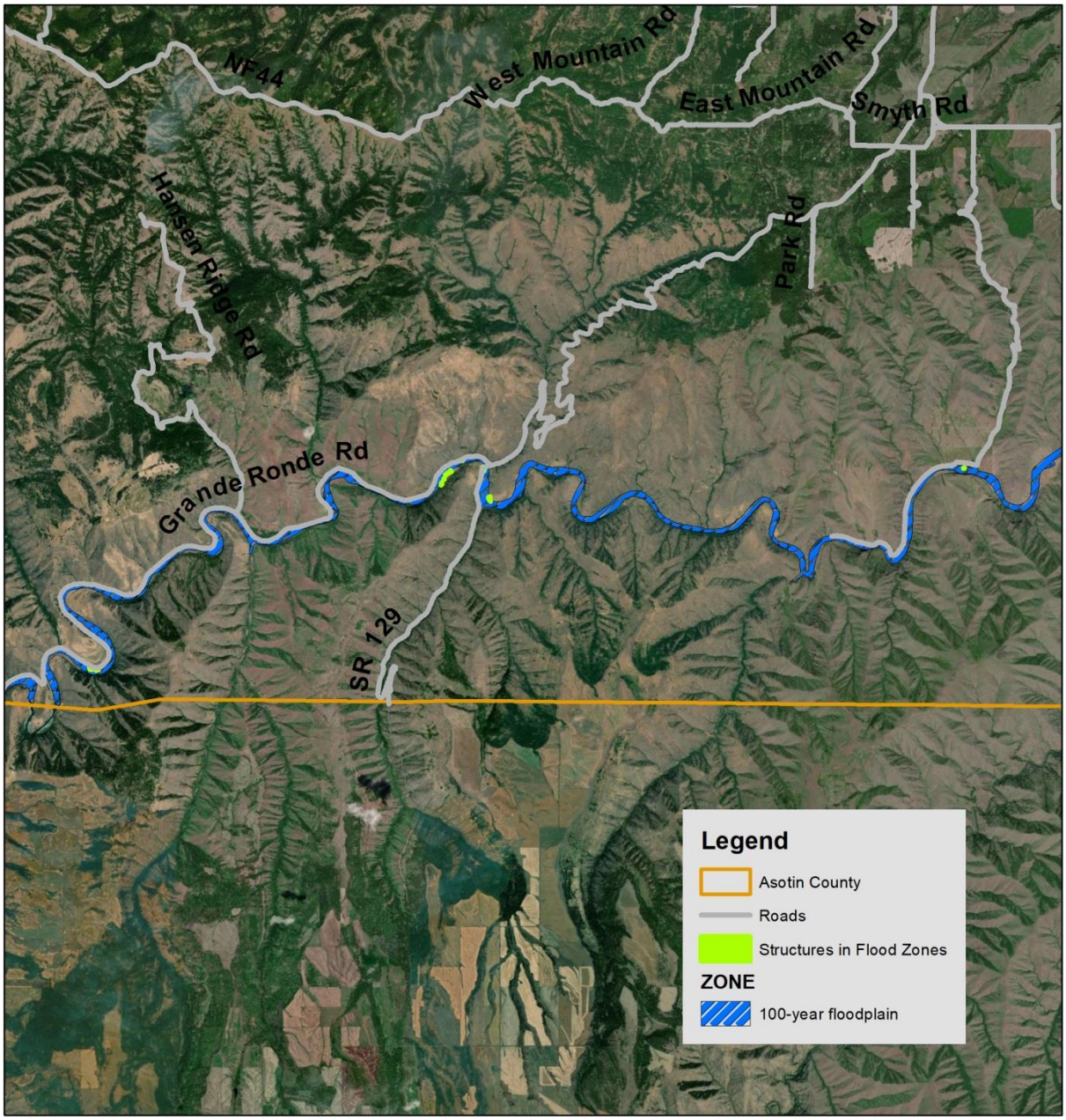
Upper Grande Ronde River Flood Zone
Asotin County, Washington



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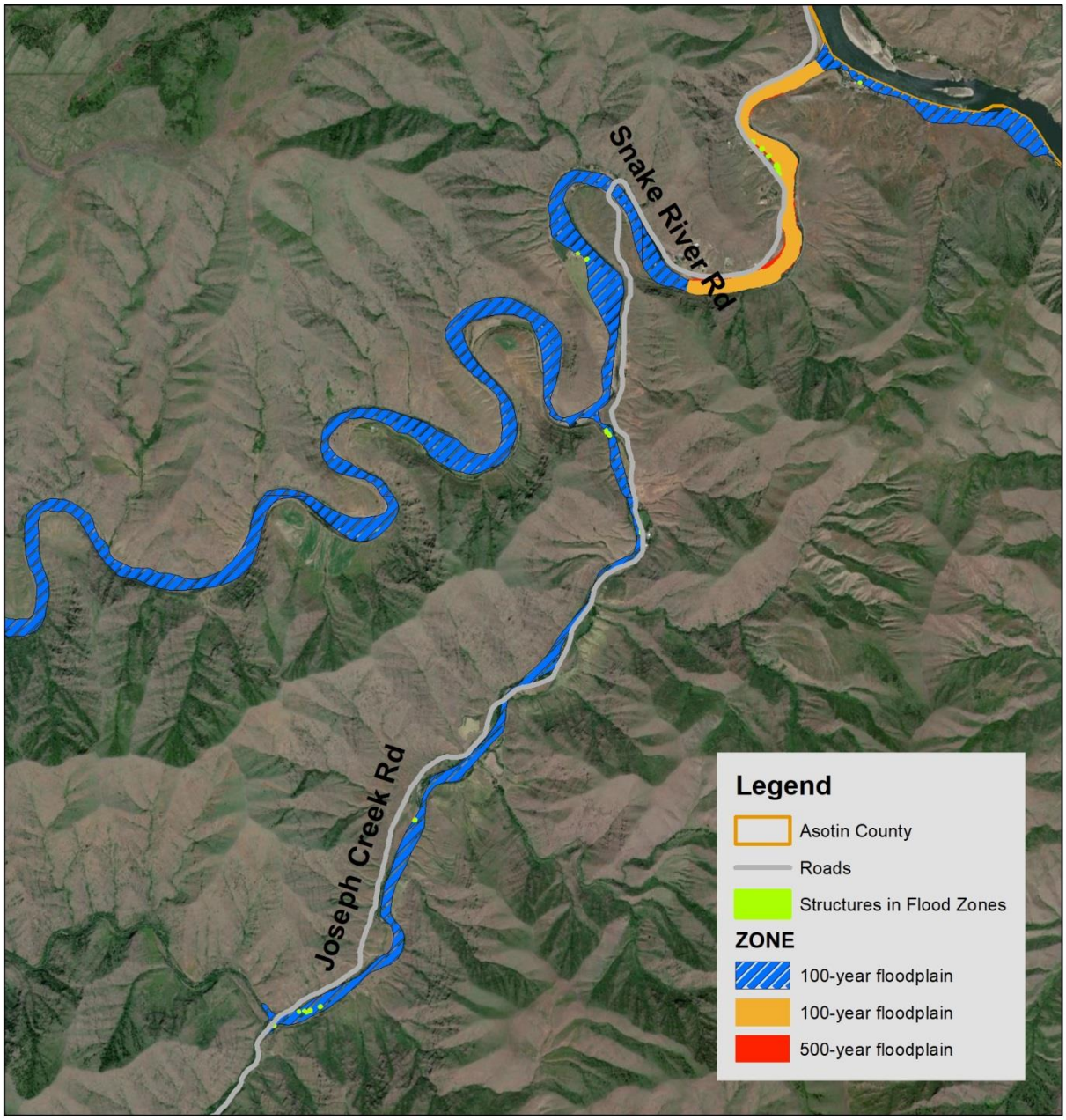
Lower Grande Ronde/Joseph Creek Flood Zone
Asotin County, Washington



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City of Asotin

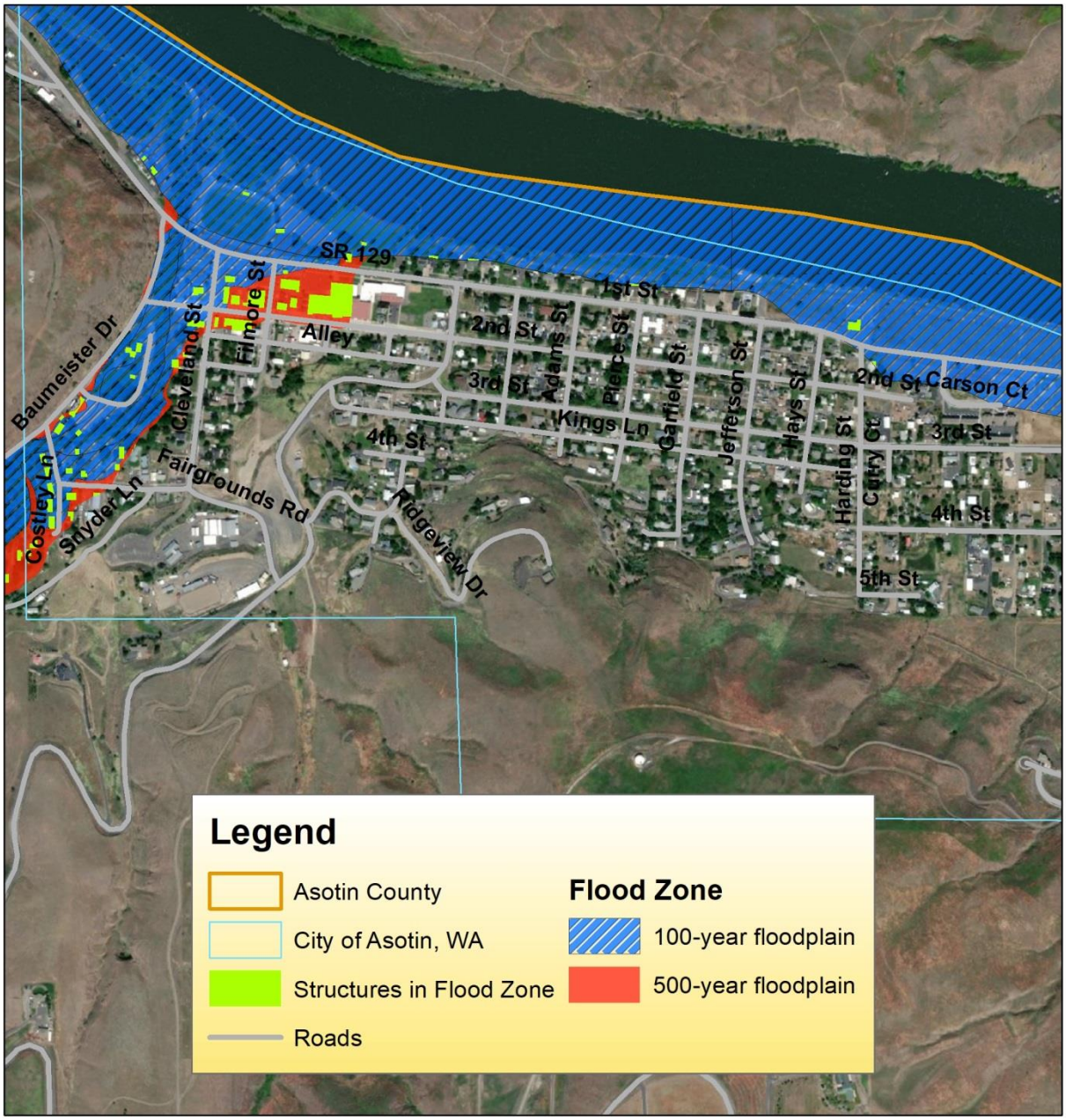
The city of Asotin is located at the confluence of Asotin Creek with the Snake River. The main Asotin Creek channel flows along the west side of Asotin affecting residential properties as well as several public facilities. The Snake River is located on the north side of Asotin. Flooding along the Snake River is uncommon due to existing upstream dams; however, there are a few structures including critical facilities located in the floodplain for this major waterway. Also, Asotin is accessed by State Highway 129 from Clarkston, which parallels the Snake River. Damage or undermining of this access route by Snake River floodwaters would effectively isolate Asotin. Alternative routes are available to the south; however, none would offer a direct route to Clarkston.

Asotin Creek drains approximately 325 square miles of Asotin and Garfield Counties. Asotin Creek is most heavily influenced by rain-on-snow events due to its large drainage area and relatively narrow channel; however, several flash floods have also been recorded. One significant flash flood struck Asotin Creek after a thunderstorm in May 1897, inflicting considerable damage, but causing no fatalities. A similar flash flood on Asotin Creek in June 1925 killed two young children, both members of the same family. A state highway department employee drowned in yet another flash flood in Dry Gulch, a tributary of Asotin Creek in 1976.[16] The most recent flood was in 1997.

Sedimentation and accumulated debris and vegetation are significantly increasing the flood risk associated with Asotin Creek. Debris jams during high water events have caused considerable flood damage to adjacent properties. Most of the structures in the FEMA-identified floodplain for all of Asotin County are located along Asotin Creek.

[16] Dougherty, Phil. "Asotin County – Thumbnail History." HistoryLink.org Essay 7643. Available online at http://www.historylink.org/index.cfm?DisplayPage=output.cfm&file_id=7643.

City of Asotin, Washington
Area of Flood Impact to Structures



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Value of Resources at Risk

Flood Impact Zone	No. of Structures	No. of Parcels	No. of Improvements	Improvement Value
City of Asotin	44	94	69	$18,059,800

There are 44 structures and 69 assessed improvements within the FEMA-identified floodplains (100- and 500-year) in Asotin, yielding an estimated total improvement value of approximately $18 million. The estimated value of contents is ½ the value of the improvements equating to an additional $9 million in potential losses. In reality, the damages will most likely not be equally distributed between buildings based on building materials, building location, and flood location. However, these estimates provide a basic approximation.

1997 Flooding in Asotin City Park.

Critical infrastructure located within the identified floodplain for Asotin includes the sewage treatment facility, the Asotin County Courthouse and Annex Building, Asotin City Hall, the post office, Asotin County Sheriff's office, water well #1, the State Highway 129 Bridge, the 2nd Street Bridge, the Costley Lane Bridge, the Asotin County Public Health District building, Asotin High School (also a Red Cross shelter), and the fire station. Asotin built an overflow system at the sewage treatment facility to help mitigate the potential for damages and/or water contamination during a high water event.

City of Clarkston

Clarkston is located at the confluence of the Clearwater and Snake Rivers. Flooding does not typically occur on the Snake River, the northern and western borders of the County, due to flood control capacity of both upstream and downstream dams. The water level of Snake River reservoirs are monitored and highly regulated for the purposes of providing not only irrigation water to the surrounding agricultural developments (mostly outside Asotin County) and hydroelectric power, but also to provide flood control for communities along this major drainage. A major flood event on the Snake River may cause minimal damages in Clarkston; however, very few structures or infrastructure are located in the floodplain associated with this waterway. The U.S. Highway 12 Bridge connecting Clarkston with Lewiston and the Red Wolf Bridge on the north side of town could be impacted by debris and/or ice in the River causing jams or directly damaging the structures. This would cause serious traffic delays; however, it is unlikely that all of the Snake River bridges at Clarkston would be impassable.

Weather related flooding tends to impact Dry Creek, a shallow draw on the west side of Clarkston Heights-Vineland. This is a small waterway draining the foothills to the south and west of the City. Dry Creek is extremely prone to flash flooding as a result of localized thunderstorms. This type of event can occur rapidly, overwhelming the carrying capacity of the channel in a short time. The duration of this type of flooding tends to be a matter of hours and is usually associated with localized thunderstorms in which the ground cannot absorb moisture as quickly as it is coming down.

Dry Creek is also heavily impacted by rain-on-snow events. Warm rains falling on the snow pack result in a significantly increased rate of snowmelt. Often the melting occurs when the ground is frozen and the water cannot be absorbed fast enough, resulting in increased overland flows. Flood waters recede slowly as the weather events tend to last for several days. Homes in the Dry Creek area are accessed by Evans Road off of U.S. Highway 12. In the event that the stream damage or washes out Evans Road, the only remaining access routes would be Ben Johnson Road to the east or out the top on Peola Road.

Value of Resources at Risk

Flood Impact Zone	No. of Structures	No. of Parcels	No. of Improvements	Improvement Value
City of Clarkston	10	38	11	$7,256,400

There are 10 structures and 11 assessed improvements within the FEMA-identified floodplains (100- and 500-year) in Clarkston, yielding an estimated total improvement value of over $7.2 million. The estimated value of contents is ½ the value of the improvements equating to an additional $3.6 million in potential losses. In reality, the damages will most likely not be equally distributed between buildings based on building materials, building location, and flood location. However, these estimates provide a basic approximation. These structure, parcel and improvement numbers, as well as improvement values, include the Dry Creek area along Evans Road that technically falls in the NFIP flood plain.

Critical infrastructure located within the identified floodplain for Clarkston includes the U.S. Highway 12 Bridge, the Red Wolf Bridge (State Highway 193), and Asotin County Port.

City of Clarkston, Washington
Area of Flood Impacts to Structures

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Asotin County Fire District #1

The Fire District does not have any differing levels of risk associated with this hazard than Asotin County as a whole.

Value of Resources at Risk

The Asotin Fire District #1 station in the Clarkston Heights is not directly at risk to flood events; however, the District may provide emergency response capabilities including water rescue, search and rescue and/or manpower for flood control measures.

Blue Mountain Fire District

The community of Anatone is located on higher terrain and the potential for flooding is very minimal, except for spring runoff on Mill Creek which runs adjacent to the city. Blue Mountain Fire District #1 has four flood impact zones located within its boundaries; the Ten Mile FZ, Lower Grande Ronde/Joseph Creek FZ, Upper Grande Ronde River FZ and a portion of the Asotin/George Creek FZ.

The Upper Grande Ronde and Lower Grande Ronde flood impact zones have high potential for flooding due to ice jams in the winter months. Depending on snow depth in the higher elevations and sudden temperature increases, there is potential for flooding due to runoff in these four flood impact zones as well as any other drainages with homes, outbuilding and bridges.

Value of Resources at Risk

Blue Mountain Fire District #1 does not have a fire station at this time but owns a five-acre lot located at 610 Sangster Road. This site includes a Conex box used for storage, a 7,000-gallon water tank, and a well. There is also a 10,000-gallon water storage tank located on Montgomery Ridge Road. Blue Mountain Fire District #1 owns four brush trucks, three tankers, and a dozer. This equipment is staged at various locations during fire season for a quick response time. These resources are not directly at risk to flood events; however, the district may provide equipment and/or manpower for flood control measures.

The city of Anatone and surrounding areas located in the four flood impact zones have moderate potential of losses to homes, outbuildings, bridges and livestock.

Asotin County Conservation District

The Conservation District is impacted by flood events in a similar way to Asotin County as a whole. However, farmers and ranchers who have land within flood zones are impacted in a particular way by flood events and the district assists these farmers and ranchers by providing technical assistance and seeking funding for projects.

Value of Resources at Risk

The conservation district has provided financial assistance to many landowners to install natural resource best management practices in the floodplain and streams throughout Asotin County. Examples of those practices include fence, tree/shrub plantings, bridges and instream structures. These resources are at risk during flood events.

Earthquake Hazard Profile

According to the USGS, "An earthquake is the ground shaking caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that we feel during an earthquake. Faults are caused by the tectonic plates grinding and scraping against each other as they continuously and slowly move."

Washington has the second highest risk of economic loss from earthquakes in the U.S., only behind California.[17] They may affect large areas, cause great damage to structures, cause injury, loss of life and alter the socioeconomic functioning of the communities involved. The hazard of earthquakes varies from place to place, dependent upon the regional and local geology.

Overview of Earthquake Hazards[18]

Primary earthquake hazards include:

- **Ground shaking**: "The Earth shakes with the passage of earthquake waves, which radiate energy that had been "stored" in stressed rocks, and were released when a fault broke and the rocks slipped to relieve the pent-up stress."
- **Landslides**: "…includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows."
- **Liquefaction**: "…a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other rapid loading." (whereupon they *liquefy* and act as a fluid)
- **Surface rupture**: "…an offset of the ground surface when fault rupture extends to the Earth's surface. Any structure built across the fault is at risk of being torn apart as the two sides of the fault slip past each other."

Secondary earthquake hazards include tsunami, seiche, flooding, and fire. Earthquakes may cause landslides and rupture dams. Severe earthquakes destroy power and telephone lines, gas, sewer, or water mains, which, in turn, may set off fires and/or hinder firefighting or rescue efforts. Earthquakes also may cause buildings and bridges to collapse.

Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge, destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soil, or trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths and injuries and extensive property damage.

[17] Washington Military Department Emergency Management Division. "Washington State Enhanced Hazard Mitigation Plan." available online at https://mil.wa.gov/asset/5d1626c2229c8. September 2020.

[18] Pacific Northwest Seismic Network. "Earthquake Hazards Overview". available online at https://www.pnsn.org/outreach/earthquakehazards. September 2020.

The USGS says that aftershock and foreshock are terms that describe earthquakes relative to the main earthquake event. "Aftershocks are smaller earthquakes that occur in the same general area during the days to years following a larger event…" The USGS also states: "As a general rule, aftershocks represent readjustments in the vicinity of a fault that slipped at the time of the 'mainshock'. The frequency of these aftershocks decreases with time. If an aftershock is larger than the first earthquake then we call it the 'mainshock' and the previous earthquakes in a sequence become foreshocks."[19]

Ground movement during an earthquake is seldom the direct cause of death or injury. Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects as a result of the ground shaking, or people trying to move more than a few feet during the shaking.[20]

Overview of Earthquake Sources[21]

- **Deep earthquakes**: "The most common source of damaging earthquakes in Washington and Oregon are deep earthquakes that rupture faults within the subducting Juan de Fuca plate - "intraplate" earthquakes." Deep earthquakes in 1949 and 1965 together killed 15 people and caused more than $500 million (2020 dollars) in property damage. The other deep earthquake (highlighted in red in Figure 4) is referring to the 2001 Nisqually earthquake.

- **Crustal earthquakes**: "Shallow earthquakes in Cascadia, with depths no greater than about 35 km, are caused by the rupture of faults within the North American Plate." Shallow (crustal) faults can cause intense local shaking – urban areas are especially vulnerable. The Puget Sound Region has the highest risk for large crustal earthquakes, though evidence has been found for large earthquakes in eastern Washington near Wenatchee, Yakima and further east, near Richland.

- **Cascadia Subduction Zone "megathrust" fault**: "The Juan de Fuca plate moves toward, and eventually is shoved beneath, the continent (North American plate)."

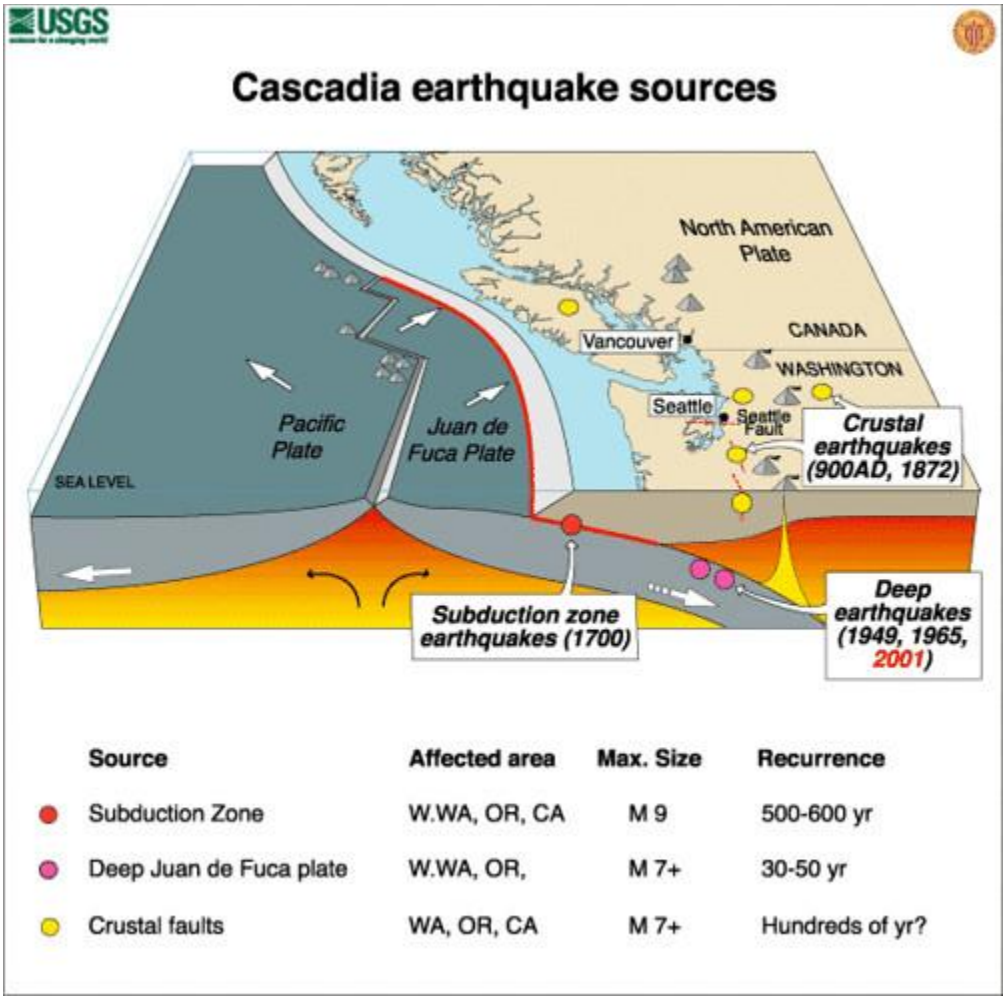
- **Volcanic earthquakes**: "Volcanically triggered earthquakes have the potential to cause cracks, ground deformation, and damage to manmade structures. They typically are much smaller than earthquakes caused by non-volcanic sources. The largest felt volcanic earthquake in the Cascades was a magnitude 5.5 in 1981, under Mount St. Helens."

[19] USGS. "Earthquake Facts & Earthquake Fantasy". available online at https://www.usgs.gov/natural-hazards/earthquake-hazards/science/earthquake-facts-earthquake-fantasy?qt-science_center_objects=0#qt-science_center_objects. September 2020.

[20] FEMA. Federal Emergency Management Agency. Available online at www.fema.gov. September 2007.

[21] Pacific Northwest Seismic Network. "PNW Earthquake Sources Overview". available online at https://www.pnsn.org/outreach/earthquakesources. September 2020.

Figure 4: Sources of earthquakes in Washington[22]



[22] Pacific Northwest Seismic Network. "PNW Earthquake Sources Overview". available online at https://www.pnsn.org/outreach/earthquakesources. September 2020.

Figure 5: Seismic Risk from High to Low and Potentially Active Faults in Washington[23]

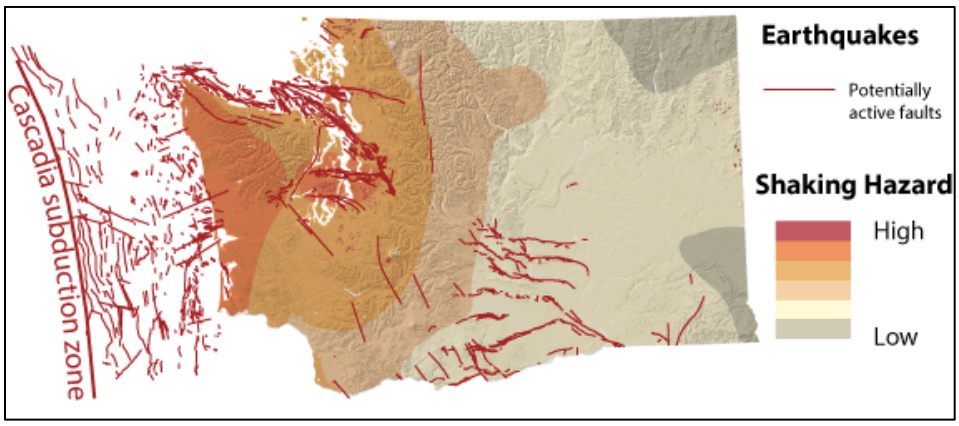


Table 16: Selected earthquakes in Washington[24]

Date	Location	Magnitude	Deaths	Injuries	Total damage
2/28/2001	Puget Sound	6.8	0-1	400	$1-4 billion
7/3/1999	Satsop	5.8	0	7	$8.1 million
4/29/1965	Puget Sound	6.7	7		$12.5 - $28 million
11/6/1962	Clark County	5.2			Minor
4/13/1949	Olympia	6.7	8	At least 64	$25 million
6/23/1946	Strait of Georgia	7.3	2		Limited
4/29/1945	North Bend	5.5			Minor
12/15/1872	North Cascades	6.5 – 7			

The 2001 Nisqually earthquake occurred on February 28 and was centered near the Nisqually Delta northwest of Olympia. The quake lasted about 40 seconds and structures in Olympia were impacted the most, including the state capitol building.

The International Building Code (IBC), a nationwide industry standard, sets construction standards for different seismic zones in the nation. IBC seismic zone rankings for Washington are among the highest in the nation. When structures are built to these standards they have a better chance to withstand earthquakes.

Structures that are in compliance with the 1970 Uniform Building Codes (UBC), which are now replaced by the International Building Code, are generally less vulnerable to seismic damages because that was when the UBC started including seismic construction standards to be applied based on regional location. This stipulated that all structures be constructed to at least seismic risk Zone 2 Standards. The State of Washington adopted the UBC as its state building code in 1972, so it is assumed that buildings built after

[23] Washington Department of Natural Resources. "Earthquakes and Faults". https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/earthquakes-and-faults

[24] Wikipedia. "List of Earthquakes in Washington". available online at https://en.wikipedia.org/wiki/List_of_earthquakes_in_Washington_(state).

that date were built in conformance with UBC seismic standards and have a lesser degree of vulnerability. Obviously, issues such as code enforcement and code compliance are factors that could impact this assumption. However, for planning purposes, establishing this line of demarcation can be an effective tool for estimating vulnerability. In 1994, seismic risk Zone 3 Standards of the UBC went into effect in Washington, requiring all new construction to be capable of withstanding the effects of 0.3 times the force of gravity. More recent housing stock is in compliance with Zone 3 standards. In 2003, the state again upgraded the building code to follow International Building Code Standards.

The Washington State Legislature also adopted the 2006 version of the International Residential Code (2006 WBCC) as the official state building code starting on July 1, 2007. The 2006 IRC governs the new construction of detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height with separate means of egress. Provisions in the 2006 IRC for earthquake structural and foundation design are determined by the seismic design category of a proposed structure as defined in Figure R301.2(2) of the 2006 IRC.[25]

Earthquake Risk Assessment

Communities in Asotin County can expect some structural failure of older multistory unreinforced masonry buildings as a result of even lower intensity earthquakes. Cornices, frieze, and other heavy decorative portions of these types of structures may fail. The potential impacts of a substantial earthquake event are highly variable. Many of the structures and infrastructure throughout the county may not incur any damages at all; however, damage to roads, bridges, unreinforced masonry, chimneys, foundations, water lines, and many other components are at risk. Fires can also be a secondary hazard to structures sustaining earthquake damage.

Because structural damage by earthquakes is typically not complete destruction, but rather tends to be subtle cracking or settling that undermines the stability of the structure. These types of repairs can be very costly. Additionally, changes to the water table or even the topography can significantly impact local municipal and private wells and could result in the loss of traditional land uses.

Local Event History

There are no recorded occurrences of earthquakes significantly impacting Asotin County, the cities, or any other adopting jurisdiction.

Several distant earthquakes produced intensities strong enough to be felt in southeastern Washington, but only two earthquakes epicenters, one in 1893 and another in 1936, were recorded for the region. Both of these earthquakes were rated as a VII on the Modified Mercalli intensity scale and produced only very slight property damages such as broken dishes and cracked plaster.[26]

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[25] FEMA. "Homebuilders Guide to Earthquake Resistant Design and Construction." available online at https://www.fema.gov/media-library-data/20130726-1535-20490-7694/fema232part1.pdf. September 2020.

[26] Noson, Linda Lawrance, et al. Washington State Earthquake Hazards. Washington Division of Geology and Earth Resources Information Circular 85. Olympia, Washington. 1988. available online at https://www.dnr.wa.gov/Publications/ger_ic85_earthquake_hazards_wa.pdf. September 2020.

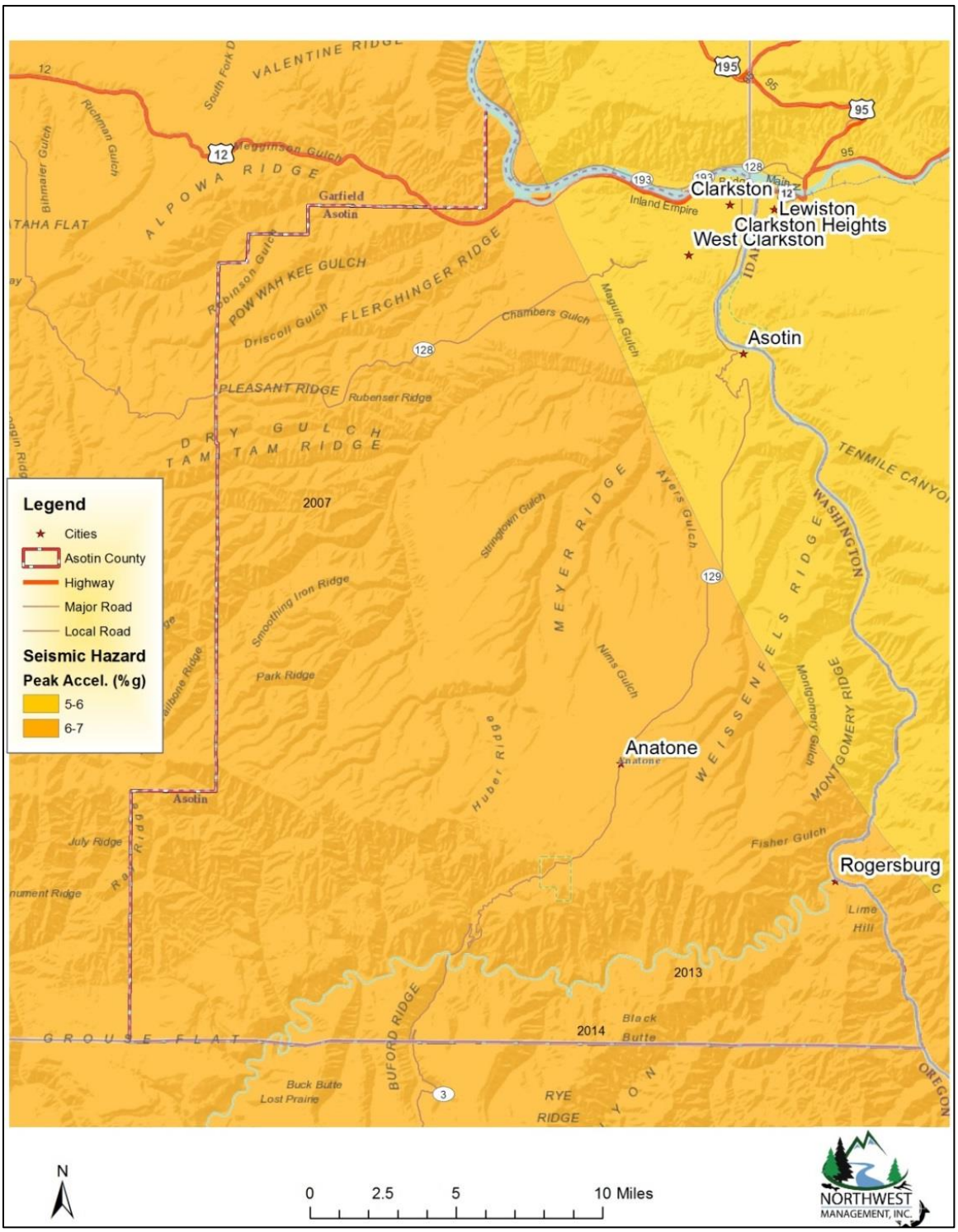
March 31, 2020 – the 2020 Central Idaho Earthquake occurred at 5:52 p.m. MDT in the Sawtooth Mountains 72 miles northeast of Boise, Idaho.[27] The earthquake was felt in Asotin County and some minor cracks formed in the concrete inside the new Asotin County Fire District #1 fire station.

Probability of Future Events

There are no known fault lines in Asotin County. Peak ground acceleration (pga) in percent g is a measure of the ground motion, which decreases, the further you are from the earthquake. The USGS Shaking Hazard maps for the United States are based on current information about the rate at which earthquakes occur in different areas and on how far strong shaking extends from quake sources. Colors on the map show the levels of horizontal shaking that have a 1 in 10 chance of being exceeded in a 50-year period. Shaking is expressed as a percentage of "g" (g is the acceleration of a falling object due to gravity). This map is based on seismic activity and fault-slip rates and takes into account the frequency of occurrence of earthquakes of various magnitudes. Locally, this hazard may be greater than that shown, because site geology may amplify ground motions. As seen in Figure 6, much of Asotin County has a 10% chance of exceeding a 6-7% pga in the next 50 years. This probability trends downwards to a 5-6% pga along the northeastern edge of the county where most of Asotin County's population resides.

[27] Wikipedia. "2020 Central Idaho earthquake." Available online at https://en.wikipedia.org/wiki/2020_Central_Idaho_earthquake. September 2020.

Figure 6: Seismic Hazard in Asotin County



Impacts of Earthquake Events by Jurisdiction

Asotin County

Past events suggest that an earthquake in the Asotin County area would cause little to no damage. Nonetheless, severity can increase in areas that have softer soils, such as unconsolidated sediments. Damage would be negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; and considerable in poorly built, old, or badly designed structures.

Value of Resources at Risk

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude earthquake. Damage to some older, more fragile bridges and land failure causing minor slides along roadways may isolate some residents.

The Lincoln Middle School, Heights Elementary School, the Highland Elementary School, and the Asotin County Fire District #1 station located in the Clarkston Heights are likely unreinforced masonry buildings. The value of the schools is unknown. These are the only known publicly accessible unreinforced masonry structures within the unincorporated Asotin County. The number and value of unreinforced masonry homes or homes with masonry chimneys in Asotin County is unknown.

City of Asotin

Asotin does not have any differing issues or levels of risk associated with this hazard than Asotin County as a whole.

Value of Resources at Risk

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. There are several publicly accessible unreinforced masonry structures in Asotin in addition to the numerous homes and other buildings throughout the City with unreinforced chimneys. Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude earthquake. Damage to some older, more fragile bridges and land failure causing minor slides along roadways may isolate some residents.

In Asotin, many of the downtown structures on Second Street (6-7 buildings) are assumed to be unreinforced masonry including the Asotin County Courthouse, Mason's building, and the fire station. The number and value of unreinforced masonry homes or homes with masonry chimneys in Asotin is unknown but estimated to include at least 30 buildings throughout the city.

City of Clarkston

Clarkston does not have any differing issues or levels of risk associated with this hazard than Asotin County as a whole, but the city of Clarkston is more densely populated with more structures built closer together than rural Asotin County. The same risks from earthquake apply to the city but the impacts might be felt on a greater magnitude due to concentrations of people, buildings, and resources.

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. There are several publicly accessible unreinforced masonry structures in Clarkston in addition to the numerous homes and other buildings throughout the city with unreinforced chimneys. Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude earthquake. Damage to some older, more fragile bridges and land failure causing minor slides along roadways may isolate some residents.

Value of Resources at Risk

In Clarkston, Tri-State Memorial Hospital, Parkway Elementary School, Clarkston High School, Clarkston City Hall, Clarkston Police Station, the Clarkston School District office, the U.S. Post Office, and Grantham Elementary School are assumed to be unreinforced masonry. These structures were built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry chimneys in Clarkston is unknown but estimated to include at least 500 buildings.

Asotin County Fire District #1

The Fire District does not have any differing issues or levels of risk associated with this hazard than Asotin County as a whole. However, in the event of a damaging earthquake, Fire District #1 would provide emergency response and search and rescue services.

Value of Resources at Risk

The Asotin Fire District #1 station in the Clarkston Heights is a pre-engineered metal building. It is considered a resilient structure and is unlikely that this building would be damaged during a moderate to severe earthquake. The current value of the building is approximately $11 million plus an additional estimated content value of $5 million.

Blue Mountain Fire District

Blue Mountain Fire District #1 and the community of Anatone do not have any differing levels of risk associated with this hazard than Asotin County as a whole. However, in the event of a major earthquake, the fire district would provide traffic control and search and rescue services.

Value of Resources at Risk

Most of the homes located in Anatone and the surrounding area are older homes with unreinforced chimneys that would likely be damaged in the event of an earthquake. Damaged or collapsed chimneys could result in a secondary hazard of fire. Nonstructural damage caused by falling and swaying objects may be considerable after any magnitude earthquake. Damage to older bridges and land failure could cause slides along roadways isolating some residents.

Asotin County Conservation District

The conservation district does not have any differing issues or levels of risk associated with this hazard than Asotin County as a whole.

Value of Resources at Risk

The district does not have any values at risk to this hazard.

Landslide Hazard Profile

Washington is one of the most landslide-prone states in the country, with hundreds to thousands of events each year. The direct cost of landslide damage includes the repair of roads and property and the loss of life. Indirect costs, such as loss of property value and tax revenue, and environmental effects, such as the degradation of water quality, can exceed direct costs. The Washington Department of Transportation routinely budgets $15 million a year for cleanup of landslides on highways.[28]

Areas typically susceptible to landslides are steep hillsides (20 degrees and greater) and convergent topography. Landforms can also be a factor in landslide susceptibility, such as areas of steep shoreline bluffs, colluvium hollows (bedrock hollows), inner gorges, meander bends, rugged topography (mountainous terrain), and on deep landslides. Features such as alluvial fans may be a hazard for flooding and debris flows.[29]

A landslide generally refers to the downhill movement of rock, soil, or debris. The term landslide can also refer to the deposit that is created by a landslide event. The data on this website are meant to provide general information only; real landslides have many variables.

Landslides nearly always move down a slope. This is because the force of gravity—which acts to move material downhill—is usually counteracted by two things: (1) the internal strength of the material, and (2) the friction of the material on the slope. A landslide usually occurs because the internal strength of the rock, soil, or sediment becomes less than the force of gravity.

The addition of water to material on a slope can make landslides more common. This is because water adds significant weight to the slope as it seeps into the ground and becomes groundwater. This extra weight adds to the gravitational force. Water also lowers the strength of the material which can make it less able to withstand the force of gravity. Water also reduces friction and increases pore fluid pressure.

The amount of friction between a deposit of rock or soil and the slope that it rests on plays a large role in when landslides happen. Imagine trying to slide a large rock along a flat surface—it's very difficult because of the friction between the rock and the surface. Pushing the rock is easier if the surface slopes downhill or is slippery. The same is true for landslides—for the same kind of material, steeper slopes have less friction, making landslides more common. Any change to the Earth's surface that increases the

[28] Washington State Department of Natural Resources. "Landslides". Available online at https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/landslides.

[29] Washington Military Department. Washington State Enhanced Hazard Mitigation Plan, 2018. Available online at https://mil.wa.gov/asset/5d1626c2229c8 pp. 92.

slope (for example, river incision or the removal of material at the base of a slope by humans) or that reduces the friction of a slope (such as the addition of water) can increase the likelihood of a landslide.[30]

Landslides cause widespread damage but are often under-represented and understudied compared to other potential geologic hazards such as earthquakes, tsunamis, and volcanoes. Landslides are complex, often moving in numerous different ways, from small shallow slumps and rock topples to deep-seated landslides. Understanding how and why these landslides move help geologists develop mitigation techniques and determine future hazards for roads, houses, infrastructure, and human life.[31]

Well-known historic landslide events in the state of Washington include the Oso Mudslide of 2014 (DR-4168) and the Aldercrest-Banyon landslide of 1998 (DR-1255). Oso occurred in northwest Washington in Snohomish County and Aldercrest-Banyon occurred in southwest Washington in Cowlitz County.

Washington State has six landslide provinces, each with its own characteristics. Asotin County is part of the Columbia Basin province. This province has extensive layers of sediments intermingling with basalt flows; sediments generally are thicker in the western part of the province. Landslides in this province include slope failures in bedrock and landslides in overlying sediments. Bedrock slope failures are most common in the form of very large ancient slumps or earth flows. A final triggering mechanism appears to have been over-steepening of a slope or removal of toe support by streams or glacial floods. Sediments contemporary with or overlying Columbia River basalt make up a major part of the large landslide complexes in the province.

Landslides are a recurrent menace to waterways and highways and a threat to homes, schools, businesses, and other facilities. The unimpeded movement over roads—whether for commerce, public utilities, school, emergencies, police, recreation, or tourism—is essential to the normal functioning of southeastern Washington. The disruption and dislocation of these or any other routes caused by landslides can quickly jeopardize travel and vital services. Although small slumps on cut and fill slopes along roads and highways is relatively common, nearly all of the landslide risk in Asotin County is associated with the steeper slopes of the Blue Mountains. There are very few structures and little infrastructure at risk in the landslide prone areas of the Blue Mountains; however, a major slide could cause severe damage to any of the major watersheds, which would have significant negative impacts on communities downstream.

Landslide Risk Assessment

To date, there is no recorded history of major landslides occurring in Asotin County. Nevertheless, there are some areas in Asotin County that have specific landslide concerns. Areas that are generally prone to landslides are:

[30] Washington State Department of Natural Resources. "Why Do Landslides Happen?" Available online at https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/landslides#why-do-landslides-happen?.3

[31] Washington State Department of Natural Resources. "Landslide Hazards in Washington State". Available online at https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/landslides#landslide-hazards-in-washington-state.1

- On existing landslides, old or recent
- On or at the base or top of slopes
- In or at the base of minor drainage hollows
- At the base or top of an old fill slope
- At the base or top of a steep cut slope

The majority of the landslide potential in Asotin County occurs in the more remote areas of the Umatilla National Forest and Grande Ronde drainage on the southern end of the county as well as in the upper reaches of the Asotin Creek drainage and along the Snake River. Most of the landslide damage potential occurs along the Snake River Road due to the location of numerous homes at the base of the steeper slope rising from the River and State Route 129. The probability of occurrence of major, high velocity landslide hazard events, including those caused by severe local storms, is moderate.

Local Event History

February 1996 – Stafford Act disaster assistance totaled $113 million and Small Business Administration disaster loans approved $61.2 million. The National Weather Service, Seattle Forecast Office considers this storm one of the top 10 weather events in Washington during the 20th Century. Near-record snowfall in January followed by warm, heavy rain, mild temperatures and snowmelt in February caused flooding, mudflows and landslides throughout the state. The storm caused three deaths, and 10 people were injured. Landslides damaged or destroyed nearly 8,000 homes, and closed traffic along major highways for several days. Damage from all causes throughout the Pacific Northwest was at least $800 million. The landslide that created the most significant impact blocked Interstate 5 and the state's main north-south railroad tracks three miles north of Woodland, Cowlitz County. The initial slide on February 8 blocked northbound lanes of I-5; a second, larger slide covered all lanes of the freeway as well as the railroad tracks to the west. It took crews until February 19 to fully reopen the interstate. The highest concentration of landslides occurred at the northwest edge of the Blue Mountains near Walla Walla. The main areas affected were the Mill Creek, Blue Creek, Touchet, Tucannon, and Walla Walla drainages. Debris flows were most numerous on open, grassy hillsides. In the Mill Creek area, debris flows destroyed seven vehicles and five homes. Similar occurrences of flooding and landslides took place in 1931 and 1964.

Probability of Future Events

The majority of the population has a low risk of landslides; however, homes and infrastructure located in or at the mouth of drainages have an elevated risk. Additionally, sections of the primary access routes are in moderate to high landslide prone areas. There is a moderate probability of small slides occurring on slopes ranging from 5-35%. This type of slide is common on the eyebrows of hills, especially where there has been soil disturbance. Generally, these low angle slides will have a low velocity and will not

impact structures or infrastructure. The Washington Emergency Management Division assigned Asotin County a Landslide Risk Index of "Medium" in the 2018 Enhanced Hazard Mitigation Plan.[32]

Soil factors that increase the potential for landslide are soils developed from parent materials high in schist and granite, and soils that are less permeable containing a resistive or hardpan layer. These soils tend to exhibit higher landslide potential under saturated conditions than do well drained soils. To determine the high-risk soils in Asotin County, the NRCS State Soils Geographic Database (STATSGO) layer was used to identify the location and characteristics of all soils in the County. The specific characteristics of each major soil type within the county were reviewed. According to this database, it was determined that the soils in Asotin County generally are not developed from schist and granitic parent materials, indicating that landslide potential is primarily due to factors associated with gravity and slope.

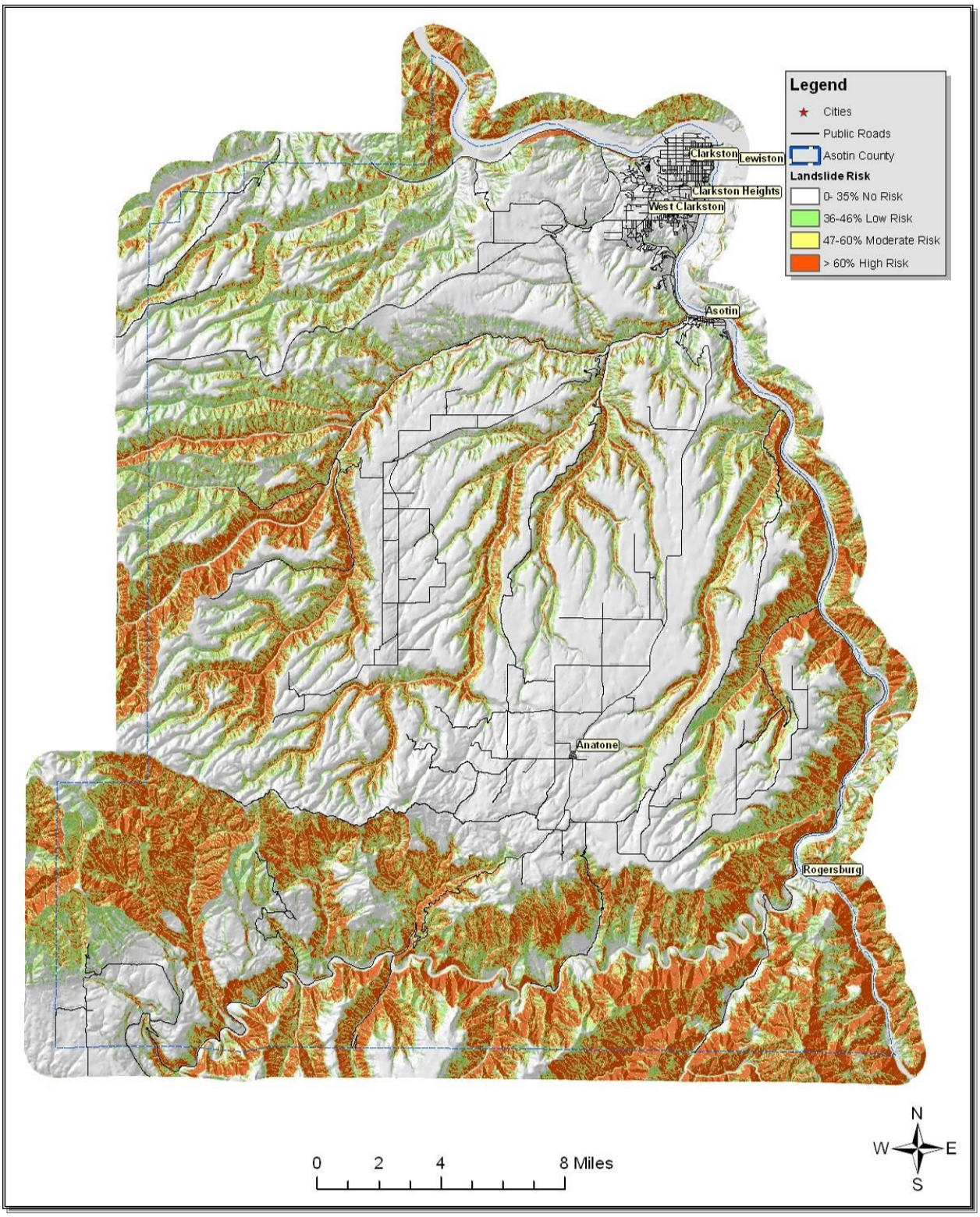
To portray areas of probable landslide risk due to slope related factors, slope models were used to identify areas of low, moderate and high risk. This analysis identified the low risk areas as slopes in the range of 20°-25° (36-46%), moderate as 26°-30° (48-60%) and high risk as slopes in the range of 31°-60° (60-173%). Slopes that exceeded 60° (173%) were considered low risk due to the fact that sliding most likely had already occurred relieving the area of the potential energy needed for a landslide. From the data layer created by this analysis, it is possible to depict areas of risk and its proximity to development and human activity. With additional reconnaissance, the areas of high risk were further defined by overlaying additional data points identifying actual slide locations, thus improving the resolution by specifically identifying the highest risk areas. This method of analysis is similar to a method developed by the Clearwater National Forest in north central Idaho.[33]

While a large portion of Asotin County is at high risk to landslides, most of this area occupies the rural mountainous regions. Home and business development in the county has been mainly on lands not at significant risk to landslides.

[32] Washington Military Department. Washington State Enhanced Hazard Mitigation Plan, 2018. Available online at https://mil.wa.gov/asset/5d1626c2229c8 pp. 94.

[33] McClelland, D.E., et al. 1977. Assessment of the 1995 and 1996 floods and landslides on the Clearwater National Forest Part 1: Landslide Assessment. Northern Region U.S. Forest Service. December 1977.

Figure 7: Landslide Risk in Asotin County



Impacts of Landslide Events by Jurisdiction

Asotin County

Much of the populated areas in Asotin County are at risk to flooding, which often results in damaging landslides. Flash floods typically carry large amounts of debris, silt, and rocks that are deposited in downstream floodplains. Additionally, soil saturation ensuing from prolonged periods of rain or flooding can lead to slope instability. Cut and fill slopes, even those well outside of the flood plain, are particularly at risk to slides and/or slumping as a result of soil saturation.

Although it does not show up as a landslide prone area in the model, State Route 129 has a history (1998 and 2009) of small slides that temporarily block the road. State Route 129 from 13th Street to the Asotin city limits, from the city limits to the top of Asotin Hill (MP 33 to 36 and Clemans Road), and Rattlesnake Grade are sections of this road that are notorious for small slides, plugged culverts, and/or rolling rocks. These slides are typically caused by severe or long lasting storms that saturate the soil. Damage is usually limited to clogged ditches and culverts and the cost to remove debris from the roadway. The Washington State Department of Transportation has installed preventative measures at Swallows Rock on State Route 129 to prevent rocks from rolling onto the roadway. The basalt cliffs adjacent to the road continue to deposit rocks in the right-of-way, particularly during sustained rains. Critchfield Road near 22nd Street and Cherry Street in Asotin have also contributed to landslide damages on a few occasions. These areas are likely to continue depositing silt and other debris on the roadway during wet soil conditions.

Six landslide impact zones in unincorporated Asotin County were identified during previous planning efforts. During planning efforts for the 2021 plan update these impact zones were used to highlight areas where high landslide risk coincides with either populated areas or areas with structures or other resources, such as roads. Property values inside the landslide impact zones were calculated by using Asotin County parcel data and identifying the values of the improvements that fall within the pre-identified area.

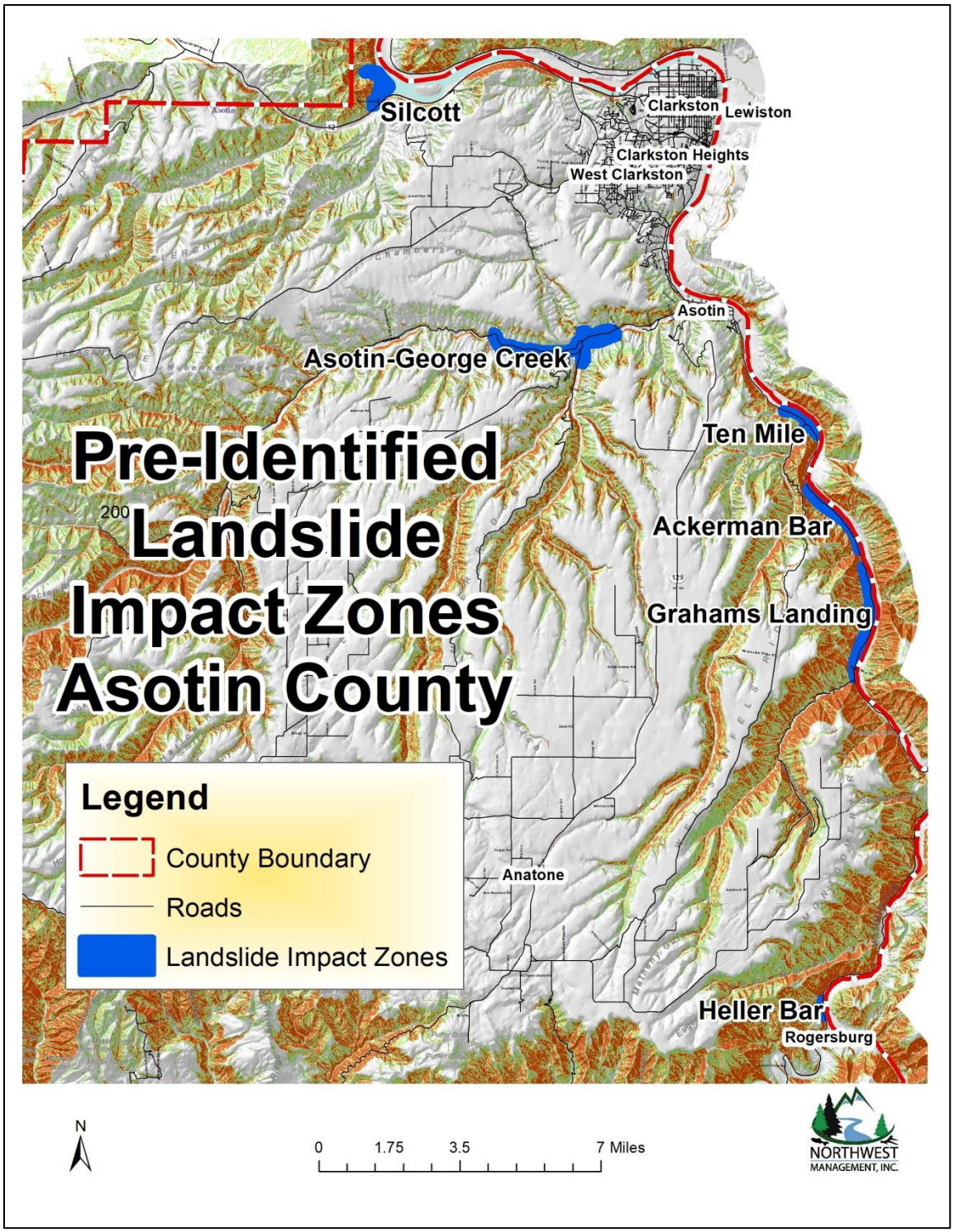
The Ackerman Bar, Grahams Landing, Heller Bar, and Ten Mile landslide impact zones encompass small population clusters on the Snake River Road paralleling the Snake River.

The Silcott landslide impact zone occurs at the mouth of Alpowa Creek on the Snake River along US Highway 12 on the northern end of the County. The Asotin Creek landslide impact zone is located at the confluence of Asotin Creek and George Creek just upstream from the city of Asotin. In addition to the residences, these Impact Zones may affect the Snake River Road, Asotin Creek Road, and possibly a small section of US Highway 12.

Many of the slopes and hillsides in these impact zones are comprised by material deposited by past landslides. In fact, much of the lower slopes near the valley floors are alluvial fans created by sediment being carried downstream and deposited at the mouths of the numerous small drainages. The presence of this material indicates the historic occurrence of high-energy, short duration floods and debris flows in these chutes in response to severe climatic conditions, such as thunderstorms and rain-on-snow events. These events are historically infrequent, with recurrence cycles on the order of years to decades.

However, they can significantly damage buildings and infrastructure, disrupt travel, reduce water quality, and jeopardize safety.

Figure 8: Landslide Impact Zones - areas where structures and infrastructure are at particular risk to landslides



Wildfires in these impact zones could cause a domino effect of multiple hazards. Higher intensity fires not only remove most of the vegetation, but they also cause soils to become hydrophobic or water repellent for a period of time after the fire. This combination leads to unusually high runoff after rain showers or during the spring runoff season. As streams and rivers begin to reach and exceed flood stage, bank failures and channel migration are common. Road building and other soil disturbances tend to exacerbate this effect leading to even more severe land and soil slides.

Value of Resources at Risk

The cost of cleanup and repairs of roadways is difficult to estimate due to the variable circumstances with each incident including size of the slide, proximity to a State or County shop, and whether the slide occurred on the cut slope or the fill slope. Other factors that could affect the cost of the damage may include culverts, streams, and removal of debris. This type of information is impossible to anticipate; thus, no repair costs for damaged roadways have been estimated.

Table 17: Parcel data, including improvements, improvement values, and number of structures within the pre-identified landslide impact zones. Number of parcels, number of improvements, and improvement values are calculated using Asotin County parcel data (2019). Number of structures is derived from a Microsoft building footprint data layer (2018).[34]

Landslide Impact Zone	No. Structures	No. Parcels	No. Improvements	Improvement Value
Ackerman Bar	34	26	19	$4,082,600
Asotin-George Creek	104	60	35	$5,278,800
Grahams Landing	61	36	26	$5,428,500
Heller Bar	15	26	13	$3,021,300
Silcott	24	26	12	$2,254,700
Ten Mile	23	23	10	$5,451,500

Slides in the identified impact zones are more likely to be larger and more damaging as weaknesses in the underlying rock formations give way. Although infrequent, this type of slide has the potential to not only block, but destroy road corridors, dam waterways, and demolish structures. The highest risk areas in these impact zones are typically at the higher elevations where slopes exceed 25% grade. There are numerous homes in each of these impact zones; however, for the most part, they are widely scattered. Thus, single slide events will not likely impact the entire population, but rather individual structures. Many roads could be at risk from slides initiating in these impact zones, particularly the Snake River Road, Asotin Creek Road, and West Lake Drive.

[34] Microsoft. "US Building Footprints." Available online at https://github.com/microsoft/USBuildingFootprints.

Figure 9: Ackerman Bar area landslide impact zone

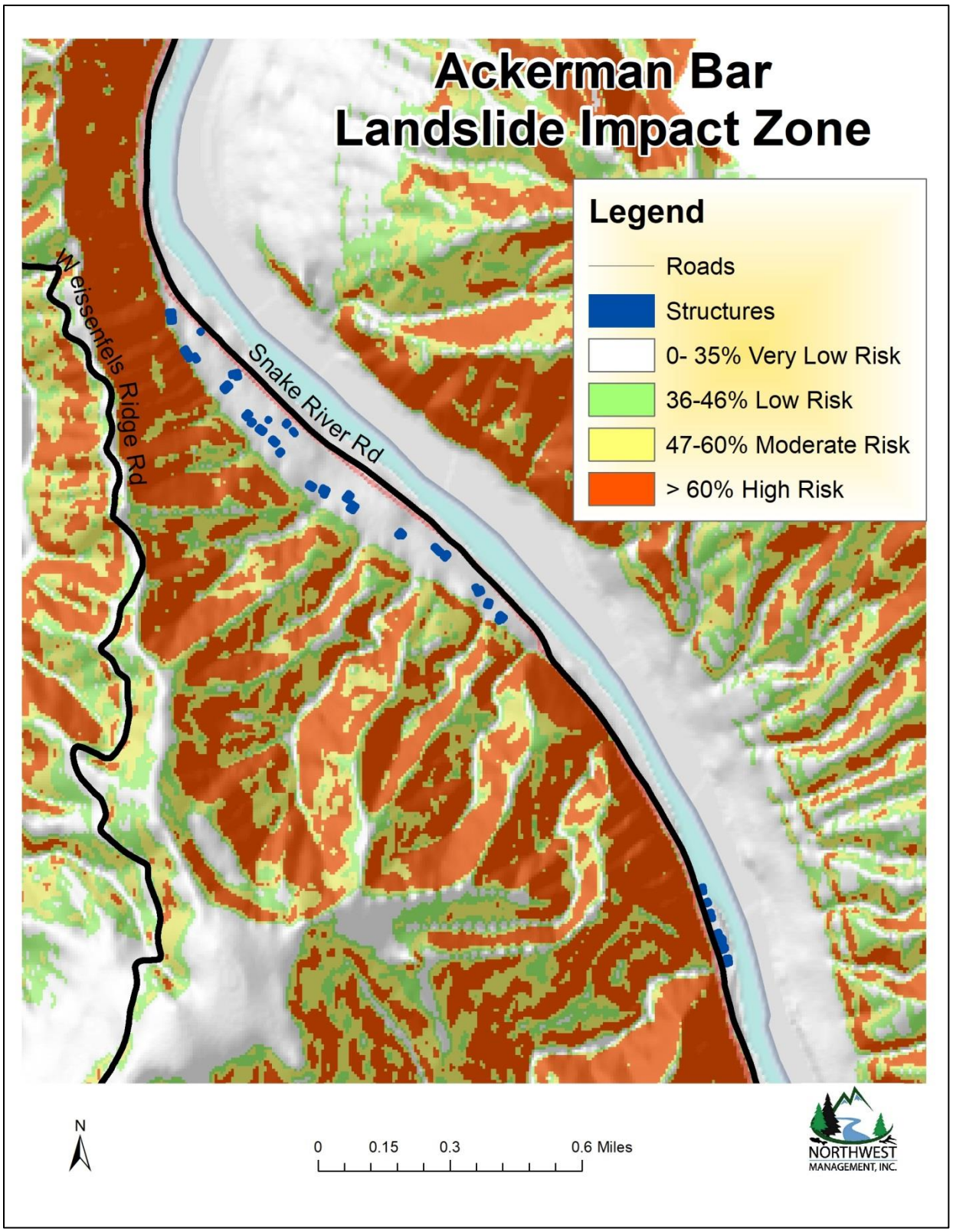


Figure 10: Asotin Creek Road and George Creek Road area landslide impact zone

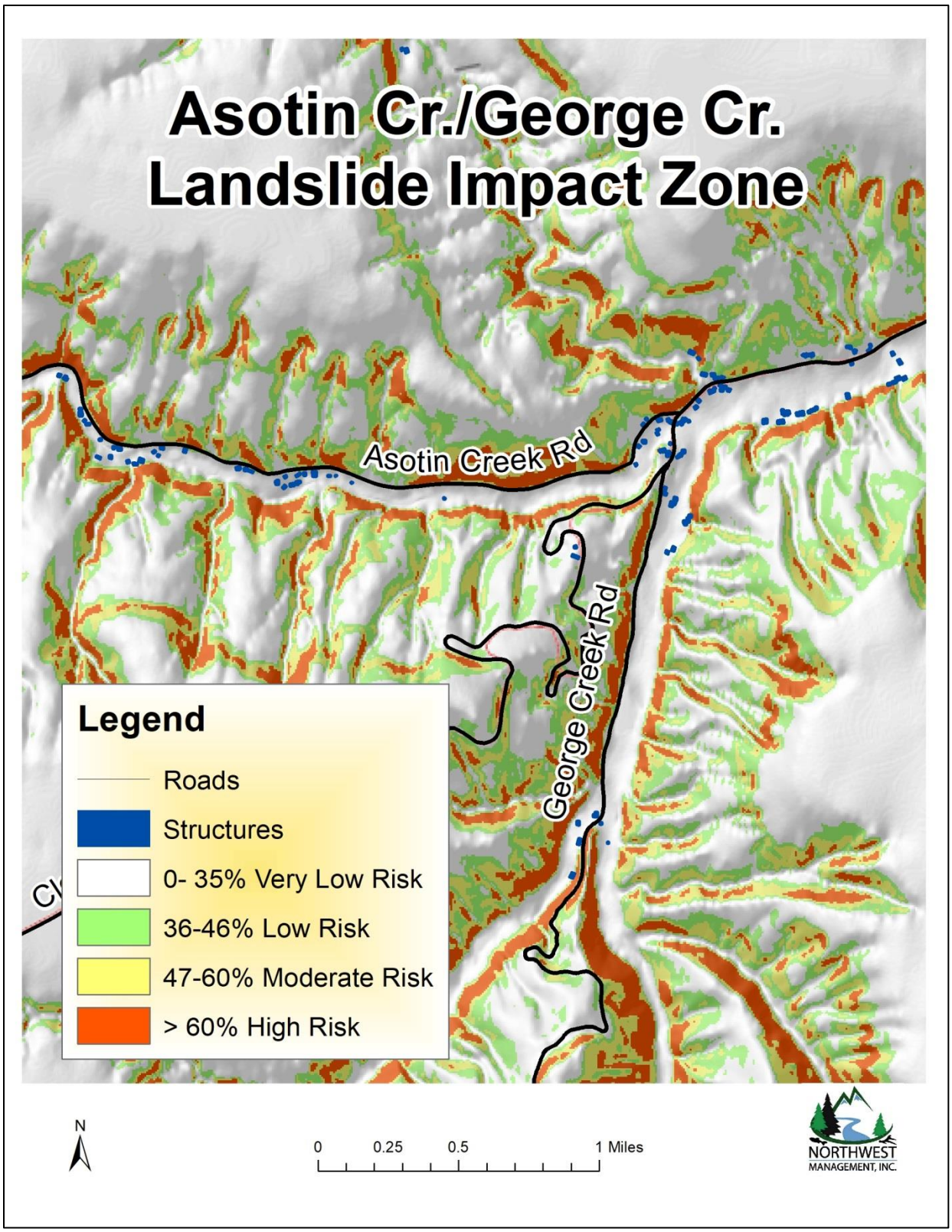


Figure 11: Grahams Landing area landslide impact zone

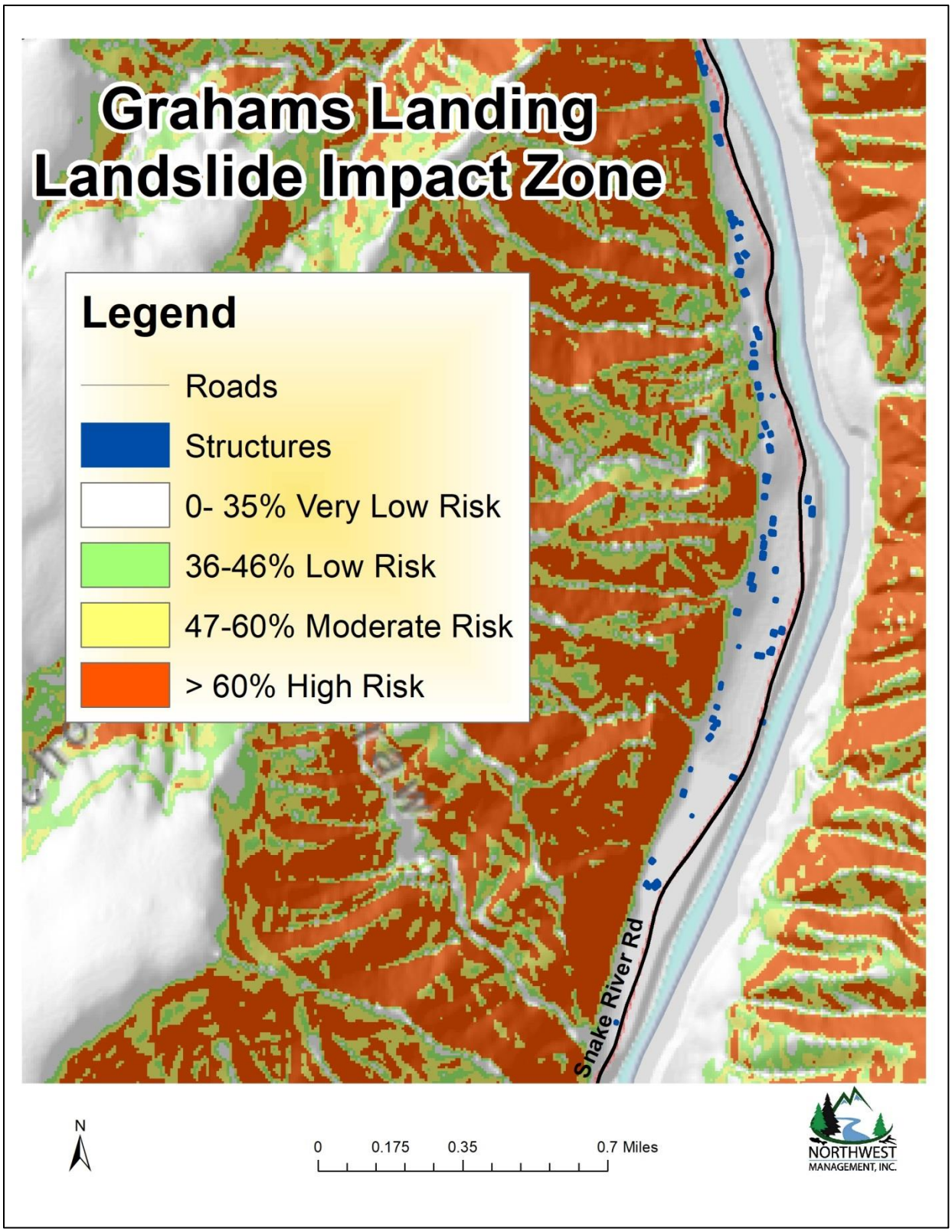


Figure 12: Heller Bar area landslide impact zone

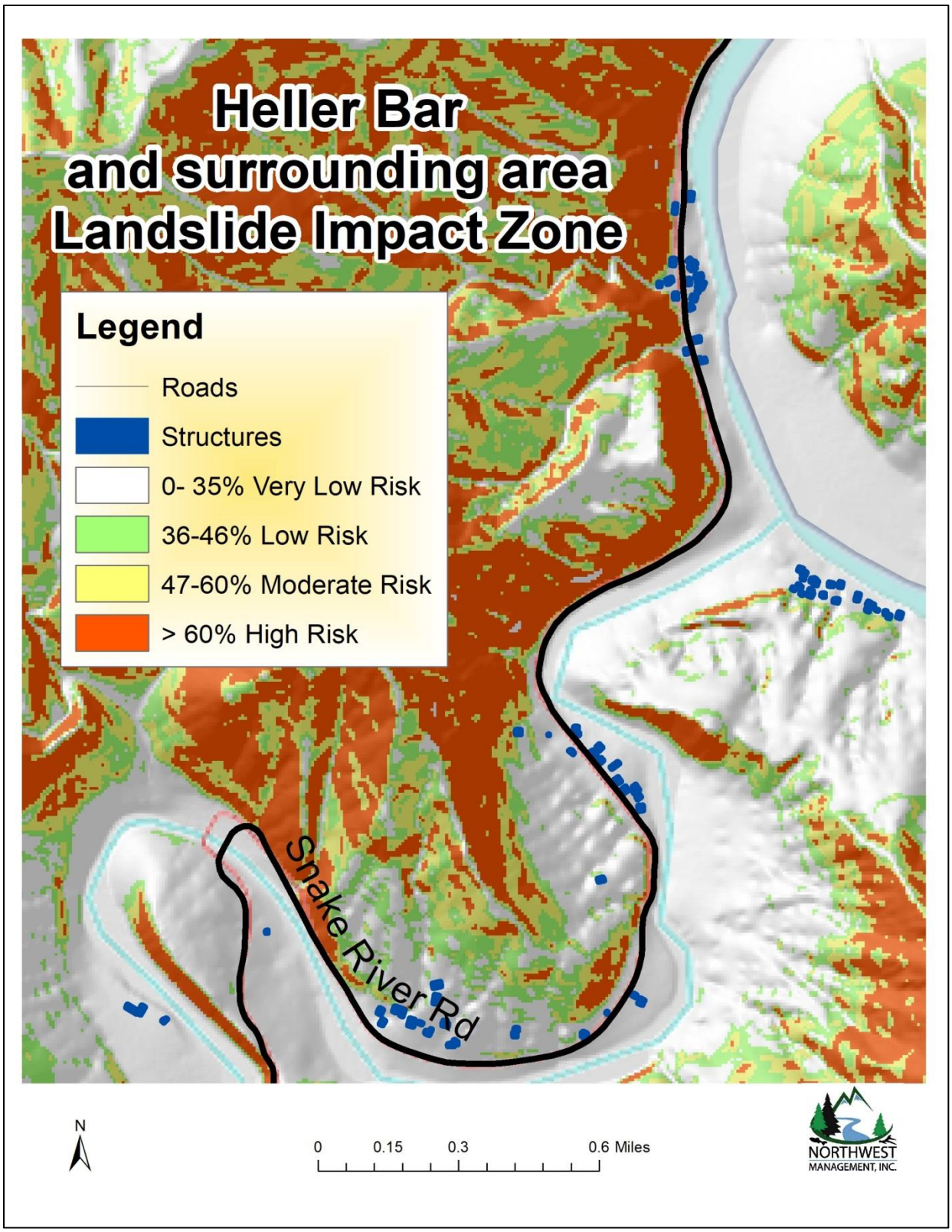


Figure 13: Silcott and West Lake Drive area landslide impact zone

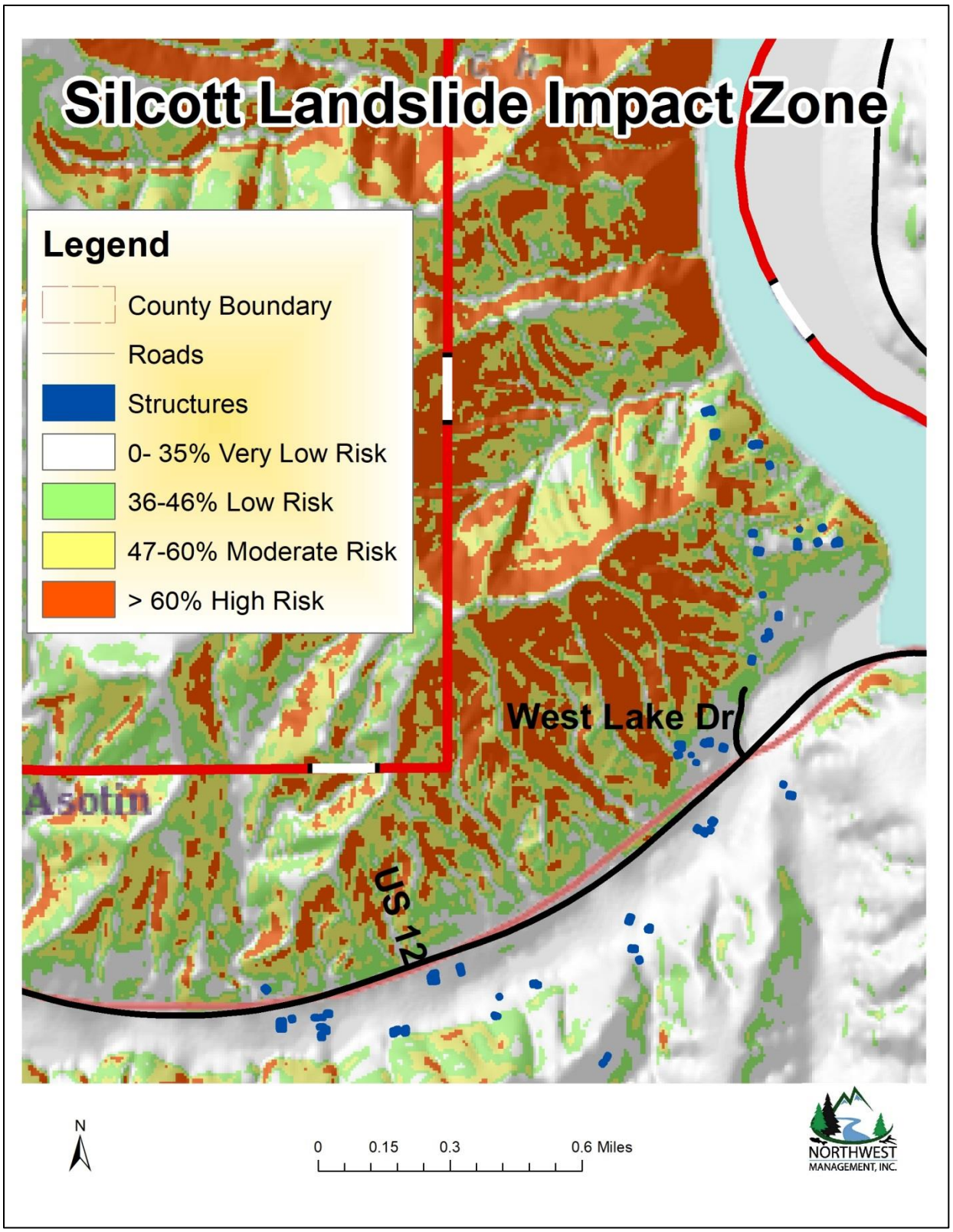
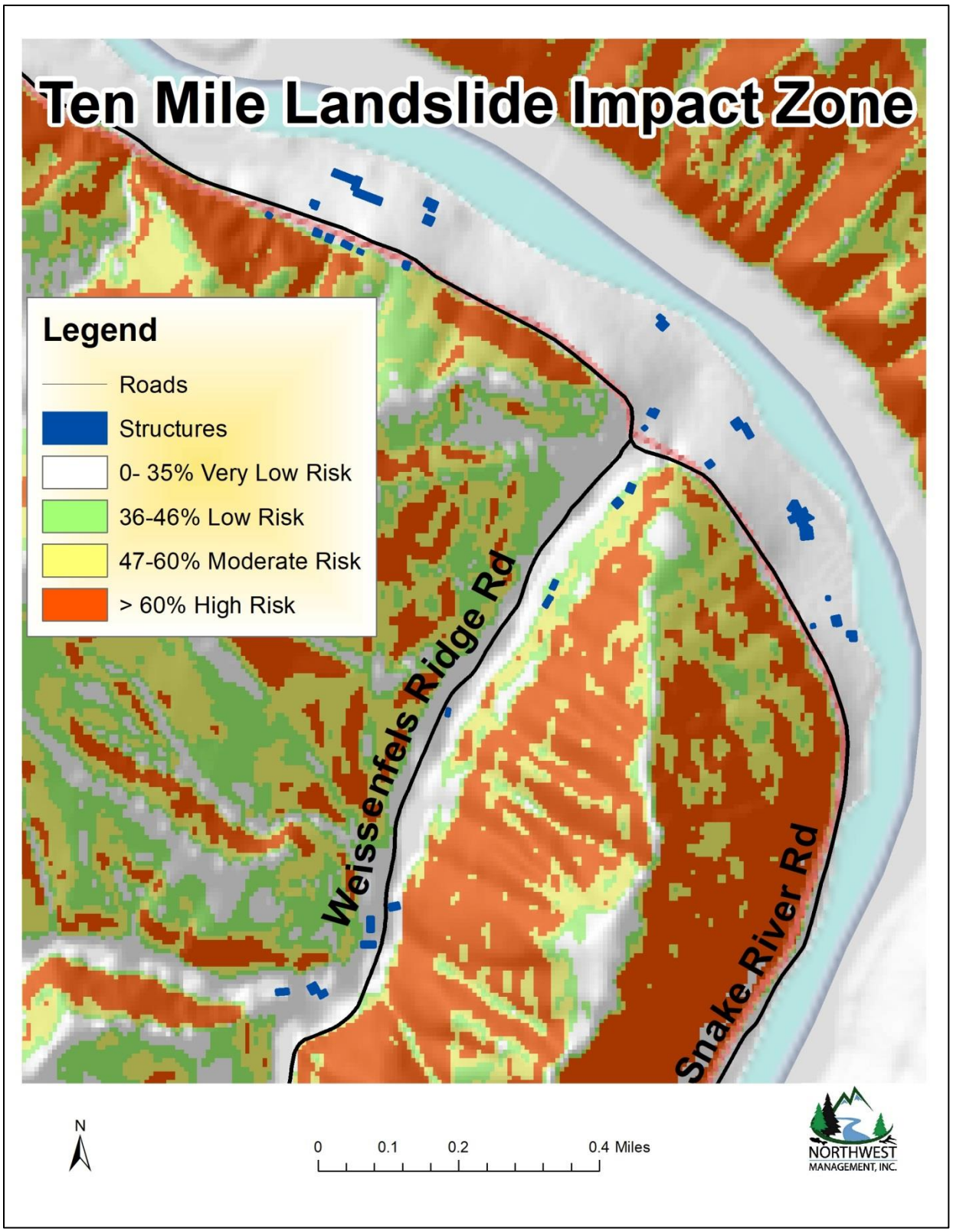


Figure 14: Ten Mile area landslide impact zone



City of Asotin

The city of Asotin has a very low probability of experiencing damaging landslides. Slopes in and around the community are generally less than 35%. While small, low angle slumps may occur on eyebrows of the surrounding hills, these will be infrequent and likely the result of water saturation or a major disturbance such as an earthquake or road construction. It is also probable that small slides will continue to occur on the cut and fill slopes of some roads. This type of slide is generally small with little permanent damage to the road or other infrastructure; however, there is some risk of traffic being delayed temporarily while road crews clear the debris and stabilize the bank.

Value of Resources at Risk

There are no structures directly at risk from landslides within the city of Asotin. Small slumps may occur along Highway 129, Asotin Creek Road, or other secondary roads. In many cases, this will cause temporary sediment delivery into nearby streams and plugged culverts. These types of events are cleaned up by county or city road departments with little complications. Road slumps are generally reported as regular maintenance; thus, there are few records associated with these events.

City of Clarkston

The city of Clarkston has a very low probability of experiencing damaging landslides. Slopes in and around the community are generally less than 35%. While small, low angle slumps may occur on eyebrows of the surrounding rolling hills, these will be infrequent and likely the result of water saturation or a major disturbance such as an earthquake or road construction. It is also probable that small slides will continue to occur on the cut and fill slopes of some roads. This type of slide is generally small with little permanent damage to the road or other infrastructure; however, there is some risk of traffic being delayed temporarily while road crews clear the debris and stabilize the bank.

Value of Resources at Risk

There are no structures directly at risk from landslides within the city of Clarkston. Small slumps may occur along U.S. Highway 12, Highways 129 and 128, or other secondary roads. In many cases, this will cause temporary sediment delivery into nearby streams and plugged culverts. These types of events are cleaned up by county or city road departments with little complications. Road slumps are generally reported as regular maintenance; thus, there are few records associated with these events.

Asotin County Fire District #1

The Fire District does not have any differing levels of risk associated with this hazard than Asotin County as a whole. However, in the event of a significant landslide, Fire District #1 would provide emergency response and search and rescue services. Fire District # 1 also may assist with any necessary evacuations or traffic accident responses.

Value of Resources at Risk

The Asotin Fire District #1 station in the Clarkston Heights is not at risk to landslides due to its location in a relatively flat, heavily developed area. The District has no other known assets or other resources at risk to landslides.

Blue Mountain Fire District

Blue Mountain Fire District #1 and the community of Anatone do not have any differing levels of risk associated with this hazard than Asotin County as a whole. Vehicle travel south of Anatone down Rattlesnake Grade on State Highway 129 to the Oregon border has a far greater risk of landslide impact due to the topography and saturation of the embankments by snowmelt or heavy rains. These landslides could potentially block State Highway 129, which is a main thoroughfare to Oregon as well as trapping the residents that live in the Grande Ronde River corridor.

Value of Resources at Risk

Blue Mountain Fire District #1 has no assets or resources at risk to landslides. However, in the event of a landslide, the district would assist accident response and search and rescue missions.

Asotin County Conservation District

The Conservation District is impacted by landslide events in a similar way to Asotin County as a whole. However, property owners who have lands that include steep slopes would be impacted in a particular way by landslide events and the district would assist these farmers and ranchers by providing technical assistance and funding for project implementation.

Value of Resources at Risk

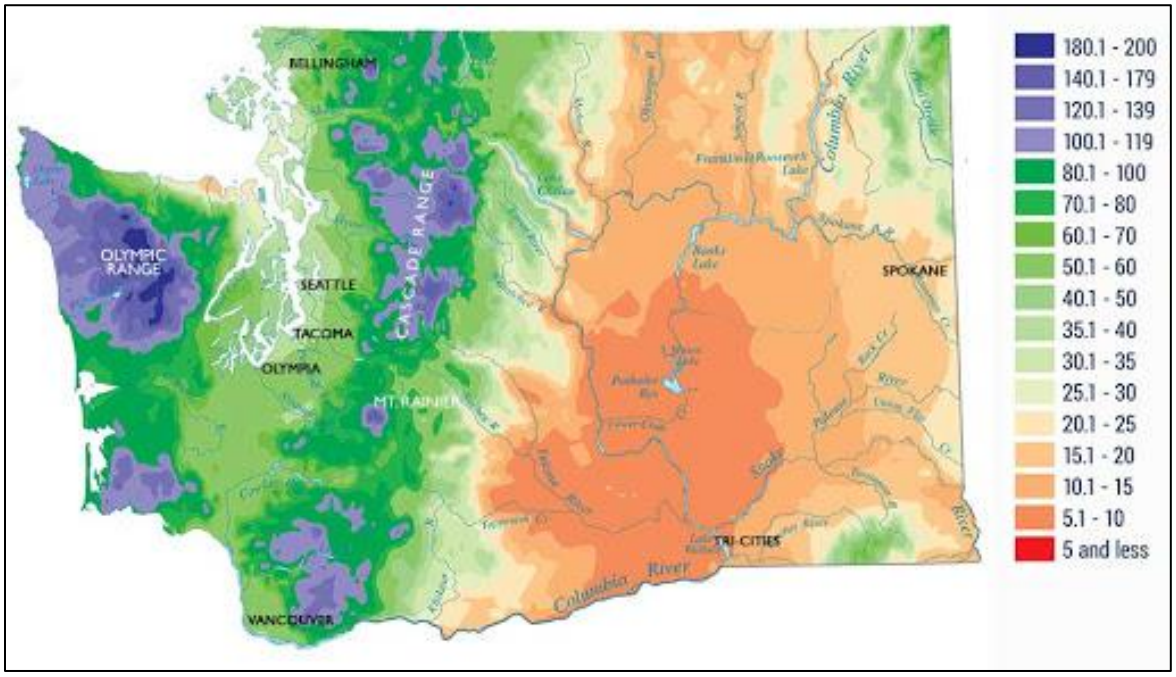
The conservation district has provided financial assistance to many landowners to install natural resource best management practices throughout Asotin County. Many of those practices have been installed in rangeland that have steep slopes and has potential risk of being impacted by a landslide.

Severe Weather Hazard Profile

The overall weather patterns that affect Asotin County are prevalent throughout Eastern Washington. This section of the state is part of the large inland basin between the Cascade and Rocky Mountains. In an easterly and northerly direction, the Rocky Mountains shield the inland basin from the winter season's cold air masses traveling southward across Canada. In a westerly direction, the Cascade Range forms a barrier to the easterly movement of moist and comparatively mild air in winter and cool air in summer. Some of the air from each of these source regions reaches this section of the State and produces a climate which has some of the characteristics of both continental and marine types. Most of the air masses and weather systems crossing eastern Washington are traveling under the influence of the prevailing westerly winds. Infrequently, dry continental air masses enter the inland basin from the north or east.

East of the Cascades, summers are warmer, winters are colder and precipitation is less than in western Washington. Annual precipitation ranges from seven to nine inches near the confluence of the Snake and Columbia Rivers and 15 to 30 inches along the eastern state line. During July and August, it is not unusual for four to eight weeks to pass with only a few scattered showers. Thunderstorms can be expected on one to three days each month from April through September. Most thunderstorms in the warmest months occur as isolated cells covering only a few square miles. A few damaging hailstorms are reported each summer. Maximum rainfall intensities to expect in one out of ten years are .6 of an inch in one hour; 1.0 inch in three hours; 1.0 to 1.5 inches in six hours; and 1.2 to 2.0 inches in 12 hours.

Figure 15: Annual precipitation in Washington state[35]



[35] Choose Washington, Washington State Department of Commerce. "Washington's diverse climate and geography." http://choosewashingtonstate.com/research-resources/about-washington/climate-geography/.

During the coldest months, a loss of heat by radiation at night and moist air crossing the Cascades and mixing with the colder air in the inland basin results in cloudiness and occasional freezing drizzle. A "chinook" wind which produces a rapid rise in temperature occurs a few times each winter. Frost penetration in the soil depends to some extent on the vegetative cover, snow cover and the duration of low temperatures. In an average winter, frost in the soil can be expected to reach a depth of 10 to 20 inches. During a few of the colder winters, with little or no snow cover, frost has reached a depth of 25 to 35 inches.

Winter season snowfall in the valleys varies from 40 to 80 inches. Both rainfall and snowfall increase along the slopes of the mountains. Snow can be expected in the higher elevations in October and in the lower valleys by the last of November. In the lower elevations, snow reaches a depth of 15 to 30 inches and remains on the ground most of the time from the first of December until March. The few snow survey reports available for elevations above 5,000 feet indicate six to eight feet of snow on the ground the first of April and four to five feet the first of May.

Cold continental air moving southward through Canada will occasionally cross the higher mountains and follow the north-south valleys into the Columbia Basin. On clear, calm winter nights, the loss of heat by radiation from over a snow cover produces ideal conditions for low temperatures. The lowest temperature in the State, -48° F, was recorded December 30, 1965, at Mazama and Winthrop. In January, the average maximum temperature is near 30° F and the minimum temperature is 15° F. Minimum temperatures from -10° to -20°F are recorded almost every winter and temperatures ranging from -25° to -42° F have been recorded in the colder valleys. In July, the average maximum temperature is 85° to 90° and the minimum temperature 45° to 50° F. Maximum temperatures reach 100° F on a few afternoons each summer and temperatures between 105° to 110° F have been recorded. The record high temperature of 118° F was recorded at Ice Harbor Dam on August 5, 1961. Temperatures in the mountains decrease three to five degrees Fahrenheit with each 1,000 feet increase in elevation. The average date of the freezing temperatures can be expected in the colder valleys by the first of September and before mid-October in the warmer areas.

Storms are naturally occurring atmospheric disturbances manifested in strong winds accompanied by rain, snow, or other precipitation, and often by thunder or lightning. All areas within this region are vulnerable to severe local storms. The affects are generally transportation problems and loss of utilities. When transportation accidents occur, motorists are stranded and schools and businesses close. The affects vary with the intensity of the storm, the level of preparation by local jurisdictions and residents, and the equipment and staff available to perform tasks to lessen the effects of severe local storms.

Major disaster declarations related to severe storms have been common in Washington and typically lead to other kinds of disaster events. Regional operational plans should reflect warning and notification of the public, prioritization of roads and streets to be cleared, provision of emergency services, mutual aid with other public entities, and procedures for requesting state and federal assistance if needed. To prepare for severe local storms, local jurisdictions should provide public information on emergency preparedness and self-help.

Severe Weather Risk Assessment

Severe weather in Asotin County ranges from the commonly occurring thunderstorms to hail, high winds, tornadoes, drought, dense fog, lightning, and snow storms.

Due to topography and climatologic conditions, the higher mountainous areas are often the most exposed to the effects of severe winter storms. Commonly, higher elevations in the county will receive snowfall, while the valley areas may not. Periodically though, individual storms can generate enough force to impact the entire county at one time. From high winds to ice storms to freezing temperatures, there are all types of winter storms that take place during the course of any given year. Winter conditions can change very rapidly. It is not uncommon to have a snowstorm at night with sunshine the next day.

Areas most vulnerable to thunderstorms are those subject to a strong southwesterly flow of moist, unstable air that generates strong, sometimes violent thunderstorms with one or more of the following characteristics: strong damaging winds, large hail, waterspouts, or tornados.

Hail can occur in any strong thunderstorm, which means hail is a threat everywhere. Hail is precipitation that is formed when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere. Large hail stones can fall at speeds faster than 100 miles per hour. Hail damage in Washington is very small in comparison with damage in areas of the central part of the United States. Often the hail that occurs does not grow to a size larger than one-half inch in diameter, and the areas affected are usually small. Quite often hail comes during early spring storms, when it is mostly of the small, soft variety with a limited damaging effect. Later, when crops are more mature and more susceptible to serious damage, hail occurs in widely scattered spots in connection with summer thunderstorms.

Windstorms are frequent in Asotin County and they have been known to cause substantial damage. Under most conditions, the County's highest winds come from the south or southwest. The National Weather Service defines high winds as sustained winds of 40 mph or gusts of 58 mph or greater, not caused by thunderstorms, expected to last for an hour or more. Areas most vulnerable to high winds are those affected by a strong pressure difference from deep storms originating over the Pacific Ocean; an outbreak of very cold, Arctic air originating over Canada; or air pressure differences between western and eastern Washington that primarily affect the Columbia River Gorge, Cascade Mountain passes, ridges and east slopes, and portions of the Columbia Basin.

A tornado is formed by the turbulent mixing of layers of air with contrasting temperature, moisture, density, and wind flow. This mixing accounts for most of the tornadoes occurring in April, May, and June, when cold, dry air from the north or northwest meets warm, moister air moving up from the south. If this scenario was to occur and a major tornado was to strike a populated area in Asotin County, damage could be widespread. Businesses could be forced to close for an extended period, and routine services such as telephone or power could be disrupted. The National Weather Service defines a tornado as a violently rotating column of air that contacts the ground; tornados usually develop from severe thunderstorms.

Local Event History

January 13, 1950 "The January 1950 Blizzard" - On this date, 21.4 inches of snow fell in Seattle, the second greatest 24-hour snowfall recorded. The snowfall was accompanied by 25-40 mph winds. The storm claimed 13 lives in the Puget Sound area. January had 18 days with high temperatures of 32 degrees or lower. The winter of 1949-50 was the coldest winter on record in Seattle, with an average temperature of 34.4 degrees. Eastern Washington, North Idaho, and parts of Oregon also were paralyzed by the snow – some lower-elevation snow depths reached nearly 50 inches and temperatures plunged into minus teens and twenties. Several dozen fatalities occurred.

1962 Columbus Day Wind Storm - The top weather event in Washington during the 20th Century, according to the National Weather Service, Seattle Forecast Office. This storm is the greatest windstorm to hit the Northwest since weather recordkeeping began in the 19th century, and called the "mother of all wind storms" in the 1900s. All windstorms in the Northwest are compared to this one. The Columbus Day Storm was the strongest widespread non-tropical windstorm to strike the continental U.S. during the 20th century, affecting an area from northern California to British Columbia. The storm claimed seven lives in Washington State; 46 died throughout the impacted region. One million homes lost power. More than 50,000 homes were damaged. Total property damage in the region was estimated at $235 million (1962 dollars). The storm blew down 15 billion board feet of timber worth $750 million (1962 dollars); this is more than three times the timber blown down by the May 1980 eruption of Mount St. Helens, and enough wood to replace every home in the state. Gusts of 88 miles per hour were recorded at Tacoma before power was lost to the recording stations.

February 1996 – Federal Disaster #1100. Stafford Act disaster assistance provided was $113 million. Small Business Administration disaster loans approved totaled $61.2 million. Heavy rainfall, mild temperatures and snowmelt caused flooding and mudslides in Adams, Asotin, Benton, Clark, Columbia, Cowlitz, Garfield, Grays Harbor, King, Kitsap, Kittitas, Klickitat, Lewis, Lincoln, Pierce, Skagit, Skamania, Snohomish, Spokane, Thurston, Wahkiakum, Walla Walla, Whitman and Yakima counties, and the Yakama Indian Reservation. This storm caused major flooding on rivers of western and southeast Washington. Mudslides occurred throughout the state. Three deaths, 10 people injured. Nearly 8,000 homes damaged or destroyed. Traffic flow both east and west, and north and south along major highways was shut down for several days. Damage throughout the Pacific Northwest estimated at $800 million.

December 1996 - January 1997 – Federal Disaster #1159. Stafford Act disaster assistance provided was $83 million. Small Business Administration loans approved totaled 31.7 million. Saturated ground combined with snow, freezing rain, rain, rapid warming and high winds within a five-day period produced flooding and landslides. Impacted counties – Adams, Asotin, Benton, Chelan, Clallam, Clark, Columbia, Cowlitz, Douglas, Ferry, Franklin, Garfield, Grant, Grays Harbor, Island, Jefferson, King, Kitsap, Kittitas, Klickitat, Lewis, Lincoln, Mason, Okanogan, Pacific, Pend Oreille, Pierce, San Juan, Skagit, Skamania, Snohomish, Spokane, Stevens, Thurston, Walla Walla, Whatcom, and Yakima. Twenty-four deaths; $140 million (est.) in insured losses; 250,000 people lost power. High winds and ice contributed to the repeated and extended power outages to rural power customers in Garfield, Asotin, and

Columbia Counties. This storm also resulted in numerous rural residences being cut off from any emergency service response for several days, due to drifting snow. The accumulations aggravated by rain, drifting snow, and ice in roof drains caused excessive weight and the collapse of structures.

1997 Tornadoes – There are 14 tornadoes on record for Washington in 1997. In May of that year, Tacoma experienced a small tornado that did an estimated $125,000 damage in a narrow swath across ten city blocks. Tornadoes also touched down north of Asotin County and east of Vancouver the same day. Tornadoes within this region are infrequent and touchdowns are not consistent or specific to any particular area within the region.

March 2, 2009 - President Obama declared that a major disaster exists in the State of Washington. This declaration made Public Assistance requested by the Governor available to State and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe winter storm and record and near record snow in Clallam, Clark, Columbia, Cowlitz, Garfield, Grays Harbor, Island, Jefferson, King, Klickitat, Lewis, Lincoln, Mason, Pacific, Pend Oreille, Skagit, Skamania, Snohomish, Spokane, Stevens, Thurston, Wahkiakum, Walla Walla, and Whatcom Counties. This declaration also made emergency protective measures (Category B), including snow removal assistance, under the Public Assistance program, requested by the Governor, available in Adams, Asotin, Benton, Chelan, Clallam, Columbia, Cowlitz, Franklin, Grays Harbor, Jefferson, King, Kittitas, Klickitat, Lewis, Mason, Pacific, Pierce, Skagit, Skamania, Snohomish, Spokane, Thurston, Wahkiakum, Walla Walla, Whatcom, Whitman, and Yakima for any continuous 48-hour period during or proximate to the incident period.[36]

April 23, 2020 – Winter Storms cause damage in southeast Washington. President Trump declared that a major disaster exists in the state of Washington for areas affected by severe storms, flooding, landslides, and mudslides. Three counties in southeast Washington (Walla Wall, Columbia, and Garfield) along with several western Washington counties were awarded public assistance for an incident period between January 20 and February 10, 2020.[37]

According to the Tornado History Project[38] and the National Weather Service[39], there have been no reports of tornadoes in Asotin County. Neighboring Whitman County had a minor tornado reported in 2011. This event occurred northwest of St. John and was reported to be a brief touchdown with no damage.

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[36] FEMA. 2009. *Severe Winter Storm and near Record Snow*. FEMA 1825-DR. Available online at http://www.fema.gov/pdf/news/pda/1825.pdf.

[37] FEMA. 2020. *Washington Severe Storms, Flooding, Landslides, and Mudslides.* FEMA DR-4539. Available online at https://www.fema.gov/disaster/4539

[38] Tornado History Project. 1999. St. Johnsbury, Vermont. Available online at http://www.tornadohistoryproject.com/tornado/Washington/table.

[39] The National Weather Service. Deparment of Commerce. National Oceanic and Atmospheric Administration. Portland, Oregon. Available online at http://www.wrh.noaa.gov/pqr/paststorms/tornado.php.

Probability of Future Events

Some kind of severe weather event is likely to occur throughout most of Asotin County on a regular basis. The 2018 Washington State Enhanced Hazard Mitigation Plan reports that Asotin County has a medium likelihood of exposure to severe weather and that the entire state has a high likelihood of experiencing numerous severe weather events annually. Most events are expected to be small in duration but expected increases in extreme heat could potentially lead to increases in severe weather events.[40]

All of Asotin County is at risk to severe winter weather events and there is a high probability of their continued occurrence in this area. An average of at least two severe storms is anticipated each winter in Asotin County. Areas most vulnerable to tornado are those subject to severe thunderstorms or those with a recurrence rate of 5 percent or greater, meaning the County experiences one damaging severe thunderstorm event at least once every 20 years.

Impacts of Severe Weather Events by Jurisdiction

Asotin County

Commonly, heavy snow accumulations are the cause of disruptions to normal commuting activities (delays and inability to plow roads and driveways). When coupled with extreme cold weather, severe winter storms have a detrimental impact on residents in Asotin County, particularly the senior population. Severe winter storms also have the potential to cause large losses among livestock and wildlife. Animal losses are usually the result of dehydration rather than cold or suffocation.

Snow loads on roofs, ice-slides off of roofs onto vehicles or other buildings, and damaged frozen pipes are also potential hazards associated with winter weather. These events represent a significant hazard to public health and safety, a substantial disruption of economic activity, and a constant threat to structures during the winter months.

Access to the radio site at Field Springs State Park is cut off due to snow during winter months and can only be reached via snowmobile. Efforts to conduct maintenance to the radio repeaters during this time period would be hindered by this limited access.

Due to their relative frequency and minimal severity, severe thunderstorms are not well documented in Asotin County. Their impacts are fairly limited and do not significantly affect the communities enough to declare a disaster. The secondary impacts of thunderstorms, floods, are emphasized within the flood chapter of this document.

The potential impacts of a severe hail storm in Asotin County include crop damage, downed power lines, downed or damaged trees, broken windows, roof damage, and vehicle damage. Hail storms can, in extreme cases, cause death by exposure. The most common direct impact from ice storms to people is traffic accidents. Over 85% of ice storm deaths nationwide are caused by traffic accidents. Hail storms

[40] Washington Military Department. Washington State Enhanced Hazard Mitigation Plan, 2018. Available online at https://mil.wa.gov/asset/5d1626c2229c8.

also have the potential to cause losses among livestock. The highest potential damage from hail storms in Asotin County is the economic loss from crop damage. Even small hail can cause significant damage to young and tender plants and fruit. Trees can also be severely damaged by hail as was seen in the 1996 ice storm near Spokane, Washington.

Due to the abundance of agricultural development in Asotin County, crop damage due to high winds can have disastrous effects on the local economy. In the case of extremely high winds, some buildings may be damaged or destroyed. Wind damages will generally be categorized into four groups: 1) structure damage to roofs, 2) structure damage from falling trees, 3) damage from wind blown dust on sensitive receptors, or 4) wind driven wildfires. Structural injury from damaged roofs is not uncommon in Asotin County. Structural damage from falling trees is also relatively common. Many homeowners have planted ornamental trees for shade and windbreak protections. However, many of these trees are located near, and upwind of homes putting them at risk to falling trees which could cause substantial structural damage and potentially put lives at risk. Airborne particulate matter increases during high wind events. When this occurs, sensitive receptors including the elderly and those with asthma are at increased risk to complications.

Asotin County and the entire region are at increased risk to wildfires during high wind events. Ignitions can occur from a variety of sources including downed power lines, lightning, or arson. Once ignited, only wildfire mitigation efforts around the community and scattered homes will assist firefighters in controlling a blaze. Details about wildfire mitigation are discussed in the wildland fire annexes of this Multi - Hazard Mitigation Plan.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Asotin County. Damage to roofs by heavy snow accumulations depends on the moisture content of the snow and the structural characteristics of the buildings. In general, snow in this region tends to have low moisture content because of the low temperatures and arid environment. However, heavy snow is not uncommon. Frozen water pipes are the most common damage to residential and business structures. Older homes tend to be at a higher risk to frozen water pipes than newer ones. Snow plowing in Asotin County occurs from a variety of departments and agencies. The state highways are maintained by the State of Washington. Plowing of county roads is done by the Asotin County Public Works Department and the road departments of the individual cities. Private landowners are responsible for maintaining their own driveways or other private roads. Utility supplies are impacted during severe winter storms as power is lost on a regional basis. This has a two-fold impact on Asotin County residents as not only is power cut to homes and businesses, but primary heating is lost for many residents. Gas furnaces and wood stoves supplement electrical heating, but with wood heating the senior population is at a disadvantage. Emergency response to severe winter storms includes site visits by police or fire department personnel, opening of shelters, or assistance with shopping, medical attention, and communications. The economic losses caused by severe winter storms may frequently be greater than structural damages. Employees may not be able to travel to work for several days and businesses may not open. Damages are seen in the form of structural repair and loss of economic activity. Asotin County

schools are occasionally closed during and right after a severe winter storm because of cold temperatures and snow covered roads.

Thunderstorms do occur within Washington affecting all counties, but usually are localized events. Their impacts are fairly limited and do not significantly affect the communities enough to declare a disaster. The loss potential from flooding that result from severe thunderstorms can be significant in Asotin County.

Although the financial impacts of hail can be substantial and extended, accurately quantifying these impacts is problematic. Hail typically causes direct losses to structures and other personal property as well as to the vast forestlands and extensive agricultural development in Asotin County. The most significant losses are most clearly seen in the agriculture sectors of the County's economy. Potential losses to agriculture can be disastrous. They can also be very localized; thus, individual farmers can have significant losses, but the event may not drastically affect the economy of the County. Furthermore, crop damage from hail will also be different depending on the time of year and the type of crop. Most farmers carry insurance on their crops to help mitigate the potential financial loss resulting from a localized hail storm. Federal and state aid is available for County's with declared hail disasters resulting in significant loss to local farmers as well as the regional economy. Homeowners in Asotin County rarely incur severe damage to structures (roofs); however, hail damage to vehicles is not uncommon. The damage to vehicles is difficult to estimate because the number of vehicles impacted by a specific ice storm is unknown. Additionally, most hail damage records are kept by various insurance agencies.

It is difficult to estimate potential losses in Asotin County due to windstorms and tornadoes. Construction throughout the County has been implemented in the presence of high wind events, and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

Power failure often accompanies severe storms. More rural parts of the County are sometimes better prepared to deal with power outages for a few days due to the frequent occurrence of such events; however, prolonged failure, especially during cold winter temperatures can have disastrous effects. All communities should be prepared to deal with power failures. Community shelters equipped with alternative power sources will help local residents stay warm and prepare food. A community-based system for monitoring and assisting elderly or disabled residents should also be developed. All households should maintain survival kits that include warm blankets, flashlights, extra batteries, nonperishable food items, and clean drinking water.

City of Asotin

The city of Asotin does not have any differing levels of risk associated with this hazard than Asotin County as a whole.

Value of Resources at Risk

Like Asotin County, costs of potential winter storm damages to structures and the economy in the city of Asotin are difficult to estimate. Please refer to the Asotin County "impacts" section above for additional details.

Values potentially at risk to winter storms in Asotin include roof damage costs from heavy snow loads and frozen water pipes. Older homes tend to be at a higher risk to frozen water pipes than newer ones. Snow plowing within the city limits is accomplished by the city's maintenance department. Private landowners are responsible for maintaining their own driveways or other private roads. Utility supplies are impacted during severe winter storms as power is lost on a regional basis. This has a two-fold impact on residents as not only is power cut to homes and businesses, but primary heating is lost for many residents. Gas furnaces and wood stoves supplement electrical heating, but with wood heating the senior population is at a disadvantage. Emergency response to severe winter storms includes site visits by police or fire department personnel, opening of shelters, or assistance with shopping, medical attention, and communications. The economic losses caused by severe winter storms may frequently be greater than structural damages. Employees may not be able to travel to work for several days and businesses may not open. Damages are seen in the form of structural repair and loss of economic activity. Asotin County schools are occasionally closed during and right after a severe winter storm because of cold temperatures and snow covered roads.

Thunderstorms are not likely to be severe enough in Asotin to cause significant damages. However, the loss potential from flooding caused by severe thunderstorms could be significant.

Although the financial impacts of hail can be substantial and extended, accurately quantifying these impacts is problematic. Hail typically causes direct losses to structures and other personal property within Asotin. The most significant losses are most clearly seen in the agriculture sectors of the economy. Potential losses to agriculture can be disastrous. Crop damage from hail will also be different depending on the time of year and the type of crop. Most farmers carry insurance on their crops to help mitigate the potential financial loss resulting from a localized hail storm. Homeowners in Asotin rarely incur severe damage to structures (roofs); however, hail damage to vehicles is not uncommon. The damage to vehicles is difficult to estimate because the number of vehicles impacted by a specific ice storm is unknown. Additionally, most hail damage records are kept by various insurance agencies.

It is difficult to estimate potential losses in Asotin due to windstorms and tornadoes. Construction throughout the County has been implemented in the presence of high wind events, and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

Power failure often accompanies severe storms. More rural parts of the County are sometimes better prepared to deal with power outages for a few days due to the frequent occurrence of such events; however, prolonged failure, especially during cold winter temperatures can have disastrous effects. All communities should be prepared to deal with power failures. Community shelters equipped with alternative power sources will help local residents stay warm and prepare food. A community-based system for monitoring and assisting elderly or disabled residents should also be developed. All households should maintain survival kits that include warm blankets, flashlights, extra batteries, nonperishable food items, and clean drinking water.

City of Clarkston

The city of Clarkston does not have any differing levels of risk associated with this hazard than Asotin County as a whole.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Clarkston. Damage to roofs by heavy snow accumulations depends on the moisture content of the snow and the structural characteristics of the buildings. In general, heavy snow along the Snake River is uncommon due the higher valley temperatures and relatively arid environment. Frozen water pipes are the most common damage to residential and business structures. Older homes tend to be at a higher risk to frozen water pipes than newer ones. Snow plowing within the city limits is accomplished by the city's public works department. Private landowners are responsible for maintaining their own driveways or other private roads. Utility supplies are impacted during severe winter storms as power is lost on a regional basis. This has a two-fold impact on residents as not only is power cut to homes and businesses, but primary heating is lost for many residents. Gas furnaces and wood stoves supplement electrical heating, but with wood heating the senior population is at a disadvantage. Emergency response to severe winter storms includes site visits by police or fire department personnel, opening of shelters, or assistance with shopping, medical attention, and communications. The economic losses caused by severe winter storms may frequently be greater than structural damages. Employees may not be able to travel to work for several days and businesses may not open. Damages are seen in the form of structural repair and loss of economic activity. Clarkston schools are occasionally closed during and right after a severe winter storm because of cold temperatures and snow covered roads.

Thunderstorms are not likely to be severe enough in Clarkston to cause significant damages. However, the loss potential from flooding that result from severe thunderstorms could be significant.

Although the financial impacts of hail can be substantial and extended, accurately quantifying these impacts is problematic. Hail typically causes direct losses to structures and other personal property within Clarkston. The most significant losses are most clearly seen in the agriculture sectors of the economy. Potential losses to agriculture can be disastrous. Crop damage from hail will also be different depending on the time of year and the type of crop. Most farmers carry insurance on their crops to help mitigate the potential financial loss resulting from a localized hail storm. Homeowners in Clarkston rarely incur severe damage to structures (roofs); however, hail damage to vehicles is not uncommon. The damage to vehicles is difficult to estimate because the number of vehicles impacted by a specific ice storm is unknown. Additionally, most hail damage records are kept by various insurance agencies.

It is difficult to estimate potential losses in Clarkston due to windstorms and tornadoes. Construction throughout the County has been implemented in the presence of high wind events, and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

Power failure often accompanies severe storms. More rural parts of the County are sometimes better prepared to deal with power outages for a few days due to the frequent occurrence of such events;

however, prolonged failure, especially during cold winter temperatures can have disastrous effects. All communities should be prepared to deal with power failures. Community shelters equipped with alternative power sources will help local residents stay warm and prepare food. A community-based system for monitoring and assisting elderly or disabled residents should also be developed. All households should maintain survival kits that include warm blankets, flashlights, extra batteries, nonperishable food items, and clean drinking water.

Asotin County Fire District #1

The Fire District does not have any differing levels of risk associated with this hazard than Asotin County as a whole. However, in the event of significant severe weather events, Fire District #1 would assist with all emergency response, delivery of special aid if necessary, and search and rescue missions.

Value of Resources at Risk

The Asotin Fire District #1 station in the Clarkston Heights is at low risk to severe high wind events, hail damage, or significant snow accumulations. Parts of the station has sections of flat roof, which may be susceptible to severe heavy snow accumulations or damage from standing water; however, the moderate weather in the Lewis and Clark Valley make this type of damage unlikely. The District has no other known assets or other resources at risk to severe weather events.

Blue Mountain Fire District

Blue Mountain Fire District #1 and the surrounding area of Anatone can be severely affected by severe weather. Due to the elevation and proximity to the mountains, the heavy snow accumulations can cause damage to homes and outbuildings as well as disruptions to normal commuting activities. Wind-blown snow can often prohibit or delay the Asotin County Road Department from plowing the county roads. The possibility of power outages is a likely scenario during these winter storms. Asotin Anatone School District runs one bus to the Anatone area. The bus stays on State Highway 129 out to Field Springs State park and then returns back to Montgomery Ridge Road. Winter storms represent a significant hazard to public safety.

Winter weather can especially impact BMFD #1 because the district does not currently have a fire station with heated bays for winter water supply. Cold weather, and heavy snows that cause road closures, can limit fire response in the Anatone area.

Thunderstorms are a significant hazard in the area as well. The potential for fires starting from lightning strikes is very high. High winds are common as these thunderstorms move through causing any wildland fire to spread rapidly. Hail is sometimes associated with thunderstorms, causing damage to crops, vehicles, and structures.

Heavy and prolonged rain can have significant impacts to county roads. Most of the roads are gravel and can be washed out, especially on Shumaker Grade, Sherry Grade and Ten Mile Grade.

Value of Resources at Risk

Blue Mountain Fire District #1 and the surrounding area is at high risk to severe weather. It is difficult to estimate the cost of potential severe weather damages to structures, roads, crops and livestock in this

area. In addition to human life, high-value resources are at risk to severe weather events including buildings and property, infrastructure, economic resources, livestock, wildlife, and agriculture.

Asotin County Conservation District

The conservation district does not have any differing issues or levels of risk associated with this hazard than Asotin County as a whole.

Value of Resources at Risk

The district does not have any values at risk to this hazard.

Wildland Fire Hazard Profile

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

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

Weather

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

Topography

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

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

Fuels

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

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

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

Wildland Fire Risk Assessment

The Asotin County Community Wildfire Protection Plan[41] provides a comprehensive analysis of the wildland fire risks and recommended protection and mitigation measures for all jurisdictions in Asotin County. However, the CWPP is out of date. Due to unforeseen difficulties during the time of the most recent MHMP 5-year update, the planning team was not able to undertake a full CWPP update. This has been identified as a high-priority project to begin as soon as 2021. This section, the Wildland Fire Risk Assessment of the MHMP, has been updated where necessary to reflect pertinent current information. This Wildland Fire Risk Assessment fully integrates the CWPP and contains some references to the Asotin County CWPP.

Southeast Washington Wildfire Hazard Assessment

Southeast Washington was analyzed using a variety of models, managed on a Geographic Information System (GIS) system. Physical features of the region including roads, streams, soils, elevation, and remotely sensed images were represented by data layers. Field visits were conducted by specialists from

[41] King, Tera and V. Bloch. 2008. Asotin County Community Wildfire Protection Plan. Northwest Management, Inc.. Moscow, Idaho.

Northwest Management, Inc. and others. Discussions with area residents and local fire suppression professionals augmented field visits and provided insights into forest health issues and treatment options. This information was analyzed and combined to develop an objective assessment of wildland fire risk in the region.

Historic Fire Regime

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

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

Table 18: Fire Regime Groups in Asotin County[42]

Fire Regime Group (FRG)	Description	Acres	% of Total
FRG I	<= 35 Year Fire Return Interval, Low and Mixed Severity	95,932	23.42%
FRG II	<= 35 Year Fire Return Interval, Replacement Severity	34,012	8.30%
FRG III	35 - 200 Year Fire Return Interval, Low and Mixed Severity	17,918	4.37%
FRG IV	35 - 200 Year Fire Return Interval, Replacement Severity	242,816	59.27%
FRG V	> 200 Year Fire Return Interval, Any Severity	6,989	1.71%
Water	Water	4,137	1.01%
Barren	Barren	72	0.02%
Sparsely Vegetated	Sparsely Vegetated	7,810	1.91%
		409,684	100.00%

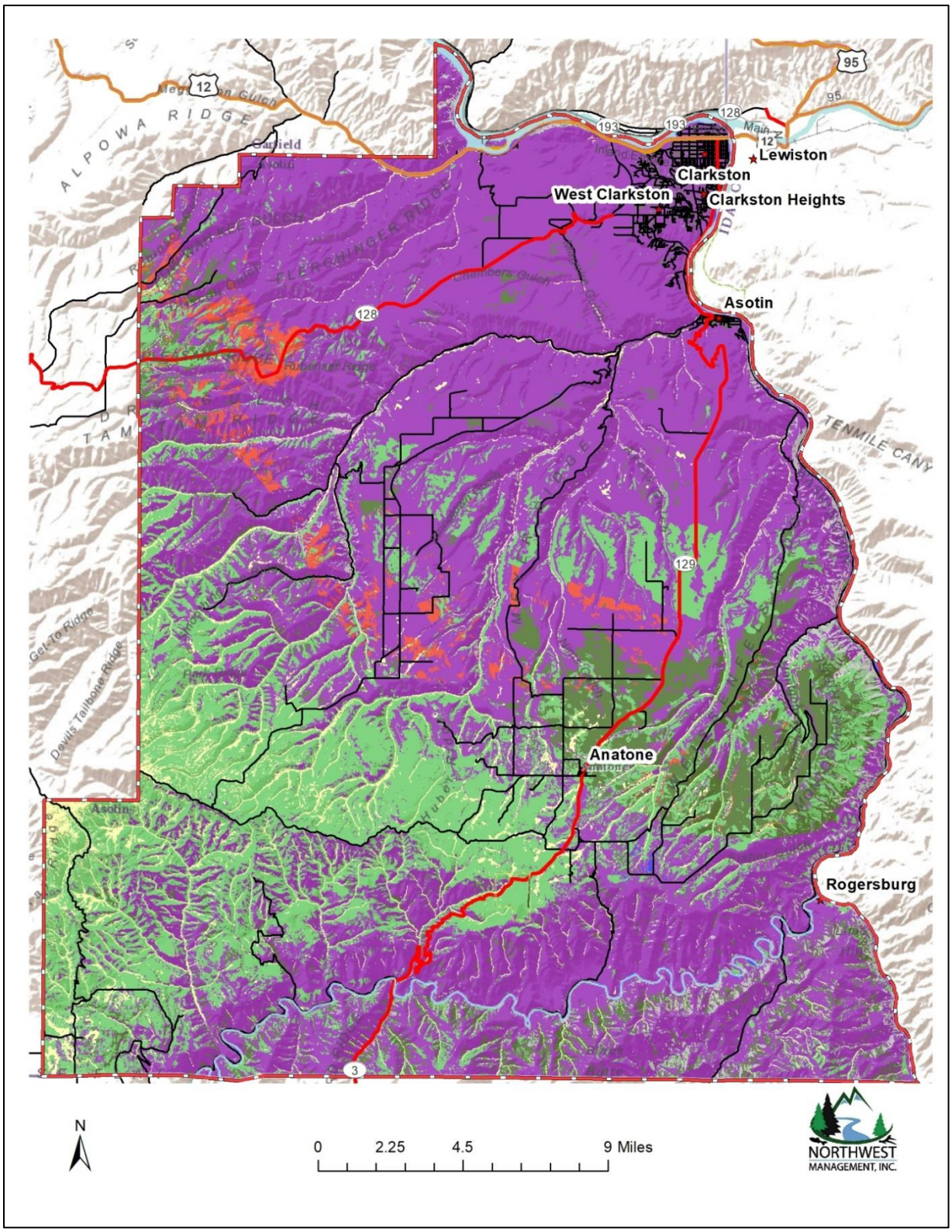
The table above shows the amount of acreage in each defined fire regime in Asotin County. The historic fire regime model shows that more than half of the area (more than 59%) has historically experienced a

[42] LANDFIRE™. "Fire Regime Groups." Available online at https://landfire.gov/frg.php.

fire return rate of 35 to 200 years with replacement severity fires. The next most significant amount of the county (almost 96,000 acres) falls into category FRG I, meaning it has historically experienced a fire return rate of equal to, or less than 35 years with low and mixed severity fires.

Figure 16: Legend for Fire Regime Group map

Figure 17: Fire Regime Group of Asotin County[43]



[43] LANDFIRE™. "Fire Regime Groups." Available online at https://landfire.gov/frg.php.

Vegetation Condition Class

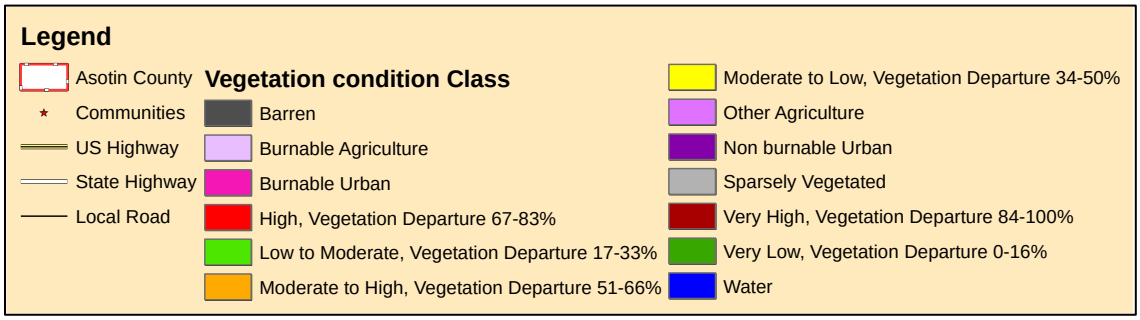
Vegetation Condition Class (VCC) represents a simple categorization of the associated Vegetation Departure (VDEP) layer and indicates the general level to which current vegetation is different from the simulated historical vegetation reference conditions. VDEP and VCC are based upon methods originally described in Interagency Fire Regime Condition Class Guidebook, but are not identical to those methods. In LANDFIRE 2012™, the original three VCC classes were divided in half to create six VCC classes to provide additional precision.[44]

An updated GIS layer using LANDFIRE data was used to create a vegetation condition class map specific to Asotin County. This resource was not available during the planning process for the 2011 Southeast Washington MHMP. The following table expresses the data captured in the VCC map.

Table 19: Vegetation Condition Class in Asotin County[45]

NEW CLASS	NEW DESCRIPTION	Acres	% of Total
VCC I.A	Very Low, Vegetation Departure 0-16%	156	0.04%
VCC I.B	Low to Moderate, Vegetation Departure 17-33%	8,805	2.15%
VCC II.A	Moderate to Low, Vegetation Departure 34-50%	94,534	23.07%
VCC II.B	Moderate to High, Vegetation Departure 51-66%	28,971	7.07%
VCC III.A	High, Vegetation Departure 67-83%	177,411	43.30%
VCC III.B	Very High, Vegetation Departure 84-100%	837	0.20%
Water	Water	4,137	1.01%
Non burnable Urban	Non burnable Urban	8,101	1.98%
Burnable Urban	Burnable Urban	8,723	2.13%
Barren	Barren	72	0.02%
Sparsely Vegetated	Sparsely Vegetated	7,803	1.90%
Other Agriculture	Non burnable Agriculture	30,062	7.34%
Burnable Agriculture	Burnable Agriculture	40,072	9.78%
		409,684	100.00%

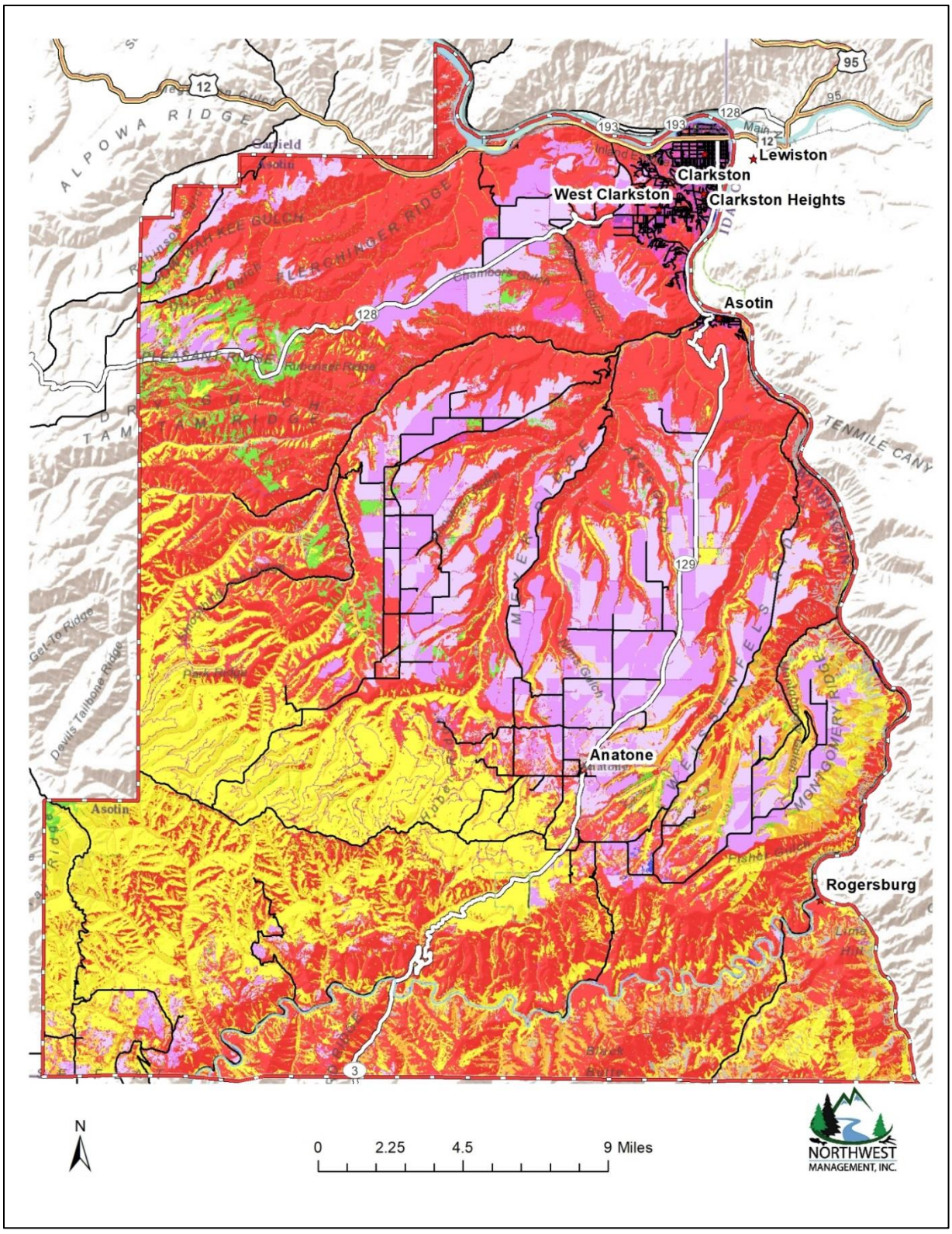
Figure 18: Legend for Vegetation Condition Class map



[44] LANDFIRE™. "Vegetation Condition Class." Available online at https://www.landfire.gov/vcc.php.

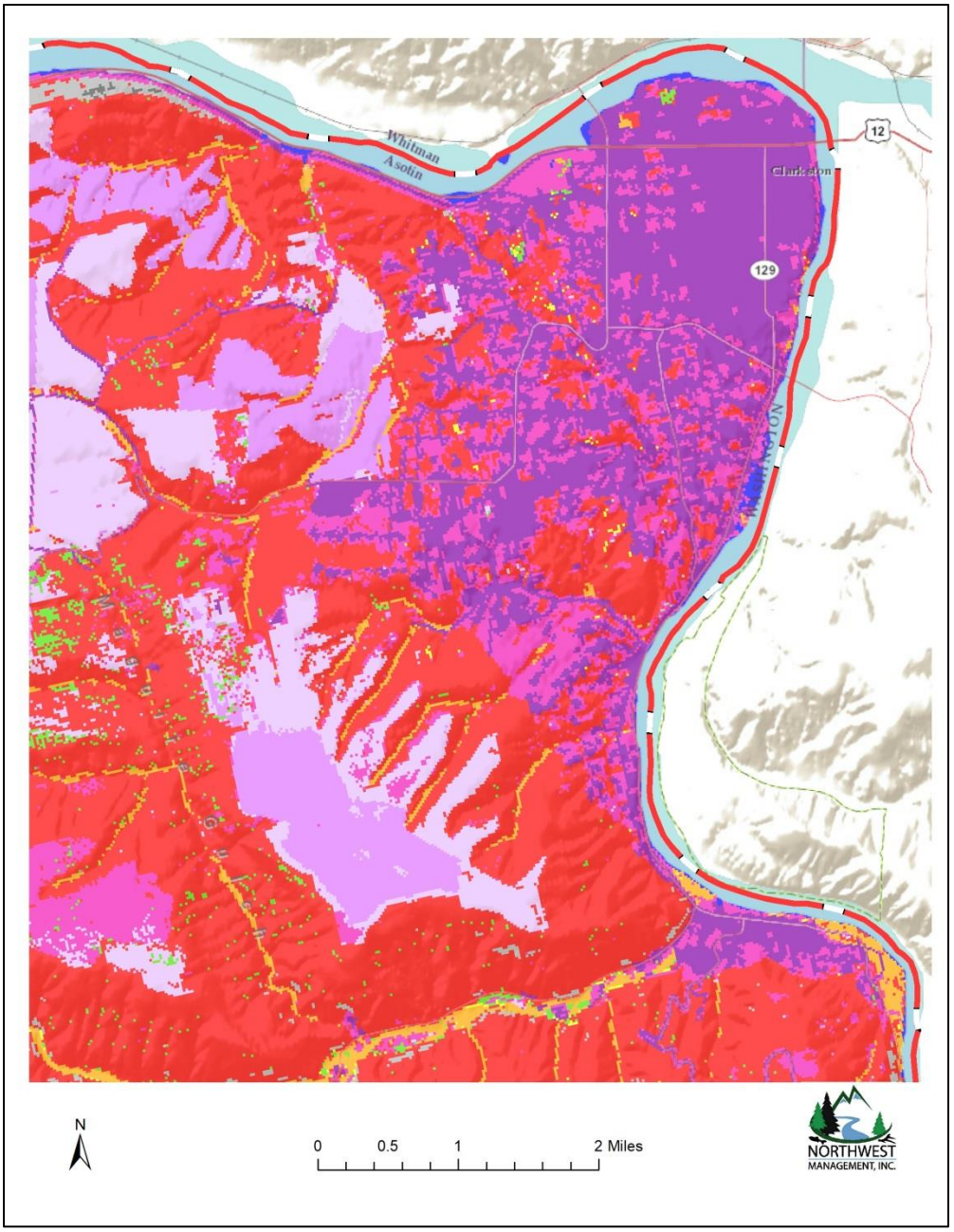
[45] LANDFIRE™. "Vegetation Condition Class." Available online at https://www.landfire.gov/vcc.php.

Figure 19: Vegetation Condition Class for Asotin County[46]



[46] LANDFIRE™. "Vegetation Condition Class". Available online at https://www.landfire.gov/vcc.php.

Figure 20: VCC[47] map with concentrated view of northeast Asotin County, including Clarkston and Asotin (legend below)



[47] LANDFIRE™. "Vegetation Condition Class". Available online at https://www.landfire.gov/vcc.php.

Wildland Urban Interface

The wildland-urban interface (WUI) can be described as the area where houses, farms, businesses, and other kinds of human development meet, border and intermingle with forestlands or undeveloped wildland vegetation. The WUI also represents areas where communities and individuals are at an increased risk to wildland fire impacts. Over the past several decades the WUI has grown significantly.[48]

A key component in meeting the underlying need for protection of people and structures is the protection and treatment of hazards in the wildland-urban interface. The WUI encompasses not only the interface (areas immediately adjacent to urban development), but also the surrounding vegetation and topography. Reducing the hazard in the wildland-urban interface requires the efforts of federal, state, and local agencies and private individuals. With treatment, a wildland-urban interface can provide firefighters a defensible area from which to suppress wildland fires or defend communities against other hazard risks. In addition, a wildland-urban interface that is properly treated will be less likely to sustain a crown fire that enters or originates within it. [49]

Fuel treatments involve physically altering vegetation, such as thinning or pruning projects, in order to lower probabilities of extreme fire behavior.[50] By reducing hazardous fuel loads, ladder fuels, and tree densities, and creating new and reinforcing existing defensible space, landowners can protect the wildland-urban interface, the biological resources of the management area, and adjacent property owners by:

- Minimizing the potential of high-severity ground or crown fires entering or leaving the area;
- Reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI.
- Improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

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

[48] United States Forest Service. "Planning in the Wildland-Urban Interface." Available online at https://www.fs.fed.us/research/urban-webinars/planning-in-the-wui.php. June 12, 2019.

[49] 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.

[50] Fire Protection Research Foundation. "Pathways for Building Fire Spread at the Wildland Urban Interface." Available online at https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/Emergency-responders/RFPathwaysForBuildingFireSpreadWUI.ashx?la=en. March 2015

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

In addition to these classifications detailed in the Federal Register, four additional classifications of population density have been included to augment these categories:

- **Rural Condition** – a situation where the scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuels. There may be miles between these clusters. The condition of the WUI connects these clusters into a relatively homogenous area.
- **High Density Urban Areas** – those areas generally identified by the population density consistent with the location of larger incorporated cities, however, the boundary is not necessarily set by the location of city boundaries: it is set by very high population densities (more than 15-30 structures per acre or more). Many counties and reservations in the west do not have high density urban areas. Asotin County, Washington, was determined not to have any areas of high density urban based on current (2006) structure locations. However, in the nearby Asotin County, Clarkston, Washington, is representative of a high density urban condition.
- **Infrastructure Area WUI** – those locations where critical and identified infrastructure are located outside of populated regions and may include high tension power line corridors, critical escape or primary access corridors, municipal watersheds, areas immediately adjacent to facilities in the wildland such as radio repeater towers or fire lookouts. These are identified by county or reservation level core teams.
- **Non-WUI Condition** - a situation where the above definitions do not apply because of a lack of structures in an area or the absence of critical infrastructure crossing these unpopulated regions. This classification is not WUI.

Asotin County's wildland-urban interface (WUI) is based on population density. Relative population density across the county was estimated using a GIS based kernel density population model that uses object locations to produce, through statistical analysis, concentric rings or areas of consistent density. To graphically identify relative population density across the county, structure locations were determined by examining aerial photography. The aerial photographs used are 1 meter resolution (very high quality) and show land based features with acceptable resolution and quality. A county-level mosaic was obtained for Asotin County, and for the adjacent counties, and was used to provide locations for digitized structures in the region. The resulting output identified the extent and level of

population density throughout the county. Based on committee review and discussion, the output was adjusted to include areas of significant infrastructure and to incorporate gaps along important transportation routes.

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

The WUI, as defined here, is unbiased and consistent, allows for edge matching with other counties, 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.

Another way to analyze the wildland-urban interface is to look at the distribution and density of structures within the WUI. Using a state of Washington building footprint layer from Microsoft[51], maps were created to express structure location and density for different regions of Asotin County. These maps are intended to accompany the WUI map (Figure 21). These structure density maps (Figures 22-25) have not replaced the established WUI classification from the CWPP, but they are to be used as additional planning tools. This type of analysis may be useful for identifying project areas based on the way structures and wildland fuels intermingal.

[51] Microsoft. "US Building Footprints." Available online at https://github.com/microsoft/USBuildingFootprints.

Figure 21: Wildland-Urban Interface in Asotin County

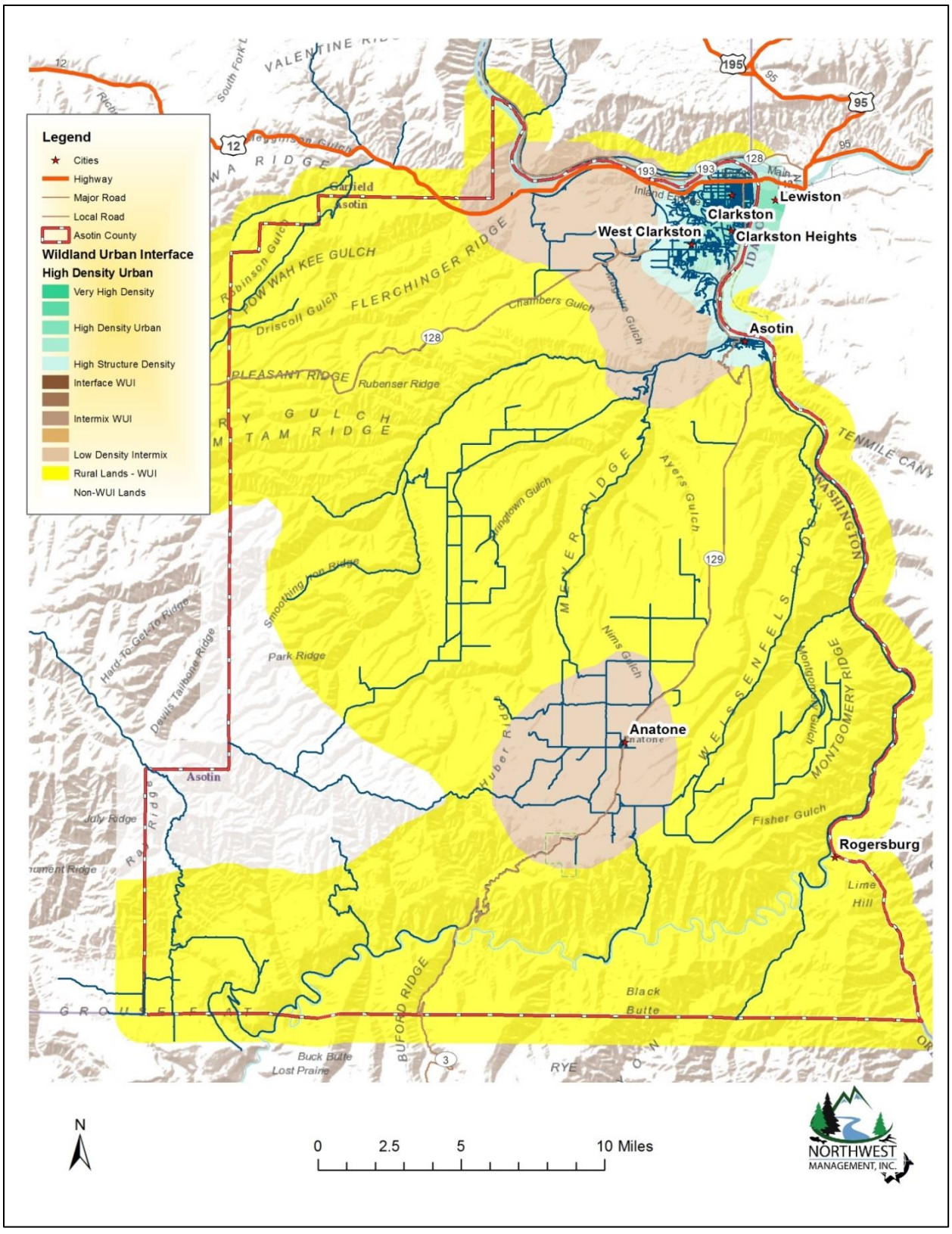


Figure 22: Structure density map with structure points in Asotin County

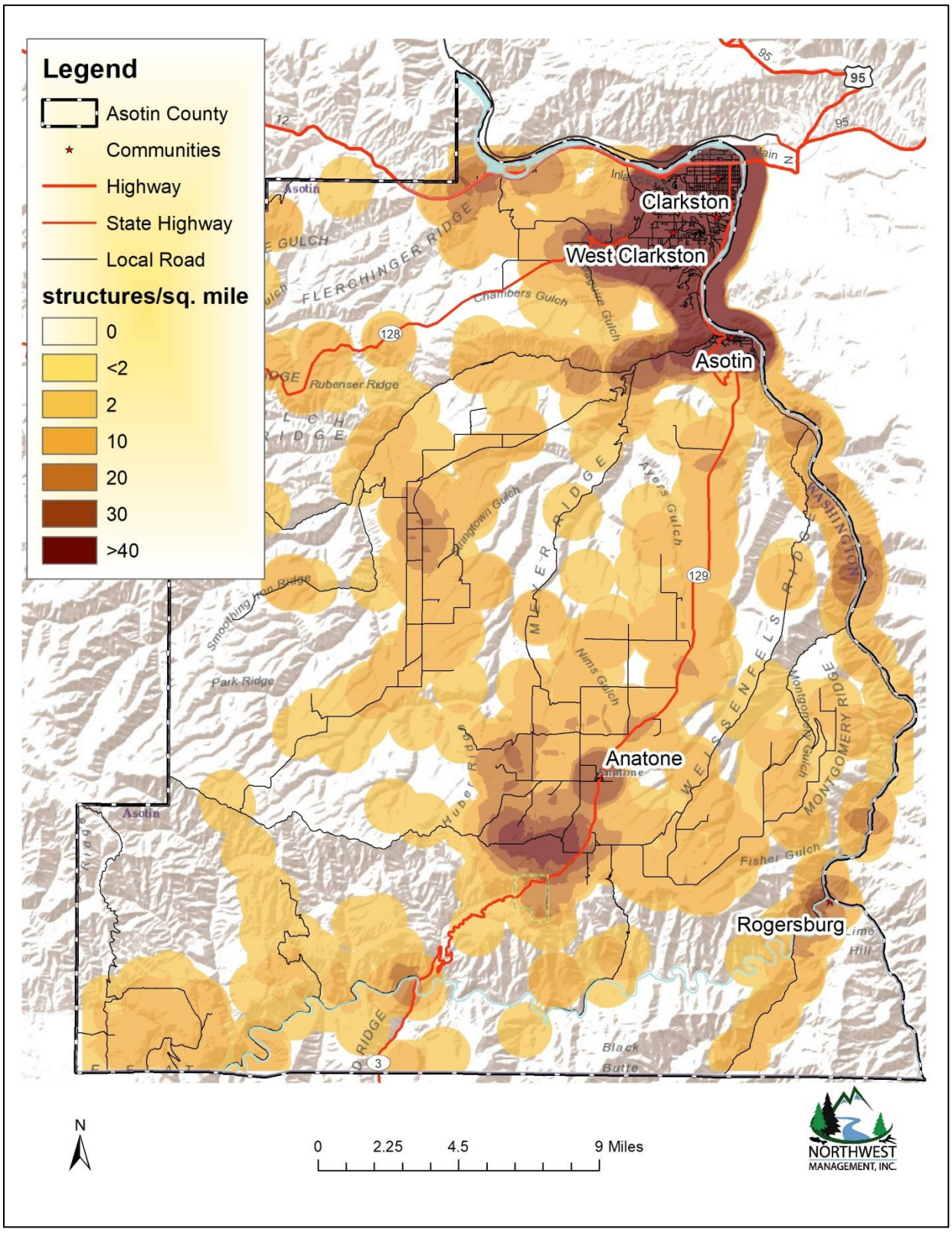


Figure 23: Structure density in the Anatone area (with structure location points)

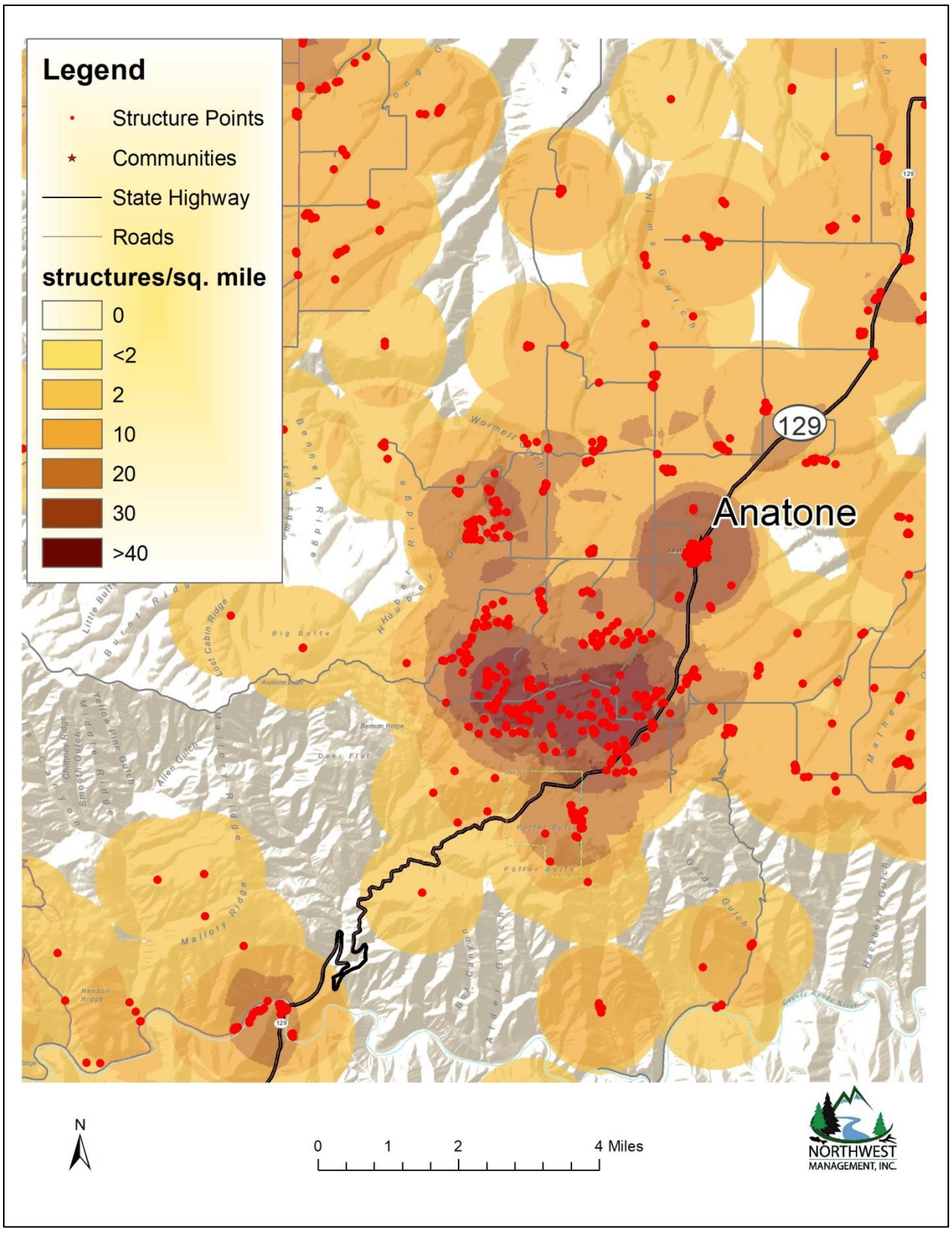


Figure 24: Structure density in the Snake River area, south of Asotin (with structure location points)

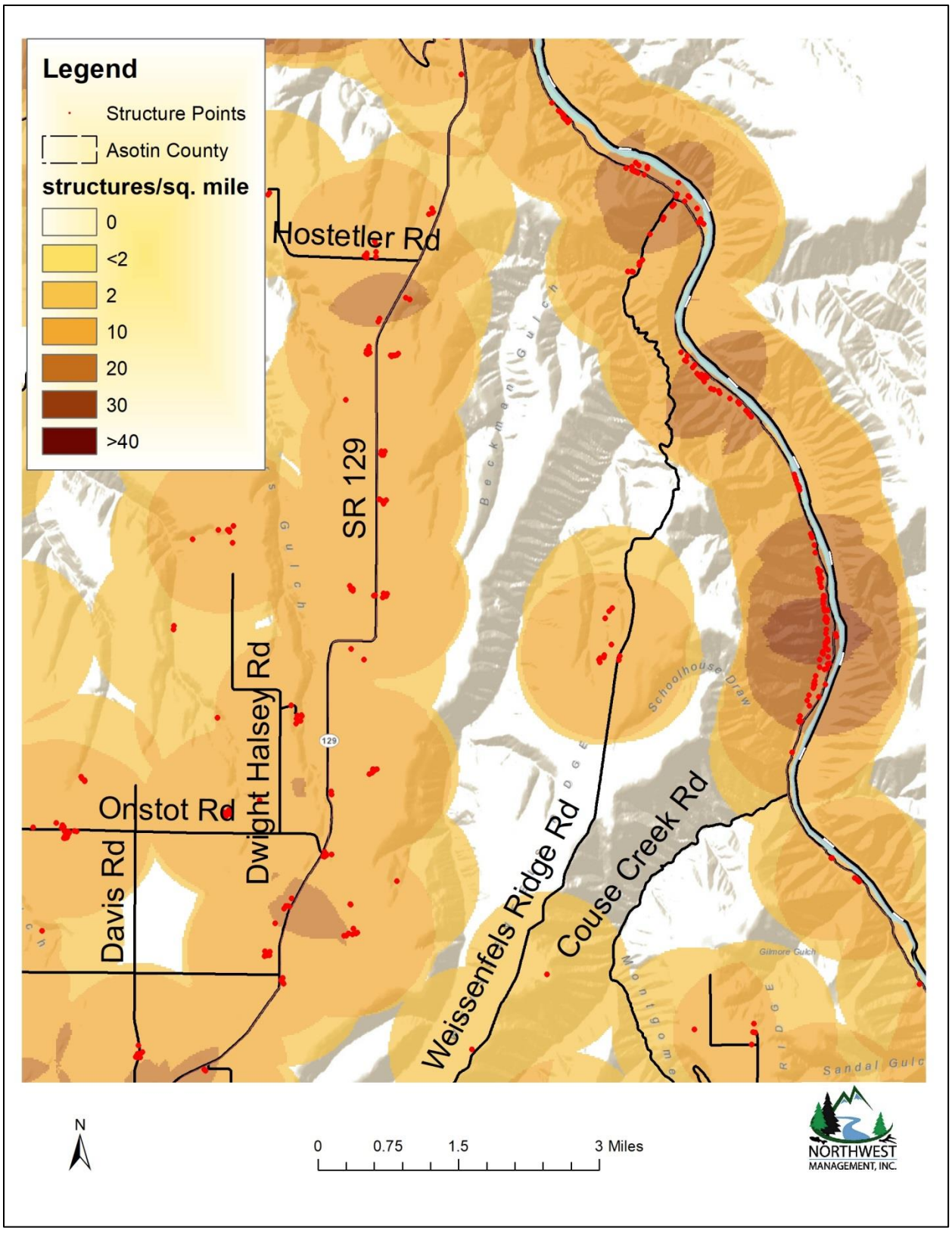
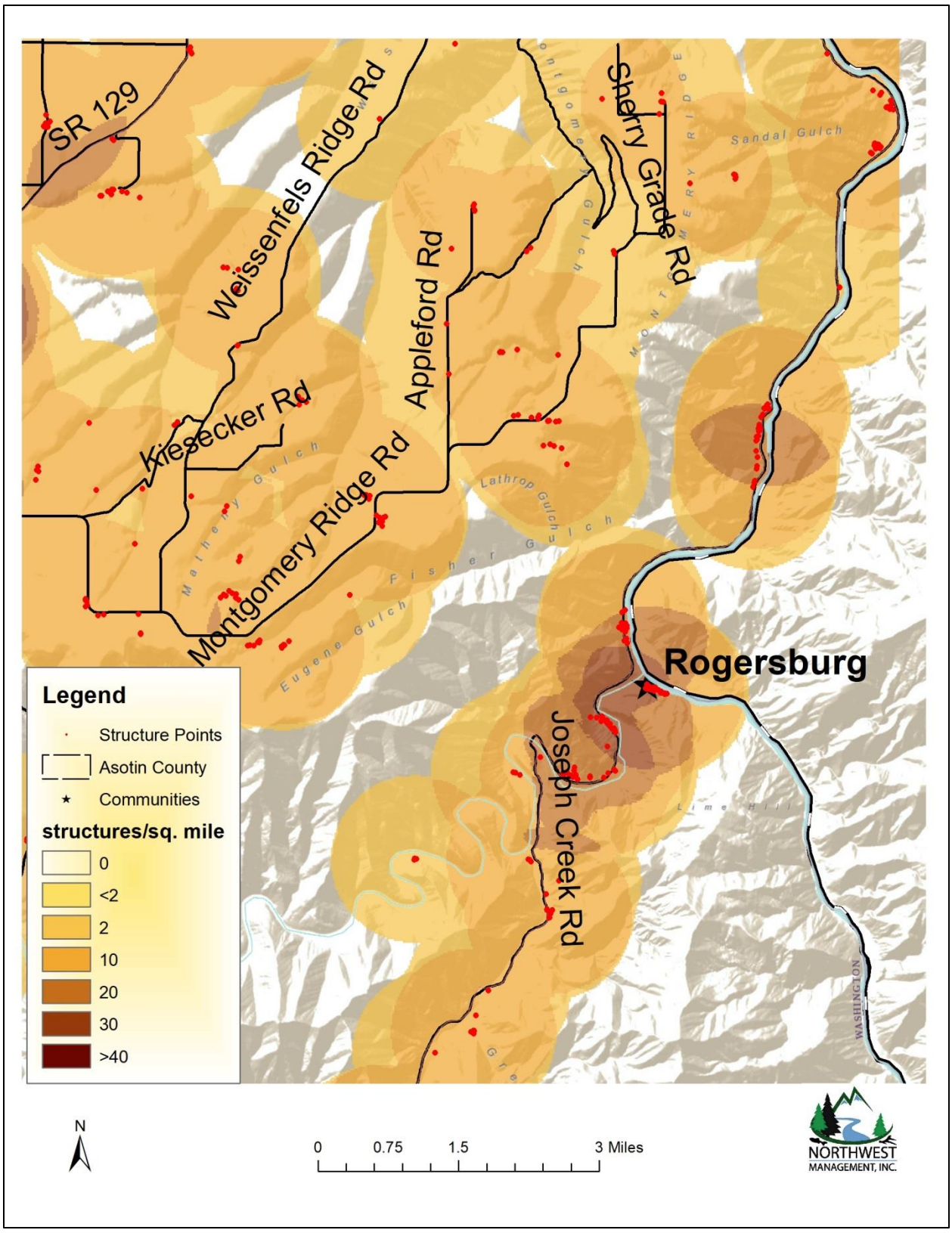


Figure 25: Structure density in the Rogersburg area (with structure location points)



Local Event History

Fire was once an integral function of the majority of ecosystems in southeastern Washington. The seasonal cycling of fire across the landscape was as regular as the July, August and September lightning storms plying across the canyons and mountains. Depending on the plant community composition, structural configuration, and buildup of plant biomass, fire resulted from ignitions with varying intensities and extent across the landscape. Shorter return intervals between fire events often resulted in less dramatic changes in plant composition.[52] The fires burned from 1 to 47 years apart, with most at 5- to 20-year intervals.[53] With infrequent return intervals, plant communities tended to burn more severely and be replaced by vegetation different in composition, structure, and age.[54] Native plant communities in this region developed under the influence of fire, and adaptations to fire are evident at the species, community, and ecosystem levels. Fire history data (from fire scars and charcoal deposits) suggest fire has played an important role in shaping the vegetation in the Columbia Basin for thousands of years.

State and Federal wildfire data was combined to express causes of fire starts over the past two decades (Figure 26). The planning team decided to break the fire starts down by human-caused, naturally-caused, and unknown causes. The breakdown of total starts by cause and acres burned can be seen in Table 20. This data used was obtained from two primary sources, the United States Forest Service[55] and the Washington Department of Natural Resources[56]. Large Fires are expressed in Figure 27 and color coded by year. This data also combined multiple data sources including the Washington DNR[57], the National Interagency Fire Center[58], and the interagency program, Monitoring Trends in Burn Severity[59].

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

[53] 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, Oregon. 106pp.

[54] Johnson, C.G.; et al. 1994. *Biotic and Abiotic Processes of Eastside Ecosytems: the Effects of Management on Plant and Community Ecology, and on Stand and Landscape Vegetation Dynamics*. Gen. Tech. Report PNW-GTR-322. USDA-Forest Service. PNW Research Station. Portland, Oregon. 722pp.

[55] USDA Forest Service. FIRESTAT yearly. available online at https://data.fs.usda.gov/geodata/edw/edw_resources/meta/S_USA.Fire_Occurrence_FIRESTAT_YRLY.xml.

[56] Washington Department of Natural Resources. DNR Fire Statistics 2008 – Present. Available online at https://data-wadnr.opendata.arcgis.com/datasets/dnr-fire-statistics-2008-present-1.

[57] Washington Department of Natural Resources. Washington Large Fires 1973-2019. Available online at https://data-wadnr.opendata.arcgis.com/datasets/washington-large-fires-1973-2019.

[58] National Interagency Fire Center. Wildfire Perimeters. available online at https://data-nifc.opendata.arcgis.com/datasets/wildfire-perimeters.

[59] Monitoring Trends in Burn Severity. Direct Downloads. Available online at https://www.mtbs.gov/direct-download.

Table 20: Number of Fire Starts by general cause and total acres burned from 2000 to 2019 (data is represented in Figure 26)

Fire Cause	Number of Starts	Acres Burned
Human-Caused	18	6,018
Natural	94	2,002
Unknown	21	3,375

Figure 26: Asotin County map of wildfire starts by cause with property ownership

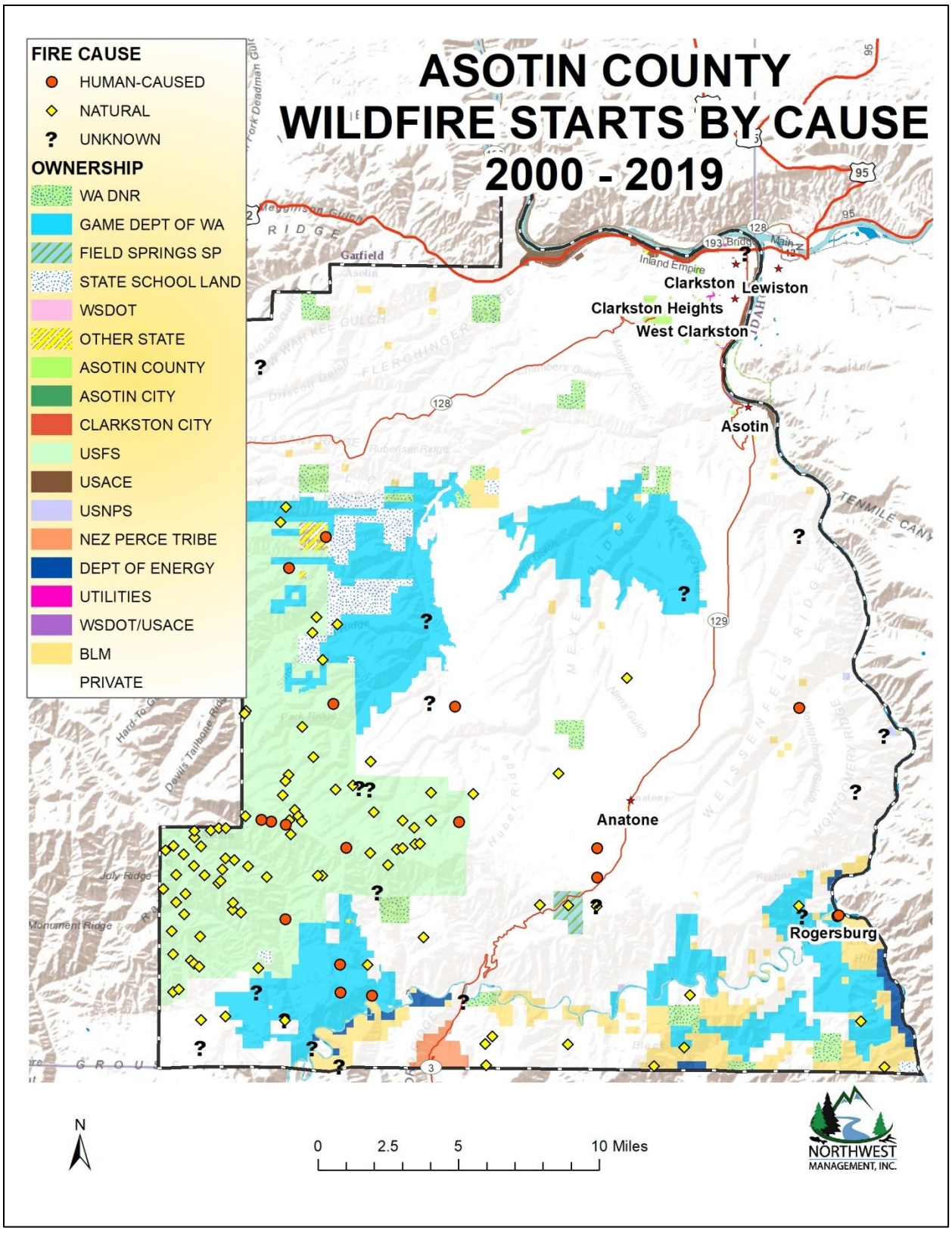
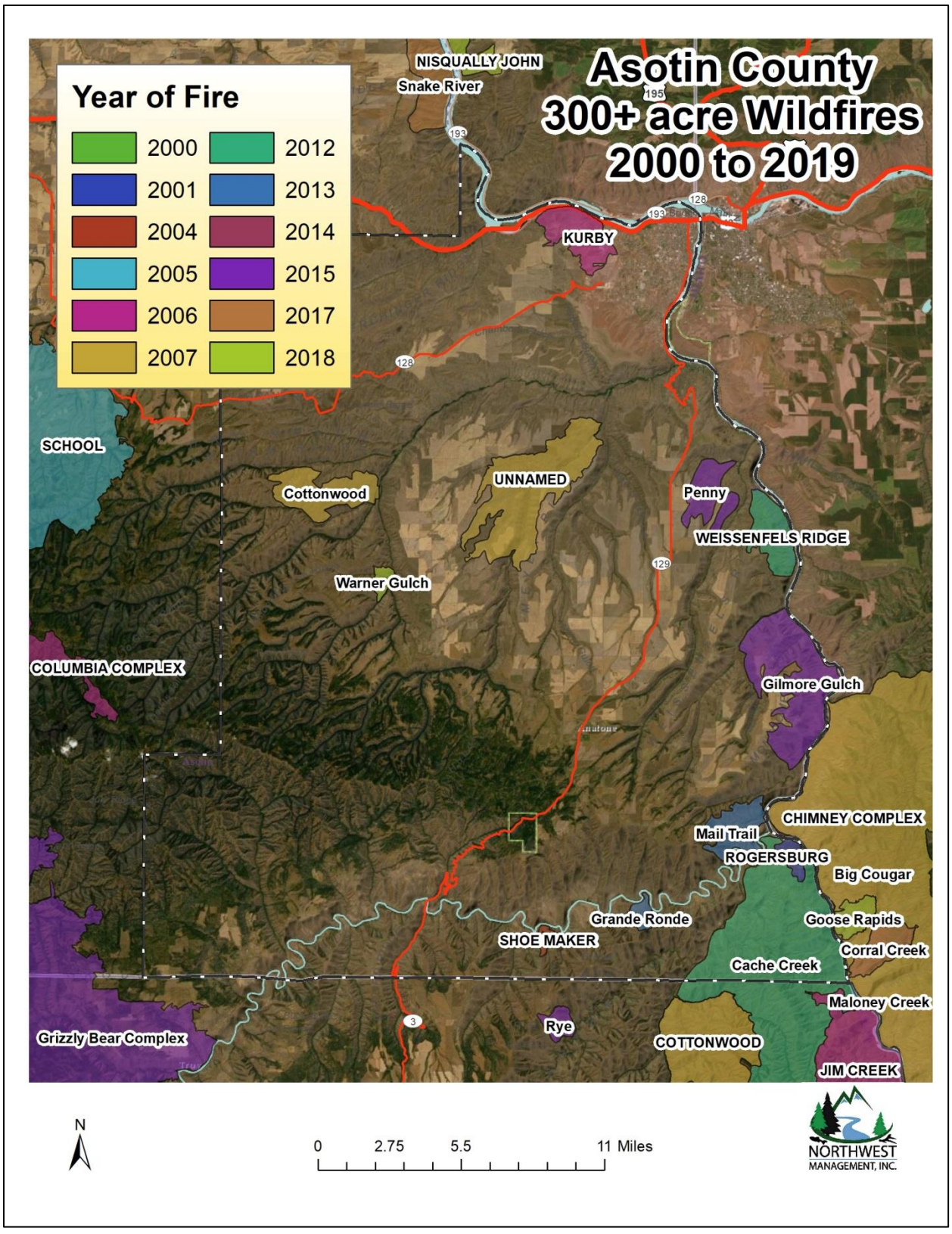


Figure 27: 300+ acre wildfires from 2000 to 2019 in Asotin County



2020 Local Wildfires

Chief Timothy Fire[60][61][62]

The Chief Timothy Fire started on August 16, 2020, five miles west of Clarkston, on the Whitman County side of the Snake River. The fire eventually grew to 1,400 acres and was contained on August 20, 2020. The fire burned mostly in grass and brush in very steep and rocky terrain and was caused by a vehicle that caught fire on the side of Wawawai Road.

Morris Canyon Fire[63][64]

The Morris Canyon Fire was caused by lightning on August 18, 2020 on the Cloverland Road, about 11 miles northwest of Anatone. Local fire crews responded and the fire burned about 95 acres on private land.

Wawawai Canyon Fire[65]

The Wawawai Canyon Fire started on September 12, 2020 and burned about 300 acres in Wawawai Canyon, near the Snake River. As of late October, 2020, the Whitman County Sheriff's office believed the fire was intentionally started. The cause of the fire is still under investigation. The fire was mostly contained about a day later and it did not damage any structures and no one was injured.

Probability of Future Events

Vegetative structure and composition in Asotin County is closely related to elevation, aspect, and precipitation. Relatively mild and dry environments characterize the undulating topography of the region which transitions from the Snake River valley riparian plant communities to the rangeland ecosystems that characterize the vast majority of the land area in Asotin County. Forested communities extend this transition as elevations increases, soils change, and conditions favor forest tree species. Forests contain high fuel accumulations that have the potential to burn at moderate to high intensities. Highly variable topography coupled with dry, windy weather conditions typical of the region is likely to create extreme fire behavior.

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[60] InciWeb – Incident Information System. "Chief Timothy Fire." Available online at https://inciweb.nwcg.gov/incident/6999/. November, 2020.

[61] Big Country News. "Crews Continue to Battle Chief Timothy Fire Today." August 18, 2020. Available online at https://www.bigcountrynewsconnection.com/local/crews-continue-to-battle-chief-timothy-fire-today/article_252b8f72-e171-11ea-9fb1-870196dcbc86.html

[62] News Break. "Wildfire Near Chief Timothy Park." August 16, 2020. Available online at https://www.newsbreak.com/washington/clarkston/accident/2042026264508/clarkston-wa-wildfire-near-chief-timothy-park.

[63] Fire, Weather, & Avalanche Center. "Morris Canyon Fire." Available online at https://www.fireweatheravalanche.org/wildfire/incident/138615/washington/morris-canyon-fire. November, 2020.

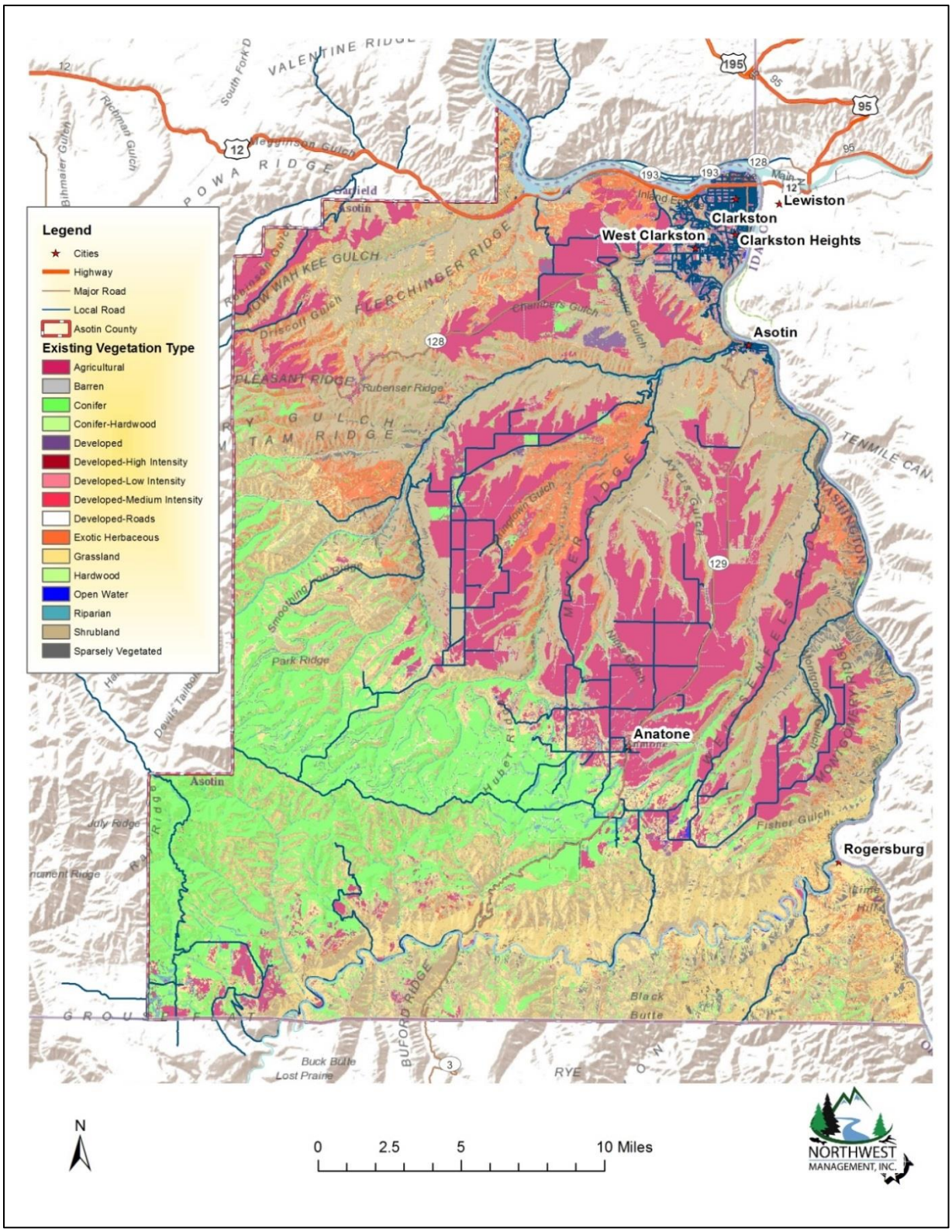
[64] Barker, Eric. Moscow-Pullman Daily News. "Fires Flare Up Across Region." August 20, 2020. Available online at https://dnews.com/local/fires-flare-up-across-region/article_7ea74213-ef67-5fb4-84d3-f7614f1f3375.html.

[65] Ellis, Evan. Pullman Radio. "September's Wawawai Canyon Fire West Of Pullman Likely Intentionally Set." October 27, 2020. Available online at https://pullmanradio.com/septembers-wawawai-canyon-fire-west-of-pullman-likely-intentionally-set/.

The transition between developed agricultural land and timberlands occurs somewhat abruptly, usually along toe slopes or distinct property boundaries. At higher elevation mountainous regions, moisture becomes less limiting due to a combination of higher precipitation and reduced solar radiation. Vegetative patterns shift from forested communities dominated by ponderosa pine, western larch, grand fir, and Douglas-fir at the lower elevations to lodgepole pine and subalpine fir at the higher elevations. Engelmann spruce is found in moist draws and frost pockets. These forested conditions possess a greater quantity of both dead and down fuels as well as live fuels. Rates of fire spread tend to be lower than those in the grasslands; however, intensities can escalate dramatically, especially under the effect of slope and wind. These conditions can lead to control problems and potentially threaten lives, structures and other valued resources.

As elevation and aspect increase available moisture, forest composition transitions to moister habitat types. Increases in moisture keep forest fuels unavailable to burn for longer periods during the summer. This increases the time between fire events, resulting in varying degrees of fuel accumulation. When these fuels do become available to burn, they typically burn in a mosaic pattern at mid elevations, where accumulations of forest fuels result in either single or group tree torching, and in some instances, short crown fire runs. At the highest elevations, fire events are typically stand replacing, as years of accumulation fuel large, intense wildfires.

Figure 28: Existing Vegetation Types in Asotin County[66]



[66] LANDFIRE™. "Existing Vegetation Type." Available online at https://landfire.gov/evt.php.

Insects and disease can cause widespread mortality of forest stands in a very short amount of time. The occurrence of Ips beetles, Douglas-fir Bark-beetle, Douglas-fir Tussock Moth, and root disease have also been recorded in Eastern Washington. However, based on a study of forest health across Washington in 2019, Asotin County did not appear to suffer from severe levels of these pests, relative to other counties.[67] Insects and disease often focus and cause the most mortality in forest stands that are overcrowded or otherwise stressed by drought, recent fires, or other factors. Large areas of dead trees are a significant fire hazard. Oftentimes, dry, dead needles hang on the killed trees for several years making them prime for a potential ignition and subsequent crown fire. Thinning overcrowded stands can help reduce stress on individual trees allowing them to better withstand insect attacks. Planting of appropriate species for the site and continual management can also help ward off future outbreaks.

Many lower elevation forested areas throughout Asotin County are highly valued for their scenic qualities as well as for their proximity to travel corridors. These attributes have led to increased recreational home development and residential home construction in and around forest fuel complexes. The juxtaposition of highly flammable forest types and rapid home development will continue to challenge management of wildland fires in the wildland-urban interface.

The slight to undulating topography and moisture availability across much of Asotin County facilitates extensive farming operations, especially from Anatone north. Agricultural fields infrequently serve to fuel a fire after curing; burning in much the same manner as consistent low grassy fuels. Fires in grass and rangeland fuel types tend to burn at relatively low intensities, with moderate flame lengths and only short-range spotting.

A patch-work of dry ponderosa pine and Douglas-fir woodlands is located in the southwestern corner of the county. Forest stands in some parts of Asotin County have begun suffering from forest health issues. In addition, tree regeneration is resulting in multistoried conditions with abundant ladder fuels. During pre-settlement times, much of this area was characterized by low intensity fires due to the relatively light fuel loading, which mostly consisted of small diameter fuels. Frequent, low intensity fires generally kept stands open; free of fire intolerant species and promoted seral species such as ponderosa pine as well as larger diameter fire resistant Douglas-fir. In some areas, low intensity fires stimulated shrubs and grasses, maintaining vigorous browse and forage. The shrub layer could either inhibit or contribute to potential fire behavior, depending on weather and live fuel moisture conditions at the time of the burn.

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

[67] United States Department of Agriculture. "Forest Health Highlights in Washington – 2019." Available online at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd733577.pdf.

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

Wildfire Smoke

As wildfire events in western Washington and Western Oregon increase in prevalence, wildfire smoke drifting in to eastern Washington and surrounding regions can impact Asotin County and can be a serious health concern to residents and visitors.

Asotin County has been specifically impacted by wildfire smoke over the past several years. It is unclear if emergency medical response in Asotin County has seen an increase directly from wildfire smoke, but there are countless examples of wildfire smoke affecting residents and visitors of Asotin County and disrupting everyday life. The elderly and those with compromised health must take extra precautions when air quality ratings are at dangerous levels. Outdoor youth activities are especially affected, as sporting events and practices have been postponed and cancelled due to long periods of time with air quality ratings at dangerous levels.

One Washington state study looked at mortality associated with wildfire smoke exposure. The study suggests that odds of mortality do rise in the first few days after exposure to wildfire smoke.[68]

The Washington Department of Ecology notes that 2020 was one of the worst years for hazardous air quality conditions due to wildfire smoke. “Between Saturday, Sept. 12, and Thursday, Sept. 17, every single air quality monitor in Washington state recorded levels of particulate pollution above the federal 24-hour standard.” One scientist found that “more Washington cities were exposed to hazardous air quality – the highest category for air pollution – for longer than any previous smoke event.”

The Washington Department of Ecology also states that it is very difficult to forecast when a particular fire season is going to lead to a bad year for wildfire smoke. However, based on recent trends in wildfire activity in the northwest and in climate change predictions, everyone in Washington: “needs to be prepared to protect themselves and their families when smoke arrives.”

“Staying inside with the doors and windows closed is the best advice to reduce smoke exposure, but that’s a tall order when hazardous air quality goes on day after day. Making sure your air conditioner — for those fortunate enough to have it — or furnace is set to recirculate helps to keep smoke outside. A

[68] Doubleday, A., Schulte, J., Sheppard, L. *et al* . Mortality associated with wildfire smoke exposure in Washington state, 2006–2017: a case-crossover study. *Environ Health* 19**,** 4 (2020). https://doi.org/10.1186/s12940-020-0559-2

clean filter with a MERV rating above 11 will capture some of the particles that do get in, and can significantly improve indoor air quality as the air recirculates." [69]

Impacts of Wildland Fire Events by Jurisdiction

Asotin County

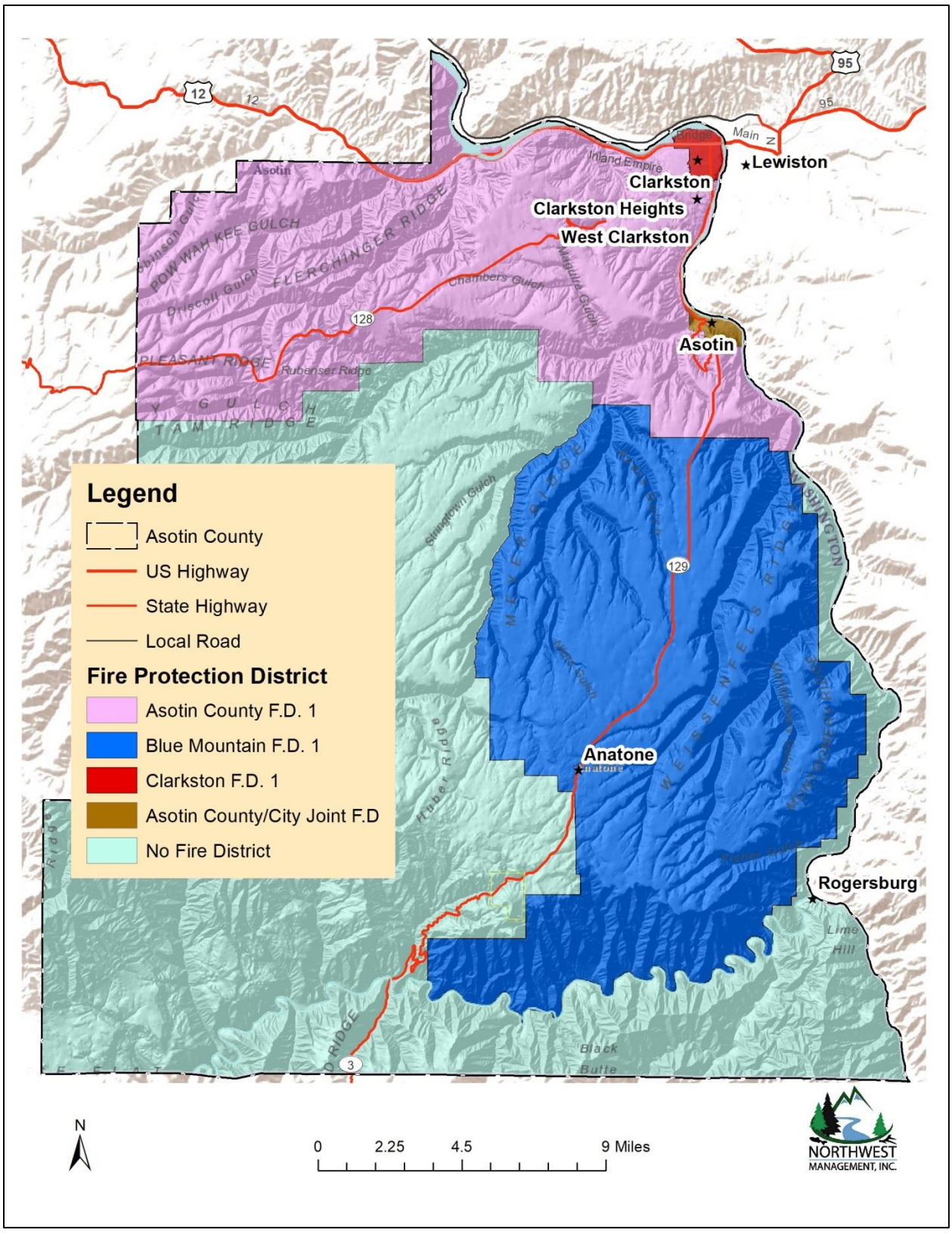
The area from Anatone north is less timbered and typically the land is used in some sort of agricultural capacity. Suppression resources are generally quite effective in such fuels. Homes and other improvements can be easily protected from the direct flame contact and radiant heat through adoption of precautionary measures around the structure. Although fires in these fuels may not present the same control problems as those associated with large, high intensity fires in timber fuel types, they can cause significant damage if precautionary measures have not taken place prior to a fire event. Wind driven fires in these short grass fuel types spread rapidly and can be difficult to control. During extreme drought and when pushed by high winds, fires in grassland fuel types can exhibit extreme rates of spread, thwarting suppression efforts.

The region southeast of Anatone is located at the top of a steep canyon dropping into the Grande Ronde River. A mosaic of rangeland and woodlands dominate the area culminating at the top of the canyon where woodlands are dominated by ponderosa pine and Douglas-fir. Many people have purchased small tracts of land in this location and built homes and cabins amongst the trees. Scenic vistas, rolling topography, and close juxtaposition to the national forest and Fields Spring State Park make this area desirable. However, the risk of catastrophic loss from wildfires in this location is significant. Fires igniting anywhere from the Grande Ronde River at the bottom of the canyon to any point up slope has the potential to grow rapidly and become very large by the time it crests the ridge near Anatone. Wildfire mitigation efforts in this area are a high priority.

There are parts of Asotin County that are not technically in any fire response jurisdiction. These areas, such as the area along the Snake River, tend to see a high concentration of travelers and/or recreationists during fire season. Local fire protection districts tend to respond to fires in these areas despite them not being part of any fire district.

[69] Wineke, Andrew. Washington Department of Ecology. "Smoky Seige." September, 22, 2020. Available online at https://ecology.wa.gov/Blog/Posts/September-2020/A-smoky-siege.

Figure 29: Fire Protection Districts in Asotin County



Value of Resources at Risk

It is difficult to estimate potential losses in Asotin County due to wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is impossible to forecast the path a wildfire will take and what type of assets and resources, manmade and ecological, will be at risk. Thus, no value estimates were made for this hazard.

Typically, structures located in forested areas without an adequate defensible space or fire resistant landscaping have the highest risk of loss. Nevertheless, homes and other structures located in the grasslands or agricultural regions are not without wildfire risk. Grass fires are often the most dangerous due to high rates of spread. Fires in this fuel type are considered somewhat easier to suppress given the right resources, but they can also be the most destructive.

Ignition potential is high throughout the County. Recreational areas, major roadways, debris burning, and agricultural equipment are typically the most likely human ignition sources. Lightning is also a common source of wildfires in Asotin County.

Asotin County is actively pursuing funds to help with wildland fire mitigation projects and public education programs. While mitigation efforts will significantly improve the probability of a structure's survivability, no amount of mitigation will guarantee survival.

City of Asotin

Asotin is located along the Snake River, upstream from its confluence with the Clearwater River and Clarkston. The city is bordered by the river to the north and east and rangeland to the west and south. Ornamental hardwoods and softwoods are scattered around homes with native hardwoods prolific along Asotin Creek. The city is clustered along Asotin Creek, the banks of the Snake River, and State Highway 129. There are also several subdivisions and scattered homes up the Asotin Creek drainage, but outside of the city limits.

The risk from structure loss due to a wildfire entering Asotin is moderate. Rangeland fuels surround this community. Fires in this fuel type have the potential to spread rapidly through the fine fuels, particularly when fanned by high winds. Scattered livestock grazing on the surrounding hillsides has drastically reduced fuel buildups; however, limited access points reduce response times and make suppression efforts difficult.

Asotin has a moderate risk of a wildfire threatening the city center; however, structure fires within the city have some potential to spread from one structure to another; either carried by radiant heat or spread through common vegetation between structures. This risk is lessened by the presence of the Blue Mountain Fire District out of Anatone.

One particular area of concern is located along the southern edge of the populated area, south of 4th Street. Here homes are located under ornamental trees with grasses and forbs growing around the structures. The area adjacent to the homes is a rangeland complex of vegetation located at the foot of the hill leading up to State Highway 129. The potential for an accidental human ignition is high. This

hillside and subsequent fuels are constantly fanned by river influenced winds (upstream and downstream) and have the potential to move rapidly; thus, threatening homes. Historically, these areas were likely grazed, but this practice has been greatly reduced.

The Asotin Slough area belongs to the U.S. Army Corps of Engineers and is located on the east side of Wilson Street along the Snake River, on the eastern end of Asotin. This area contains unmaintained vegetation for Wildland habitat and therefore presents a fire hazard due to combustible fuels. Several open areas belonging to the U.S. Army Corps of Engineers along the river that are minimally maintained are also a potential fire risk. These areas are near the City of Asotin Wastewater Treatment Plant on the west end of town, and along the Snake River, between Jefferson Street and Wilson Street on either side of the Asotin City Shop.

The Asotin Cemetery, owned and maintained by the City of Asotin, is situated outside the incorporated city limits to the south. It is located part way up the Asotin-Anatone grade in an open field that would be at risk to wildland fire in the area.

New homes are being built on the ridges surrounding Asotin. These homes are placed among the rangeland fuels with grasses and forbs intermixed with sagebrush. Very little fire protection is afforded as they are perched at or near the top of the ridges with often substandard access. Annual vegetation management is warranted in the areas to reduce the potential risk to life and property.

Access in and out of Asotin is provided by State Highway 129 running northwest-southeast, and by the Snake River Road beginning in Asotin and paralleling the river south to Rogersburg. Many smaller, graveled access routes tie into these two-lane roads. State Highway 129 from Asotin to Anatone begins by climbing a steep grade with numerous switchbacks in order to gain elevation to the upper plateau from the Snake River. This grade is the primary access route for travel between Asotin and Anatone. The Asotin Creek Road provides access to many homes, farms, and ranches in the Asotin Creek drainage as well as the Cloverland and Meyer Ridge areas.

The Asotin Water Department maintains two community water supply points (Well #1 and #2). One is located along the edge of the Snake River, the other is at the intersection of Meador Street and Cleveland Street. Power poles along road rights-of-way supply power to individual homes and businesses. Many poles are older with lines passing through ornamental trees.

The city of Asotin is protected by the Asotin Fire Department and has a good coverage of fire hydrants for homes in the city. The Asotin County Fire District #1 provides structural and wildland fire protection in the city and rural areas surrounding the city through an auto-aid agreement.

All private lands within the fire protection district have joint jurisdiction with the Washington Department of Natural Resources (DNR). Under joint jurisdiction, it is recognized that the fire district has primary responsibility for structure protection and the DNR will have primary responsibility for wildland fire suppression on state and private lands. The DNR provides wildfire protection during the fire season between April and October with varying degrees of available resources in the early spring and late autumn months. The U.S. Forest Service responds to all wildland fires on their jurisdiction and may also

respond to wildland fires on private or state lands based on a closest forces, reciprocal agreement with the DNR when resources are available.

Asotin possesses many homes densely clustered into the city limits with many new homes being built along the perimeter of the city to the south. This change in housing density poses some challenges for the community's wildfire protection. In terms fuels management for the established homes in Asotin, much of the focus should be on managing the grassland and sagebrush fuels along the southern edge of the city. A combination of field burning when conditions merit with long-term livestock grazing, would effectively lessen the range fire threat for those adjacent homes. Most of the mile long southern border of Asotin could effectively be treated in this manner.

The new construction, much of which is scattered beyond the southern edge of Asotin, warrants individual home site protection. In these cases, a combination of defensible space around the immediate 150 feet of the structure, coupled with access improvements, and firewise building material selection, will improve home's survivability.

Value of Resources at Risk

It is difficult to estimate potential losses in Asotin from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is impossible to forecast the path a wildfire will take and what type of assets and resources, manmade and ecological, will be at risk. Thus, no value estimates were made for this hazard.

Typically, structures located in forested areas without an adequate defensible space or fire resistant landscaping have the highest risk of loss. Nevertheless, homes and other structures located in the grasslands or agricultural regions are not without wildfire risk. Grass fires are often the most dangerous due to high rates of spread. Fires in this fuel type are considered somewhat easier to suppress given the right resources, but they can also be the most destructive. Homes along the perimeter of the community would have the highest risk due to their adjacency to flashy fuels.

City of Clarkston

Clarkston assessment area consists of the traditionally known incorporated city as well as the adjacent Clarkston Heights-Vineland area, West Clarkston, and the Clemens Addition south of Clarkston Heights, which is south of Clarkston. There is no noticeable break between the city limits and these developments; thus, for the purposes of this assessment, all of these areas will be considered together.

This area (Clarkston and Asotin) is the only example of High Density Urban WUI designation in the county. It is characterized by extremely high population densities, integrated structure fire services, and rangeland/agricultural fuels. The Snake River defines the eastern and northern boundary of the city. Lewiston, Idaho, is located due east of Clarkston on the opposite side of the river with a similar high density urban designation. These two cities comprise the largest metropolitan center in the region.

The risk from structure loss due to a wildfire entering the Clarkston area is minimal. The surrounding Snake River to the north and east (as well as the location of Lewiston to the east), dramatically reduces the risk from a wildfire moving in from these directions.

Rangeland fuels are present along the entire western and southern border of Clarkston. These fuels are primarily grasses and sagebrush all intermixed with agriculture fields. Most of the native vegetation is grazed by livestock. Numerous vacant lots and pasture are scattered throughout the Clarkston urban area, which could aid fire spread depending on management, fuel moisture, and weather. Steep terrain dominated by both native and nonnative grasses and weeds between home sites also poses a potential problem. This type of fuel is very flashy, but typically does not burn with the intensity of a forestland fuel complex. While these fuels do not generally threaten homes in the area, they could ignite debris and wood structures adjacent to the homes (e.g. firewood stacks, decks, stored lumber, or rubbish). In this manner, these scattered lots within the city limits and adjacent to homes can act as a fuse carrying wildfire from the rangeland to homes. The converse is also true, in that a structure fire can spread to adjacent rangeland fuels, which is then carried to neighboring structures or into the rangeland.

Identification of the vacant lots in the area which support rangeland fuels and are on steep slopes, especially those leading to homes perched on the top of ridges, is critical to reducing the wildfire risk in Clarkston.

There are many ornamental trees around homes and within parks maintained within the Clarkston urban area. These hardwoods and softwoods do not pose a substantial wildfire risk in that most are maintained in a green and lush condition for the majority of the fire season.

Clarkston has a low risk of wildfire threatening the city center; however, structure fires within the city have some potential to spread from one structure to another; either carried by radiant heat or spread through common vegetation between structures. This risk is lessened by the presence of an active fire department and fire protection district.

Access in and out of Clarkston is provided by Highway 12 running east-west. State Highway 183 provides access from the northern end of Clarkston across the Snake River (Red Wolf Crossing) to Whitman County. State Highway 129 (a.k.a. Snake River Road) parallels the Snake River from Clarkston to Asotin; however, this access point is primarily a means for residents in the southern locations to gain access north, as opposed to Clarkston residents escaping to the south. There are several options for access across the Snake River between Clarkston and Lewiston. Clarkston is a major regional transportation hub.

There are eight municipal water supply wells located within Clarkston. All of them supply community drinking water and are managed by the Public Utilities District #1 of Asotin County. One of them (well #4, Standby) is an emergency water supply source. The remaining wells are permanent.

Electricity supply to the city is from various locale linked to the hydroelectric grid of the region. In the oldest parts of the city, powerlines supply power to homes and businesses. New construction and new subdivisions in the area tend to have underground power supplies. The removal of the power poles and the hanging wires over the native vegetation is an exceptional improvement to the risk portfolio of the city.

The Clarkston Fire Department provides primarily structural fire protection within the city limits of Clarkston. The Asotin County Fire District #1 provides structural and wildland protection to unincorporated areas of Clarkston and the surrounding area (105 square miles). A complete system of fire hydrants is present throughout the city. Access challenges are present where steep driveways or inadequately built bridges are the only ingress/egress points. One way in, one way out streets accessing subdivisions or private homes, particularly in new construction areas, has become a safety issue for both residents and firefighters.

Because of the moderate level of risk in Clarkston, few potential mitigation activities are recommended at this time. The continued use of the surrounding landscape for active agricultural (not CRP) and livestock grazing will reduce fuel loading and; therefore, the potential fire risk.

In addition, the Asotin County Fire District #1 has so far been relatively successful at suppressing wildland fires. The continued support of these services by the community will improve their ability to fight fires effectively.

Value of Resources at Risk

It is difficult to estimate potential losses in Clarkston from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is impossible to forecast the path a wildfire will take and what type of assets and resources, manmade and ecological, will be at risk. Thus, no value estimates were made for this hazard.

Typically, structures located in forested areas without an adequate defensible space or fire resistant landscaping have the highest risk of loss. Nevertheless, homes and other structures located in the grasslands or agricultural regions are not without wildfire risk. Grass fires are often the most dangerous due to high rates of spread. Fires in this fuel type are considered somewhat easier to suppress given the right resources, but they can also be the most destructive. Homes along the perimeter of the community would have the highest risk due to their adjacency to flashy fuels.

Asotin County Fire District #1

Asotin County Fire District #1 covers much of the north end of Asotin County. The District provides structural fire protection, wildland fire protection, and river rescue in the unincorporated areas surrounding the cities of Clarkston and Asotin. All of the private lands within the fire protection district are the responsibility of Fire District # 1. There are some areas of joint jurisdiction with the Washington Department of Natural Resources (DNR). Under this joint jurisdiction, it is recognized that the fire district has primary responsibility for structure protection and the DNR will have primary responsibility for wildland fire suppression on state own lands. The DNR provides wildfire protection during the fire season between April and October with varying degrees of available resources in the early spring and late autumn months.

The Fire District does not have any differing levels of risk associated with this hazard than Asotin County as a whole. However, in the event of a wildland fire, Fire District #1 would provide all fire response, protection, and search and rescue services within the district boundaries, which include U.S. Corp of Engineer property, habitat and structures along the Snake River. The fire district will also provide fire

suppression on local state and federal land through mutual aid or cooperative agreements with Washington DNR and the National Forest Service.

Another key issue is the growth of developments in the rural areas of the county and fire district, even beyond the urban interface. The primary growth pattern for larger developments will be south and west of the primary residential areas of the unincorporated areas of Clarkston and Asotin. The fire district is seeing larger developments in these areas and proposed future developments. Water supply for fire suppression will be an issue in these areas without public water system. Water for suppression will be dependent on tender/tanker shuttles. All homes are on private wells and general water supply with more pressure on the water table is also of concern. With more homes and structures being built in these developments, the potential for loss is higher, especially during wind driven events.

Value of Resources at Risk

The Asotin Fire District #1 station in the Clarkston Heights is not at risk to wildland fire due to its location in an urban area. The District has no other known assets or other resources at risk to wildland fires.

Blue Mountain Fire District

Blue Mountain Fire District #1 covers much of the southern end of Asotin County. The District provides wildland fire protection in the unincorporated areas surrounding Anatone, extending east to the Snake River, but does not include the Snake River corridor. All the private lands within the district have mutual aid agreements with Washington Department of Natural Resources (DNR), United States Forest Service (USFS), and Washington Department of Fish and Wildlife (WDFW).

The wildland urban interface (WUI) area bordering Blue Mountain Fire District #1 to the west and south is under the protection of DNR and USFS, although Blue Mountain Fire District #1 is usually first to respond. This area is heavily timbered and the increased development in the WUI means higher wildfire risk and more suppression needs. Many of these homes and cabins have no visible addresses and are hard to access due to the one-way road leading in. The risk of catastrophic loss from wildland fires in this location is significant.

Value of Resources at Risk

Blue Mountain Fire District #1 has no fire station at this time but owns a five-acre lot located at 610 Sangster Road which is surrounded by farm ground. There is a well, water storage tank, and a Conex box located on this property. The Conex box is primarily used for storage. The brush trucks and tankers are staged throughout the district during the summer months for quicker response time during a wildfire event.

It is difficult to estimate potential losses caused by wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is impossible to forecast the path a wildfire will take and what type of assets and resources, manmade and ecological, will be at risk. Thus, no value estimates were made for this hazard.

Asotin County Conservation District

The Conservation District is impacted by wildland fire events in a similar way to Asotin County as a whole. However, farmers and ranchers who have land impacted by fire can seek technical assistance and

funding for project implementation to address natural resource concerns. In the past, the District has provided assistance to replace fencing, livestock water developments and tree and shrubs that have been damaged or destroyed in wildland fires.

Value of Resources at Risk

The conservation district has provided financial assistance to many landowners to install natural resource best management practices throughout Asotin County. Practices installed in rangeland, riparian corridors and forestlands are at a higher risk for impact from wildland fire events.

Avalanche Hazard Profile

An avalanche is a rapid flow of snow downslope from either natural triggers or human activity. Typically occurring in mountainous terrain, an avalanche can mix air and water with the descending snow. Powerful avalanches have the capability to entrain ice, rocks, trees, and other material on the slope. Avalanches are primarily composed of flowing snow, and are distinct from mudslides, rock slides, rock avalanches, and serac collapses on an icefall. In mountainous terrain, avalanches are among the most serious objective hazards to life and property, with their destructive capability resulting from their potential to carry an enormous mass of snow rapidly over large distances.

Example of an avalanche covering a road

There are two types of avalanches, loose and slab, and two types of slab avalanches, dry and wet. Although the most dangerous avalanche is the slab avalanche, loose slides can and do produce injury and death. Loose avalanches occur when grains of snow cannot hold onto a slope and begin sliding downhill, picking up more snow and fanning out in an inverted V. Slab avalanches occur when a cohesive mass of snow breaks away from the slope all at once. Most slides in the Northwest are slab avalanches. Dry slab avalanches occur when the stresses on a slab overcome the internal strength of the slab and its attachment to surrounding snow. A decrease in strength produced through warming, melting snow, or rain, or an increase in stress produced by the weight of additional snowfall, a skier or a snowmobile cause this type of avalanche. Dry slab avalanches can travel 60 to 80 miles per hour or more, reaching these speeds within five seconds after the fracture; they account for most avalanche fatalities. Wet slab avalanches occur when water percolating through the top slab weakens it and dissolves its bond with a lower layer, decreasing the ability of the weaker, lower layer to hold on to the top slab, as well as decreasing the slab's strength.

For a slope to generate an avalanche it must be simultaneously capable of retaining snow and allowing snow to accelerate once set in motion. The angle of the slope that can hold snow depends on the ductile and shear strength of the snow, which is determined by the temperature and moisture content. Drier and colder snow, with lower ductile and shear strength, will only bond to lower angle slopes; while wet and warm snow, with higher ductile and shear strength, can bind to very steep surfaces. Snow that has been water saturated to the point of slush can accelerate on shallow angled terrain; while a cohesive snow pack will not accelerate on steep slopes.

A number of weather and terrain factors determine avalanche danger:

Weather:

- Storms – A large percentage of all snow avalanches occur during and shortly after storms.
- Rate of snowfall – Snow falling at a rate of one inch or more per hour rapidly increases avalanche danger.
- Temperature – Storms starting with low temperatures and dry snow, followed by rising temperatures and wetter snow, are more likely to cause avalanches than storms that start warm and then cool with snowfall.
- Wet snow – Rainstorms or spring weather with warm, moist winds and cloudy nights can warm the snow cover resulting in wet snow avalanches. Wet snow avalanches are more likely on sun-exposed terrain (south-facing slopes) and under exposed rocks or cliffs.

Terrain:

- Ground cover – Large rocks, trees and heavy shrubs help anchor snow.
- Slope profile – Dangerous slab avalanches are more likely to occur on convex slopes.
- Slope aspect – Leeward slopes are dangerous because windblown snow adds depth and creates dense slabs. South facing slopes are more dangerous in the springtime.
- Slope steepness – Snow avalanches are most common on slopes of 30 to 45 degrees.

Avalanches occur in four mountain ranges in the state – the Cascade Range, which divides the state east and west, the Olympic Mountains in northwest Washington, the Blue Mountains in southeast Washington, and the Selkirk Mountains in northeast Washington. The avalanche season begins in November and continues until early summer for all mountain areas of the state.

Avalanches kill one to two people, on average, every year in Washington, although many more are involved in avalanche accidents that do not result in fatalities. Most of the recent avalanche accidents reported in Washington State involved skiers and snowmobilers. A recent non-skier fatality occurred near Blewett Pass on U.S. 97 in Chelan County. In this incident one person was killed on January 23, 2020 after an avalanche released from the roof of a home and buried her where she was later found underneath 4-5 feet of debris.[70] There were no avalanche fatalities reported during the 2018-2019 avalanche season but seven were reported killed in avalanche accidents during the 2017-2018 season.[71] One of the nation's worst avalanche disasters occurred in 1910 when massive avalanches hit two trains stopped on the west side of Stevens Pass; 96 people were killed.

The only known avalanche in southeastern Washington occurred in Pomeroy in 1932. No injuries were reported, but snow had to be removed from the railroad tracks. In southeastern Washington, the only

[70] Northwest Avalanche Center. *Northwest Avalanche Accident Summary*. Available online at https://www.nwac.us/accidents/accident-reports/.

[71] Colorado Avalanche Information Center. *US Avalanche Fatalities.* Available online at https://avalanche.org/avalanche-accidents/.

area having significant risk to avalanches is the Blue Mountains in the southern regions of Asotin and Garfield County. This area is primarily at risk due to the intensity of winter recreation activities, particularly skiing and snowmobiling. With this exception, this region is not at risk of avalanches as snowpack is typically minimal.

Avalanche Risk Assessment

Local Event History

There have been no reported damages or lives lost due to an avalanche in Asotin County.

Probability of Future Events

The Blue Mountains in the southeast region of the County have a high propensity for avalanches; however, there are very few structures or infrastructure in these higher risk areas. Recreational activities such as skiing and snowmobiling have been increasing in these areas; thus, as these types of activities increase, so does the potential avalanche risk.

Impacts of Avalanche Events by Jurisdiction

Asotin County

Increases in recreational use of avalanche areas in the Blue Mountains and rural Asotin County might create added vulnerabilities or potential impacts to the county in the future. There are currently no avalanche mitigation programs occurring in Asotin County.

Value of Resources at Risk

Asotin County has no assets at significant risk of avalanches due to low snow accumulations in populated areas. The highest potential risk would likely be the result of a skier, snowboarder, snowmobiler, or other recreationist becoming trapped in an avalanche in the backcountry. These areas are generally difficult to access; thus, a rescue attempt may also be difficult.

There is a small possibility that an avalanche could cover a rural section of a US Forest Service road, but this type of slide would not likely impact necessary travel routes. Actual damage to the road would likely be minimal.

City of Asotin

Although the Blue Mountains in southwestern Asotin County have a high probability of experiencing avalanches in remote areas, the city of Asotin will not be directly impacted by this type of localized event due to the lack of snow accumulations.

Value of Resources at Risk

The city of Asotin has no assets at risk to avalanches.

City of Clarkston

Although the Blue Mountains in southwestern Asotin County has a high probability of experiencing avalanches in remote areas, the city of Clarkston will not be directly impacted by this type of localized event due to the lack of snow accumulation.

Value of Resources at Risk

The city of Clarkston has no assets at risk to avalanches.

Asotin County Fire District #1

The Fire District does not have any differing levels of risk associated with this hazard than Asotin County as a whole. However, in the event of a significant avalanche event, Fire District #1 may assist with any necessary evacuations or search and rescue operations.

Value of Resources at Risk

The Asotin Fire District #1 station in the Clarkston Heights is not at risk to avalanches due to its location in a relatively flat, heavily developed area. The District has no other known assets or other resources at risk to avalanches.

Blue Mountain Fire District

Blue Mountain Fire District #1 does not have any differing levels of risk associated with this hazard than Asotin County as a whole. Rattlesnake Grade, located just south of Anatone, could be at risk of an avalanche but the risk is potentially very low. In the event of an avalanche, BMFD1 may assist with any necessary evacuations or search and rescue operation.

Value of Resources at Risk

The Blue Mountain Fire District #1 assets located on Sangster Road and various locations are not at risk to avalanches due to the locations being relatively flat. The District has no other known assets or resources at risk to avalanches.

Asotin County Conservation District

The conservation district does not have any differing issues or levels of risk associated with this hazard than Asotin County as a whole.

Value of Resources at Risk

The district does not have any values at risk to this hazard.

Tsunami Hazard Profile

While a true tsunami will never directly impact southeast Washington, the Snake River shoreline is vulnerable to inland tsunamis (pronounced soo-ná-mees); more accurately referred to as seiches. An inland tsunami, or seiche, is a sudden, large wave that can cause loss of life and property damage. Inland tsunamis are typically defined as standing waves on a closed or semi-closed body of water such as rivers, reservoirs, ponds, and lakes.

The effect of an inland tsunami is caused by resonances in a body of water that has been disturbed by one or more of a number of factors, most often meteorological effects (wind and atmospheric pressure variations), seismic activity, or landslides. Gravity always seeks to restore the horizontal surface of a body of liquid water, as this represents the configuration in which the water is in hydrostatic equilibrium. Vertical harmonic motion produces an impulse that travels the length of the basin at a velocity that depends on the depth of the water. The impulse is reflected back from the end of the basin generating interference. Repeated reflections produce standing waves with one or more nodes, or points, that experience no vertical motion. The frequency of the oscillation is determined by the size of the basin, its depth and contours, and the water temperature.[72]

Although highly sophisticated tsunami warning systems exist along the Pacific coast, inland tsunamis have the potential to cause extreme damage to waterways and shoreline communities due to their infrequency and the lack of a warning system. Residences, businesses, and other resources along the Lake Roosevelt shoreline where these localized events might occur may be severely damaged by a series of high waves.

The Snake River corridor does not have a history of landslides that resulted in inland tsunamis, but due to the steep topography and continued development along the adjacent slopes, there is potential for a landslide initiating a wave that causes damage on the opposite shoreline. Inland tsunamis on Lake Roosevelt in northeastern Washington, which has similar topography and land and water uses, have exclusively been the result of landslides. Reports of these events suggest that only one wave hit the shoreline opposite of a landslide. The two major geologic parameters that affect the generation of a water wave from a landslide are the volume of the slide mass and the motion of the mass as it reaches the water.

Lake Roosevelt Inland Tsunamis

Landslides into Lake Roosevelt generated numerous seiches (commonly recorded as tsunamis) from 1944 to 1953 after Grand Coulee Dam created the lake on the Columbia River. Most seiches on Lake Roosevelt have generated large waves (30 to 60 feet in height) that struck the opposite shore of the

[72] Wikipedia. "Seiche." Wikipedia Foundation, Inc. Available online at http://en.wikipedia.org/wiki/Seiche. Most recent access May 4, 2020.

lake, with some waves observed miles from the source. Several seiches have been recorded on Lake Roosevelt since 1944.[73]

The most recent example of a seiche on Lake Roosevelt happened in 2009 in Lincoln County, Washington. On August 25, 2009 a large landslide occurred near the Blue Creek drainage on the Spokane Indian Reservation side of the Spokane Arm of Lake Roosevelt. This resulted in a 12-foot wave hitting Porcupine Campground on the south shore of the lake. Damage to National Park Service facilities was estimated at $250,000.[74]

Tsunami Risk Assessment

Local Event History

There have been no reported damages or lives lost due to a localized tsunami in Asotin County.

Probability of Future Events

The northern and eastern borders of Asotin County are formed by the Snake River. There is a low probability of landslides causing localized tsunamis in this vicinity.

Impacts of Tsunami Events by Jurisdiction

Asotin County

Due to population density and infrastructure along the Snake River, it is possible that an inland tsunami would cause significant damages within the County.

Value of Resources at Risk

In a tsunami event, infrastructure including several major roadways, marinas, and businesses as well as homes along the waterfront may be damaged, but widespread losses are unlikely. It is also not probable that an inland tsunami would have a significant impact on any of the Snake River bridges near Clarkston.

City of Asotin

The city of Asotin is located along the Snake River; thus, there could be some potential impacts from an inland tsunami occurring in a location that caused large waves to break at Asotin. This type of event would likely be the result of a large landslide on the Idaho side of the River directly across from Asotin.

Value of Resources at Risk

Damage from an inland tsunami in the city of Asotin would be limited to infrastructure and recreational facilities within less than 100 feet of the Snake River shoreline. This may include some secondary access roads, the marina, beaches, and, in extreme cases, possibly the wastewater treatment facility. The wastewater treatment facility is protected by an elevated berm; thus, it is unknown what type of

[73] Sliding Thought Blog: Washington's Landslide Blog. *Lake Roosevelt Landslide/Seiche*. Available online at https://slidingthought.wordpress.com/2009/04/.

[74] Sliding Thought Blog: Washington's Landslide Blog. *Porcupine Bay Landslide, Lincoln, County*. Available online at https://slidingthought.wordpress.com/2009/08/.

damage a large wave would cause. There are currently no residences or businesses at risk to inland tsunamis in Asotin.

City of Clarkston

The city of Clarkston is located along the Snake River; thus, there could be some potential impacts from an inland tsunami occurring in a location that caused large waves to break at Clarkston. This type of event would likely be the result of a large landslide on the Idaho or Washington side of the River directly across from Clarkston.

Value of Resources at Risk

Damage from an inland tsunami in the city of Clarkston would be limited to infrastructure, structures, and recreational facilities within less than 100 feet of the Snake River shoreline. This may include some secondary access roads, the marina, industrial businesses, and RV park, and public access areas. There are currently no residences at risk to inland tsunamis in Clarkston. It is unlikely that an inland tsunami would damage the Red Wolf Bridge, the Southway Bridge, or the US Highway 12 Bridge at Clarkston due to their height.

Asotin County Fire District #1

The Fire District does not have any differing levels of risk associated with this hazard than Asotin County as a whole. However, in the event of an inland tsunami, Fire District #1 may assist with any necessary evacuations or search and rescue operations with their marine rescue units.

Value of Resources at Risk

The Asotin Fire District #1 station in the Clarkston Heights is not at risk to tsunamis due to its location on high ground away from the Snake River channel. The District has no other known assets or other resources at risk to tsunamis.

Blue Mountain Fire District

The Blue Mountain Fire District #1 does not have any differing levels of risk associated with this hazard than Asotin County as a whole. However, in the event of an inland tsunami, BMFD1 may assist with any necessary evacuations or search and rescue operation.

Value of Resources at Risk

Blue Mountain Fire District #1 assets are not at risk to tsunamis due to the location of the property where the assets are stored being on high ground away from the Snake River and Grande Ronde River channel.

Asotin County Conservation District

The conservation district does not have any differing issues or levels of risk associated with this hazard than Asotin County as a whole.

Value of Resources at Risk

The district does not have any values at risk to this hazard.

Volcano Hazard Profile

The Cascade Range of the Pacific Northwest has more than a dozen potentially active volcanoes. Cascade volcanoes tend to erupt explosively, and on average two eruptions occur per century—the most recent were at Mount St. Helens, Washington (1980–86 and 2004–8), and Lassen Peak, California (1914–17). On May 18, 1980, after 2 months of earthquakes and minor eruptions, Mount St. Helens, Washington, exploded in one of the most devastating volcanic eruptions of the 20th century. Although less than 0.1 cubic mile of molten rock (magma) was erupted, 57 people died, and damage exceeded $1 billion. Fortunately, most people in the area were able to evacuate safely before the eruption because public officials had been alerted to the danger by U.S. Geological Survey (USGS) and other scientists. To help protect the Pacific Northwest's rapidly expanding population, USGS scientists at the Cascades Volcano Observatory in Vancouver, Washington, monitor and assess the hazards posed by the region's volcanoes.[75]

There are no active volcanoes in southeastern Washington; however, Asotin County communities could be directly affected by an eruption from any one of the Cascade volcanoes. During an eruption, such as the 1980 eruption of Mount St. Helens, southeastern Washington is not likely to be directly affected by lava flows, pyroclastic flows, landslides, or lahars; however, this region may be indirectly impacted due to damming of waterways, reduced air and water quality, acid rain, and ash fallout.

An explosive eruption blasts solid and molten rock fragments (tephra) and volcanic gases into the air with tremendous force. The largest rock fragments (bombs) usually fall back to the ground within 2 miles of the vent. Small fragments (less than about 0.1 inch across) of volcanic glass, minerals, and rock (ash) rise high into the air, forming a huge, billowing eruption column.

Eruption columns can grow rapidly and reach more than 12 miles above a volcano in less than 30 minutes, forming an eruption cloud. The volcanic ash in the cloud can pose a serious hazard to aviation. During the past 15 years, about 80 commercial jets have been damaged by inadvertently flying into ash clouds, and several have nearly crashed because of engine failure. Large eruption clouds can extend hundreds of miles downwind, resulting in ash fall over enormous areas; the wind carries the smallest ash particles the farthest. Ash from the May 18, 1980, eruption of Mount St. Helens, Washington, fell over an area of 22,000 square miles in the Western United States. Heavy ash fall can collapse buildings, and even minor ash fall can damage crops, electronics, and machinery.

Volcanoes emit gases during eruptions. Even when a volcano is not erupting, cracks in the ground allow gases to reach the surface through small openings called fumaroles. More than ninety percent of all gas emitted by volcanoes is water vapor (steam), most of which is heated ground water (underground water from rain fall and streams). Other common volcanic gases are carbon dioxide, sulfur dioxide, hydrogen sulfide, hydrogen, and fluorine. Sulfur dioxide gas can react with water droplets in the atmosphere to create acid rain, which causes corrosion and harms vegetation. Carbon dioxide is heavier than air and

[75] Dzurisin, Dan, et al. "Living with Volcanic Risk in the Cascades." U.S. Geological Survey – Reducing the Risk from Volcano Hazards. USGS. Vancouver, Washington. 1997. Available online at https://pubs.usgs.gov/fs/old.1997/fs165-97/.

can be trapped in low areas in concentrations that are deadly to people and animals. Fluorine, which in high concentrations is toxic, can be adsorbed onto volcanic ash particles that later fall to the ground. The fluorine on the particles can poison livestock grazing on ash-coated grass and also contaminate domestic water supplies.[76]

Volcanoes of the Cascades[77]

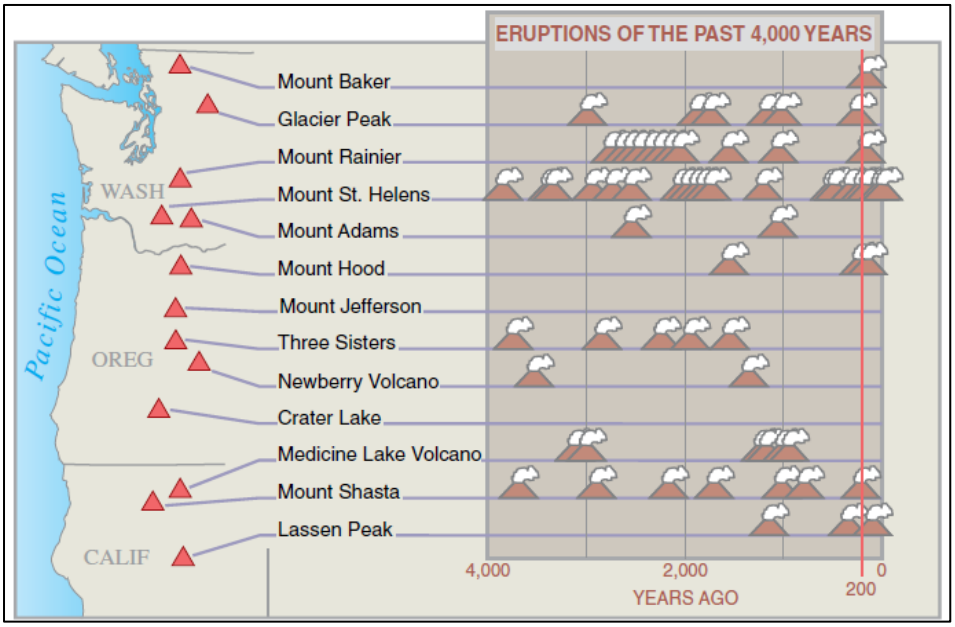
The volcanoes of the Cascade Range, which stretches from northern California into British Columbia, have produced more than 100 eruptions, most of them explosive, in just the past few thousand years. However, individual Cascade volcanoes can lie dormant for many centuries between eruptions, and the great risk posed by volcanic activity in the region is therefore not always apparent.

When Cascade volcanoes do erupt, high-speed avalanches of hot ash and rock (pyroclastic flows), lava flows, and landslides can devastate areas 10 or more miles away; and huge mudflows of volcanic ash and debris, called lahars, can inundate valleys more than 50 miles downstream. Falling ash from explosive eruptions can disrupt human activities hundreds of miles downwind, and drifting clouds of fine ash can cause severe damage to jet aircraft even thousands of miles away. Erupting Cascade volcanoes are more prone than other U.S. volcanoes to explosive volcanic activity, resulting in pyroclastic flows. These are hot, often incandescent mixtures of volcanic fragments and gases that sweep along close to the ground at speeds up to 450 mph.

Because the population of the Pacific Northwest is rapidly expanding, the volcanoes of the Cascade Range in Washington, Oregon, and northern California are some of the most dangerous in the United States. Although Cascade volcanoes do not often erupt (on average, about two erupt each century), they can be dangerous because of their violently explosive behavior, their permanent snow and ice cover that can fuel large volcanic debris flows (lahars), and their proximity to various critical infrastructure, air routes, and populated areas in Washington, Oregon, and California.

[76] Myers, Bobbie, et al. "What are Volcano Hazards?" U.S. Geological Survey. Vancouver, Washington. July 2004.
[77] Dzurisin, Dan, et al. "Living with Volcanic Risk in the Cascades." U.S. Geological Survey – Reducing the Risk from Volcano Hazards. USGS. Vancouver, Washington. 1997. Available online at https://pubs.usgs.gov/fs/old.1997/fs165-97/.

Figure 30: Record of Cascade Range Volcanic Eruptions[78]



Of the 13 potentially active volcanoes in the Cascade Range, 11 have erupted in the past 4,000 years. More than 100 eruptions have occurred during that period, making the volcanoes of the Cascade Range some of the most hazardous in the U.S. Each eruption symbol in Figure 30 represents from one to several eruptions closely spaced in time at or near the named volcano.

Washington

Mount Baker erupted in the mid-1800s for the first time in several thousand years. Activity at steam vents (fumaroles) in Sherman Crater, near the volcano's summit, increased in 1975 and is still vigorous, but there is no evidence that an eruption is imminent. **Glacier Peak** has erupted at least six times in the past 4,000 years. About 13,000 years ago, an especially powerful series of eruptions deposited volcanic ash at least as far away as Wyoming. **Mount Rainier** has produced at least ten eruptions and numerous lahars in the past 4,000 years. It is capped by more glacier ice than the rest of the Cascade volcanoes combined, and parts of Rainier's steep slopes have been weakened by hot, acidic volcanic gases and water. These factors make this volcano especially prone to landslides and lahars. **Mount St. Helens** is the most frequently active volcano in the Cascades. During the past 4,000 years, it has produced many lahars and a wide variety of eruptive activity, from relatively quiet outflows of lava to explosive eruptions much larger than that of May 18, 1980. **Mount Adams** has produced few eruptions during the past several thousand years. This volcano's most recent activity was a series of small eruptions about 1,000 years ago.

[78] Dzurisin, Dan, et al. "Living with Volcanic Risk in the Cascades." U.S. Geological Survey – Reducing the Risk from Volcano Hazards. USGS. Vancouver, Washington. 1997. Available online at https://pubs.usgs.gov/fs/old.1997/fs165-97/.

Oregon

Mount Hood last erupted about 200 years ago, producing pyroclastic flows, lahars, and a prominent lava dome (Crater Rock) near the volcano's summit. Most recently, a series of steam blasts occurred between 1856 and 1865. **Mount Jefferson** last erupted more than 20,000 years ago. However, eruptions nearby have produced several lava flows and small volcanic cones in the past 10,000 years. Three Sisters Volcanic Center in central Oregon includes five large volcanoes—**North Sister, Middle Sister, South Sister, Broken Top**, and **Mount Bachelor**. About 2,000 years ago, eruptions occurred on South Sister, as well as from several small volcanoes north of North Sister. Since 1997, a broad area centered 3 miles west of South Sister has domed upward by more than 8 inches. Scientists think that this doming reflects the ongoing accumulation of magma at a depth of 3 to 4 miles. The outcome of this activity is uncertain, but there is no evidence that an eruption is imminent. The USGS and its partners have increased monitoring efforts in the area to detect any changes that might warrant more concern. **Newberry Volcano**, a broad shield covering more than 500 square miles, is capped by Newberry Crater, a large volcanic depression (caldera) 5 miles across. Its most recent eruption was about 1,300 years ago. **Crater Lake** occupies a 6-mile-wide caldera formed 7,700 years ago when the summit of an ancient volcano (referred to as Mount Mazama) collapsed during a huge explosive eruption. More than 10 cubic miles of magma was erupted, 10 times as much as in any other eruption in the Cascades during the past 10,000 years. Smaller eruptions ending about 5,000 years ago formed Wizard Island and several submerged cones and lava domes on the lake floor.

Reducing the Risk[79]

After the 1980 eruption of Mount St. Helens, Congress provided increased funding that enabled the USGS to establish a volcano observatory for the Cascade Range. Located in Vancouver, Washington, the David A. Johnston Cascades Volcano Observatory (CVO) was named for a USGS scientist killed at a forward observation post by the May 18, 1980, eruption.

Scientists at CVO quickly recognized that it was not economically feasible to fully monitor all potentially active Cascade volcanoes. To address this and similar problems elsewhere in the United States and abroad, the USGS developed a suite of portable volcano-monitoring instruments—essentially, a portable volcano observatory. In the Pacific Northwest, when regional networks of earthquake sensors, operated in cooperation with the University of Washington's Pacific Northwest Seismic Network, detect unusual seismic activity at a volcano, CVO staff will rapidly deploy this portable equipment to evaluate the hazard and, if needed, provide timely warnings to local officials and the public.

CVO also uses remote sensing as an early-detection tool. A technique called interferometric synthetic-aperture radar (InSAR) allows scientists to measure subtle movements of the ground surface, using radar images obtained by Earth-orbiting satellites. The current ground doming at Three Sisters was first detected using this technique.

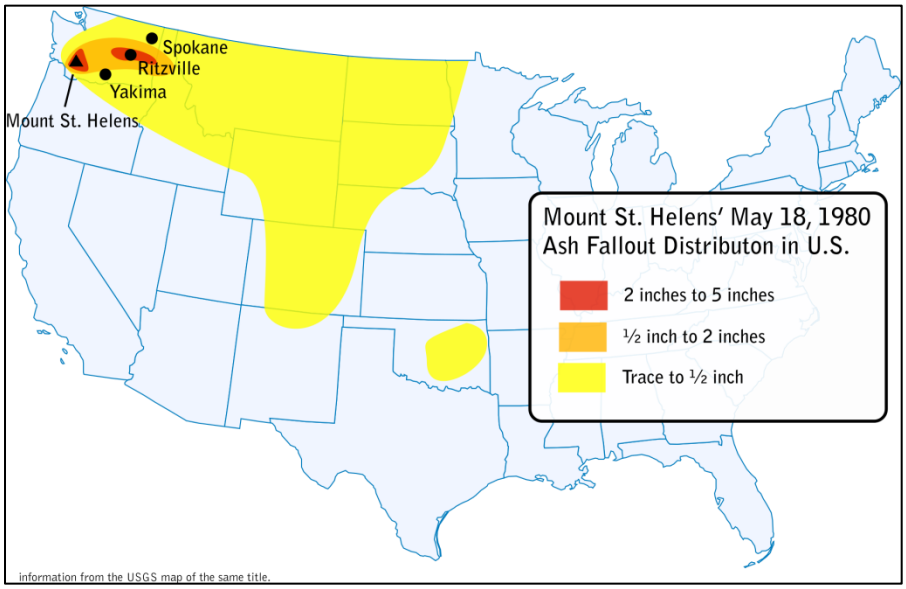
[79] Dzurisin, Dan, et al. "Living with Volcanic Risk in the Cascades." U.S. Geological Survey – Reducing the Risk from Volcano Hazards. USGS. Vancouver, Washington. 1997. Available online at https://pubs.usgs.gov/fs/old.1997/fs165-97/.

Volcano Risk Assessment

Local Event History

The May 18, 1980 eruption of Mount St. Helens in western Washington affected Asotin County because of ash fallout. The figure below shows the ash distribution by ash depth. Asotin County and the surrounding area received several inches. Businesses and schools closed, transportation was hampered, the operations of local industries were interrupted, and way of life was disrupted. Those with respiratory conditions or compromised health were especially affected. The fine particle makeup of the ash made cleanup difficult and ash dust in the air continued to impact travel and commerce long after the ash fell. Reports of agricultural statistics show that Washington and Idaho had record wheat and barley production in 1980, and there are several anecdotal reports of boosted crop yields.[80]

Figure 31: Map of ash distribution from the Mount St. Helens eruption over the United States[81]



Probability of Future Events

Asotin County is not directly at risk of experiencing a volcano; however, there is a high probability that ash and other particulates from an eruption in western Washington or Oregon would be carried to and deposited within Asotin County.

[80] Spence, William L. "Where Were You When Mount St. Helens Blew? Lewiston Morning Tribune, May 16, 2010. https://lmtribune.com/northwest/where-were-you-when-mount-st-helens-blew/article_c9205488-5bd8-5915-93dc-3a1d22414c91.html.

[81] Murraybuckley - Own work, Public Domain, https://commons.wikimedia.org/w/index.php?curid=3193684.

Impacts of Volcano Events by Jurisdiction

Asotin County

The Mount St. Helens eruption in 1980 deposited several inches of ash causing widespread damages to vehicles and other equipment in Asotin County. The airborne particulates can also cause respiratory problems for both people and animals. These affects are particularly notable for populations already dealing with respiratory illnesses. Local accounts of the 1980 eruption did not indicate that the ash deposition adversely affected crops. Some noted that the addition of volcanic ash increased the water retention properties of the soil. As noted under *Local Event History*, several regional crop yields were exceptional in 1980, potentially boosted by the ash fallout.[82] It's unclear how the ash fallout from a future volcanic event would affect the agriculture industry of Asotin County.

Value of Resources at Risk

Asotin County has no assets at direct risk of being impacted by a volcanic eruption. However, the secondary effects of ash and airborne particulates may have varying degrees of negative effects within the County. Damages to property will likely be limited to vehicles and cleanup costs. Additionally, residents of Asotin County will be at risk to health problems associated with the respiratory effects of breathing airborne particulates.

City of Asotin

The city of Asotin does not have any differing levels of risk associated with this hazard than Asotin County as a whole.

Value of Resources at Risk

The city of Asotin has no assets at direct risk of being impacted by a volcanic eruption. However, the secondary effects of ash and airborne particulates may have varying degrees of negative effects. Damages to property will likely be limited to vehicles and cleanup costs. Additionally, residents of Asotin will be at risk to health problems associated with the respiratory effects of breathing airborne particulates.

City of Clarkston

The city of Clarkston does not have any differing levels of risk associated with this hazard than Asotin County as a whole.

Value of Resources at Risk

The city of Clarkston has no assets at direct risk of being impacted by a volcanic eruption. However, the secondary effects of ash and airborne particulates may have varying degrees of negative effects. Damages to property will likely be limited to vehicles and cleanup costs. Additionally, residents of Clarkston will be at risk to health problems associated with the respiratory effects of breathing airborne particulates.

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[82] Spence, William L. "Where Were You When Mount St. Helens Blew? Lewiston Morning Tribune, May 16, 2010. https://lmtribune.com/northwest/where-were-you-when-mount-st-helens-blew/article_c9205488-5bd8-5915-93dc-3a1d22414c91.html.

Asotin County Fire District #1

The Fire District does not have any differing levels of risk associated with this hazard than Asotin County as a whole. However, in the event of a volcanic eruption in western Washington or Oregon, Fire District #1 may assist with any emergencies or necessary evacuations, medical responses, or traffic accidents.

Value of Resources at Risk

The Asotin Fire District #1 station in the Clarkston Heights is not have any direct risk to volcanoes; however, there may be damage to the structure and/or equipment/PPE caused by ash fallout.

Blue Mountain Fire District

Blue Mountain Fire District #1 does not have any differing levels of risk associated with this hazard than Asotin County as a whole. However, in the event of a volcanic eruption, the District may assist with any necessary evacuations or traffic control.

Value of Resources at Risk

Blue Mountain Fire District #1 property does not have any direct risk to volcanos; however, there may be damage to the equipment caused by ash fallout.

Asotin County Conservation District

The conservation district does not have any differing issues or levels of risk associated with this hazard than Asotin County as a whole.

Value of Resources at Risk

The district does not have any values at risk to this hazard.

Drought Hazard Profile

Drought is defined as a prolonged period of dryness severe enough to reduce soil moisture, water levels, and snow levels below the minimum necessary for sustaining plant, animal and economic systems.[83] The National Drought Mitigation Center says the following: "In the most general sense, drought is defined as a deficiency of precipitation over an extended period of time (usually a season or more), resulting in a water shortage."[84] In the past century, Washington State has experienced a number of drought cycles including several that lasted for more than a single season.

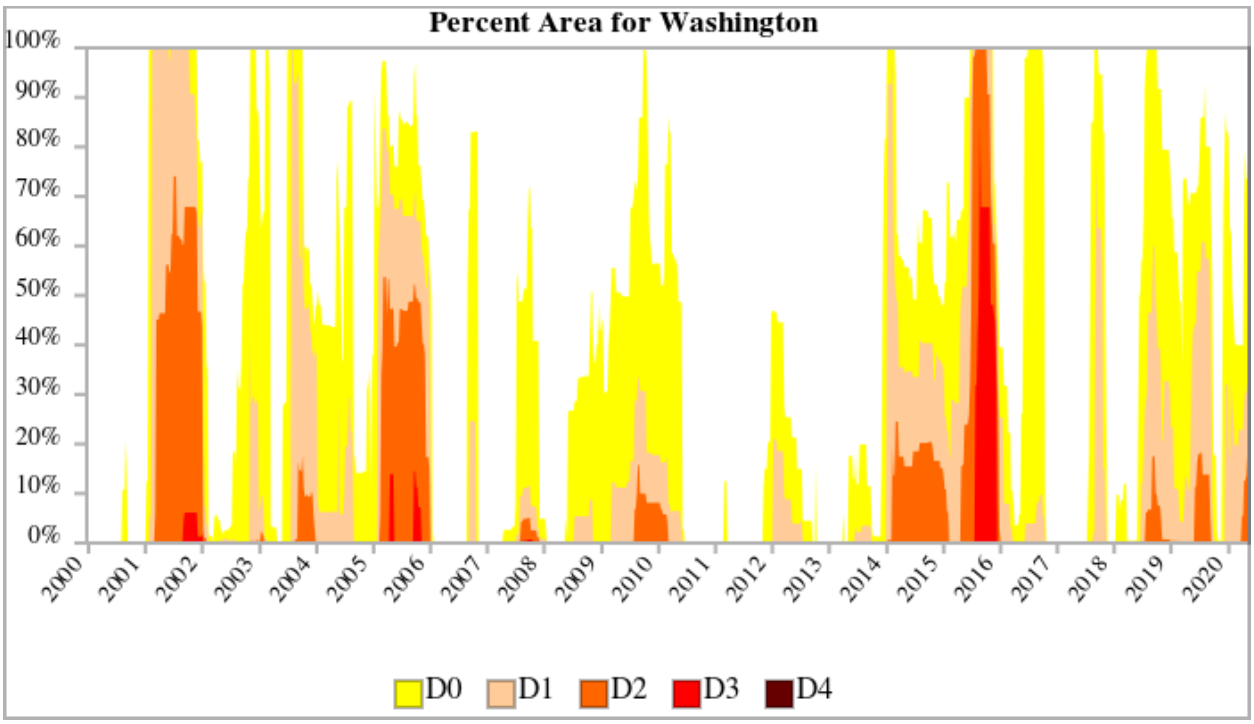
Since the inception of the U.S. Drought Monitor in 2000, the longest duration of drought (D1-D4) in Washington lasted 116 weeks beginning on January 7, 2014 and ending on March 22, 2016. The most intense period of drought occurred the week of August 25, 2015 where D3 affected 84.64% of Washington land.[85]

Figure 32: Drought Intensity Categories and Severity Scale

Description	Possible Impacts
Abnormally Dry	Going into drought: short-term dryness slows growth of crops/pastures. Coming out of drought: some lingering water deficits; crops/pastures not fully recovered.
Moderate Drought	Some damage to crops/pastures; streams, reservoirs, or wells are low with some water shortages developing or imminent; voluntary water-use restrictions requested.
Severe Drought	Crop/pasture losses are likely; water shortages are common and water restrictions are imposed.
Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions.
Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies.

[83] Washington Emergency Management Division. *Drought*. https://mil.wa.gov/drought.
[84] National Drought Mitigation Center. University of Nebraska-Lincoln. *Drought Basics*. https://drought.unl.edu/Education/DroughtBasics.aspx.
[85] National Integrated Drought Information System. *Drought in Washington*. https://www.drought.gov/drought/states/washington.

Figure 33: Percent Area in Drought in Washington from 2000-2020 as discussed in the previous paragraph



Unlike most states, Washington has a statutory definition of drought, consisting of two parts:

1. An area has to be experiencing or projected to experience a water supply that is below 75 percent of normal.
2. Water users within those areas will likely incur undue hardships as a result of the shortage.[86]

On average, the nationwide annual economic impacts of drought – between $6 billion and $8 billion annually in the United States – are greater than the impacts of any other natural hazard. They occur primarily in the agriculture, transportation, recreation and tourism, forestry, and energy sectors. Social and environmental impacts are also significant, although it is difficult to put a precise cost on these impacts. A drought directly or indirectly affects all of the residents of Asotin County. The National Drought Mitigation Center groups drought impacts into three main categories: economic, environmental, and social. Specific impacts within each category include farmers losing livelihood due to destroyed crops, loss or destruction of habitat or water for animals, and threat to public safety from increased wildfires.[87]

Additionally, drought threatens the supply of electricity in Washington. When supplies of locally generated hydropower shrink because of drought, utilities seek other sources of electricity, which can drive up prices as well as reduce supply. According to the U.S. Energy Information Administration, electricity is primarily produced from hydropower. "Hydroelectric power typically accounts for more

[86] Washington Emergency Management Division. *Drought*. https://mil.wa.gov/drought.
[87] National Drought Mitigation Center. University of Nebraska-Lincoln. *Drought Basics*. https://drought.unl.edu/Education/DroughtBasics.aspx.

than two-thirds of Washington's electricity generation. In 2018, hydropower accounted for 69% of the state's net generation. In part because of the relatively low operating costs of hydroelectric power generation, Washington had the nation's third-lowest average retail price for electricity in 2018."[88]

Drought can also effect groundwater sources, but generally not as quickly as surface water supplies. However, groundwater supplies usually take longer to recover. Reduced precipitation during a drought means that groundwater supplies are not replenished at the normal rate. This can lead to a reduction in groundwater levels and problems such as reduced pumping capacity or wells going dry. Shallow wells are more susceptible than deep wells. Low ground and surface water supplies directly impact Southeastern Washington fisheries by reducing river and stream levels and thereby reducing potential habitat.

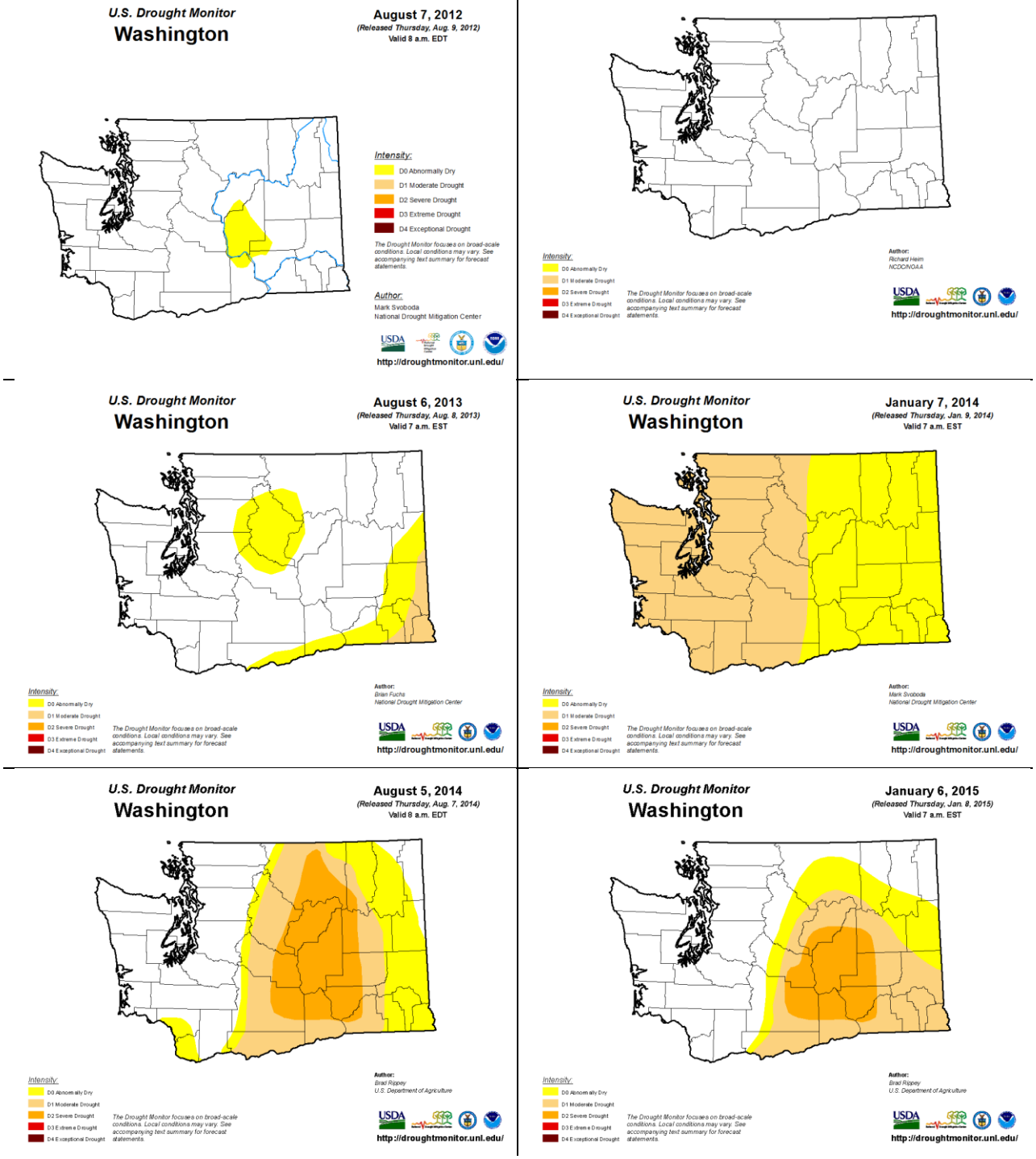
Agriculture is the industry most heavily affected by drought. Low water flow in the Snake River can present problems for wheat growers in Southeastern Washington since more than 80% of their crop is transported by barge. Lack of dredging combined with low river levels reduces the capacity for barge transportation down river from Lewiston, forcing Southeast Washington growers to use higher cost alternatives such as trucking and rail.

Drought indices assimilate thousands of bits of data on rainfall, snowpack, streamflow, and other water supply indicators into a comprehensible big picture. A drought index value is typically a single number, far more useful than raw data for decision making. The U.S. Drought Monitor is a synthesis of multiple indices and impacts that represents a consensus of federal and academic scientists.[89]

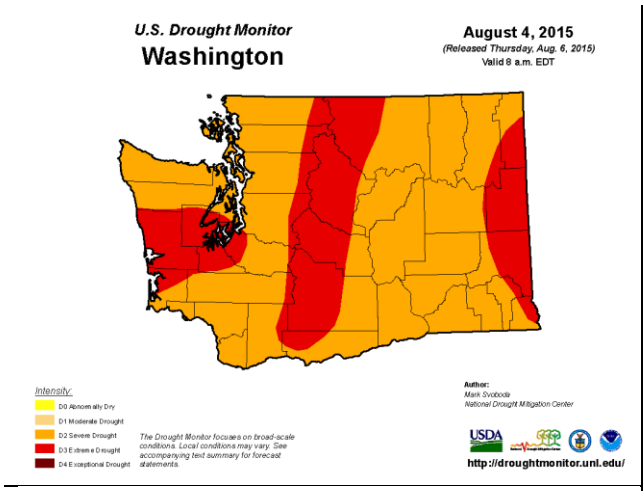
[88] U.S. Energy Information Administration. "Washington: Electricity". Available online at https://www.eia.gov/state/analysis.php?sid=WA.

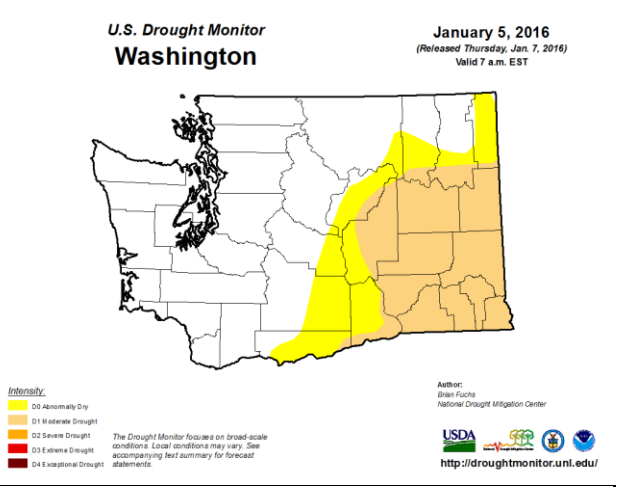
[89] National Drought Mitigation Center. University of Nebraska-Lincoln. "U.S. Drought Monitor". Available online at https://droughtmonitor.unl.edu/. May 2020.

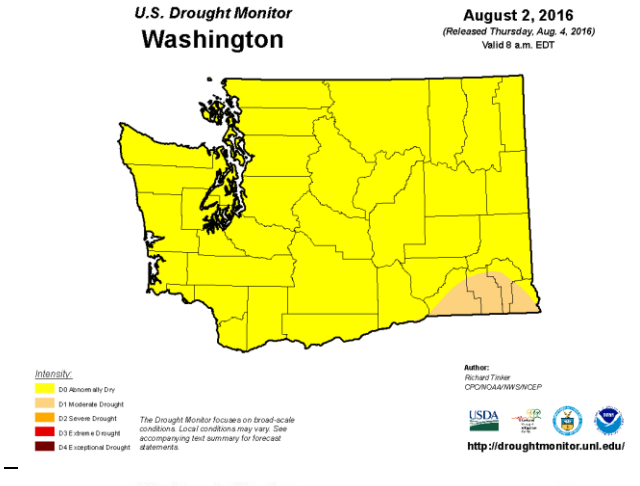
Figure 34: U.S. Drought Monitor - snapshots of first weeks of August 2012-2019 vs. first weeks of January 2013-2020[90]



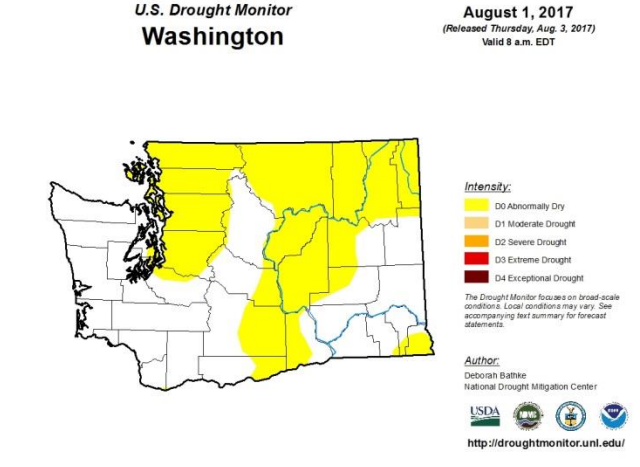
[90] National Drought Mitigation Center. University of Nebraska-Lincoln. "U.S. Drought Monitor". Available online at https://droughtmonitor.unl.edu/. May 2020.


U.S. Drought Monitor
Washington
August 4, 2015
(Released Thursday, Aug. 6, 2015)
Valid 8 a.m. EDT
Intensity:
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
Author:
Mark Svoboda
National Drought Mitigation Center
http://droughtmonitor.unl.edu/


U.S. Drought Monitor
Washington
January 5, 2016
(Released Thursday, Jan. 7, 2016)
Valid 7 a.m. EST
Intensity:
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
Author:
Brian Fuchs
National Drought Mitigation Center
http://droughtmonitor.unl.edu/


U.S. Drought Monitor
Washington
August 2, 2016
(Released Thursday, Aug. 4, 2016)
Valid 8 a.m. EDT
Intensity:
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
Author:
Richard Tinker
CPC/NOAA/NWS/NCEP
http://droughtmonitor.unl.edu/


U.S. Drought Monitor
Washington
January 3, 2017
(Released Thursday, Jan. 5, 2017)
Valid 7 a.m. EST
Intensity:
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
Author:
David Miskus
NOAA/NWS/NCEP/CPC
http://droughtmonitor.unl.edu/


U.S. Drought Monitor
Washington
August 1, 2017
(Released Thursday, Aug. 3, 2017)
Valid 8 a.m. EDT
Intensity:
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
Author:
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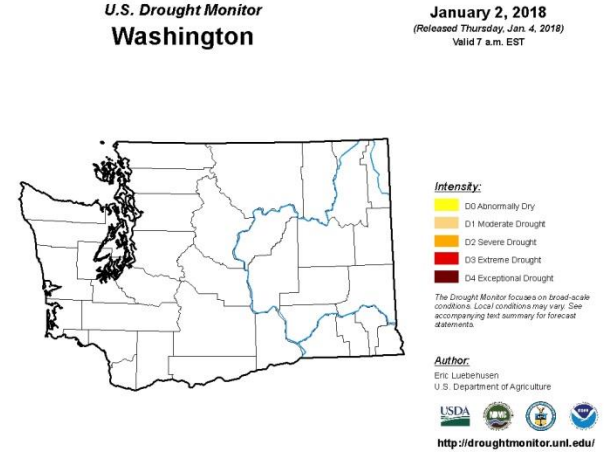
National Drought Mitigation Center
http://droughtmonitor.unl.edu/


U.S. Drought Monitor
Washington
January 2, 2018
(Released Thursday, Jan. 4, 2018)
Valid 7 a.m. EST
Intensity:
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
Author:
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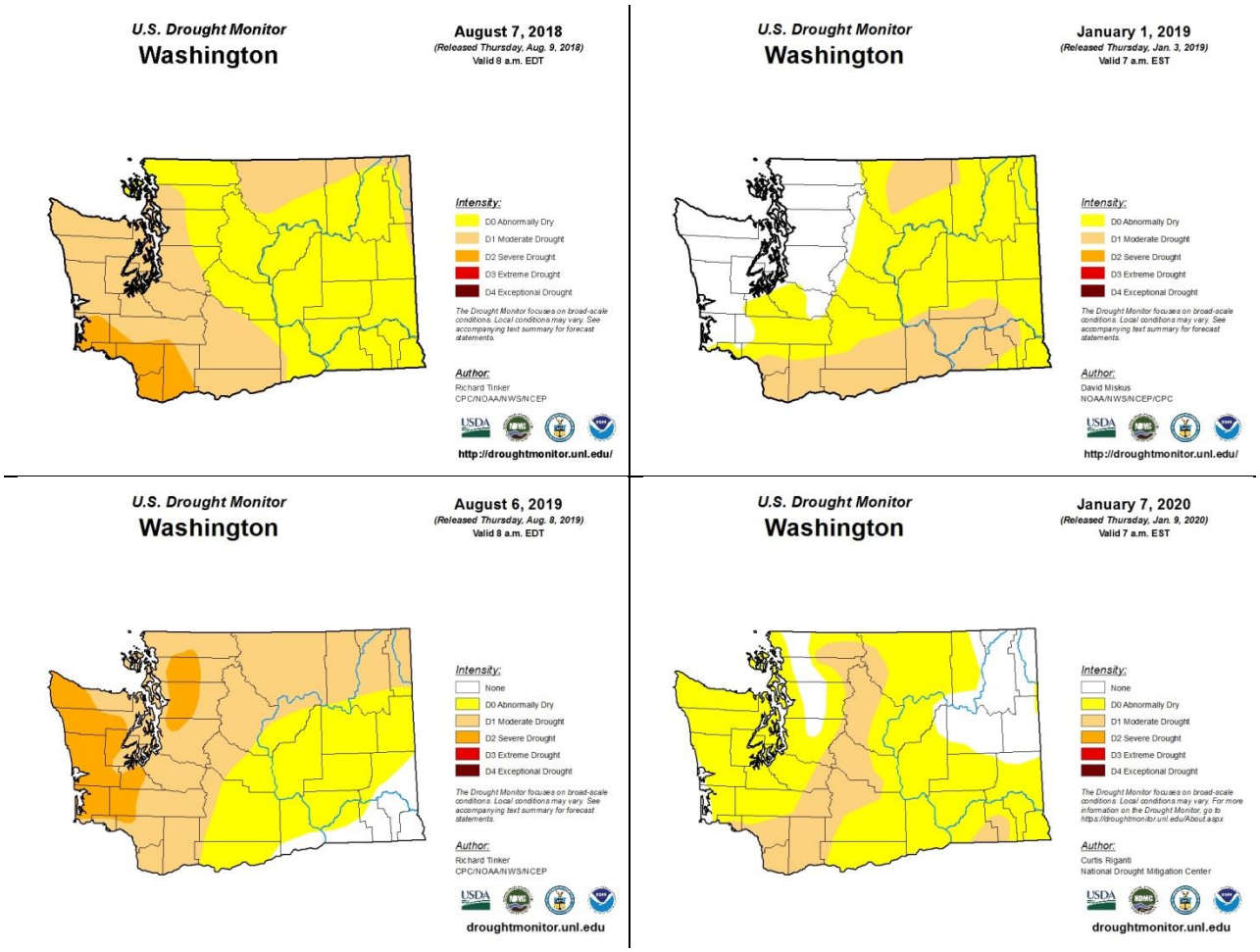


The major causes of droughts in Washington are either low snow accumulations from either low precipitation or warm winter temperatures; or by warm weather in the late winter-early spring that causes early melt of the snowpack. Most of the state's annual precipitation occurs during the winter. Precipitation in the Blue Mountains is normally stored as snow that slowly melts during the spring and summer, maintaining stream and river flows. This is the primary source of water for irrigation and municipal use.

Drought Risk Assessment

This plan uses three categories to describe likely drought impacts to Asotin County and the region:

- Agriculture – drought threatens crops and ecosystems that rely on natural precipitation
- Water Supply – drought threatens supplies of water for irrigated crops, for communities, and for industries
- Fire Hazard – drought increases the threat of wildfire from dry conditions in forest and rangelands

Drought affects water levels for use by industry, agriculture and individual consumers. Water shortages affect firefighting capabilities through reduced flows and pressures. Drought also affects electricity production. When water levels drop, electric companies cannot produce enough power to meet demand and are forced to buy electricity from other sources. It is often difficult to recognize a drought before being in the middle of it. Droughts do not occur spontaneously, they evolve over time as certain conditions are met. Therefore, it is difficult to measure the losses and gains due to a drought.

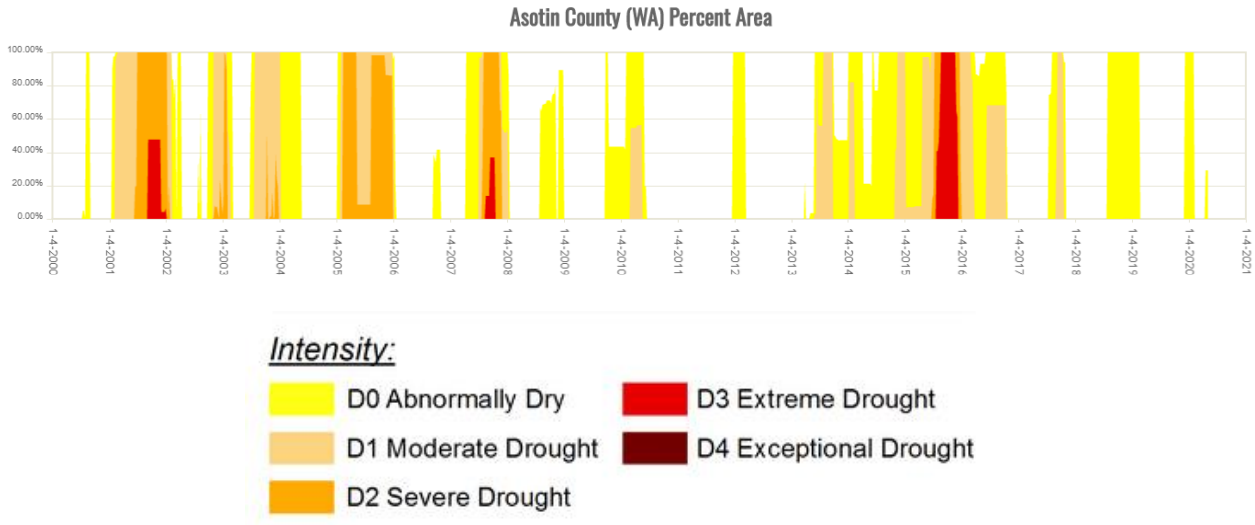
Often times, drought is accompanied by extreme heat. When temperatures reach 90 degrees and above, people are vulnerable to sunstroke, heat cramps and heat exhaustion. Pets and livestock are also vulnerable to heat-related injuries. Crops can be vulnerable as well. In past Washington state droughts, wheat has been scorched, apples have sunburned and peeled and yields were significantly lessened.

Local Event History

The Washington State Legislature in 1989 gave permanent drought relief authority to the Department of Ecology and enabled them to issue orders declaring drought emergencies. Nearly all areas of the state are vulnerable to drought. In every drought, agriculture is adversely impacted, especially in non-irrigated areas such as dry land farms and rangelands. Droughts impact individuals (farm owners, tenants, and farm laborers), the agricultural industry, and other agriculture-related sectors.

The National Integrated Drought Information System has a time series feature (Figure 35). This is an interactive tool that shows how long drought durations spanned from the years 2000 through 2020. This tool can be used to view what percent area of Asotin County was in drought during a given timespan.[91]

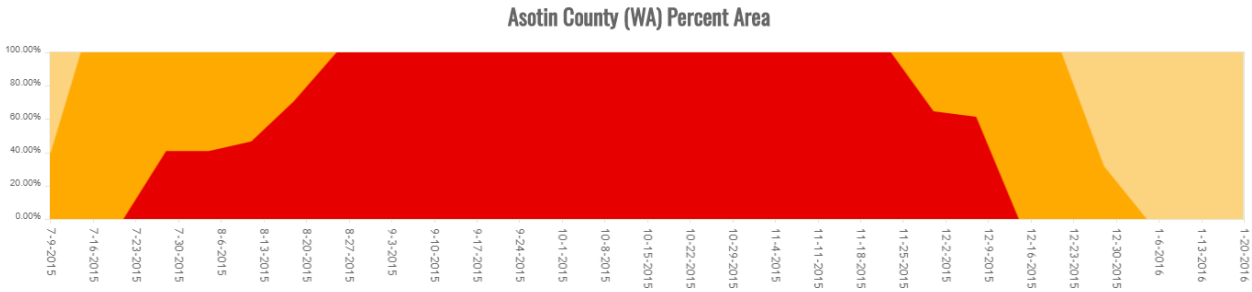
Figure 35: Time series from 2000 to 2020 showing the percent area of Asotin County in drought.



[91] United States Drought Monitor. "Time Series." Available online at https://droughtmonitor.unl.edu/Data/Timeseries.aspx.

Figure 36 highlights the most recent severe drought event experienced in Asotin County. This occurred in 2015, between roughly August 25 and November 25, when 100% of the county was at least in D3 drought severity.[92]

Figure 36: Asotin County drought time series from July 2015 to January 2016. 100% of county is in D3 drought (red) from late August to late November.



Probability of Future Events

The Washington State Legislature states that "drought and water shortages can place a significant hardship on Washington communities, farms, and the natural environment," and recognizing that due to the potential for rising temperatures droughts may become more frequent or more severe. The Legislature also states that "effective emergency drought response is predicated on building resiliency and preparedness before water shortages occur."[93]

Federal and state governments play an active role in developing new water projects and soil conservation programs. The state legislature outlines emergency drought relief in Chapter 173-166 WAC, including orders for forecasting drought conditions and steps that can be taken.[94]

The National Integrated Drought Information System (NIDIS) at Drought.gov provides several drought outlook and climate forecasting tools to be used to try to predict drought occurrence, severity and duration.[95]

Impacts of Drought Events by Jurisdiction

Asotin County

Drought increases the danger of forest and wildland fires. Millions of board feet of timber have been lost. Loss of forests and trees increases erosion causing serious damage to aquatic life, irrigation, and

[92] United States Drought Monitor. "Time Series." Available online at https://droughtmonitor.unl.edu/Data/Timeseries.aspx.

[93] Washington State Legislature. RCW 43.83B.400. Available online at https://app.leg.wa.gov/RCW/default.aspx?cite=43.83B.400.

[94] Washington State Legislature. Chapter 173-166 WAC. Available online at https://app.leg.wa.gov/wac/default.aspx?cite=173-166.

[95] NIDIS Drought.gov. Outlooks & Forecasts. Available online at https://www.drought.gov/drought/data-maps-tools/outlooks-forecasts.

power development by heavy silting of streams, reservoirs, and rivers. Low stream flows have created high temperatures, oxygen depletion, disease, and lack of spawning areas for our fish resources.

High quality agricultural soils exist in much of central and northern Asotin County. These areas of the county sustain dry land crops such as wheat that are dependent upon moisture through the winter and spring and dry arid conditions in the summer. While Asotin County does experience droughts, on the whole, these droughts are mild and they do not cause long term damage.

Value of Resources at Risk

The most direct impact of drought is economic rather than loss of life or immediate destruction of property. Droughts impact individuals, the agricultural industry, and other related sectors. Additionally, there is increased danger of wildland fires associated with most droughts. Millions of board feet of timber have been lost, and in many cases, erosion occurred which caused serious damage to aquatic life, irrigation, and power production by heavy silting of streams, reservoirs, and rivers.

The 2001 and 2005 drought years caused only minor damages. There were no threats to any critical facilities. Thus, a minor to moderate drought has a low probability of affecting the county's economy directly.

In the event of an extended drought cycle, water shortages may lead to crop failures, or at the least, the necessity to plant lower value crops that are less water-dependent. The majority of the population is employed either directly by the agriculture industry or to a service industry dependent on agriculture. Crop losses resulting from extended droughts would likely be considered a disaster for Asotin County. Lower water levels may also affect the County's ability to efficiently transport crops to available markets. Barging of goods on the Snake River could be reduced due to lower water levels.

Domestic and municipal water shortages are also likely to occur during an extended drought. Efforts to conserve water resources, including public education on conservation techniques, are encouraged by Asotin County during the summer months.

According to the 2017 USDA Census of Agriculture, Asotin County contains 205 farms making up 250,865 acres of farmland and the average farm is 1,224 acres. The Ag Census estimates that the market value of land and buildings in Asotin County is more than $1.6 million per farm and about $1,300 per acre. The market value of agricultural products sold in Asotin County is $62,961 per farm. Of the 205 farms in Asotin County, roughly 20% (42 in total) had sales values of $100,000 or more.

City of Asotin

The city of Asotin does not have any differing levels of risk associated with this hazard than Asotin County as a whole. However, the city does have its own policies concerning water conservation practices during the dry months. Additionally, the city may develop programs to deal with residents and businesses significantly impacted by drought if necessary.

Value of Resources at Risk

The city of Asotin has no assets directly at risk to drought; however, the economic impacts of a drought or a wildland fire caused by extended dry periods would have a great impact on the community. The majority of the population is employed either directly by the agriculture industry or to a service industry dependent on agriculture. Crop losses resulting from extended droughts would likely be considered a disaster for the community.

City of Clarkston

The city of Clarkston does not have any differing levels of risk associated with this hazard than Asotin County as a whole. However, the city does have its own policies concerning water conservation practices during the dry months. Additionally, the city may develop programs to deal with residents and businesses significantly impacted by drought if necessary.

Value of Resources at Risk

The city of Clarkston has no assets directly at risk to drought; however, the economic impacts of a drought or a wildland fire caused by extended dry periods would have a great impact on the community. A large portion of the population is employed either directly by the agriculture industry or to a service industry dependent on agriculture. Crop losses resulting from extended droughts would likely be considered a disaster for the community.

Asotin County Fire District #1

The Fire District does not have any differing levels of risk associated with this hazard as a whole. However, the potential increase in wildland fires due to extreme dry low flashy fuels would impact resources and cause financial strain. Also, in severe drought years, the District may have difficulty finding adequate water resources for wildland fire fighting purposes, particularly where drafting from ponds or streams is necessary.

Value of Resources at Risk

The Asotin Fire District #1 station in the Clarkston Heights does not have any direct risks to drought.

Blue Mountain Fire District

Blue Mountain Fire District #1 and the community of Anatone do not have any differing levels of risk associated with this hazard than Asotin County as a whole. However, in the event of a severe drought, the shortage of water in the ponds and rivers would be a concern when drafting during a wildland fire.

Value of Resources at Risk

Blue Mountain Fire District #1 and the community of Anatone have no assets directly at risk to drought. However, in the event of a wildland fire, extra precaution would need to be taken to protect the Conex box located on Sangster Road as the lot is surrounded by farm ground. Crop losses and dry pastures resulting from extended drought would cause major economic losses for farmers and ranchers in this area. In the event of a wildland fire in the Wildland Urban Interface the economic losses would be significant. Extended droughts would be considered a disaster for the community and the local economy.

Asotin County Conservation District

The Conservation District is impacted by drought events in a similar way to Asotin County as a whole. However, the Conservation District has made a significant investment by working with farmers and ranchers by installing tree, shrub and grass planting projects throughout Asotin County. The Conservation District has also worked with ranchers to develop livestock water sources that include wells and springs.

Value of Resources at Risk

The conservation district has provided financial assistance to many landowners to install natural resource best management practices throughout Asotin County to restore riparian and upland habitat by planting trees and shrubs and establish grass/hay land planting areas. Livestock watering facilities are developed throughout the county. These planting and water development projects have the potential of being impacted failing during drought.

CHAPTER 5 – HAZARD MITIGATION STRATEGY

Administration and Implementation of Action Items

Critical to the implementation of this Multi-Hazard Mitigation Plan will be the identification of, and implementation of, an integrated schedule of action items targeted at eliminating loss of life and reducing the amount of property destroyed, infrastructure compromised, and unique ecosystems damaged that serve to sustain the way-of-life and economy of Asotin County.

Asotin County encourages the philosophy of instilling disaster resistance in normal day-to-day operations. By implementing plan activities through existing programs and resources, the cost of mitigation is often a small portion of the overall cost of a project's design or program. Through their resolution of adoption as well as their participation on the planning team, each jurisdiction is aware of, and committed to incorporating the risk assessments and mitigation strategies contained herein. It is anticipated that the research, local knowledge, and documentation of hazard conditions contained in this document will serve as a tool for decision-makers as new policies, plans, and projects are evaluated.

All risk assessments were made based on the conditions existing during the 2019-2020 planning process, thus, the recommendations in this section have been made in light of those conditions. However, risks can change as can the state of preparedness and resources of the county. It will be necessary to review the recommendations outlined in this plan annually to adjust for changes in the components of risk, population density changes, infrastructure modifications, and other factors.

Prioritization of Action Items

The prioritization process includes a benefit-cost analysis as well as a review of efficacy and feasibility. The process will reflect that a key component in funding decision is a determination that the project will provide an equivalent or more in benefits over the life of the project when compared with the costs. Projects will be administered by the individual jurisdictions or the assigned organizations with support provided by the Emergency Manager.

County Commissioners and the elected officials of all jurisdictions have evaluated opportunities and established their own unique priorities to accomplish mitigation activities where existing funds and resources are available and there is community interest in implementing mitigation measures. If no federal funding is used in these situations, the prioritization process may be less formal. Often the types of projects that each county can afford to do on their own are in relation to improved codes and standards, department planning and preparedness, and education. These types of projects may not meet the traditional project model, selection criteria, and benefit-cost model. Asotin County and each jurisdiction will use this Multi-Hazard Mitigation Plan as guidance when considering pre-disaster mitigation proposals.

The prioritization of new projects and deletion of completed projects will occur annually and be facilitated by each county's emergency manager and the joint planning committee. All mitigation activities, recommendations, and action items mentioned in this document are dependent on available funding and staffing.

Prioritization Scheme

Scheme One

During the conception of the Southeast Washington Multi-Hazard Mitigation Plan, the action items and project recommendations were prioritized by Asotin County using a process referred to as Scheme One. Most of the jurisdictions met with their represented governing bodies and prioritized their own list of projects, ranking their mitigation strategy recommendations through a group discussion, informal benefit/cost review, and voting process. Projects in these sections are rated on a "High", "Moderate", or "Low" scale.

2021 MHMP Update Prioritization Scheme

During the planning process for the 2021 update, the planning team utilized a modified version of FEMA Worksheet 6.1, the "Mitigation Action Evaluation Worksheet", to evaluate and prioritize each mitigation action item. An example of the table can be found in the Chapter 6 Appendix. This prioritization method combines the formulaic evaluation from the worksheet with the informal system of "Scheme One".

Using a set of criteria, each action/project is evaluated using a +1, -1, or 0 ranking. For example:

- Under the criterion 'Life Safety', the action/project is scored as +1 if it is deemed highly effective at protecting human life.
- The action/project is scored -1 if it is considered ineffective at safeguarding human life.
- A score of 0 is assigned if it is not apparent whether the action/project will protect human life, or if the criterion is not applicable.

Once the final numbers are added up the action item is left with a score. This score then assists the planning team, or the representatives from the adopting jurisdiction, in ranking the action item as "High", "Moderate", or "Low".

Jurisdictional Mitigation Strategies

Asotin County

Hazard/ Item Code	Action Item	Goals Addressed/ Ranking	Responsible Departments or Organizations	Potential Resources	Status/Projected Completion Year
General AC-1	Purchase and implement a county-wide emergency notification system (reverse 911).	Goal # 2, 7 Priority Ranking: High	**County-wide Partnership**: led by Asotin County Emergency Management, Asotin County Emergency Communications Committee	In-house county government, cost-share, Homeland Security grants Cost estimate: $6,500 annually	As soon as possible
General AC-3	Install generators or battery backup power systems into each radio site identified.	Goal # 1, 4 Priority Ranking: High	Asotin County Emergency Management, Asotin County Emergency Communications Committee	Homeland Security Grants, Emergency Communications Committee Cost Share Cost estimate: $100,000	2025
General AC-2	Conduct a public safety radio system assessment.	Goal # 4 Priority Ranking: High	Asotin County Emergency Management, Asotin County Emergency Communications Committee	Homeland Security Grants, Emergency Communications Committee Cost Share	2023
General AC-4	Develop a Comprehensive Interoperable Communications Plan (As required by FEMA).	Goal # 5 Priority Ranking: Low	Asotin County Emergency Management , Asotin County Emergency Communications Committee	Homeland Security Grants, Emergency Communications Committee Cost Share Cost estimate: $15,000	New Project in 2021 Complete by 2025
General AC-5	Build and equip a new Emergency Operations Center at the Asotin County FD#1 Station. This includes space for training exercises for all Public Safety agencies in Asotin County.	Goal # 2, 4 Priority Ranking: Moderate	**Partnership**: Asotin County Fire District #1 and Asotin County	Grants, Public Safety agency cost share. Cost estimate: $50,000	Asotin County EOC to be built by 2025

Hazard/ Item Code	Action Item	Goals Addressed/ Ranking	Responsible Departments or Organizations	Potential Resources	Status/Projected Completion Year
General AC-6	Obtain funding for a generator to serve as an alternate power source for public water and sewer systems.	Goal # 2, 10 Priority Ranking: Moderate	Asotin County PUD	In-house funding through the Capital Improvement Plan Cost estimate: water - $150,000 Sewer - $50, 000	2022-23 2035
General AC-7	Develop an emergency response and evacuation plan specifically for the special needs populations throughout the county including a location database.	Goal # 11 Priority Ranking: Moderate	Asotin County Local Emergency Planning Committee	Grants, Public Safety agency cost share	2024
General AC-8	Change kilometer markers in Asotin County to mile markers. Project includes informing the public and seeking input, pulling the kilometer posts, placing the mile posts, changing address signs, and making changes in Assessor's data.	Goal # 1, 11 Priority Ranking: High	Asotin County Public Works	Asotin County Assessor's office, Sheriff, Commissioners, Emergency Department, Fire Districts, Building and Planning	New project in 2021 2025
General AC-9	Assess Public Works Communications system, including radio repeater sites, addressing "dead spots" within the county.	Goal # 5 Priority Ranking: High	Asotin County Public Works, Equipment Rental and Repair.	Community Development Block Grants	Project has been implemented and needs to continue
General AC-10	Address the "failed designation" given to septic systems in Asotin County.	Goal # 1, 4 Priority Ranking: High	Asotin County Public Health	Washington State Department of Health	New project
General AC-11	Obtain funding to update, improve and repair the Search and Rescue building at the fairgrounds.	Goal # 2, 3, 10 Priority Ranking: Low	Partnership: Emergency Management, Sheriff, SAR, Commissioners	FEMA PDM grant program, WA EMD mitigation	Contingent on funding
Wildland Fire AC-12	Update the Community Wildfire Protection Plan.	Goal # 2, 9 Priority Ranking: Moderate	Partnership: CWPP stakeholders	WA DNR, PDM grant program Potentially update tri-county CWPP from 2008	Begin project in 2021

Completed Action Items

General	Establish GIS capabilities for Asotin County including software, training, and development of a parcel master listing.	Goal #4	Asotin County in partnership with other local agencies	Government cost share Cost estimate: $100,000	Completed in 2013
General	Obtain funding to build a new Fire District #1 station in the Clarkston Heights	Goal #6	**Partnership**: Asotin County Fire District #1 and Asotin County	Community Development Block Grant, Capital Funds, bonds	Completed in 2020

City of Asotin

Hazard/ Item Code	Action Item	Goals Addressed/ Ranking	Responsible Departments or Organizations	Potential Resources	Status/Projected Completion Year
General A-1	Obtain funding for generators to serve as alternate power sources for City Hall, Fire Department, wells houses (2), and wastewater treatment lift station.	Goal # 1 Priority Ranking: High	City of Asotin	FEMA PDM grant program, NOAA, NWS	5-10 years
General A-2	Obtain funding to remodel or rebuild and retrofit the city fire station to include space for training and serve as a potential community shelter.	Goal # 1 Priority Ranking: High	City of Asotin	FEMA PDM grant program	5-10 years
Flood A-3	Evaluate and improve the dyke system along Asotin Creek.	Goal # 3 Priority Ranking: Moderate	City of Asotin	ECY Flood Control Assistance Account, FMA grant program	5-10 years
Wildland Fire A-4	Continue to work on action items and proposed projects identified in the Asotin County Community Wildfire Protection Plan.	Goal # 1 Priority Ranking: Low	City of Asotin, Asotin County, other CWPP partners	PDM grant program, DNR Fire	Ongoing project implementation
General A-5	Obtain funding for containment (security) and upgrade to the lift station.	Goal # 3 Priority Ranking: Low	City of Asotin	Community Development Block Grants	5-10 years
Flood/ General A-6	Obtain funding for acquiring and replacing of rolling stock and emergency apparatus of flood mitigation and public safety	Goal # 3 Priority Ranking: Low	City of Asotin	ECY Flood Control Assistance Account, FMA grant program	5-10 years
Severe Weather A-7	Continue to improve storm water drainage throughout the city, including curbs, gutters, and sidewalks.	Goal # 3 Priority Ranking: Moderate	City of Asotin	Community Development Block Grants and other water systems funding sources	Project is underway, continue implementation with curbs and sidewalks
General A-8	Develop an emergency response and evacuation plan to include special needs populations throughout the city with a location database.	Goal # 3 Priority Ranking: Moderate	**Partnership**: City of Asotin and Asotin County	EMD Mitigation and LEPC, FEMA PDM grant program, Public Safety agency cost share	Ongoing

Hazard/ Item Code	Action Item	Goals Addressed/ Ranking	Responsible Departments or Organizations	Potential Resources	Status/Projected Completion Year
General A-9	Institute and maintain GIS capabilities for Asotin including software, training, and development of a parcel master listing.	Goal # 3 Priority Ranking: Low	City of Asotin	Cooperating Technical Partnership Program	Ongoing, parcel master completed
General A-10	Obtain funding to upgrade the community center complex to an emergency preparedness center for potential use by Asotin Anatone School District, evacuations, command center, shelter, or temporary homelessness.	Goal # 3 Priority Ranking: Low	City of Asotin and Asotin County Emergency Management	FEMA PDM grant program, WA EMD Mitigation	5 years
General A-11	Refurbish Memorial Bridge to maintain emergency exits from town.	Goal # 3 Priority Ranking: High	City of Asotin	EMD Mitigation and Geologic Hazards, WSDOT, FEMA PDM grant program	5-10 years
General A-12	Upgrade the Asotin public safety radio communications system.	Goal # 1 Priority Ranking: High	City of Asotin	FEMA PDM grant program, WA EMD Mitigation	5-10 years
General A-13	Study the flow of hazardous materials near Asotin Schools on Highway 129.	County goal # 6 Priority Ranking: High	City of Asotin	WSDOT, EMD Mitigation and LEPC	5 years

City of Clarkston

Hazard/ Item Code	Action Item	Goals Addressed/ Ranking	Responsible Departments or Organizations	Potential Resources	Status/Projected Completion Year
General C-1	Continue to improve GIS capabilities for Clarkston including software, training, and development of a parcel master listing.	Goal # 5 Priority Ranking: Low	City of Clarkston Public Works	Cooperating Technical Partnership Program	Ongoing, Parcel master is completed
General C-2	Obtain funding for updating and upgrading the Clarkston wastewater treatment plant.	Goal # 5 Priority Ranking: High	City of Clarkston Public Works	Combined Water Quality Funding Program	3 years
Severe Weather C-3	Continue to improve storm water drainage throughout the city including curbs, gutters, and sidewalks.	Goal # 2 and 5 Priority Ranking: Moderate	City of Clarkston Public Works	Combined Water Quality Funding Program	Ongoing
Wildland Fire C-4	Continue to work on action items and proposed projects identified in the Asotin County Community Wildfire Protection Plan.	Goal # 1 and 5 Priority Ranking: Low	**Partnership**: CWPP stakeholders	PDM grant program, WA DNR Fire	Ongoing project implementation

Completed Action Items

Wildland Fire	Continue remodel of public safety building to create a "campus" including the expansion of the fire station.	Goal #1, 5	City of Clarkston Public Works	Community Development Block Grant	Completed in 2019

Asotin County Fire District #1

Hazard/ Item Code	Action Item	Goals Addressed/ Ranking	Responsible Departments or Organizations	Potential Resources	Status/Projected Completion Year
General AFD-1	Identify and obtain funding to fulfill mandatory equipment and personal protective equipment upgrades and training props.	Goal #1, 8 Priority Ranking: High	Asotin County Fire District #1	FEMA American Firefighter Grant, WA DNR Fire	1-2 years
General AFD-2	Obtain funding to help provide equipment and communications for the Asotin County Emergency Operations Center at Asotin County Fire District #1.	Goal #1, 4 Priority Ranking: High	**Partnership:** Asotin County Fire District #1 and Asotin County	FEMA American Firefighter Grant, WA DNR Fire	2 years
General AFD-3	Develop a program that will lead to better firefighter retention and recruitment into the District.	Goal #8 Priority Ranking: High	Asotin County Fire District #1	FEMA American Firefighter Grant, WA DNR Fire	2 years
Wildland Fire AFD-4	Continue to work on action items and proposed projects identified in the Asotin County Community Wildfire Protection Plan.	Goal #1, 2, 5, 6, and 7 Priority Ranking: Moderate	**Partnership**: CWPP stakeholders	PDM grant program, WA DNR Fire	Ongoing

Completed Action Items

General	Obtain funding to build a new station in the Clarkston Heights to include space for training exercises and to house the Asotin County Emergency Operations Center.	Goal #1, 4, and 6	**Partnership**: Asotin County Fire District #1 and Asotin County	Community Development Block Grant, Capital Funds, bonds	Completed in 2020

Blue Mountain Fire District #1

Hazard/ Item Code	Action Item	Goals Addressed/ Ranking	Responsible Departments or Organizations	Potential Resources	Status/Projected Completion Year
BM-1	Obtain funding to build a fire station on Sangster Road to include heated bays for winter water supply and office/training room.	Goal: 1 Priority Ranking: HIGH	Blue Mountain Fire District #1 and Asotin County	Community Development Block Grant, Capital Funds	2022
BM-2	Develop an emergency response and evacuation plan for the Anatone area including updating all address signs to be visible from the road	Goal: 5 Priority Ranking: HIGH	Blue Mountain Fire District #1	Ready Set Go	2021
BM-3	Continue to work on action items and proposed projects identified in the Asotin County Community Wildfire Protection Plan.	Goal: 7 Priority Ranking: MODERATE	Blue Mountain Fire District #1 and CWPP stakeholders	PDM grant program, WA DNR Fire	Ongoing
BM-4	Identify and obtain funding to fulfill equipment and personal protective equipment upgrades.	Goal: 4 Priority Ranking: HIGH	Blue Mountain Fire District #1	FEMA American Firefighter Grant, WA DNR Fire	Ongoing

Asotin County Conservation District

Hazard/ Item Code	Action Item	Goals Addressed/ Ranking	Responsible Departments or Organizations	Potential Resources	Status/Projected Completion Year
General CD-1	Develop a Comprehensive Watershed Assessment for the tributaries of the Snake River in Asotin County to assist with integrating local priorities for maintaining critical infrastructure along waterways and improving salmon and other fisheries habitats.	Goal # 1, 5 Priority Ranking: Moderate	**Partnership**: Asotin County Conservation District, Snake River Salmon Recovery Board, Washington State Fish and Wildlife, Nez Perce Tribe, Umatilla Tribe	Assessments funded by Bonneville Power Administration, Washington State Recreation and Conservation Office	Asotin, George, Couse, Ten Mile, and Alpowa Creeks completed in 2018. Grande Ronde and tributaries in 2021

CHAPTER 6 – APPENDIX

Supporting Documentation

Planning Meeting Agendas and Sign-in Sheets

Item 1 : Sign in Sheets for the July 16, 2019 "Kickoff" Meeting

Asotin County Hazard Mitigation Planning Meeting — Date: 7-16-19

Name	Organization	Phone	Email
Mark Janowski	Asotin CO DEM	509-243-2088	Mjanowski@co.asotin.wa.us
Peter Hartmann	EM, WA State Mil Dept	509-435-6288	peter.hartmann@mil.wa.gov
Adam Herrenbruck	Planning Associate-NMC	(208) 310-2822	herrenbruck@northwestmanagement.com
ERIC NELSON	Planning Associate-NMC	(208) 892-9002	nelson@northwestmanagement.com
Michael Levkowitz	Mitigation Strategist	253-512-7207	Michael.levkowitz@emd.wa.gov
Reagan Bush	HMP Coordinator-EMD	253-512-7143	reagan.bush@mil.wa.gov
Brad Tucker	Northwest Management	208-310-0320	tucker@northwestmanagement.com
Chris Seubert	Asotin County	509-254-1464	cseubert@co.asotin.wa.us
Dustin Johnson	Asotin Co	509-243-2079	djohnson@co.asotin.wa.us
Craig Richie	ASOTIN CO. PUD	509-758-1010	Criehie@asotinpud.org
John Hilderbrand	Asotin Co. SHERIFF	509 243-4717	Jhilderbrand@co.asotin.wa.us

Asotin County MHMP Meeting
16-Jul-19

Name	Department	Phone	E-mail
John Guillotte	Asotin County Public Works	(509)243-2079	JGuillotte@co.asotin.wa.us
Karst Riggers	Asotin County Planning	509 243-2020	Kriggers@co.asotin.wa.us
Noel Hayden	Asotin County Fire/Asotin	509 758 5181	acfd2@cablerocket.net
Mark Janowski	Asotin County DEM	509 243-2088	MJanowski@co.Asotin.WA.US
Chris Seubert	Asotin County	509-243-2059	cseubert@co.asotin.WA.US

Item 2: Kickoff Meeting Agenda

A G E N D A	**Asotin County Hazard Mitigation Plan** **Tuesday, July 16, 2019** **3:00 p.m. – 5:00 p.m.** **County Commissioners Chambers** **Asotin, WA**	
3:00 p.m.	**OPEN – Introductions**	
3:15 p.m.	**GROUP MEETING** **I. Overview** ✓ County Efforts To-Date ✓ Overview of HMP presentation **II. Build the Planning Team** ✓ Planning Team i. Who's Missing? ii. Planning Team Responsibilities **III. Developing Outreach Strategy** ✓ Stakeholders ✓ Public Involvement **IV. Exercises** ✓ Determine Overall Significance Ranking ✓ Capability Assessment exercise **V. Communications Plan** ✓ Establish Primary Points of Contact ✓ Interacting with the Planning Team **VI. Timeline** ✓ Completion Date – August 2020 ✓ Next Meeting and Meeting Schedule **VII. Homework** ✓ Data and Information Request	NMI/Group
4:45 p.m.	**OPEN DISCUSSION**	Group
5:00 p.m.	ADJOURNMENT	

Item 3: Sign-in Sheet for August 27, 2020 Planning Meeting (Meeting #2)

Asotin County Hazard Mitigation Planning Meeting			Date: 8/27/19
Name	Organization	Phone	Email
Mark Jonowski	Asotin EM	509-243-2080	MJonowski@CO.Asotin.wa.us
Pete Hartmann	EM, WA State	509-435-[illegible]	peter.hartmann@mil.wa.gov
John Guillotte	Public Works - Asotin County	509-243-2074	JGuillotte@co.asotin.wa.us
Ryan Basket	Clarkston Fire	509-758-8681	FIRECHIEF@CLARKSTON-WA.com
Megan Stewart	Asotin Co CD	509-552-8100	megan@asotincd.org
Karst Riggers	Asotin Co. Planning	509 243-2070	Kriggers@co.asotin.wa.us
Sissie Applefordt	Blue Mt Fire	509-256-3325	[illegible]
Chris Seubert	Asotin County	509-243-2059	CSeubert@asotinWA.us

Item 4: Meeting #2 Agenda

A G E N D A	**Asotin County Hazard Mitigation Plan** **Tuesday, August 27, 2019** **10:00 a.m. – 12:00 p.m.** **Asotin County Commissioners Chambers** **95 2nd St. #2, Asotin, WA 99402**	
10:00 a.m.	**OPEN – Introductions**	
10:15 a.m.	**GROUP MEETING** **I. Recap of last meeting** ✓ Summary of HMP presentation i. Purpose of hazard mitigation planning ii. Why we are here **II. The Planning Team** ✓ Adopting Jurisdictions ✓ Planning Team/Stakeholders i. Who's missing? **III. Document Outline** **IV. The Hazards** ✓ Hazards Summary Worksheet **V. Document Review** ✓ Chapter 1 i. Planning Philosophy, Mission Statement, Goals ii. Planning Mechanisms **VI. Homework** ✓ Review Chapter 1 i. Goals ii. Planning Mechanisms ✓ Fill out Hazard Summary Worksheet **VII. Timeline** ✓ Next Meeting and Meeting Schedule	NMI/Group
11:45 a.m.	**OPEN DISCUSSION**	Group
12:00 p.m.	ADJOURNMENT	

Item 5: Sign-in Sheet for October 1, 2019 Planning Meeting (Meeting #3)

Asotin County Hazard Mitigation Planning Meeting		Date: 10-1-19	
Name	Organization	Phone	Email
Mark Janowski	EMer Mgmt	509-243-2088	MJanowski@CO.Asotin.WA.US
Monte Renzelman	Asotin City		Asotin500@GMAIL.com
Ryan Baskett	City of Clarkston	253-377-4805	FFECHIEF@CLARKSTON-WA.com
Adam Herrenbruck	NMI	(208) 310-2822	herrenbruck@nmi2.com
Eric Nelson	NMI	(208) 892-9002	nelson@nmi2.com
Megan Stewart	Asotin Co CD	509.552.8100	megan@asotincd.org
Chris Seubert	Asotin Co.	509-243-2059	cseubert@co.asotin.wa.us
Justin Moss	BMFD	208-790-2817	JustinMossBMFD@Yahoo.com
Brady Woodbury	Asotin County Pub. Health	509-243-3544	bwoodbury@ac-hd.org
John Guillotte	Asotin Co. Dept Public Works	509-243-2074	JGuillotte@co.asotin.wa.us
Karst Riggers	Asotin Co Planning	243-2020	Kriggers@co.asotin.wa.us
Noel Hall	Asotin County Fire Dist. #1	208 790-3379	actfd1@cableone.net
John Hildebrand	Asotin County Sheriff	509-243-4717	JHildebrand@Co.asotin.wa.us

Item 6: Meeting #3 Agenda

A G E N D A	**Asotin County Hazard Mitigation Plan Update Meeting #3** **Tuesday, October 1, 2019** **10:00 a.m. – 12:00 p.m.** **Asotin County Commissioners Chambers** **95 2nd St. #2, Asotin, WA 99402**	
10:00 a.m.	**OPEN – Introductions/Housekeeping**	Mark Janowski
10:15 a.m.	**GROUP MEETING** **I. Old Business** ✓ Finalize Adopting Jurisdictions i. Blue Mountain Fire District ii. Asotin County Conservation District iii. Requirements ✓ Past Homework i. Hazard Summary Worksheets ii. Goals a. Review county goals, regional goals ✓ Requests for Feedback i. Planning Philosophy and Mission Statement ii. Review of Section 1 **II. Capabilities Assessment Exercise** **III. Document Review** ✓ Chapter 2 i. Planning Team Members ii. Plan Monitoring and Maintenance ✓ Chapter 3 i. Organization/Topics Discussed ii. Individual Descriptions of Topics a. What is missing that would better describe Asotin County, Clarkston, Asotin, and/or other jurisdictions? **IV. Homework** ✓ Capabilities Assessment (see Agenda Item II) ✓ Review Chapters 2 and 3 (see Agenda Item III) ✓ Any Previous Incomplete Assignments **V. Review of Timeline** ✓ Where Are We In The Process? ✓ Next Meeting and Meeting Schedule	NMI/Group
11:45 a.m.	**OPEN DISCUSSION**	Group
12:00 p.m.	ADJOURNMENT	

Item 7: Sign-in Sheet for November 6, 2019 Planning Meeting (Meeting #4)

Asotin County Hazard Mitigation Planning Meeting		Date: 11/6/19	
Name	Organization	Phone	Email
Marek Jonowski	Asotin County Dem	243-2088	MJonowski@CO.Asotin.WA.US
John Hilderbrand	Asotin Co. Sheriff	243-4717	jhilderbrand@co.asotin.wa.us
Pete Hartmann	WA State EMD	435-6288	peter.hartmann@mil.wa.gov
Adam Heppenbrock	NMI	208-310-2822	
Ryan Baskett	City of Clarkston	253-377-4805	FIRECHIEF@CLARKSTON-WA.COM
Kevin Poole	"	509-758-4467	[illegible]
Chris Seubert	Asotin	509-895-1464	cseubert@asotin-wa.us
John Guillotte	Asotin Co. Public Works	509-243-2074	JGuillotte@co.asotin.wa.us
Karst Riggers	Asotin Co. Planning	509-243-2020	Kriggers@co.asotin.wa.us
Megan Stewart	Asotin Co CD	509-552-8100	megan@asotincd.org
Dustin Johnson	Asotin Co. Public Works	509-243-2074	DJohnson@co.asotin.wa.us
Brady Woodbury	AC Public Health	509-243-3344	bwoodbury@ac-hd.org
Monte Glenn	Asotin City	509 243 4411	ASOTIN300@GMAIL.COM

Item 8: Meeting #4 Agenda

A G E N D A	**Asotin County Hazard Mitigation Plan Update Meeting #4** **Wednesday, November 6, 2019** **10:00 a.m. – 12:00 p.m.** **Asotin County Commissioners Chambers** **95 2nd St. #2, Asotin, WA 99402**	
10:00 a.m.	**OPEN – Introductions/Housekeeping**	Mark Janowski
10:15 a.m.	**GROUP MEETING** **I. Old Business** ✓ Review Previous Homework Assignments i. Hazard Summary Worksheet ii. Goals a. Review old goals and accept as written or submit changes/new goals iii. Capabilities Assessment iv. Description of Jurisdiction v. Chapters 1-3 a. Review and submit feedback **II. Discuss Public Outreach Strategy** ✓ Public meeting i. Time, date, location, format, etc. **III. Chapter 4 Outline Review** ✓ Hazard Profile ✓ Hazard Risk Assessment i. Local Event History ii. Probability of Future Events iii. Impacts of Hazard Events by Jurisdiction a. Value of Resources at Risk **IV. New Homework** ✓ Look for Chapter 4 by Nov. 13 i. Can we trim, update, or improve anywhere? ii. Update your jurisdiction's "impacts" section ✓ Any Previous Incomplete Assignments **V. Review of Timeline** ✓ Where Are We In The Process? ✓ Next Meeting Format	NMI/Group
11:45 a.m.	**OPEN DISCUSSION**	Group
12:00 p.m.	ADJOURNMENT	

Item 9: Sign-in Sheet for January 22, 2020 Planning Meeting (Meeting #5)

Project: Asotin County HMP Update Date: Jan. 22, 2020 Location: Asotin County Commissioners

Name	Organization/Community	Phone	Email Address	Contact Me
Adam Hermenbruck	Northwest Management, Inc.	208 310-2822		
Pete Hartmann	EM, WA military dept	509 438-6255	peter.hartmann@mil.wa.gov	
Brady Woodbury	Public Health	509-243-3344	bwoodbury@ac-hd.org	
Megan Stewart	Asotin Co CD	509 552-8100	megan@asotincd.org	
Kevin Poole	Clarkston	509 758-1662	[illegible]	
Karst Riggers	Asotin Co.	243-2020	kriggers@co.asotin.wa.us	
Dustin Johnson	Asotin Co. (Public Works)	243-2074	djohnson@co.asotin.wa.us	
Marek Jonowski	Asotin CO EM	243-2088	MJonowski@CO.Asotin.WA.US	
Noel Hardin	Asotin County Fire Dist. #1	509-758-5181	actd1@cablone.net	
Susie Appleford	Blue Mountain Fire	509-256-3325	bmfd1@yahoo.com	

Item 10: Meeting #5 Agenda

A G E N D A	**Asotin County Hazard Mitigation Plan Update Meeting #5** **Wednesday, January 22, 2020** **10:00 a.m. – 12:00 p.m.** **Asotin County Commissioners Chambers** **95 2nd St. #2, Asotin, WA 99402**	
10:00 a.m.	**OPEN – Introductions/Housekeeping**	Mark Janowski
10:15 a.m.	**GROUP MEETING** **I. Chapter 4 Review** ✓ Discuss Feedback Presented i. Flood ii. Earthquake iii. Landslide iv. Severe Weather v. Wildland Fire vi. Avalanche vii. Tsunami viii. Volcano ix. Drought **II. Regional Issues Annex** ✓ Review for relevancy ✓ Items can be implemented into other parts of plan if desired **III. If time allows: Discuss Hazard Mitigation Strategy** ✓ Prioritization i. Time, date, location, format, etc. ✓ Review Mitigation Action Items i. Priority, responsible organizations, timeframe, potential funding sources, proposed costs **IV. New Homework** ✓ Continue to review Chapter 4 i. Update your jurisdiction's "impacts" section ✓ Review the Regional Issues Annex from the old plan ✓ Any Previous Incomplete Assignments **V. Review of Timeline** ✓ Where Are We In The Process?	NMI/Group
11:45 a.m.	**OPEN DISCUSSION**	Group
12:00 p.m.	ADJOURNMENT	

Item 11: Sign-in Sheet for February 12, 2020 Planning Meeting (Meeting #6)

Project: Hazard Mitigation Plan Update Date: 2/12/2020 Location: Asotin County Commissioners Chambers

Name	Organization/Community	Phone	Email Address	Contact Me
Adam Herrenbruck	Northwest Management	208 310 2822		
Mark Jankowski	Asotin County DEM	509 243-2088		
Chris Seubert	Asotin County	595-1464		
Ryan Bassett	Clarkston City	253-377-4809		
John Guillotte	Asotin County Public Works	243-2074		
Susie Appleford	BMFD #1	2563335		
MARK APPLEFORD	BMFD #1	256-3325		
Megan Stewart	ACCD	552-8100		
Karst Riggers	Asotin Co. Planning	509 243-2080		
Dustin Johnson	Asotin Co PW	243-2074		
Justin Moss	BMFD #1	208-790-2817		
Noel Hardin	ACFO #1	208-790-3379		

Item 12: Meeting #6 Agenda

A G E N D A	**Asotin County Hazard Mitigation Plan Update Meeting #6** **Wednesday, February 12, 2020** **10:00 a.m. – 12:00 p.m.** **Asotin County Commissioners Chambers** **95 2nd St. #2, Asotin, WA 99402**	
10:00 a.m.	**OPEN – Introductions/Housekeeping**	Mark Janowski
10:15 a.m.	**GROUP MEETING** **I. Chapter 4 Review** ✓ Discuss Feedback Presented i. Review General Feedback ii. Wildland Fire iii. Drought **II. Chapter 5 Review: Hazard Mitigation Strategy** ✓ Full chapter will be sent out later this week ✓ Review Mitigation Action Items i. Priority, responsible organizations, timeframe, potential funding sources, proposed costs **III. Public Outreach Plan** ✓ Plan next public meeting i. "Town Hall – style" public meeting **IV. New Homework** ✓ Continue to review Chapter 4 i. Update your jurisdiction's "impacts" section ✓ Review Chapter 5: Hazard Mitigation Strategy (full chapter to be sent out later this week) ✓ Review Jurisdictional Mitigation Strategies (projects) ✓ Generate new projects ✓ Any Previous Incomplete Assignments **V. Review of Timeline** ✓ Where are we in the process? ✓ Schedule next planning meeting	NMI/Group
11:45 a.m.	**OPEN DISCUSSION**	Group
12:00 p.m.	ADJOURNMENT	

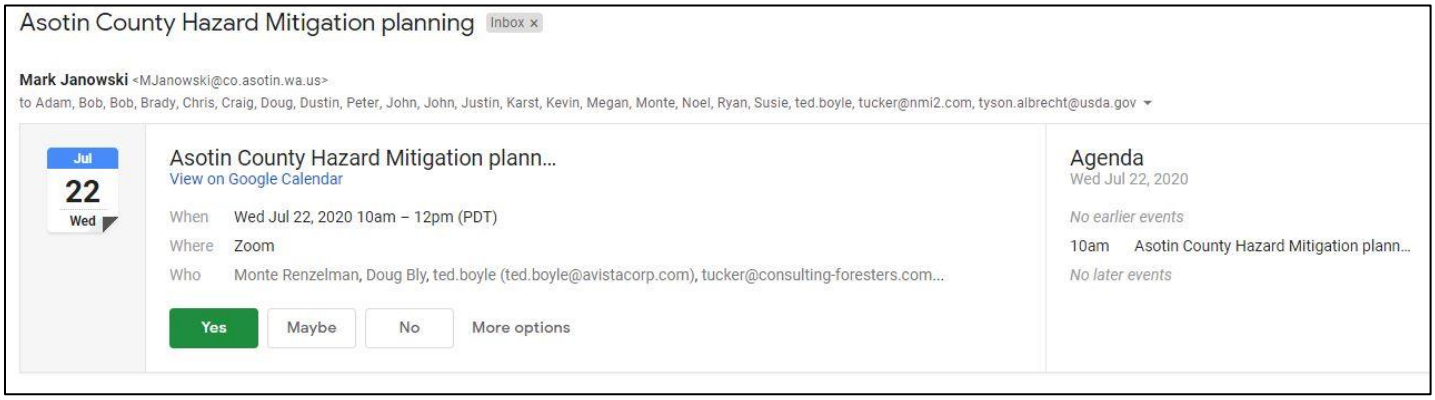
Virtual Planning Meetings

Due to restrictions and precautions associated with COVID-19, the planning team switched to virtual meetings. These meetings were held on the Zoom platform. Not all meetings had an assigned agenda. A record of the meetings is found below.

July 22, 2020 Virtual Meeting Attendance

Mark Janowski
Brad Tucker
Adam Herrenbruck
John Guillotte
Pete Hartmann
Megan Stewart
Chris Seubert
Karst Riggers
Monte Renzelman
Noel Hardin
Darren White

Item 13: Virtual Meeting Email Invitation for July 22, 2020 meeting



Item 14: Agenda for first Virtual Planning Meeting (July 22, 2020)

A G E N D A	**Asotin County Hazard Mitigation Plan** **Virtual Planning Meeting** **Wednesday, July 22, 2020** **10:00 a.m. – 12:00 p.m.** **Virtual Meeting via Zoom**	
10:00 a.m.	**OPEN – General Housekeeping** **Who is on the call?**	Mark Janowski NMI
10:15 a.m.	**TEAM MEETING** **VIII. Resuming Course: where are we?** a. All components of the document are present but in draft form b. Some pieces within each component are still missing c. Chapter 5: Mitigation Strategy is where we left off d. Public outreach campaign needs to be rethought **IX. Resuming Course: proposed timeline** a. Hold virtual meetings regularly i. discuss new meeting format b. Timeframe for final draft review c. Timeframe for public review and comment period d. State review e. FEMA review f. Adoption **X. Maps** a. fire history maps b. structure density maps c. flood zone maps **XI. Public Outreach Strategy** a. Virtual Town Hall Meeting b. Online/Social Media Campaign **XII. Chapter 5: Mitigation Strategy** a. using the review tool to review old action items b. developing new action items	NMI and Planning Team
11:45 a.m.	**OPEN DISCUSSION**	Planning Team
12:00 p.m.	ADJOURNMENT	

August 11, 2020 Virtual Meeting Attendance

Adam Herrenbruck
Mark Janowski
John Guillotte
Karst Riggers
Monte Renzelman
Darren White

Item 15: Virtual Meeting Email Invitation for August 11, 2020 meeting

August 25, 2020 Virtual Meeting Attendance

Adam Herrenbruck
Mark Janowski
John Hilderbrand
John Guillotte
Chris Seubert

Item 16: Virtual Meeting Email Invitation for August 25, 2020 meeting

September 22, 2020 Virtual Meeting Attendance

Mark Janowski
John Guillotte
Karst Riggers
Adam Herrenbruck
Monte Renzelman

Item 17: Virtual Meeting Email Invitation for September 22, 2020

October 27, 2020 Virtual Meeting Attendance

Mark Janowski
Darren White
Chris Seubert
Noel Hardin
Megan Stewart
John Guillotte
Monte Renzelman
John Hilderbrand
Adam Herrenbruck

Item 18: Virtual Meeting Email Invitation for October 27, 2020

meeting October 27

Adam Herrenbruck <herrenbruck@northwestmanagement.com> Tue, Sep 22, 11:02
to Mark

Hello folks,

For our next meeting we will discuss all the hazards in chapter 4, including wildfire, flood, and drought. Please plan on attending or send your feedback on chapter 4 to Adam or Mark. Look for an email with these documents over the coming week.

Northwest Management is inviting you to a scheduled Zoom meeting.

Topic: Asotin County HMP - chapter 4 discussion
Time: **Oct 27, 2020 10:00 AM** Pacific Time (US and Canada)

Join Zoom Meeting
https://us02web.zoom.us/j/89524143878?pwd=bzlSaFpEdnpMN3p4QzNxY282WFhRUT09

Meeting ID: 895 2414 3878
Passcode: 489953

Dial by your location ***Only use this number if you do not have speakers and/or a microphone on the device you are using to log into the meeting.**
+1 253 215 8782 US (Tacoma)

See you there!
--
Adam Herrenbruck
Northwest Management, Inc.
PO Box 9748
233 E Palouse River Drive
Moscow, ID 83843
(208) 883 - 4488
cell: (208) 310 - 2822

November 17, 2020 Virtual Meeting Attendance

Mark Janowski
Pete Hartmann
Megan Stewart
John Guillotte
Karst Riggers
Noel Hardin
Adam Herrenbruck

Item 19: Virtual Meeting Email Invitation for November 17, 2020

Asotin County Hazard Mitigation Plan Inbox ×

Mark Janowski <MJanowski@co.asotin.wa.us>
to Adam, Bob, Bob, Brady, Chris, Craig, Doug, Peter, John, John, Justin, Karst, Kevin, Megan, Monte, Noel, Ryan, Susie, ted.boyle, tucker@nmi2.com, tyson.albrecht@usda.gov

Nov
17
Tue

Asotin County Hazard Mitigation Plan
View on Google Calendar

When Tue Nov 17, 2020 10am – 12pm (PST)
Where Join Zoom Meeting' Time: Nov 17, 2020 10:00 AM Pacific Time (US and Canada)
Who Monte Renzelman, Doug Bly, ted.boyle (ted.boyle@avistacorp.com), tucker@consulting-foresters.com...

Yes Maybe No More options

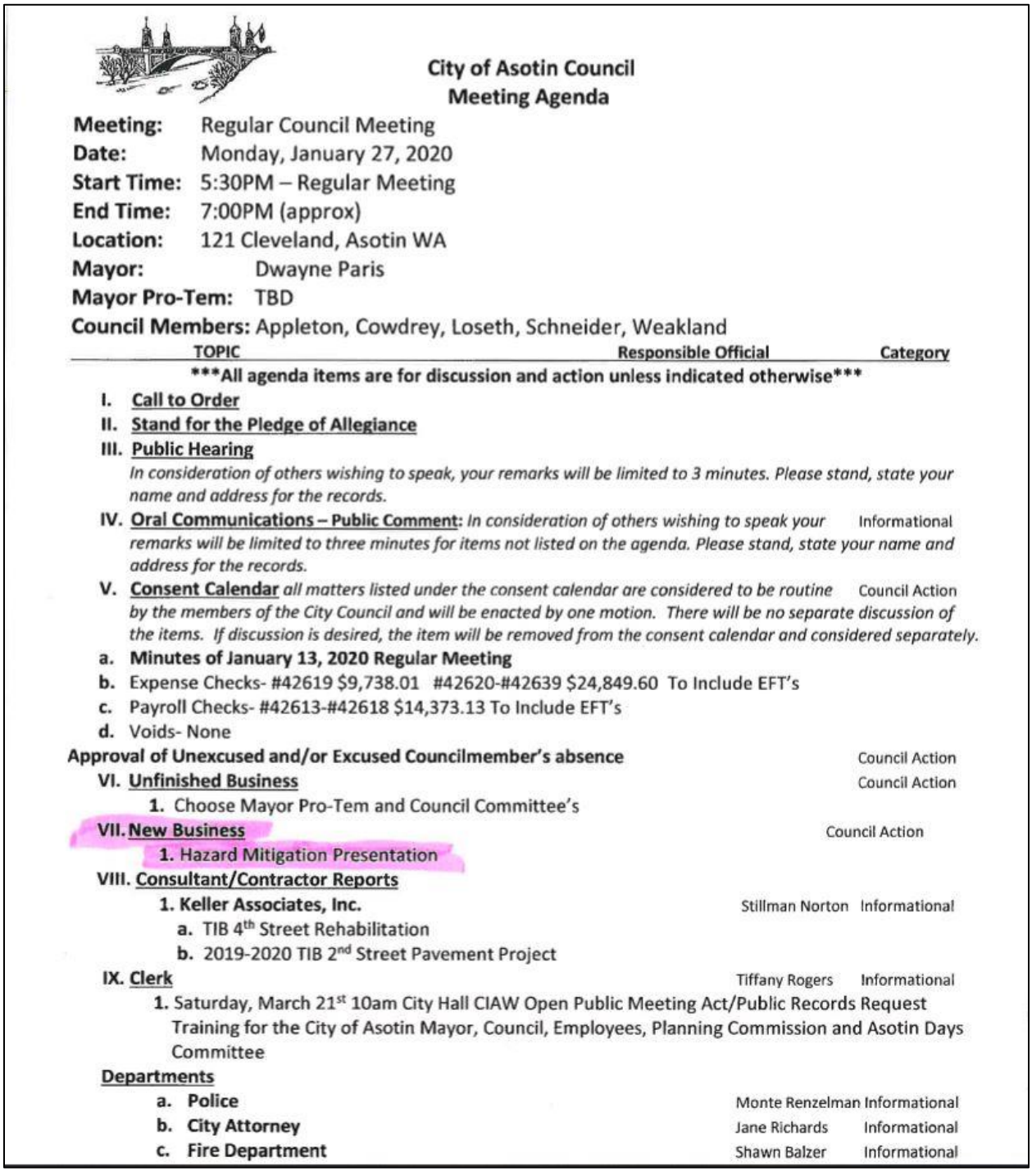
Agenda
Tue Nov 17, 2020

No earlier events
10am Asotin County Hazard Mitigation Plan
No later events

Public Meeting Agendas, Handout, and Power Point Presentation

January 27, 2020 City Council Agendas

Item 20: Agenda for the Asotin City Council Meeting on January 27, 2020 (New Business Item 1 is highlighted)



City of Asotin Council
Meeting Agenda

Meeting: Regular Council Meeting
Date: Monday, January 27, 2020
Start Time: 5:30PM – Regular Meeting
End Time: 7:00PM (approx)
Location: 121 Cleveland, Asotin WA
Mayor: Dwayne Paris
Mayor Pro-Tem: TBD
Council Members: Appleton, Cowdrey, Loseth, Schneider, Weakland

TOPIC	Responsible Official	Category

*****All agenda items are for discussion and action unless indicated otherwise*****

I. **Call to Order**
II. **Stand for the Pledge of Allegiance**
III. **Public Hearing**
In consideration of others wishing to speak, your remarks will be limited to 3 minutes. Please stand, state your name and address for the records.
IV. **Oral Communications – Public Comment:** *In consideration of others wishing to speak your remarks will be limited to three minutes for items not listed on the agenda. Please stand, state your name and address for the records.* — Informational
V. **Consent Calendar** *all matters listed under the consent calendar are considered to be routine by the members of the City Council and will be enacted by one motion. There will be no separate discussion of the items. If discussion is desired, the item will be removed from the consent calendar and considered separately.* — Council Action
a. **Minutes of January 13, 2020 Regular Meeting**
b. Expense Checks- #42619 $9,738.01 #42620-#42639 $24,849.60 To Include EFT's
c. Payroll Checks- #42613-#42618 $14,373.13 To Include EFT's
d. Voids- None

Approval of Unexcused and/or Excused Councilmember's absence — Council Action

VI. **Unfinished Business** — Council Action
1. Choose Mayor Pro-Tem and Council Committee's

VII. **New Business** — Council Action
1. Hazard Mitigation Presentation

VIII. **Consultant/Contractor Reports**
1. **Keller Associates, Inc.** — Stillman Norton — Informational
a. TIB 4th Street Rehabilitation
b. 2019-2020 TIB 2nd Street Pavement Project

IX. **Clerk** — Tiffany Rogers — Informational
1. Saturday, March 21st 10am City Hall CIAW Open Public Meeting Act/Public Records Request Training for the City of Asotin Mayor, Council, Employees, Planning Commission and Asotin Days Committee

Departments
a. **Police** — Monte Renzelman — Informational
b. **City Attorney** — Jane Richards — Informational
c. **Fire Department** — Shawn Balzer — Informational

Item 21: Agenda for the Clarkston City Council Meeting on January 27, 2020 (New Business Item B is highlighted)

CITY OF CLARKSTON
CITY COUNCIL AGENDA
829 5th Street
MONDAY, JANUARY 27, 2020

1. CALL TO ORDER: 7:00 P.M.
2. PLEDGE OF ALLEGIANCE:
3. AGENDA CHANGES:
4. APPROVAL OF MINUTES: January 13, 2019 Regular Meeting

5. COMMUNICATIONS:
   - A. From the Public:
   - B. From the Mayor:
   - C. From Staff or Employees:

6. COMMITTEE REPORTS:
   - A. Finance/Admin – Audit Report on Current Bills – January 27
   - B. Public Safety – No Meeting
   - C. Public Works – January 21
   - D. Outside Organizations – Health District, EMS Council, Valley Vision, PTBA, SEWEDA, MPO, Regional Stormwater, Lodging Tax Advisory

7. UNFINISHED BUSINESS: None

8. CONSENT AGENDA: None

9. NEW BUSINESS:
   - A. Intergovernmental Cooperation Agreement – PUD (Finance)
   - B. Presentation of Asotin County Hazard Mitigation Plan – Northwest Management
   - C. Presentation on Bridge/2nd/Diagonal Intersection – Keller Associates
   - D. Presentation on Diagonal/8th/Elm Intersection – Keller Associates
   - E. Lewis Clark Valley MPO Update – Shannon Grow

10. COUNCIL COMMENTS:

11. QUESTIONS FROM THE PRESS:

12. EXECUTIVE SESSION: None

13. ADJOURN:

Time limits for addressing the council have been established by council direction. Presentations are limited to 15 minutes and public comments are limited to 3 minutes per person, per topic.

January 27, 2020 Public Meeting Agenda Handout

Item 22: Front Side of Public Meeting Handout, used on January 27, 2020

Asotin County – Hazard Mitigation Plan Update 2020

Public Information Meeting Agenda
Presented by Northwest Management, Inc.

What is Hazard Mitigation?

The Effort to Reduce the Risk of **Loss of Life and Property**, **Human Suffering, Economic Disruption**, and **Disaster Assistance Costs**, by lessening the impact of disasters.

Hazard Mitigation creates more *Resilient Communities*

A Resilient Community:

- Makes proactive investments and policy decisions
- Communicates risk and vulnerability to all
- Builds public and private sector capabilities and partnerships
- Resumes normal operations and recovers rapidly after hazard events

Hazard Mitigation Planning

- Identifies risks and vulnerabilities associated with natural disasters
- Develops long term strategies for protecting people and property
- Increases education and awareness regarding hazards
- Prioritizes mitigation projects and helps to obtain funding for projects

FEMA Requirements and Plan Components

- Counties are required to have hazard mitigation plan to secure mitigation funding
- Plans needs to be updated every five years
- Plan contains several components, including mitigation goals, a hazard risk assessment, mitigation strategy, documented planning process, opportunities for public involvement, and adoption by local governments

The Planning Team

Emergency Services, Representatives from the adopting jurisdictions, County/City departments and staff, local districts, federal agencies, groups/organizations, Washington EMD (in assisting role)

Item 23: Back Side of Public Meeting Handout, used on January 27, 2020

Adopting Jurisdictions

Asotin County, city of Clarkston, city of Asotin, Asotin County Fire District #1, Blue Mountain Fire District, Asotin County Public Health District, Asotin County Conservation District.

Hazard Profile and Risk Assessment

- Identification and definition of each hazard
- Local hazard event history
- Probability of each hazard reoccurring
- Impacts that a hazard event has on a given jurisdiction
- The values of resources at risk to each hazard

The Hazards

FEMA covers *natural* hazards for the Hazard Mitigation Plan: Flood, Earthquake, Landslide, Severe Weather, Wildland Fire, Avalanche, Tsunami, Volcano and Drought.

Hazard Mitigation Strategy

- Mitigation Projects
- Education/Awareness Campaigns
- Studies and Evaluations
- Prioritization Plan

Public Involvement

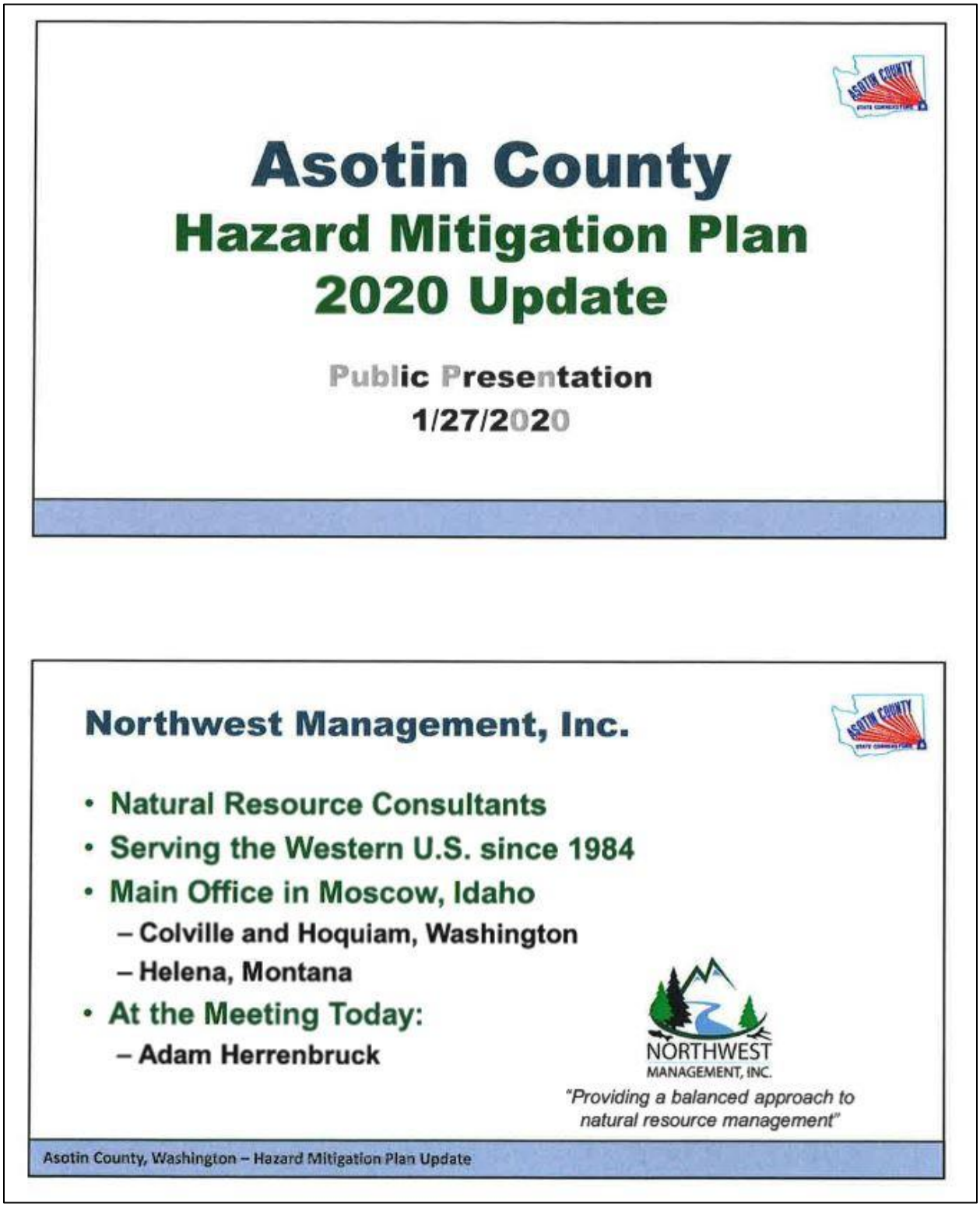
- Awareness through the media and public meetings
- Open public review and comment period when a draft is submitted (this will be announced and publicized)

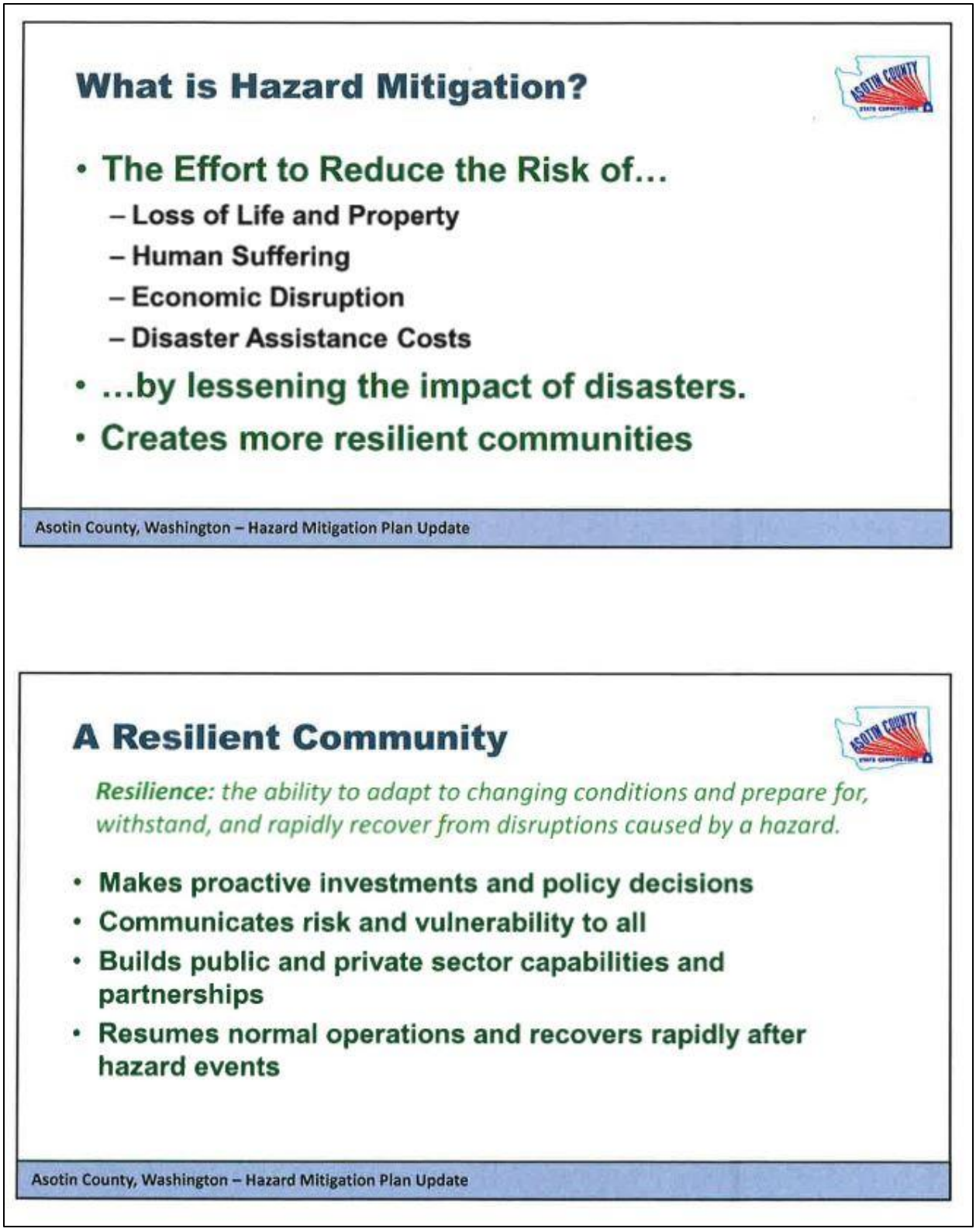
Your Input

Contact Asotin County Emergency Services with comments or questions, or reach out to a member of the planning team.

Asotin County Emergency Services Mark Janowski Emergency Services Director Desk: 509-243-2088 Cell: 509-780-2782 mjanowski@co.asotin.wa.us	Northwest Management, Inc. Environmental Planning Dept. Adam Herrenbruck – primary contact Brad Tucker, Eric Nelson – secondary contacts 208-883-4488 herrenbruck@nmi2.com

January 27, 2020 Public Meeting PowerPoint Presentation




What is Hazard Mitigation?
• The Effort to Reduce the Risk of…
– Loss of Life and Property
– Human Suffering
– Economic Disruption
– Disaster Assistance Costs
• …by lessening the impact of disasters.
• Creates more resilient communities
Asotin County, Washington – Hazard Mitigation Plan Update
A Resilient Community
Resilience: the ability to adapt to changing conditions and prepare for, withstand, and rapidly recover from disruptions caused by a hazard.
• Makes proactive investments and policy decisions
• Communicates risk and vulnerability to all
• Builds public and private sector capabilities and partnerships
• Resumes normal operations and recovers rapidly after hazard events
Asotin County, Washington – Hazard Mitigation Plan Update

Hazard Mitigation Planning

- **Empowers local governments and groups to…**
  - Identify risks and vulnerabilities associated with natural disasters
  - Develop long-term strategies for protecting people and property from future hazard events
  - Begin breaking the cycle of disaster damage, reconstruction, and repeated damage
  - Increase education and awareness around threats, hazards, and vulnerabilities
  - Build partnerships for risk reduction
  - Align mitigation objectives with other community objectives
  - Prioritize mitigation projects and obtain project funding

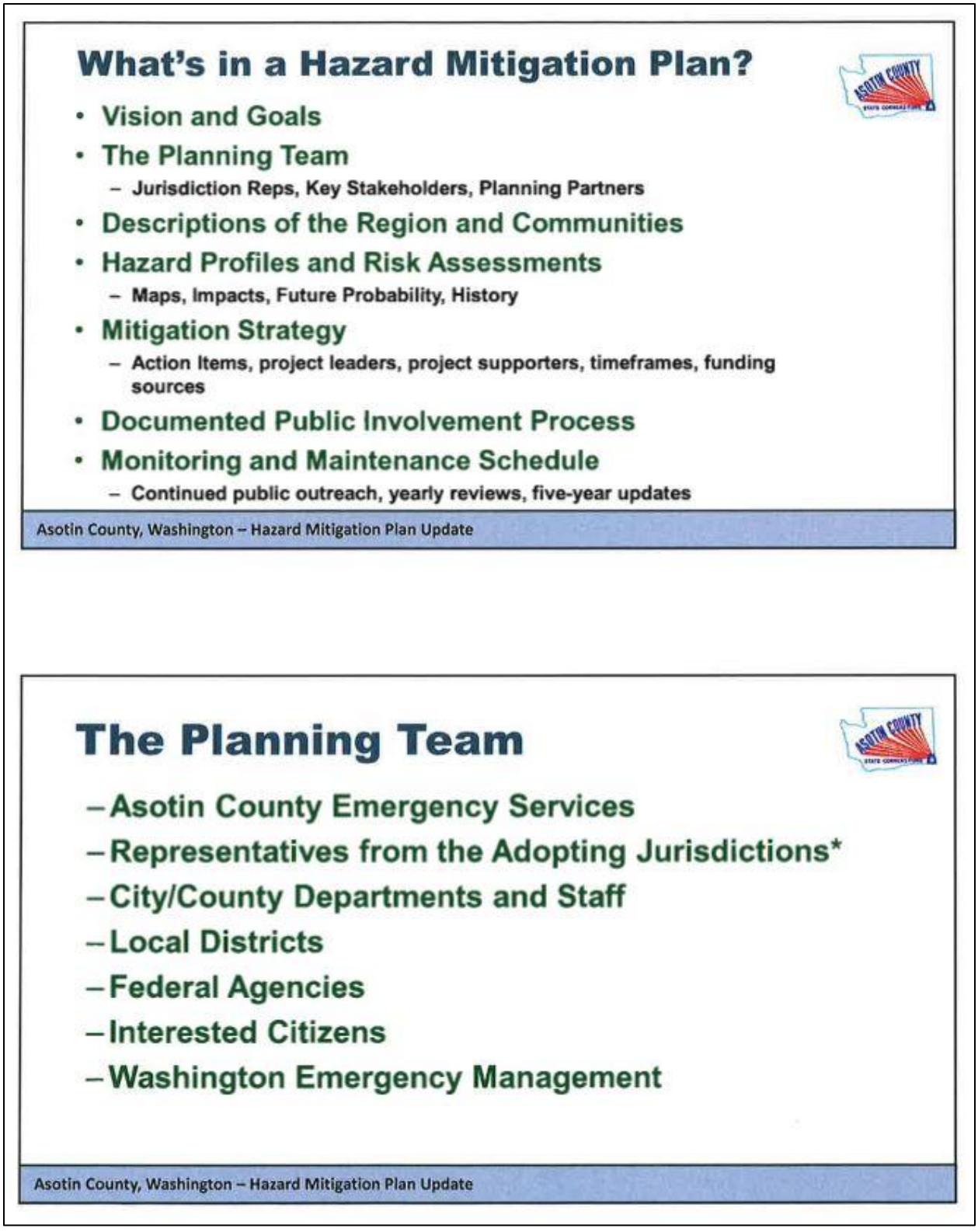
Asotin County, Washington – Hazard Mitigation Plan Update

FEMA Hazard Mitigation Plan

- **Disaster Mitigation Act of 2000**
  - Establishes eligibility for FEMA Hazard Mitigation Assistance (HMA)
  - Requires Tribal, State, and local governments to submit plans to FEMA for review
- **Title 44 Code of Federal Regulations (CFR) 201.6 or 201.7**
  - Publishes requirements for approval of a local mitigation plan
  - Requires mitigation plan approved by FEMA in order to receive hazard mitigation project grants
  - Requires plan to be updated every five years

As of November 1, 2004
FEMA requires ALL counties to have an HMP

Asotin County, Washington – Hazard Mitigation Plan Update


What's in a Hazard Mitigation Plan?
• Vision and Goals
• The Planning Team
– Jurisdiction Reps, Key Stakeholders, Planning Partners
• Descriptions of the Region and Communities
• Hazard Profiles and Risk Assessments
– Maps, Impacts, Future Probability, History
• Mitigation Strategy
– Action Items, project leaders, project supporters, timeframes, funding sources
• Documented Public Involvement Process
• Monitoring and Maintenance Schedule
– Continued public outreach, yearly reviews, five-year updates
Asotin County, Washington – Hazard Mitigation Plan Update
The Planning Team
–Asotin County Emergency Services
–Representatives from the Adopting Jurisdictions*
–City/County Departments and Staff
–Local Districts
–Federal Agencies
–Interested Citizens
–Washington Emergency Management
Asotin County, Washington – Hazard Mitigation Plan Update

Adopting Jurisdictions

- Asotin County
- City of Clarkston
- City of Asotin
- Asotin County Fire District #1
- Blue Mountain Fire District #1
- Asotin County Conservation District
- Asotin County Public Health District

Asotin County, Washington – Hazard Mitigation Plan Update

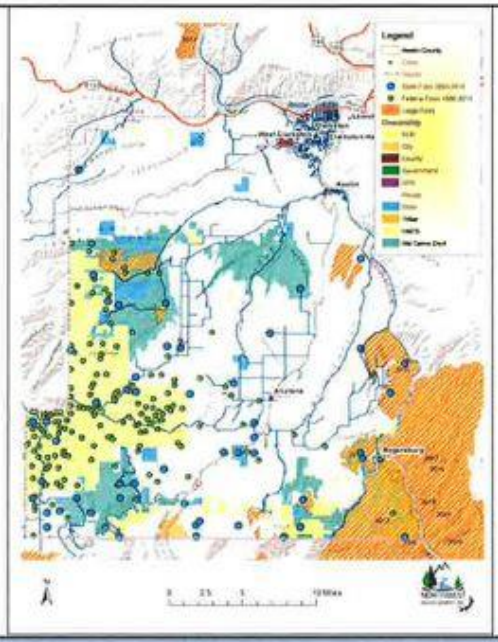
Hazards Discussed in the HMP

- Flood
- Earthquake
- Landslide
- Severe Weather
- Wildland Fire
- Avalanche
- Tsunami
- Volcano
- Drought

Asotin County, Washington – Hazard Mitigation Plan Update

Hazard Profile and Risk Assessment

- Each Hazard and Each Jurisdiction:
  - Background Information
  - Definitions
  - Local Event History
  - Probability of Future Occurrence
  - Impacts of Hazard Events
  - Development Trends
  - Value of Resources at Risk



Asotin County, Washington – Hazard Mitigation Plan Update

Mitigation Strategy

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

Asotin County, Washington – Hazard Mitigation Plan Update

Public Involvement

- Public Meetings
- Public Review and Comment Period
  - This will be facilitated once all sections have been completed and reviewed by the planning team
  - Anyone can review the most current DRAFT of the plan and provide feedback
- Open public adoption hearings

Asotin County, Washington – Hazard Mitigation Plan Update

Your Input

- Reach out to a planning team member to ask questions or provide input
- Let us know your questions, ideas, and concerns
- Look for future outreach regarding the plan update process

Contact Information:

Asotin County Emergency Services Mark Janowski Emergency Services Director Desk: 509-243-2088 Cell: 509-780-2782 mjanowski@co.asotin.wa.us	Northwest Management, Inc. Environmental Planning Dept. Adam Herrenbruck – primary contact Brad Tucker, Eric Nelson – other contacts 208-883-4488 herrenbruck@nmi2.com

Thank you

Asotin County, Washington – Hazard Mitigation Plan Update

Public Survey Data

Item 24: Question 1 Summary of Responses

Hazards in Asotin County

Q1 Please identify the general area within Asotin County where you live and/or work (Asotin, Clarkston, Anatone, Unincorporated, etc.).

Answered: 59 Skipped: 0

ANSWER CHOICES	RESPONSES	
Live:	93.22%	55
Work:	86.44%	51

Item 25: Individual Responses to Question 1 from those who stated they live in Asotin County (55 responses)

#	LIVE:	DATE
1	Clarkston but in County next to city limits	11/3/2020 10:19 AM
2	Heights	11/3/2020 8:52 AM
3	Clarkston Heights	10/30/2020 9:03 PM
4	Clarkston heights	10/30/2020 10:11 AM
5	Clarkston	10/30/2020 9:00 AM
6	Clarkston	10/30/2020 8:30 AM
7	Clarkston	10/29/2020 8:20 AM
8	Clarkston	10/28/2020 1:11 PM
9	Clarkston	10/28/2020 12:49 PM
10	Asotin county 14th and elm	10/28/2020 11:45 AM
11	Clarkston	10/28/2020 10:03 AM
12	1212 grelle ave apt c	10/28/2020 9:58 AM
13	Clarkston Heights	10/28/2020 9:48 AM
14	Clarkston	10/28/2020 9:44 AM
15	Clarkston	10/28/2020 9:32 AM
16	Clarkston	10/27/2020 11:57 PM
17	Clarkston	10/27/2020 8:11 PM
18	Clarkston	10/27/2020 8:01 PM
19	anatone	10/27/2020 7:49 PM
20	Clarkston	10/27/2020 4:29 PM
21	CLARKSTON	10/27/2020 4:27 PM
22	Asotin	10/27/2020 2:26 PM
23	Clarkston	10/27/2020 1:58 PM
24	Clarkston	10/27/2020 12:46 PM
25	Clarkston	10/27/2020 12:26 PM
26	Clarkston	10/27/2020 12:25 PM
27	Lenore, ID	10/27/2020 12:01 PM
28	Clarkston	10/27/2020 11:34 AM
29	Clarkston	10/27/2020 11:34 AM
30	Unincorporated	10/27/2020 11:20 AM
31	Clarkston Heights	10/27/2020 10:44 AM
32	Clarkston	10/26/2020 12:49 AM
33	Clarkston	10/25/2020 2:11 AM
34	Clarkston Heights	10/24/2020 9:22 PM
35	clarkston	10/22/2020 7:54 PM
36	Asotin	10/22/2020 7:08 PM
37	Clarkston (county,)	10/22/2020 5:02 AM

Hazards in Asotin County

38	Asotin	10/21/2020 7:40 PM
39	Asotin Creek 1 mile from Asotin	10/21/2020 10:11 AM
40	Cloverland	10/21/2020 9:52 AM
41	Anatone	10/21/2020 9:19 AM
42	Anatone	10/21/2020 7:25 AM
43	unincorporated Anatone	10/21/2020 6:09 AM
44	Clarkston	10/20/2020 7:52 PM
45	Anatone	10/20/2020 7:41 PM
46	Clarkston	10/20/2020 6:31 PM
47	Anatone	10/20/2020 1:36 PM
48	Asotin	10/20/2020 1:31 PM
49	Asotin	10/20/2020 1:10 PM
50	unincorporated	10/20/2020 1:08 PM
51	Asotin	10/20/2020 12:47 PM
52	Clarkston	10/20/2020 12:11 PM
53	Asotin	10/20/2020 12:10 PM
54	Asotin County	10/20/2020 12:10 PM
55	Cloverland	10/20/2020 12:06 PM

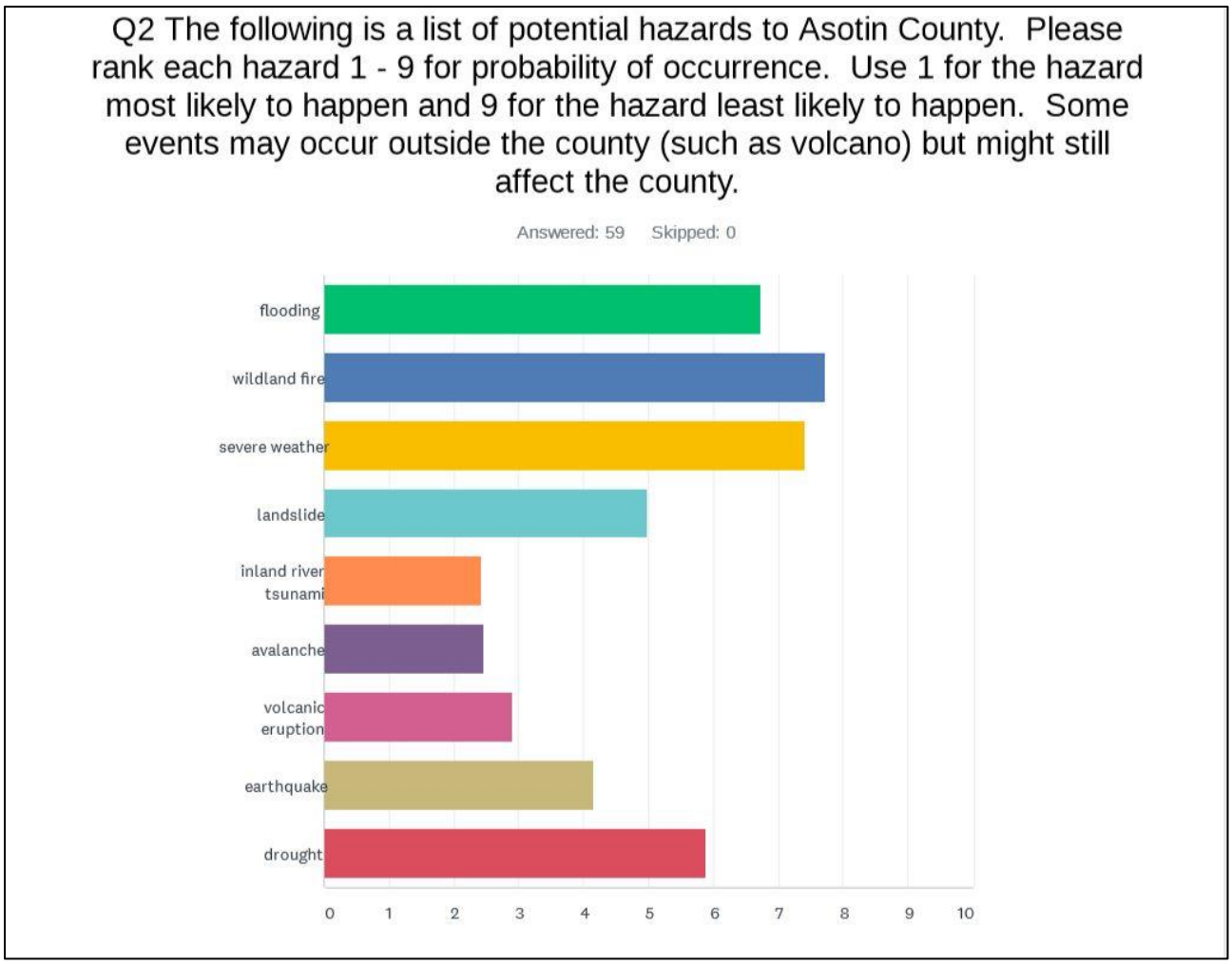
Item 26: Individual Responses to Question 1 from those who stated they work in Asotin County (51 responses)

#	WORK:	DATE
1	Asotin	11/3/2020 10:19 AM
2	Clarkston DSHS	10/30/2020 9:03 PM
3	Lewiston, idaho	10/30/2020 10:11 AM
4	N/A	10/30/2020 8:30 AM
5	Asotin	10/30/2020 7:34 AM
6	Clarkston	10/29/2020 8:20 AM
7	Clarkston	10/28/2020 1:11 PM
8	Retired	10/28/2020 12:49 PM
9	Lewiston Idaho	10/28/2020 11:45 AM
10	Clarkston	10/28/2020 10:03 AM
11	Linkus enterpriseS	10/28/2020 9:58 AM
12	Clarkston Heights	10/28/2020 9:48 AM
13	retired	10/28/2020 9:44 AM
14	Clarkston	10/28/2020 9:32 AM
15	NA	10/27/2020 11:57 PM
16	Clarkston	10/27/2020 8:11 PM
17	N/a	10/27/2020 8:01 PM
18	retired	10/27/2020 7:49 PM
19	Asotin	10/27/2020 4:29 PM
20	CLARKSTON	10/27/2020 4:27 PM
21	Retired	10/27/2020 2:26 PM
22	Clarkston	10/27/2020 1:58 PM
23	Lewiston	10/27/2020 12:46 PM
24	Lewiston	10/27/2020 12:26 PM
25	Clarkston fire	10/27/2020 12:01 PM
26	Costco	10/27/2020 11:34 AM
27	Clarkston	10/27/2020 11:34 AM
28	Downtown Clarkston	10/27/2020 10:44 AM
29	Lewiston	10/26/2020 12:49 AM
30	Clarkston	10/25/2020 2:11 AM
31	Clarkston downtown	10/24/2020 9:22 PM
32	retired	10/22/2020 7:54 PM
33	From home	10/22/2020 7:08 PM
34	Clarkston	10/22/2020 5:02 AM
35	Asotin	10/21/2020 7:40 PM
36	Grouse Flat, Anatone Zip Code, Unincorporated	10/21/2020 2:21 PM
37	Retired	10/21/2020 10:11 AM

Hazards in Asotin County

38	Cloverland	10/21/2020 9:52 AM
39	Anatone	10/21/2020 9:19 AM
40	County wide	10/21/2020 8:08 AM
41	Anatone	10/21/2020 7:25 AM
42	Timbered portions + WDFW ownership	10/21/2020 7:07 AM
43	same	10/21/2020 6:09 AM
44	Retired	10/20/2020 7:52 PM
45	Clarkston	10/20/2020 7:41 PM
46	Asotin	10/20/2020 6:31 PM
47	Clarkston	10/20/2020 1:10 PM
48	unincorporated	10/20/2020 1:08 PM
49	Retired	10/20/2020 12:10 PM
50	City of Asotin	10/20/2020 12:10 PM
51	Clarkston	10/20/2020 12:06 PM

Item 27: Question 2 Summary

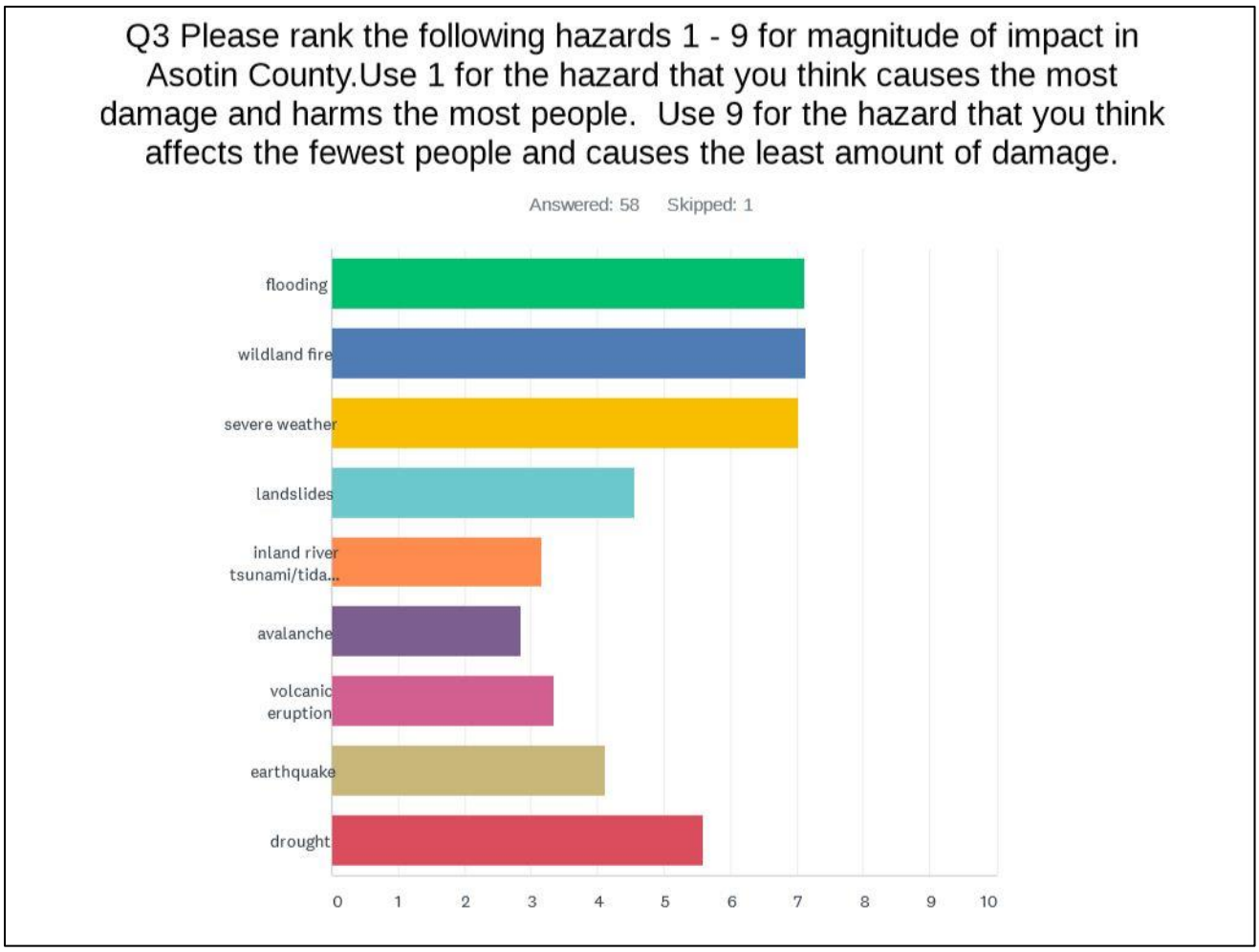


Item 28: Question 2 Summary

Hazards in Asotin County

	1	2	3	4	5	6	7	8	9	TOTAL	SCORE
flooding	13.46% 7	23.08% 12	23.08% 12	15.38% 8	15.38% 8	7.69% 4	1.92% 1	0.00% 0	0.00% 0	52	6.73
wildland fire	39.62% 21	26.42% 14	18.87% 10	7.55% 4	1.89% 1	1.89% 1	1.89% 1	1.89% 1	0.00% 0	53	7.72
severe weather	27.27% 15	27.27% 15	23.64% 13	12.73% 7	1.82% 1	3.64% 2	3.64% 2	0.00% 0	0.00% 0	55	7.40
landslide	0.00% 0	3.85% 2	3.85% 2	26.92% 14	36.54% 19	17.31% 9	3.85% 2	7.69% 4	0.00% 0	52	4.98
inland river tsunami	1.96% 1	0.00% 0	1.96% 1	1.96% 1	3.92% 2	11.76% 6	17.65% 9	19.61% 10	41.18% 21	51	2.43
avalanche	0.00% 0	0.00% 0	0.00% 0	0.00% 0	3.85% 2	17.31% 9	21.15% 11	36.54% 19	21.15% 11	52	2.46
volcanic eruption	1.85% 1	1.85% 1	3.70% 2	5.56% 3	0.00% 0	11.11% 6	27.78% 15	24.07% 13	24.07% 13	54	2.91
earthquake	1.72% 1	1.72% 1	3.45% 2	10.34% 6	24.14% 14	24.14% 14	20.69% 12	6.90% 4	6.90% 4	58	4.16
drought	15.52% 9	10.34% 6	24.14% 14	15.52% 9	12.07% 7	3.45% 2	3.45% 2	3.45% 2	12.07% 7	58	5.88

Item 29: Question 3 Summary



Item 30: Question 3 Summary

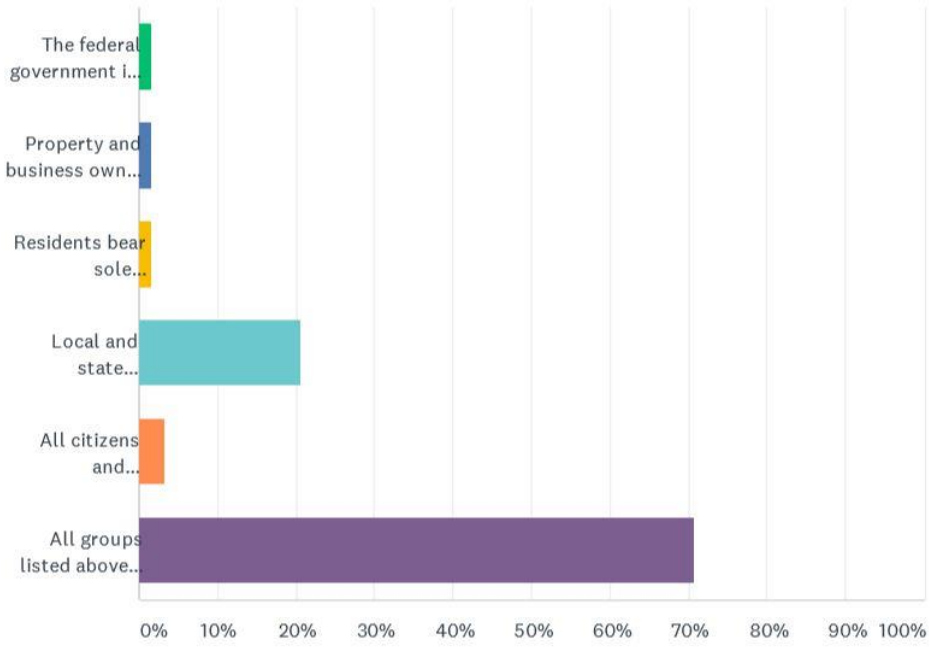
Hazards in Asotin County

	1	2	3	4	5	6	7	8	9	TOTAL	SCORE
flooding	27.27% 15	10.91% 6	30.91% 17	16.36% 9	9.09% 5	1.82% 1	3.64% 2	0.00% 0	0.00% 0	55	7.11
wildland fire	25.00% 14	33.93% 19	14.29% 8	8.93% 5	5.36% 3	5.36% 3	3.57% 2	1.79% 1	1.79% 1	56	7.14
severe weather	17.31% 9	30.77% 16	19.23% 10	17.31% 9	7.69% 4	3.85% 2	0.00% 0	3.85% 2	0.00% 0	52	7.02
landslides	0.00% 0	3.85% 2	0.00% 0	21.15% 11	34.62% 18	15.38% 8	15.38% 8	7.69% 4	1.92% 1	52	4.56
inland river tsunami/tidal wave	3.85% 2	1.92% 1	3.85% 2	5.77% 3	7.69% 4	9.62% 5	17.31% 9	25.00% 13	25.00% 13	52	3.15
avalanche	0.00% 0	3.64% 2	0.00% 0	1.82% 1	7.27% 4	16.36% 9	23.64% 13	25.45% 14	21.82% 12	55	2.85
volcanic eruption	5.45% 3	5.45% 3	3.64% 2	3.64% 2	9.09% 5	10.91% 6	12.73% 7	18.18% 10	30.91% 17	55	3.35
earthquake	1.85% 1	0.00% 0	12.96% 7	11.11% 6	11.11% 6	25.93% 14	14.81% 8	12.96% 7	9.26% 5	54	4.13
drought	19.30% 11	10.53% 6	14.04% 8	14.04% 8	7.02% 4	8.77% 5	8.77% 5	3.51% 2	14.04% 8	57	5.58

Item 31: Question 4 Summary

Q4 Hazard Mitigation is "any action taken to reduce or eliminate long-term risk to people and property from natural disasters".Who should be working on hazard mitigation? Who bears the responsibility to mitigate hazards and reduce or eliminate long-term risk from natural disasters?

Answered: 58 Skipped: 1

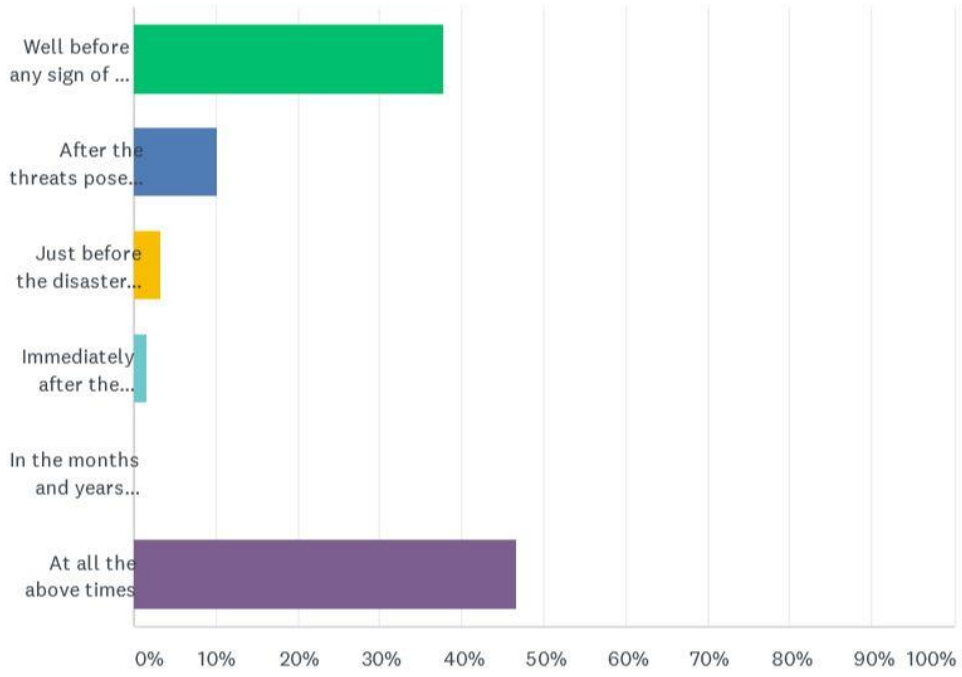


ANSWER CHOICES	RESPONSES	
The federal government is required to mitigate hazards for their constituents.	1.72%	1
Property and business owners bear sole responsibility to mitigate the hazards in their community.	1.72%	1
Residents bear sole responsibility to mitigate the hazards in their community.	1.72%	1
Local and state governments should be taking on the bulk of the responsibility of hazard mitigation.	20.69%	12
All citizens and non-government groups, including property owners, churches, civic organizations, and businesses should be working together to mitigate hazards but the government should largely stay out of this.	3.45%	2
All groups listed above should partner to mitigate hazards and each group bears some responsibility.	70.69%	41
TOTAL		58

Item 32: Question 5 Summary

Q5 Thinking of a timeline, when should hazard mitigation take place in relationship to a disaster event (such as a flood, and earthquake, or a wildfire)?

Answered: 58 Skipped: 1



ANSWER CHOICES	RESPONSES	
Well before any sign of a disaster and during basic community planning.	37.93%	22
After the threats posed by a given hazard are recognized but before any sign of a disaster occurring.	10.34%	6
Just before the disaster strikes and when the threat is imminent; after signs are recognized that a disaster will occur soon.	3.45%	2
Immediately after the disaster strikes as part of the response plan in dealing with the disaster itself.	1.72%	1
In the months and years following the disaster; as part of the recovery plan in dealing with the effects of the disaster.	0.00%	0
At all the above times	46.55%	27
TOTAL		58

Item 33: Question 6 Summary

Hazards in Asotin County

Q6 Can you think of an example of how you, your neighbors, local organizations, or the government, has applied some form of hazard mitigation in your community? Please briefly describe the situation.

Answered: 40 Skipped: 19

Item 34: Question 6 Individual Responses (40 responses)

1	none	11/3/2020 10:19 AM
2	No	11/3/2020 8:52 AM
3	No	10/30/2020 9:03 PM
4	No	10/30/2020 10:11 AM
5	The only think i can think of is the news reporting an event is coming like flooding, bad weather, and air quality	10/30/2020 9:00 AM
6	During fire season and 4th of July sprayed down my wood pile and cut down weeds.	10/30/2020 8:30 AM
7	Don't know	10/28/2020 12:49 PM
8	you have your emergency providers but honestly a plan for a plan for a plan for a plan is the best plan	10/28/2020 11:45 AM
9	N/A	10/28/2020 10:03 AM
10	No If you have a cabin or property thin the surrounding timber	10/28/2020 9:58 AM
11	Some neighbors are great about keeping weeds and vegetation trimmed and healthy	10/28/2020 9:48 AM
12	Weed control	10/28/2020 9:44 AM
13	No	10/28/2020 9:32 AM
14	The stormwater "program"/fee but I'm not sure what if anything is actually done with the funds collected	10/27/2020 8:11 PM
15	Storm drains	10/27/2020 8:01 PM
16	keeping trees trimmed and brushcut back	10/27/2020 7:49 PM
17	The over stepping of authority by the state and local governments by shutting down the state and city for the coronavirus pandemic. Each individual should be able to make logical and comments sense decisions.	10/27/2020 4:27 PM
18	Fire protection	10/27/2020 2:26 PM
19	N/A	10/27/2020 12:01 PM
20	No	10/27/2020 11:34 AM
21	not really	10/27/2020 11:34 AM
22	Fire fighting	10/27/2020 10:44 AM
23	Our HOA requires undeveloped lots to be mown at least once each summer. While I believe this is for aesthetics in our neighborhood, I believe that it also helps mitigate fire danger.	10/24/2020 9:22 PM
24	Cattle grazing, home owners managing their land. NO fireworks!	10/22/2020 7:08 PM
25	Active shooter drills	10/22/2020 5:02 AM
26	Wildfire mitigation outreach from DNR to local, private landowners.	10/21/2020 2:21 PM
27	The Corp of Engineers many years ago put a major dike system on Asotin Creek which has helped keep many places from flooding.	10/21/2020 10:11 AM
28	Mowing ditches, spraying weeds, keeping water tanks full in case of fire.	10/21/2020 9:52 AM
29	For a very small community Blue Mountain Fire is prepared. Could be a little better but they have an amazing community effort.	10/21/2020 9:19 AM
30	Wildfire fuels reduction in forestland.	10/21/2020 8:08 AM
31	Keeping fire fuels down in our area	10/21/2020 7:25 AM
32	Firewise principles surrounding defensible space. Building codes. Forest and fuels treatments (including logging) which modify the forest fuel structure and create a more ecologically	10/21/2020 7:07 AM

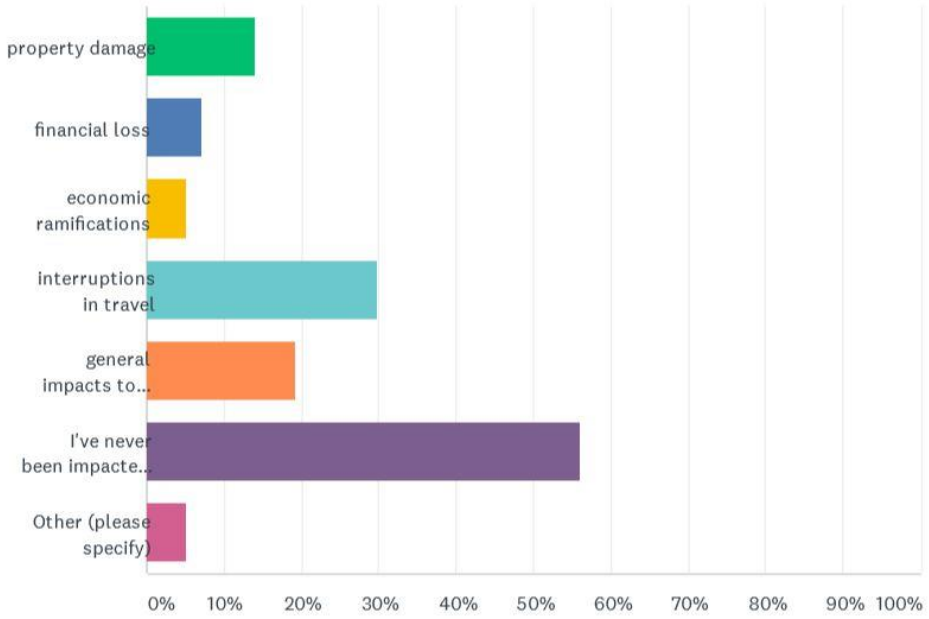
Hazards in Asotin County

	balanced forest vegetation type. Road construction and associated standards. Roadside vegetation management. Educational programs for landowners/homeowners identifying preplanning and firewise education.	
33	Forming BMFD1 fire district & Firewise	10/21/2020 6:09 AM
34	None to my knowledge	10/20/2020 7:52 PM
35	As part of the local fire district we formed the district to be better organized and trained for fires and other events that may occur. We also try to educate the public in ways to be safer.	10/20/2020 7:41 PM
36	Clearing land to prevent fires	10/20/2020 1:31 PM
37	Don't know	10/20/2020 1:10 PM
38	Cutting down trees around our cabin in anatone	10/20/2020 12:47 PM
39	Don't know.	10/20/2020 12:10 PM
40	Wildland Fires a few years ago. Government along with private citizens and communities pull together resources and information. From the appearance of a local citizens view, was awesome team work .	10/20/2020 12:10 PM

Item 35: Question 7 Summary

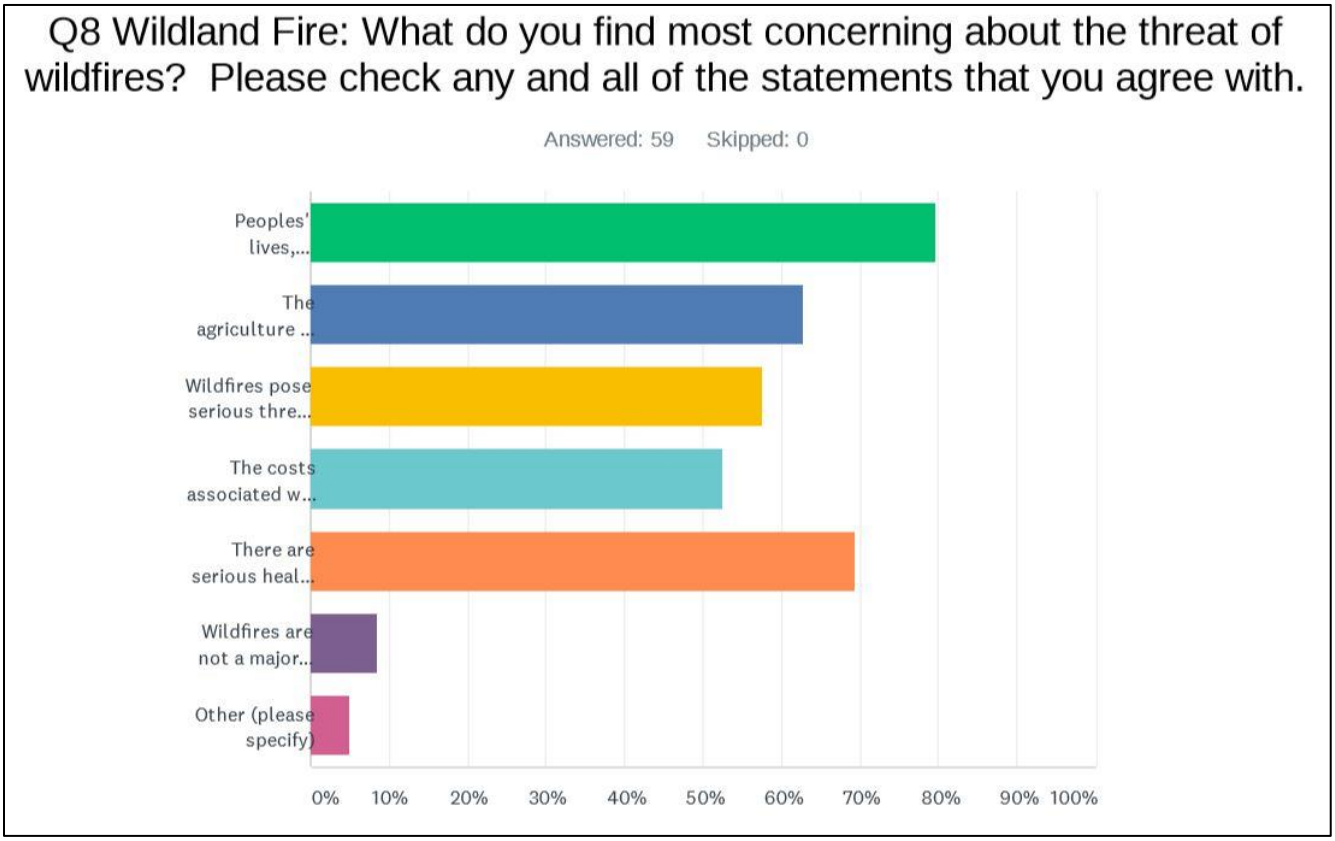
Q7 Flood: In the past five years, have you experienced a flood event in a direct and substantial way on at least one occasion? If yes, check a box next to the kind of impact the flood event had on you. Check all that apply.

Answered: 57 Skipped: 2



ANSWER CHOICES	RESPONSES	
property damage	14.04%	8
financial loss	7.02%	4
economic ramifications	5.26%	3
interruptions in travel	29.82%	17
general impacts to daily life	19.30%	11
I've never been impacted by flooding	56.14%	32
Other (please specify)	5.26%	3
Total Respondents: 57		

Item 36: Question 8 Summary

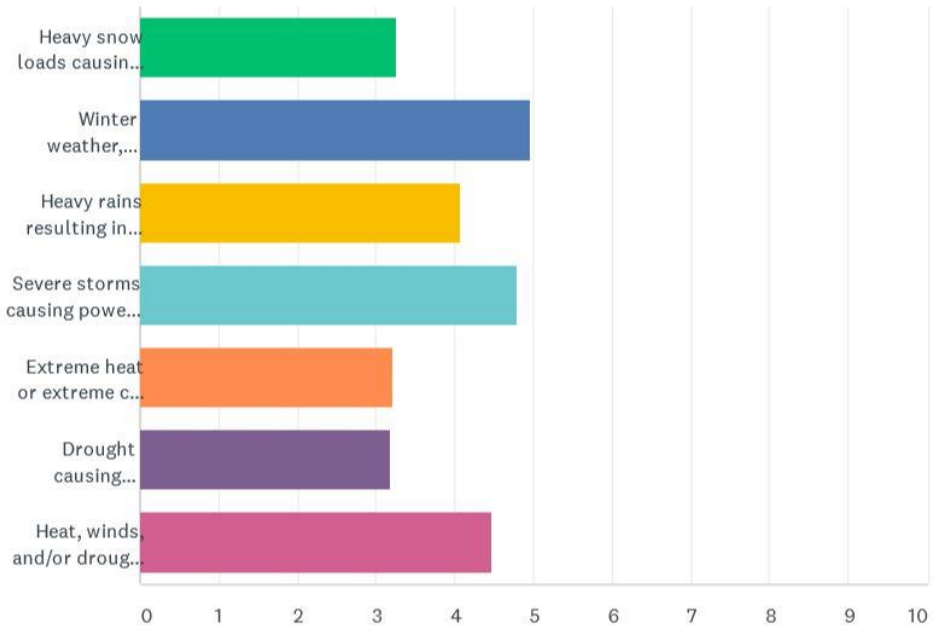


ANSWER CHOICES	RESPONSES	
Peoples' lives, livelihoods, and property are at risk	79.66%	47
The agriculture and timber industries are directly threatened by wildfire activity in the region.	62.71%	37
Wildfires pose serious threats to natural ecosystems and wildlife habitat.	57.63%	34
The costs associated with wildfire response and recovery are going to have disastrous financial consequences.	52.54%	31
There are serious health risks associated with breathing in wildfire smoke.	69.49%	41
Wildfires are not a major concern to Asotin County at this time.	8.47%	5
Other (please specify)	5.08%	3
Total Respondents: 59		

Item 37: Question 9 Summary

Q9 Severe Weather: What types of severe weather events carry the most risk in Asotin County? What kinds of weather is Asotin County most vulnerable to? Please rank these categories 1 - 7 with 1 being of most concern and 7 being of least concern.

Answered: 58 Skipped: 1



	1	2	3	4	5	6	7	TOTAL	SCORE
Heavy snow loads causing safety issues and potential building damage	3.77% 2	20.75% 11	9.43% 5	5.66% 3	15.09% 8	15.09% 8	30.19% 16	53	3.26
Winter weather, including wind, ice, and snow, making routine travel hazardous	23.08% 12	15.38% 8	28.85% 15	11.54% 6	11.54% 6	7.69% 4	1.92% 1	52	4.96
Heavy rains resulting in unusual flooding or flash flooding beyond normal seasonal flooding	11.54% 6	11.54% 6	13.46% 7	26.92% 14	17.31% 9	11.54% 6	7.69% 4	52	4.08
Severe storms causing power outages or property damage, such as wind or hail damage	23.08% 12	9.62% 5	21.15% 11	26.92% 14	11.54% 6	3.85% 2	3.85% 2	52	4.79
Extreme heat or extreme cold resulting in medical emergencies due to exposure	3.57% 2	12.50% 7	12.50% 7	5.36% 3	23.21% 13	26.79% 15	16.07% 9	56	3.23
Drought causing agricultural damage, resulting in personal and regional economic losses	5.56% 3	11.11% 6	9.26% 5	11.11% 6	18.52% 10	20.37% 11	24.07% 13	54	3.17
Heat, winds, and/or drought leading to extreme fire danger conditions	27.59% 16	18.97% 11	6.90% 4	12.07% 7	3.45% 2	15.52% 9	15.52% 9	58	4.47

Item 38: Question 10 Summary

Hazards in Asotin County

Q10 Can you identify a potential mitigation project in your community that would reduce the impacts of any hazards? What kind of funding, resources, and support, would you need to complete this project?

Answered: 36 Skipped: 23

Item 39: Question 10 Individual Responses (36 responses)

1	None	11/3/2020 10:19 AM
2	No	11/3/2020 8:52 AM
3	No	10/30/2020 9:03 PM
4	No	10/30/2020 10:11 AM
5	We are required to wear masks for a virus now, why not come up with more ways to safeguard against natural disasters. How about safe buildings to go to and stay when flash floods happen and people cant remain in their home or stay in it due to damage, having a crew help shovel snow for people who cant physically do it, more food drives and more donations for clothing items not just in facilities like old folks homes. Have it donation based, have the schools do fundraisers for it, create a scholarship out of it to get kids motivated to act, businesses to participate. Dont just go to big business, go to the ma and pop stores too.	10/30/2020 9:00 AM
6	Can't think of anything other than all the trees people have allowed to over grow on their personal property. If a fire went through here there would be lots of fuel, but being it's all private property I doubt they would take kindly to me barging in and telling them it needs to be cut back.	10/30/2020 8:30 AM
7	Regular trucks deicing the roads early enough for people who work at early times to get to work safely too	10/29/2020 8:20 AM
8	Government, State funding	10/28/2020 12:49 PM
9	no	10/28/2020 11:45 AM
10	?	10/28/2020 10:03 AM
11	Not currently	10/28/2020 9:58 AM
12	Unsure	10/28/2020 9:48 AM
13	No	10/28/2020 9:32 AM
14	Not sure what resources the county is lacking	10/27/2020 8:11 PM
15	n/a	10/27/2020 7:49 PM
16	Making sure citizens, landowners, neighbors, keep their own property in good clean condition. Weeds in control. Trees in good condition. Cite property owners that let property get rundown and become a fire hazard.	10/27/2020 4:27 PM
17	Clear firelines	10/27/2020 2:26 PM
18	N/A	10/27/2020 12:01 PM
19	No	10/27/2020 11:34 AM
20	no	10/27/2020 11:34 AM
21	The Asotin County Hazard Mitigation Plan.	10/27/2020 11:20 AM
22	I'd like to see a park built in several Heights neighborhoods. It helps with fire mitigation (green space) as well as erosion. Trees can help decrease the affects of wind in wind prone areas, which can also help decrease fire activity/spread. And it is an environment that can absorb more moisture during severe storms/heavy rains (as opposed to undeveloped or paved land).	10/24/2020 9:22 PM
23	more grazing of public lands	10/22/2020 7:54 PM
24	Evacuation drills, for fast moving fire. Asotin has one main road out. Alt routes lead into rural areas.	10/22/2020 5:02 AM
25	Funding to reduce wildfire fuels in privately owned and federally owned lands. Education to homeowners located within timber areas for creating defensible spaces.	10/21/2020 2:21 PM
26	We presently are collecting flood control money. I think some of it should used to prevent some major problems before they arise. Removing some old dead trees along stream banks could help reduce flooding problems.	10/21/2020 10:11 AM

Hazards in Asotin County

27	More water storage capacity, along with pumping capacity and well drilling. Not sure what the associated costs would be.	10/21/2020 9:52 AM
28	Blue mountain fire could use a Fire Station and a part time training officer/emt	10/21/2020 9:19 AM
29	Fuels reduction in forestland, reduction of invasive weeds on rangeland. Need more financial assistance for landowners to complete these activities.	10/21/2020 8:08 AM
30	Establishment of firewise communities, education on firewise topics. Cost share for landowner based forest health improvement projects (preferably this could include commercial stands). Advanced CWPP Planning and timely updates (more than every 10 years). Doing our part to encourage restoration of late successional ecologial function to stands on the National Forest lands which heavily implact boardering private lands. overall education for landowners on fuels treatments which will keep us from ending up in the same place as Colfax/Malden.	10/21/2020 7:07 AM
31	Build a fire station in Anatone. Any and all funding available	10/21/2020 6:09 AM
32	Question 9 would not let me put a number in they were all ready in 1 thru 7 I could not change it....□□	10/20/2020 7:52 PM
33	Education for rural areas, funding for emergency services in rural and unincorporated areas.	10/20/2020 7:41 PM
34	What if Hell's canyon dam failed. You didn't address that.	10/20/2020 1:10 PM
35	Better communication	10/20/2020 12:47 PM
36	Don't know.	10/20/2020 12:10 PM

FEMA Worksheets Consulted

FEMA Worksheet 4.1 Capability Assessment

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan		
Capital Improvements Plan		
Economic Development Plan		
Local Emergency Operations Plan		
Continuity of Operations Plan		
Transportation Plan		
Stormwater Management Plan		
Community Wildfire Protection Plan		
Other special plans (i.e., brownfields redevelopment ,disaster recovery, coastal zone management, climate change adaptation)		

Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?
Building Code		
Building Code Effectiveness Grading Schedule (BCEGS) Score		
Fire department ISO rating		
Site plan review requirements		
Land Use Planning and Ordinances	**Yes/No**	**Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?**
Zoning ordinance		
Subdivision ordinance		
Floodplain ordinance		
Natural hazard specific ordinance (stormwater, steep slope, wildfire)		
Flood insurance rate maps		
Acquisition of land for open space and public recreation uses		
Other		
How can these capabilities be expanded and improved to reduce risk?		

Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission		
Mitigation Planning Committee		
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems		
Mutual aid agreements		
Staff	**Yes/No FT/PT[96]**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official		
Floodplain Administrator		
Emergency Manager		
Community Planner		
Civil Engineer		
GIS Coordinator		
Other		

[96] Full-time (FT) or part-time (PT) position

Technical	Yes/No	Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services (Reverse 911, outdoor warning signals)		
Hazard data and information		
Grant writing		
Hazus analysis		
Other		
How can these capabilities be expanded and improved to reduce risk?		

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding		
Authority to levy taxes for specific purposes		
Fees for water, sewer, gas, or electric services		
Impact fees for new development		
Storm water utility fee		

Incur debt through general obligation bonds and/or special tax bonds		
Incur debt through private activities		
Community Development Block Grant		
Other federal funding programs		
State funding programs		
Other		
How can these capabilities be expanded and improved to reduce risk?		

Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.		
Natural disaster or safety related school programs		
StormReady certification		

Firewise Communities certification		
Public-private partnership initiatives addressing disaster-related issues		
Other		
How can these capabilities be expanded and improved to reduce risk?		

Jurisdiction ***Asotin County***

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Yes 1999	No, No, No
Capital Improvements Plan	Yes /	Jail added to the Plan but overall no, mostly for land use I believe
Economic Development Plan	Yes / 2018-2023	The county is part of the SWEDA.org plan www.SEWEDA.ORG which I assume includes both cities as well. On the website, the publications have different updates and reports.
Local Emergency Operations Plan	Yes 2014	Yes it addresses all potential hazards. This is next up for being re-written completely after the MP is done.
Continuity of Operations Plan	No	
Transportation Plan	Yes 2019	Public Works has a 5 years transportation plan and the MPO also has plans for roads, bikes and pedestrians.
Stormwater Management Plan	Yes 2010	https://asotincountystormwater.com/
Community Wildfire Protection Plan	No	The CWPP is dated July 9th, 2008 and is being incorporated into this new plan.
Other special plans (i.e., brownfields redevelopment ,disaster recovery, coastal zone management, climate change adaptation)	Yes / 2017	Shoreline management plan through Asotin County. No, No, No just regulates land use / development on the shoreline.
Building Code, Permitting, and Inspections	**Yes/No**	**Are codes adequately enforced?**
Building Code	Yes	yes
Building Code Effectiveness Grading Schedule (BCEGS) Score	UNK	Don't know what this is
Fire department ISO rating	Yes	ISO protection Class 5 for ACFD #1
Site plan review requirements	Yes	yes

Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Yes 2019	Yes and yes
Subdivision ordinance	Yes 2019	Yes and yes
Floodplain ordinance	Yes	Yes and yes
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	No	Yes see stormwater, ,yes critical area ordinance 2018, and wetlands ordinance and yes
Flood insurance rate maps	No	No
Acquisition of land for open space and public recreation uses	Don't know	Need to ask Assessor
Other		

How can these capabilities be expanded and improved to reduce risk?
I would think it would be helpful to have flood insurance rate maps available for use and in a GIS. The City of Asotin doesn't have them either.

Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	Yes	Yes, reviews all land use applications
Mitigation Planning Committee	Yes	Established to update this plan. So far so good!
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	Yes	County road crews perform all maintenance need for County
Mutual aid agreements	Yes	Fire and Police agencies

Staff	Yes/No FT/PT[97]	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Yes / FT	Karst - County Planner, Yes, yes, yes
Floodplain Administrator	Yes	Karst - County Planner yes, yes yes
Emergency Manager	Yes	Mark J. 50% Emergency management duties, 50% 911 duties
Community Planner	Yes	Karst – County Planner
Civil Engineer	Yes	Public Works Director is the County Engineer
GIS Coordinator	Yes	GIS coordinator works for the public works director
Other / Road Supervisor	Yes	The road supervisor operates under the direction of the Public Works Director
Technical	**Yes/No**	**Describe capability Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)	No	Do not have a warning system other than the EAS system for TV and Radio.
Hazard data and information	No	We do have some dam failure data and inundation flooding maps?
Grant writing	No	No designated person, each department writes and manages their own grants.
Hazus analysis	No	no
Other		
How can these capabilities be expanded and improved to reduce risk?		

[97] Full-time (FT) or part-time (PT) position

Asotin County is one of a hand full of counties with no warning system or reverse 911 system.

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Transportation and Sewer Plant
Authority to levy taxes for specific purposes	Yes	2/10ths for PTBA (transportation)
Fees for water, sewer, gas, or electric services	no	
Impact fees for new development	No	
Storm water utility fee	Yes	Implemented through Asotin County Regional storm water. Also some funding from department of ecology
Incur debt through general obligation bonds and/or special tax bonds	Yes	Jail ??? (new)
Incur debt through private activities	Yes	????
Community Development Block Grant	Yes	Not used
Other federal funding programs	Yes	Federal Highway STP funds, PDM – Mitigatoin Grants
State funding programs	Yes	Ecology storm water grant and transportation roads projects
Other		
How can these capabilities be expanded and improved to reduce risk?		

Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	Ranger rain – storm water (Ask Jeff), 911 Public Education, Fire Wise, National Night Out
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	Yes	Fire Department safety and public education Police Department community outreach. Fire Wise – conservation district
Natural disaster or safety related school programs	No	
StormReady certification	No	
Firewise Communities certification	No	Conservation district?
Public-private partnership initiatives addressing disaster-related issues	No	
Other		

How can these capabilities be expanded and improved to reduce risk?

Jurisdiction: Asotin City

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Yes	No No Yes
Capital Improvements Plan	No	
Economic Development Plan	Yes	SEWEDA
Local Emergency Operations Plan	Yes	Yes
Continuity of Operations Plan	No	
Transportation Plan	Yes	Yes
Stormwater Management Plan	Yes	Yes
Community Wildfire Protection Plan	No	
Other special plans (i.e., brownfields redevelopment ,disaster recovery, coastal zone management, climate change adaptation)	Yes	Shoreline Master Plan
Building Code, Permitting, and Inspections	**Yes/No**	**Are codes adequately enforced?**
Building Code	Yes	Yes
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	7
Site plan review requirements	Yes	Yes

Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Yes	Yes Yes
Subdivision ordinance	Yes	Yes Yes
Floodplain ordinance	Yes	County
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Yes	Stormwater, Comprehensive Plan
Flood insurance rate maps	No	County
Acquisition of land for open space and public recreation uses	Yes	WWRDA Bill (CORP Engineers Land)
Other		
How can these capabilities be expanded and improved to reduce risk?		

Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	Yes	Yes
Mitigation Planning Committee	No	County
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	Yes	Yes
Mutual aid agreements	Yes	

Staff	**Yes/No FT/PT98**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Yes	Part Time In Process of City Review and Change
Floodplain Administrator	Yes	Through County
Emergency Manager	Yes	Through County
Community Planner	Yes	City Council/Staff Joint, Not specific person
Civil Engineer	*	By Contract
GIS Coordinator	No	
Other	Yes	Road Supervisor under Public Works
Technical	**Yes/No**	**Describe capability Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)	No	
Hazard data and information	Yes	Hazmat and MSDS
Grant writing	*	Each Department Specific
Hazus analysis	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		

[98] Full-time (FT) or part-time (PT) position

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	No	
Authority to levy taxes for specific purposes	Yes	EMS Levy, Levy Lid lift, Street Levy No
Fees for water, sewer, gas, or electric services	No	Reserved Funds No
Impact fees for new development	No	
Storm water utility fee	Yes	Yes, Conjunction w/ County No
Incur debt through general obligation bonds and/or special tax bonds	Yes	USDA Sewer Plant, Grant/Loan, Water Upgrade No
Incur debt through private activities	No	Loan P1FCU Yes
Community Development Block Grant	Yes	Street Furniture Grant No
Other federal funding programs	Yes	USDA, Street Grants, Wastewater T.P., Stormwater, Ecology No
State funding programs	Yes	TIB, Streets Grants No
Other		
How can these capabilities be expanded and improved to reduce risk?		

Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	Ranger Drain Program through Stormwater
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	Yes	Fire, PUD, Conservation, Quality Behavior Health,
Natural disaster or safety related school programs	Yes	Law Enforcement Safety Schools
StormReady certification	No	
Firewise Communities certification		?? Conservation District
Public-private partnership initiatives addressing disaster-related issues	No	
Other		

How can these capabilities be expanded and improved to reduce risk?

Jurisdiction _____ City of Clarkston _____

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Yes 2019	
Capital Improvements Plan	Yes	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes 2014	Yes it addresses all potential hazards
Continuity of Operations Plan	No	
Transportation Plan	Yes 2019	
Stormwater Management Plan	Yes 2017	
Community Wildfire Protection Plan	No	
Other special plans (i.e., brownfields redevelopment ,disaster recovery, coastal zone management, climate change adaptation)	Yes	Shoreline management plan through Asotin County
Building Code, Permitting, and Inspections	**Yes/No**	**Are codes adequately enforced?**
Building Code	Yes 2015	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	ISO protection Class 5
Site plan review requirements	Yes 2015	

Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Yes 2019	
Subdivision ordinance	Yes 2019	
Floodplain ordinance	Yes	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	No	
Flood insurance rate maps	No	
Acquisition of land for open space and public recreation uses	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		

Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	Yes	
Mitigation Planning Committee	No	
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	Yes	
Mutual aid agreements	Yes	Fire and Police agencies

Staff	Yes/No FT/PT[99]	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Yes	
Floodplain Administrator	No	
Emergency Manager	No	
Community Planner	No	
Civil Engineer	Yes	
GIS Coordinator	No	
Other		
Technical	**Yes/No**	**Describe capability** **Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)	No	
Hazard data and information	No	
Grant writing	Yes	
Hazus analysis	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		

[99] Full-time (FT) or part-time (PT) position

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Transportation and Sewer Plant
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	Yes	Not implemented yet
Storm water utility fee	Yes	Implemented through Asotin County Regional storm water
Incur debt through general obligation bonds and/or special tax bonds	Yes	Sewer Plant
Incur debt through private activities	No	
Community Development Block Grant	Yes	Not used
Other federal funding programs	Yes	Federal Highway STP funds
State funding programs	Yes	Ecology storm water grant
Other		
How can these capabilities be expanded and improved to reduce risk?		

Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	Yes	Fire Department safety and public education Police Department community outreach
Natural disaster or safety related school programs	No	
StormReady certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	
Other		

How can these capabilities be expanded and improved to reduce risk?

Jurisdiction: Asotin County Fire District # 1

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	No	
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	Yes	
Community Wildfire Protection Plan	Yes	
Other special plans (i.e., brownfields redevelopment ,disaster recovery, coastal zone management, climate change adaptation)		
Building Code, Permitting, and Inspections	**Yes/No**	**Are codes adequately enforced?**
Building Code	Yes	Yes
Building Code Effectiveness Grading Schedule (BCEGS) Score		
Fire department ISO rating	5	Yes

Site plan review requirements	Yes	Yes
Land Use Planning and Ordinances	**Yes/No**	**Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?**
Zoning ordinance	Yes	Yes
Subdivision ordinance	Yes	Yes, when enforced properly.
Floodplain ordinance		
Natural hazard specific ordinance (stormwater, steep slope, wildfire)		
Flood insurance rate maps		
Acquisition of land for open space and public recreation uses		
Other		
How can these capabilities be expanded and improved to reduce risk?		

Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	**Yes/No**	**Describe capability Is coordination effective?**
Planning Commission		
Mitigation Planning Committee		
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems		

Mutual aid agreements		
Staff	**Yes/No FT/PT100**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Yes	
Floodplain Administrator		
Emergency Manager	Yes	For the moment yes.
Community Planner		
Civil Engineer		
GIS Coordinator	Yes	Yes
Other		
Technical	**Yes/No**	**Describe capability Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)		
Hazard data and information		
Grant writing		
Hazus analysis		
Other		
How can these capabilities be expanded and improved to reduce risk?		

[100] Full-time (FT) or part-time (PT) position

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	New fire station, new equipment. Need training props.
Authority to levy taxes for specific purposes		
Fees for water, sewer, gas, or electric services		
Impact fees for new development		
Storm water utility fee		
Incur debt through general obligation bonds and/or special tax bonds	Yes	We have two bonds out on new station project
Incur debt through private activities		
Community Development Block Grant	Yes	We received a community development block grant for new station
Other federal funding programs	Yes	American Firefighter grants are available annually
State funding programs	Yes	Some small state grants are available
Other		
How can these capabilities be expanded and improved to reduce risk?		

Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	Yes	On going education
Natural disaster or safety related school programs		
StormReady certification		
Firewise Communities certification		
Public-private partnership initiatives addressing disaster-related issues		
Other		

How can these capabilities be expanded and improved to reduce risk?

Jurisdiction – Asotin County Conservation District

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan		
Capital Improvements Plan		
Economic Development Plan		
Local Emergency Operations Plan		
Continuity of Operations Plan		
Transportation Plan		
Stormwater Management Plan		
Community Wildfire Protection Plan	Yes 2005	ACCD was a partner in the development of the Asotin County CWPP
Other special plans (i.e., brownfields redevelopment ,disaster recovery, coastal zone management, climate change adaptation)	Yes	2018 – Asotin Geomorphic Assessment and Conceptual Restoration Plan 2021 – Grande Ronde and Snake River Geomorphic Assessment and Conceptual Restoration Plan
Building Code, Permitting, and Inspections	**Yes/No**	**Are codes adequately enforced?**
Building Code		
Building Code Effectiveness Grading Schedule (BCEGS) Score		
Fire department ISO rating		
Site plan review requirements		

Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance		
Subdivision ordinance		
Floodplain ordinance		
Natural hazard specific ordinance (stormwater, steep slope, wildfire)		
Flood insurance rate maps		
Acquisition of land for open space and public recreation uses		
Other		
How can these capabilities be expanded and improved to reduce risk?		

Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission		
Mitigation Planning Committee		
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems		
Mutual aid agreements		

Staff	**Yes/No FT/PT101**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official		
Floodplain Administrator		
Emergency Manager		
Community Planner		
Civil Engineer		
GIS Coordinator		
Other	Yes 4 FT 1 PT	Conservation District technical staff coordinate with agencies and landowners in Asotin County to plan and implement activities that protect and enhance natural resources which support hazard mitigation efforts.
Technical	**Yes/No**	**Describe capability Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)		
Hazard data and information		
Grant writing	Yes	ACCD staff writes grants for funding for planning and implementation activities that protect and enhance natural resources which support hazard mitigation efforts.
Hazus analysis		
Other		
How can these capabilities be expanded and improved to reduce risk?		

[101] Full-time (FT) or part-time (PT) position

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	ACCD seeks and receives funding to implement projects that include stream habitat improvement, fish passage, forest fuel reduction and watershed health.
Authority to levy taxes for specific purposes		
Fees for water, sewer, gas, or electric services		
Impact fees for new development		
Storm water utility fee		
Incur debt through general obligation bonds and/or special tax bonds		
Incur debt through private activities		
Community Development Block Grant		
Other federal funding programs	Yes	Bonneville Power Administration contracts for fish habitat projects
State funding programs	Yes	Grant funding from WA Conservation Commission (WSCC), Department of Ecology (DOE) and Recreation and Conservation Office (RCO) to implement natural resource enhancement and protection projects
Other		
How can these capabilities be expanded and improved to reduce risk?		

Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	Yes	Outreach tours and materials that promote and educate landowners regarding opportunities and benefits for natural resource enhancement and protection projects
Natural disaster or safety related school programs		
StormReady certification		
Firewise Communities certification	Yes	ACCD has provided funding and education to assist homeowners with implementing Firewise actions on an individual basis
Public-private partnership initiatives addressing disaster-related issues	Yes	ACCD works with private and public landowners to plan and implement natural resource protection and enhancement projects
Other		

How can these capabilities be expanded and improved to reduce risk?

Jurisdiction _Blue Mountain Fire District #1

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	no	
Capital Improvements Plan	no	
Economic Development Plan	no	
Local Emergency Operations Plan	no	
Continuity of Operations Plan	no	
Transportation Plan	no	
Stormwater Management Plan	no	
Community Wildfire Protection Plan	yes	This plan is old and outdated. Needs to be renewed
Other special plans (i.e., brownfields redevelopment ,disaster recovery, coastal zone management, climate change adaptation)		
Building Code, Permitting, and Inspections	**Yes/No**	**Are codes adequately enforced?**
Building Code	?	
Building Code Effectiveness Grading Schedule (BCEGS) Score	?	
Fire department ISO rating	10	
Site plan review requirements	?	

Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	?	
Subdivision ordinance	?	
Floodplain ordinance	?	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	?	
Flood insurance rate maps	?	
Acquisition of land for open space and public recreation uses	?	
Other		
How can these capabilities be expanded and improved to reduce risk?		

Administrative and Technical

Identify whether your community has the following administrative and technical capabilities. These include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	NO	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	No	
Mutual aid agreements	Yes	ACFD#1, City of Asotin, WA DNR, USFS, Wheatland Fire YES

Staff	Yes/No FT/PT[102]	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	No	
Floodplain Administrator	No	
Emergency Manager	No	
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Other		
Technical	**Yes/No**	**Describe capability** **Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)	No	
Hazard data and information	No	
Grant writing	No	
Hazus analysis	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		

[102] Full-time (FT) or part-time (PT) position

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/ Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	No	
Authority to levy taxes for specific purposes	No	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	No	
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	No	
State funding programs	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		

Education and Outreach

Identify education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	NoNo	
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	No	
Natural disaster or safety related school programs	No	
StormReady certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	
Other		

How can these capabilities be expanded and improved to reduce risk?

FEMA Worksheet 5.1 Hazard Summary Worksheet

Worksheet 5.1
Hazard Summary Worksheet

Hazards Summary Worksheet

Use this worksheet to summarize hazard description information and identify which hazards are most significant to the planning area. The definitions provided on the following page can be modified to meet local needs and methods.

Hazard	Location (Geographic Area Affected)	Maximum Probable Extent (Magnitude/Strength)	Probability of Future Events	Overall Significance Ranking
Avalanche				
Dam Failure				
Drought				
Earthquake				
Erosion				
Expansive Soils				
Extreme Cold				
Extreme Heat				
Flood				
Hail				
Hurricane				
Landslide				
Lightning				
Sea Level Rise				
Severe Wind				
Severe Winter Weather				
Storm Surge				
Subsidence				
Tornado				
Tsunami				
Wildfire				

Worksheet 5.1

Hazard Summary Worksheet

Definitions for Classifications

Location (Geographic Area Affected)

- **Negligible:** Less than 10 percent of planning area or isolated single-point occurrences
- **Limited:** 10 to 25 percent of the planning area or limited single-point occurrences
- **Significant:** 25 to 75 percent of planning area or frequent single-point occurrences
- **Extensive:** 75 to 100 percent of planning area or consistent single-point occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)

- **Weak:** Limited classification on scientific scale, slow speed of onset or short duration of event, resulting in little to no damage
- **Moderate:** Moderate classification on scientific scale, moderate speed of onset or moderate duration of event, resulting in some damage and loss of services for days
- **Severe:** Severe classification on scientific scale, fast speed of onset or long duration of event, resulting in devastating damage and loss of services for weeks or months
- **Extreme:** Extreme classification on scientific scale, immediate onset or extended duration of event, resulting in catastrophic damage and uninhabitable conditions

Hazard	Scale / Index	Weak	Moderate	Severe	Extreme
Drought	Palmer Drought Severity Index[3]	-1.99 to +1.99	-2.00 to -2.99	-3.00 to -3.99	-4.00 and below
Earthquake	Modified Mercalli Scale[4]	I to IV	V to VII	VII	IX to XII
	Richter Magnitude[5]	2, 3	4, 5	6	7, 8
Hurricane Wind	Saffir-Simpson Hurricane Wind Scale[6]	1	2	3	4, 5
Tornado	Fujita Tornado Damage Scale[7]	F0	F1, F2	F3	F4, F5

Probability of Future Events

- **Unlikely:** Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.
- **Occasional:** 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
- **Likely:** 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years
- **Highly Likely:** 90 to 100 percent probability of occurrence in the next year or a recurrence interval of less than 1 year.

Overall Significance

- **Low:** Two or more criteria fall in lower classifications or the event has a minimal impact on the planning area. This rating is sometimes used for hazards with a minimal or unknown record of occurrences or for hazards with minimal mitigation potential.
- **Medium:** The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is sometimes used for hazards with a high extent rating but very low probability rating.
- **High:** The criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area.

3 Cumulative meteorological drought and wet conditions: http://ncdc.noaa.gov/

4 Earthquake intensity and effect on population and structures: http://earthquake.usgs.gov

5 Earthquake magnitude as a logarithmic scale, measured by a seismograph: http://earthquake.usgs.gov

6 Hurricane rating based on sustained wind speed: http://nhc.noaa.gov

7 Tornado rating based on wind speed and associated damage: http://spc.noaa.gov

FEMA Worksheet 6.1 Mitigation Action Evaluation Worksheet

Worksheet 6.1
Mitigation Action Evaluation Worksheet

Mitigation Action Evaluation Worksheet

Use this worksheet to help evaluate and prioritize each mitigation action being considered by the planning team. For each action, evaluate the potential benefits and/or likelihood of successful implementation for the criteria defined below.

Rank each of the criteria with a -1, 0 or 1 using the following scale:

- 1 = Highly effective or feasible
- 0 = Neutral
- -1 = Ineffective or not feasible

Example Evaluation Criteria

Life Safety – How effective will the action be at protecting lives and preventing injuries?

Property Protection – How significant will the action be at eliminating or reducing damage to structures and infrastructure?

Technical – Is the mitigation action technically feasible? Is it a long-term solution? Eliminate actions that, from a technical standpoint, will not meet the goals.

Political – Is there overall public support for the mitigation action? Is there the political will to support it?

Legal – Does the community have the authority to implement the action?

Environmental – What are the potential environmental impacts of the action? Will it comply with environmental regulations?

Social – Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?

Administrative – Does the community have the personnel and administrative capabilities to implement the action and maintain it or will outside help be necessary?

Local Champion – Is there a strong advocate for the action or project among local departments and agencies that will support the action's implementation?

Other Community Objectives – Does the action advance other community objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of the comprehensive plan?

Worksheet 6.1

Mitigation Action Evaluation Worksheet

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
Local Plans and Regulations											
Structure and Infrastructure Projects											
Natural Systems Protection											
Education and Awareness Programs											