Gilliam County
MULTI-JURISDICTION NATURAL HAZARDS MITIGATION PLAN

- Gilliam County
- City of Arlington
- City of Condon
- City of Lonerock

Effective {DATE} 2018 through {DATE}, 2023
The 2018 Gilliam County Multi-Jurisdictional Natural Hazards Mitigation Plan is a living document that will be reviewed and updated periodically. Comments, suggestions, corrections, and additions are enthusiastically encouraged to be submitted from all interested parties.

For further information and to provide comments, contact:

Chris Fitzsimmons, Emergency Manager
Gilliam County
211 South Oregon Street, Oregon 97823
Telephone: 541-384-2851
Email: chris.fitz@co.gilliam.or.us
Special Thanks & Acknowledgements

Gilliam County developed this Multi-Jurisdictional Natural Hazards Mitigation Plan through a regional partnership funded by the Federal Emergency Management Agency’s Pre-Disaster Mitigation Grant Program. FEMA awarded the grant to support the update of natural hazards mitigation plans for eight counties in the region. The region’s planning process utilized a four-phased planning process and plan development support provided by the University of Oregon’s Institute for Policy Research and Engagement (IPRE) which includes the Resource Assistance for Rural Environments (RARE), and the Oregon Partnership for Disaster Resilience (OPDR). This project would not have been possible without technical and financial support provided by the Department of Land Conservation and Development (DLCD). In 2017, DLCD received two Pre-Disaster Mitigation grants (PDMC-PL-10-OR-2016-003 and PDMC-PL-10-OR-2016-005) from FEMA through the Oregon Emergency Management (OEM) to assist Gilliam County and seven other counties with their NHMPs.

Regional partners include:

- Department of Land Conservation and Development (DLCD)
- Oregon Office of Emergency Management (OEM)
- FEMA Region X
- Oregon Partnership for Disaster Resilience at the Institute for Policy Research and Engagement (IPRE)
- Resource Assistance to Rural Environments at the University of Oregon’s Community Service Center

**Gilliam County NHMP Steering Committee:**

Convener: Chris Fitzsimmons, Coordinator, Gilliam County Emergency Management

Susie Anderson, Planner, Gilliam County Planning Department

Gary Bettencourt, Sheriff, Gilliam County Sheriff’s Office

Shannon Coppock, Coordinator, Gilliam County Fire Services

Brian Foster, City of Arlington Public Works

Dewey Kennedy, Road Master, Gilliam County Road Department

Paul O’Dell, Mayor, City of Lonerock

Gibb Wilkins, Assistant, City of Condon Public Works

Chet Wilkins, Assessor, Gilliam County Assessor’s Office
City of Arlington NHMP Steering Committee:
Convener: Pam Rosenbalm, City Recorder, City of Arlington
Chris Fitzsimmons, Coordinator, Gilliam County Emergency Management
Brian Foster, City of Arlington Public Works

City of Condon NHMP Steering Committee:
Convener: Gibb Wilkins, Assistant, City of Condon Public Works
Chris Fitzsimmons, Coordinator, Gilliam County Emergency Management
Kathyrn Greiner, City Administrator, City of Condon

City of Lonerock NHMP Steering Committee:
Convener: Paul O'dell, Mayor, City of Lonerock
Aletta Clark, Citizen, City of Lonerock
Jim Crandall, Citizen, City of Lonerock
Chris Fitzsimmons, Coordinator, Gilliam County Emergency Management
Karen O’dell, City of Lonerock

Project Managers:
Nicolia Mehrling, Resource Assistance for Rural Environments
Chris Fitzsimmons, Coordinator, Gilliam County Emergency Management
Tricia Sears, Natural Hazards Planner, Department of Land Conservation and Development

Institute for Policy Research and Engagement Staff:
Megan Smith, Director, Resource Assistance for Rural Environments; Co-Director, Community Service Center
Michael Howard, Assistant Program Director, Oregon Partnership for Disaster Resilience
Titus Tomlinson, Program Coordinator, Resource Assistance for Rural Environments
Aniko Drlik-Muehleck, Project Coordinator
Julie Foster, Grants Administrator, Community Service Center
Geographic Information Systems (GIS) Maps:

Map developed by the following entities contributed to the plan update process. The contributions from these departments were essential in illustrating the extent and potential losses associated with the natural hazards affecting the community:

Department of Geology and Mineral Industries
Federal Emergency Management Agency
U.S. Geological Survey

About the Department of Land Conservation and Development

Oregon’s statewide land use planning program — originated in 1973 under Senate Bill 100 — provides protection of farm and forest lands, conservation of natural resources, orderly and efficient development, coordination among local governments, and citizen involvement. The program affords all Oregonians predictability and sustainability to the development process by allocating land for industrial, commercial and housing development, as well as transportation and agriculture. The Department of Land Conservation and Development (DLCD) administers the program. A seven-member volunteer citizen board known as the Land Conservation and Development Commission (LCDC) guides DLCD.

Under the program, all cities and counties have adopted comprehensive plans that meet mandatory state standards. The standards are 19 Statewide Planning Goals that deal with land use, development, housing, transportation, and conservation of natural resources. Periodic review of plans and technical assistance in the form of grants to local jurisdictions are key elements of the program.¹

About the Institute for Policy Research and Engagement

The Institute for Policy Research and Engagement (IPRE), a research center affiliated with the School of Planning, Public Policy, and Management at the University of Oregon, is an interdisciplinary organization that assists Oregon communities by providing planning and technical assistance to help solve local issues and improve the quality of life for Oregon residents. The role of the IPRE is to link the skills, expertise, and innovation of higher education with the transportation, economic development, and environmental needs of communities and regions in the State of Oregon, thereby providing service to Oregon and learning opportunities to the students involved.

About the Oregon Partnership for Disaster Resilience

The Oregon Partnership for Disaster Resilience (OPDR) is a coalition of public, private, and professional organizations working collectively toward the mission of creating a disaster-resilient and sustainable state. Developed and coordinated by the Institute for Policy Research

¹ About Us; Oregon Department of Land Conservation and Development; http://www.oregon.gov/LCD/Pages/about_us.aspx
and Engagement at the University of Oregon, the OPDR employs a service-learning model to increase community capacity and enhance disaster safety and resilience statewide.

About Resource Assistance to Rural Environments

Resource Assistance for Rural Environments (RARE) is an AmeriCorps program administered through the University of Oregon’s Institute for Policy Research and Engagement. RARE is currently supported through grants from the Corporation for National & Community Service (AmeriCorps), The Ford Family Foundation, the University of Oregon, the Oregon Food Bank, the Federal Emergency Management Agency, the Oregon Department of Transportation, and other agencies. In addition, each participating community provides $19,000 of approximately $32,000 needed to place, train, and support a full-time RARE member.

Plan Template Disclaimer

This Natural Hazards Mitigation Plan update is based in part on a plan template developed by the University of Oregon’s Institute for Policy Research and Engagement (IPRE) - Oregon Partnership for Disaster Resilience (OPDR) and used in the 2013 Gilliam County NHMP. OPDR provided copies of the plan templates to communities for use in developing or updating their natural hazards mitigation plans at that time. OPDR hereby authorizes the use of all content and language provided to Gilliam County in the plan template. The template is structured to address the requirements contained in 44 CFR 201.6; where language is applicable to communities throughout Oregon, OPDR encourages the use of standardized language. However, emphasis is placed on identifying and describing the unique attributes of the counties and cities for each plan. The basic format of the 2013 NHMP has been retained for this 2018 NHMP update.
# Gilliam County

**Multi-jurisdictional Natural Hazards Mitigation Plan**

## Table of Contents

**Volume I: Multi-Jurisdictional Natural Hazards Mitigation Plan**

- Executive Summary
  
- Section 1: Introduction
- Section 2: Risk Assessment
- Section 3: Mitigation Strategy
- Section 4: Plan Implementation and Maintenance

**Volume II: Jurisdictional Addenda**

- City of Arlington Addendum
- City of Condon Addendum
- City of Lonerock Addendum

**Volume II: Mitigation Resources**

- Appendix A: Action Item Forms
- Appendix B: Planning and Public Process
- Appendix C: Community Profile
- Appendix D: Economic Analysis
- Appendix E: Survey Results
- Appendix F: Grant Programs
- Appendix G: Oregon Climate Change Research Institute (OCCRI) Report
Volume I: Multi-Jurisdictional Natural Hazards Mitigation Plan
Gilliam County developed this Multi-jurisdictional Natural Hazards Mitigation Plan in an effort to prepare for the long-term effects resulting from natural hazards. This plan was developed with and for the following jurisdictions: Gilliam County, the City of Arlington, the City of Condon, and the City of Lonerock. It is impossible to predict exactly when these hazards will occur, or the extent to which they will affect the community. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to create a resilient community that will benefit from long-term recovery planning efforts.

The Federal Emergency Management Agency (FEMA) defines mitigation as “... the effort to reduce loss of life and property by lessening the impact of disasters ... through risk analysis, which results in information that provides a foundation for mitigation activities that reduce risk.” Said another way, natural hazard mitigation is a method of reducing or alleviating the losses of life, property, and injuries resulting from natural hazards through long and short-term strategies.

Example strategies include policy changes, such as updated ordinances, projects, such as seismic retrofits to critical facilities; and education and outreach to targeted audiences, such as Spanish speaking residents or the elderly. Natural hazard mitigation is the responsibility of the “Whole Community” – as defined by FEMA this includes individuals, families, businesses and industries, faith and community based organizations, non-profits, media outlets, schools and academia, and state, local and federal governments (https://www.fema.gov/whole-community).

**Why Develop this Mitigation Plan?**

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K) and the regulations contained in 44 CFR 201 require that jurisdictions maintain an approved NHMP in order to receive federal funds for mitigation projects. Local and federal approval of this plan ensures that the County and listed Cities will remain eligible for pre- and post-disaster mitigation grant funds.

**Who Participated in Developing the Plan?**

Gilliam County Natural Hazards Mitigation Plan is the result of a collaborative effort between the County, Cities, special districts, citizens, public agencies, non-profit organizations, the private sector, and regional organizations. A project Steering Committee guided the plan...
development process. The project Steering Committee included representatives from the following organizations.

- City of Arlington
- City of Condon
- City of Lonerock
- Gilliam County Assessor’s Office
- Gilliam County Emergency Management Department
- Gilliam County Fire Services
- Gilliam County Planning Department
- Gilliam County Road Department
- Gilliam County Sheriff’s Office

The Steering Committee meetings occurred between April and June 2018. See Section B, Plan Implementation and Process for details on the NHMP participation and outreach during the update process.

Other organizations that were involved in this 2018 NHMP update include: the Oregon Department of Land Conservation and Development and the University of Oregon’s Institute for Policy Research and Engagement, which involved both the Oregon Partnership for Disaster Resilience and the Resource Assistance for Rural Environments.

Gilliam County Emergency Management convened the planning process and will take the lead in implementing, maintaining, and updating the plan. Public participation played a key role in the development of goals and action items.

How Does this Mitigation Plan Reduce Risk?

This Natural Hazards Mitigation Plan is intended to assist Gilliam County, the City of Arlington, the City of Condon, and the City of Lonerock reduce the risk from natural hazards by identifying resources, information, and strategies for risk reduction. It is also intended to guide and coordinate mitigation activities throughout the County. A risk assessment consists of three phases: hazard identification, vulnerability assessment, and risk analysis, as illustrated in the following graphic.
By identifying and understanding the relationship between natural hazards, vulnerable systems, and existing capacity, communities in Gilliam County are better equipped to identify and implement actions aimed at reducing the overall risk to natural hazards.

**What is the County’s Overall Risk to Hazards?**

Gilliam County reviewed and updated their risk assessment to evaluate the probability of each hazard as well as the vulnerability of the community to that hazard. In addition, the Cities of Arlington, Condon, and Lonerock Steering Committees reviewed the recently updated Gilliam County risk assessment to compare risk and vulnerability particular to their jurisdiction. Table ES.1 and ES.2, below, summarize hazard probability and vulnerability for the County and Cities as determined by the respective Steering Committees.

Table ES.1 shows that the Cities have the same probability ratings as the County for the winter storm, volcanic event, and earthquake hazards. The Cities have different probability ratings than the County for the drought, flood, wildfire and windstorm hazards. The County and Cities did not identify landslides as a distinct hazard; landslides are included in this NHMP as a component of winter storm events.
Table ES.1 Risk Assessment - Probability

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Gilliam County</th>
<th>Arlington</th>
<th>Condon</th>
<th>Lonerock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Flood</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Wildfire</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Windstorm</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: Gilliam County, Arlington, Condon and Lonerock NHMP Steering Committees

Table ES.2 shows the vulnerability ratings as determined by the County and City Steering Committees during their hazard risk assessment evaluations. The table shows that there is significant variability in vulnerability between the County and the participating Cities.

Table ES.2 Risk Assessment - Vulnerability

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Gilliam County</th>
<th>Arlington</th>
<th>Condon</th>
<th>Lonerock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Flood</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Wildfire</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Windstorm</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Source: Gilliam County, Arlington, Condon and Lonerock NHMP Steering Committees

What are the Plan Goals?

The plan goals describe the overall direction that the participating jurisdiction’s agencies, organizations, and citizens can take toward mitigating risk from natural hazards.

1. Safety of life and the preservation of property and industry.
2. Increased cooperation and collaboration between groups and agencies.
3. Motivate the public, private sector, and government agencies to mitigate against the effects of natural hazards through information and education.

How are the Action Items Organized?

The action items are organized within an action matrix (located at the end of this Summary),
which lists all the multi-hazard and hazard-specific mitigation action items included in the mitigation plan. Data collection, research and the public participation process resulted in the development of the action items. The Action Item Matrix, in Table 3.1, portrays the overall plan framework and identifies linkages between the plan goals, and actions. The matrix documents the title of each action along with, the coordinating organization, timeline, and the plan goals addressed. See Section 3 Mitigation Strategy, Tables 3.1 and 3.2, for the mitigation actions identified for this 2018 NHMP update. See Appendix A, Action Item Forms, for additional details on each of the mitigation actions.

How will the plan be implemented?

The plan maintenance section of this plan details the formal process that will ensure that the Gilliam County Natural Hazards Mitigation Plan remains an active and relevant document. The plan will be implemented, maintained and updated by a designated convener. The convener is responsible for overseeing the review processes. Cities and special districts developing jurisdiction specific information to the County plan will also designate a convener and will work closely with the County convener to maintain coordination. The plan maintenance process includes a schedule for monitoring and evaluating the plan semi-annually and producing a plan revision every five years. This section describes how the communities will integrate public participation throughout the plan maintenance process.

Plan Adoption

After the plan is locally reviewed and deemed complete the Gilliam County Emergency Management Coordinator submits it to the State Hazard Mitigation Officer at Oregon Emergency Management. Oregon Emergency Management reviews the plan and submits it to the Federal Emergency Management Agency (FEMA – Region X) for review.

The FEMA review will address the criteria outlined in FEMA Interim Final Rule 44 CFR Part 201.6. Once the plan is pre-approved by FEMA, indicated by a letter provided from FEMA to the county called the “Approval Pending Adoption” the county will then formally adopt the plan via resolution. The participating individual jurisdiction’s conveners will be responsible for obtaining local adoption of the Gilliam County Natural Hazards Mitigation Plan and providing the support necessary to ensure plan implementation. In this plan that would be the Cities of Arlington, Condon, and Lonerock. Once the resolution is executed at the local level and documentation is provided to FEMA, the plan is formally acknowledged by FEMA with an approval letter. With this, the county maintains eligibility for the Hazard Mitigation Assistance grant funds called the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Programs, and the Flood Mitigation Assistance program.
The accomplishment of the Natural Hazards Mitigation Plan goals and actions depends upon the maintenance of a competent Steering Committee and adequate support from the County and City departments reflected in the plan in incorporating the mitigation action items into existing County plans and procedures. It is hereby directed that the appropriate County departments and programs implement and maintain the concepts in this plan. Thorough familiarity with this NHMP will result in the efficient and effective implementation of appropriate mitigation activities and a reduction in the risk and the potential for loss from future natural hazard events.

The Gilliam County Court adopted the plan on \{DATE\}, per Resolution \#\#

The City of Arlington adopted the plan on \{DATE\}, per Resolution \#\#

The City of Condon adopted the plan on \{DATE\}, per Resolution \#\#

The City of Lonerock adopted the plan on \{DATE\}, per Resolution \#\#

FEMA Region X approved the Gilliam County Multi-jurisdictional NHMP on \{DATE\}. With approval of this plan, the entities listed above are now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act’s hazard mitigation project grants through \{DATE, 2023\}.
SECTION 1: INTRODUCTION

This section provides a general introduction to natural hazards mitigation planning in Gilliam County. In addition, this section addresses the planning process requirements contained in 44 CFR 201.6(b) thereby meeting the planning process documentation requirement contained in 44 CFR 201.6(c)(1). The section concludes with a general description of how the plan is organized.

What is Natural Hazard Mitigation?

The Federal Emergency Management Agency (FEMA) defines mitigation as “... the effort to reduce loss of life and property by lessening the impact of disasters ... through risk analysis, which results in information that provides a foundation for mitigation activities that reduce risk.” Said another way, natural hazard mitigation is a method of reducing or alleviating the losses of life, property, and injuries resulting from natural hazards through long and short-term strategies. Example strategies include policy changes, such as updated ordinances, projects, such as seismic retrofits to critical facilities; and education and outreach to targeted audiences, such as Spanish speaking residents or the elderly. Natural hazard mitigation is the responsibility of the “Whole Community” – as defined by FEMA this includes individuals, families, businesses and industries, faith and community based organizations, non-profits, media outlets, schools and academia, and state, local and federal governments (https://www.fema.gov/whole-community).

Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities, and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

Why Develop a Mitigation Plan?

Gilliam County developed this multi-jurisdictional Natural Hazards Mitigation Plan in an effort to reduce future loss of life and damage to property resulting from natural hazards. This plan was developed with and for the following jurisdictions: Gilliam County, the City of Arlington, the City of Condon, and the City of Lonerock. It is impossible to predict exactly when natural hazard events will occur, or the extent to which they will affect community assets. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from natural hazards.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K) and the regulations contained in 44 CFR 201 require that jurisdictions maintain an approved NHMP in order to receive federal funds for mitigation projects. Local and federal approval of this plan ensures that the County and listed Cities will remain eligible for pre- and post-disaster mitigation grant funds.
What Federal Requirements Does This Plan Address?

The Disaster Mitigation Act of 2000 (DMA 2000) is the latest federal legislation addressing natural hazards mitigation planning. It reinforces the importance of mitigation planning and emphasizes planning for natural hazards before they occur. As such, this Act established the Pre-Disaster Mitigation (PDM) grant program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). Section 322 of the Act specifically addresses mitigation planning at the state and local levels. State and local jurisdictions must have approved mitigation plans in place in order to qualify to receive post-disaster HMGP funds. Mitigation plans must demonstrate that their proposed mitigation measures are based on a sound planning process that accounts for the risk to the individual and their capabilities.

Development of the local mitigation plan update process was pursued in compliance with subsections from 44 CFR 201.6 guidelines. These four subsections address plan requirements, the planning process, plan content, and plan review. Subsection (a) provides an outline of the overall plan requirements, including an overview of general plan components, exceptions to requirements, and multi-jurisdictional participation. Subsection (b) outlines the requirements of the planning process, with particular focus on public involvement in the update process, as well as the role of local agencies, organizations and other relevant entities in the development process, as well as standards for adequate levels of review and incorporation of existing plans and policies. Subsection (c) outlines requirements concerning the plan update’s content, including an overview of necessary components for the update’s planning process, risk assessment, mitigation strategy, plan maintenance, and overall process documentation. Subsection (d) outlines the steps and agencies required for proper review of the plan before finished plans are adopted by their respective communities.

What is the Policy Framework for Natural Hazards Planning in Oregon?

Planning for natural hazards is an integral element of Oregon’s statewide land use planning program, which began in 1973. All Oregon cities and counties have comprehensive plans and implementing ordinances that are required to comply with the statewide planning goals. The challenge faced by state and local governments is to keep this network of local plans coordinated in response to the changing conditions and needs of Oregon communities.

Statewide Planning Goal 7: Areas Subject to Natural Hazards calls for local plans to include inventories, policies and ordinances to guide development in or away from hazard areas. Goal 7, along with other land use planning goals, has helped to reduce losses from natural hazards. Through risk identification and the recommendation of risk-reduction actions, this plan aligns with the goals of Gilliam County’s and the Cities Comprehensive Plans, and helps each jurisdiction meet the requirements of Statewide Planning Goal 7.

The primary responsibility for the development and implementation of risk reduction strategies and policies lies with local jurisdictions. However, resources exist at the state and federal levels. Some of the key agencies in this area include Oregon Emergency Management (OEM), Oregon Building Codes Division (BCD), Oregon Department of Forestry (ODF), Oregon Department of Geology and Mineral Industries (DOGAMI), and the Department of Land Conservation and Development (DLCD).
How was the Plan Developed?

The first Gilliam County Natural Hazards Mitigation Plan was developed and approved in 2008. The 2018 plan update process marks the second update and third version of the County’s NHMP. This updated NHMP replaces prior versions of the plan.

2018 Plan Update Process

The plan was developed following a schedule developed by the Department of Land Conservation and Development in collaboration with Gilliam County and University of Oregon. Figure 1.1, NHMP Update Timeline, shows the timeline that was developed for completion of the updates to sections of the NHMP. It was altered as needed throughout the process to reflect then-current levels of progress.

Figure 1.1: NHMP Update Timeline

<table>
<thead>
<tr>
<th>Stage 1 Work Session</th>
<th>Organize Resources</th>
<th>March</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 2 Work Session</td>
<td>Risk Assessment</td>
<td>April</td>
</tr>
<tr>
<td>Stage 3 Work Session</td>
<td>Mission, Goals, Actions</td>
<td>May</td>
</tr>
<tr>
<td>Stage 4 Work Session</td>
<td>Implementation &amp; Maintenance</td>
<td>May</td>
</tr>
<tr>
<td>Stage 5</td>
<td>Final Plan Preparation</td>
<td>June - July</td>
</tr>
<tr>
<td>Stage 6</td>
<td>Plan Implementation</td>
<td></td>
</tr>
</tbody>
</table>

Source: Oregon Partnership for Disaster Resilience, 2012 and updated in 2018

Gilliam County funded the 2018 update of the Natural Hazards Mitigation Plan through partnership with the Federal Emergency Management Agency (FEMA), the Department of Land Conservation and Development (DLCD), and the University of Oregon Resource Assistance for Rural Environments Program (RARE). In 2017, DLCD received two Pre-Disaster Mitigation grants (PDMC-PL-10-OR-2016-003 and PDMC-PL-10-OR-2016-005) from FEMA through the Oregon Emergency Management (OEM) to assist Gilliam County and seven other counties with their NHMPs.

The Gilliam County Emergency Management Department served as the convener for Gilliam County Natural Hazards Mitigation Plan update process. The Gilliam County Emergency Management Coordinator developed a Steering Committee to review and update the NHMP and to oversee the planning process. The committee included both existing members from the
prior plan updates and new partners to ensure that County departments and special districts maintained active participation in the process. Between April 2018 and June 2018, the Steering Committee convened for two update meetings. Also during the update process, each City in Gilliam County held a risk assessment meeting to identify and analyze community vulnerabilities for each hazard addressed in the plan. Volume III: Appendix B: *Planning and Public Process* includes meeting materials for each of the plan update meetings.

**County Survey and Public Outreach**

Public outreach began early on in the spring of 2018; the RARE participant developed a survey that was included in the public notice of the plan update on the County and City websites (with the exception of Lonerock). The voluntary survey consisted of eight questions regarding natural hazard information; community vulnerabilities and hazard mitigation strategies; mitigation and preparedness activities in your household; and general household information. The RARE participant designed the survey to determine public perceptions and opinions regarding natural hazards. Briefly describe how it was shared/made available to the public. The County received 26 responses. Volume III: Appendix E: *Survey Results* includes the survey and results.

During early stages of the planning process, pre-existing plans, studies, reports and other technical information from Gilliam County were identified and reviewed for inclusion in the updated plan. Information and policy cultivated from this review was used to inform updates of the County’s community profile, risk assessment and mitigation strategy sections, and listed where appropriate for general reference.

**How is the Plan Organized?**

Each volume of the NHMP provides specific information and resources to assist readers in understanding the hazard-specific issues facing County citizens, businesses, and the environment. Combined, the sections work in synergy to create a mitigation plan that furthers the community’s effort to reduce loss of life and property by lessening the impact of disasters. This plan structure enables stakeholders to use the section(s) of interest to them.

**Volume I: Multi-jurisdictional Natural Hazards Mitigation Plan**

**Section 1: Introduction**

The Introduction briefly describes the countywide mitigation planning efforts and the methodology used to develop the plan.

**Section 2: Risk Assessment**

Section 2 provides the factual basis for the mitigation strategies contained in Section 3.

This section provides an overall description of hazards that impact Gilliam County. A hazard summary is provided for each of the hazards addressed in the plan. The summary includes hazard characteristics, history, location and extent, vulnerability and probability. The hazard specifically addressed and included with this plan are the following:

- Drought;
• Earthquake;
• Flood;
• Volcanic Event;
• Wildfire;
• Windstorm; and
• Winter Storm (includes landslides)

This section allows readers to gain an understanding of the County’s sensitivities — those community assets and characteristics that may be impacted by natural hazards, as well as the County’s resilience — the ability to manage risk and adapt to hazard event impacts.

Section 3: Mitigation Strategy

This section documents the plan goals and actions and also describes the components that guide implementation of the identified mitigation strategies. Actions are based on community sensitivity and resilience factors and the hazard assessments in Section 2 and the Oregon NHMP’s Region 5: Regional Profile and Risk Assessment.

Section 4: Plan Implementation and Maintenance

This section provides information on the implementation and maintenance of the plan. It describes the process for prioritizing projects, and includes a suggested list of tasks for updating the plan to be completed at the semi-annual and five-year review meetings. The participating cities and north and south Gilliam County Fire Districts will utilize this implementation and maintenance process as well.

Volume II: Jurisdictional Addenda

Volume II of the plan is reserved for any city or special district addenda developed through this multi-jurisdictional planning process. Each of the Cities within the County participated in the NHMP process and created an addendum. As such, the five-year update cycle will be the same for all of the Cities and the County. This plan includes addenda for the jurisdictions of the Cities of Arlington, Condon, and Lonerock.

Special districts did not create addenda for this version of the NHMP, however, they may be included in future updates. See the “Acknowledgements” section in this plan’s cover pages for a list of the people who participated in the development of this NHMP, including those that represent special districts.

Volume III: Mitigation Resources

The mitigation resources are designed to provide the users of the Gilliam County Multi-jurisdictional Natural Hazards Mitigation Plan with additional information to assist them in understanding the contents of the mitigation plan, and provide them with potential resources to assist with plan implementation.
Appendix A: Action Item Forms

This appendix contains the detailed action item forms for each of the mitigation strategies identified in this plan.

Appendix B: Planning and Public Process

This appendix includes documentation of all the countywide public processes utilized to develop the plan. It includes invitation lists, agendas, sign-in sheets, and summaries of Steering Committee meetings as well as any other public involvement methods.

Appendix C: Community Profile

This appendix provides an overall description of Gilliam County. The Community Profile is comprised of six different sections that describe Gilliam County from a number of perspectives in order to help define and understand the sensitivity and resilience to natural hazards. These sections include: natural environment capacity, social demographic capacity, regional economic capacity, built capacity, community connectivity capacity, and political capital. The information in this section represents a snapshot in time of the current sensitivity and resilience factors in the County when the plan was updated.

Appendix D: Economic Analysis

This appendix describes the Federal Emergency Management Agency’s (FEMA) requirements for benefit cost analysis in natural hazards mitigation, as well as various approaches for conducting economic analysis of proposed mitigation activities. This appendix was developed by OPDR as part of Gilliam County’s original NHMP in 2008 and has been updated for this NHMP. It has been reviewed and accepted by the Federal Emergency Management Agency as a means of documenting how the prioritization of actions shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

Appendix E: Survey Results

This appendix includes the survey instrument and results from the online survey implemented by the RARE participant. The survey aims to gauge household concerns and priorities regarding natural hazards and mitigation strategies.

Appendix F: Grant Programs

This appendix lists pre-disaster and post-disaster federal grant programs, activities, and initiatives for natural hazards mitigation. This section also includes state mitigation programs and contact information.

Appendix G: Oregon Climate Change Research Institute (OCCRI) Report

This appendix describes predicted changes to weather patterns and natural hazard indicators for Hood River County and Oregon based on aggregated climate models.
This section of the NHMP addresses 44 CFR 201.6(b)(2) - Risk Assessment. In addition, this chapter can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

This section first assesses risk by identifying hazards that can impact the jurisdiction. Potential impacts of each hazard are evaluated according to type, location, and extent. Then, important community assets and system vulnerabilities are identified. Finally, the plan evaluates the extent to which local hazards overlap with, or have an impact on, important assets.

The information presented below, along with community characteristics presented in the Appendix C: Community Profile will be used as the local level rationale for the risk reduction actions identified in Section 3: Mitigation Strategy. The risk assessment process is graphically depicted in Figure 2.1 below. Ultimately, the goal of hazard mitigation is to reduce the area where hazards and vulnerable systems overlap, which is the risk area.

**Figure 2.1: Understanding Risk**

Source: Oregon Partnership for Disaster Resilience, IPRE

---

**Table of Contents:**

- Drought .......................................................... 5
- Earthquake .......................................................... 8
- Flood ............................................................... 14
- Volcanic Event ..................................................... 18
- Wildfire .............................................................. 20
- Windstorm .......................................................... 24
- Winter Storm ....................................................... 26
- Community Vulnerability ........................................ 30
- Risk Assessment .................................................. 37
Hazard Identification

The first step in the risk assessment process is hazard identification. Identifying hazards present in the county and their potential impacts is a way to look ahead towards the future and identify possible mitigation projects. Being cognizant of which hazards will most affect the county and identifying the generalized locations of these events will allow residents, emergency managers, and county staff to be prepared as much as possible. Gilliam County identifies seven natural hazards that could potentially have an impact on the County. These hazards include: drought, earthquake, flood, volcanic event, wildfire, windstorm and winter storm. Table 2.1 displays the hazards identified by Gilliam County compared to the regional hazards identified in the State of Oregon NHMP for the Mid-Columbia Region in which Gilliam County is included.

Table 2.1: Gilliam County Hazard Identification

<table>
<thead>
<tr>
<th>Gilliam County Hazards*</th>
<th>Oregon NHMP Region 5: Mid-Columbia Regional Hazards^</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>Drought</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Earthquake</td>
</tr>
<tr>
<td>Flood</td>
<td>Flood</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>Volcano</td>
</tr>
<tr>
<td>Wildfire</td>
<td>Wildfire</td>
</tr>
<tr>
<td>Windstorm</td>
<td>Windstorm</td>
</tr>
<tr>
<td>Winter Storm (includes landslide)</td>
<td>Winter Storm</td>
</tr>
</tbody>
</table>

Source*: Gilliam County NHMP Steering Committee, Updated April 28, 2018
Source^: State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia, 2015

Seven out of the nine hazards identified in the Mid Columbia region (Morrow, Sherman, Wasco, Umatilla, Hood River, and Gilliam Counties) are included within the Gilliam County NHMP. Landslide/debris flow is not identified as a separate hazard by the County, but rather is included within the winter storm hazard category because landslides most commonly occur as a secondary affect of heavy rains. Landslides in the Mid Columbia Region, also called Region 5, are more common in the Cascade Range and Columbia Gorge area. The County has no history of dust storms, which primarily impact Morrow and Umatilla counties to the east of Gilliam. For City specific hazard characteristics, extents, and prior occurrences, see Volume II: City Addenda.

Federal Disaster Declarations

Looking at the past events that have occurred in the county can provide a general sense of the hazards that have caused significant damage in the county. Significant hazard events are noted via presidential disaster declarations. Observing hazard trends can help inform hazard mitigation project priorities.

President Dwight D. Eisenhower approved the first federal disaster declaration in May 1953 following a tornado in Georgia. Since then, federally disaster declarations have been approved within every state as a result of natural hazard related events. As of May 2018, FEMA has approved a total of 79 disasters in Oregon, including 44 major fires, 15 severe storm
declarations, 14 flood disasters, two earthquake events, and one drought.\textsuperscript{1} A Presidential Major Disaster Declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, and designed to help disaster victims, businesses, and public entities.\textsuperscript{2} When a governor asks for a presidential declaration because of a major disaster or emergency, they stipulate which counties in the state they want included in the declaration. Table 2.2 summarizes the seven major disasters declared for Gilliam County by FEMA since 1953. The table shows that all of the major disaster declarations in Gilliam County have been weather related.

<table>
<thead>
<tr>
<th>Declaration Number</th>
<th>Declaration Date</th>
<th>Incident(s):</th>
<th>Incident(s) Period:</th>
<th>Individual Assistance</th>
<th>Public Assistance Categories:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR-1632</td>
<td>20-Mar-2006</td>
<td>Severe Storms, Flooding, Landslides and Mudslides</td>
<td>18-Dec-2005 to 21-Jan-2006</td>
<td>None</td>
<td>A, B, C, D, E, F, G</td>
</tr>
<tr>
<td>DR-1510</td>
<td>19-Feb-2004</td>
<td>Severe Winter Storms</td>
<td>26-Dec-2003 to 14-Jan-2004</td>
<td>None</td>
<td>A, B, C, D, E, F, G</td>
</tr>
<tr>
<td>DR-1160</td>
<td>23-Jan-1997</td>
<td>Winter Storms/Flooding</td>
<td>25-Dec-1996 to 06-Jan-1997</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td>DR-1099</td>
<td>9-Feb-1996</td>
<td>Severe Storms, Flooding</td>
<td>4-Feb-1996 to 21-Feb-1996</td>
<td>Yes</td>
<td>A, B, C, D, E, F, G</td>
</tr>
<tr>
<td>DR - 3039</td>
<td>29-Apr-1977</td>
<td>Drought</td>
<td>29-Apr-1977</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td>DR-413</td>
<td>25-Jan-1974</td>
<td>Severe Storms, Snowmelt, Flooding</td>
<td>15-Jan-1974</td>
<td>Yes</td>
<td>A, B, C, D, E, F, G</td>
</tr>
<tr>
<td>DR-184</td>
<td>24-Dec-1964</td>
<td>Heavy Rain, Flooding</td>
<td>24-Dec-1964</td>
<td>Yes</td>
<td>A, B, C, D, E, F, G</td>
</tr>
</tbody>
</table>

Source: FEMA, Oregon Disaster History, Major Disaster Declarations, retrieved 5/23/2018

**Federal Emergency Declarations**

An emergency declaration is more limited in scope and without the long-term federal recovery programs of a Major Disaster Declaration. Generally, federal assistance and funding are provided to meet a specific emergency need or to help prevent a major disaster from occurring.\textsuperscript{3} Table 2.3 lists the only federal emergency declaration for the County. In April 1977, a drought was declared for numerous counties in Oregon including Gilliam County.

Table 2.3: FEMA Emergency Declarations - Gilliam County

<table>
<thead>
<tr>
<th>Declaration Number:</th>
<th>Declaration Date:</th>
<th>Incident(s):</th>
<th>Incident(s) Period:</th>
<th>Individual Assistance:</th>
<th>Public Assistance Categories:</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM-3039</td>
<td>29-Apr-1977</td>
<td>Drought</td>
<td>None</td>
<td>A, B</td>
<td></td>
</tr>
</tbody>
</table>

Source: FEMA, Oregon Disaster History, Emergency Declarations, retrieved 5/22/2018

The following subsections summarize the characteristics and extent of each hazard. For additional information on each hazard, refer to Region 5 Risk Assessment in the 2015 State of Oregon Natural Hazards Mitigation Plan.

**CLIMATE CHANGE**

The most reliable information on climate change to date is at the state level. The state information indicates that hazards projected to be impacted by climate change in Region 5 include drought and wildfire. Climate models project warmer drier summers and a decline in mean summer precipitation for Oregon. Coupled with projected decreases in mountain snowpack due to warmer winter temperatures, all eight regions in Oregon are expected to be affected by an increased incidence of drought and wildfire. An increase in drought could result in the increased incidence of dust storms, though no current research is available on the direct effects of future climate conditions on the incidence of dust storms. While winter storms and windstorms affect Region 5, there is little research on how climate change influences these hazards in the Pacific Northwest. For more information on climate drivers and the projected impacts of climate change in Oregon, see the section, Introduction to Climate Change, in the State Natural Hazards Mitigation Plan.

The Oregon Climate Change Research Institute (OCCRI) has recently performed research describing climate change related to Gilliam County. The basis of the research prepared by OCCRI uses future climate projections that are derived from 10–20 global climate models and have been “downscaled”—made locally relevant. Several climate metrics that relate to natural hazards are being calculated for historical and mid-21st century periods under two future emissions scenarios that result in varying future temperature increases for the State of Oregon. See Appendix G for the full report on Gilliam County and Oregon.

For the hazards discussion below, it should be noted that Gilliam County and the Cities of Arlington, Condon, and Lonerock performed a Hazard Vulnerability Assessment (HVA). This HVA will be discussed in more detail later in this Section 2. Each hazard has information about probability and vulnerability that are based on the HVA.

---


5 Ibid.
Drought

**Characteristics**

A drought is a period of drier than normal conditions. Drought occurs in virtually every climatic zone, but its characteristics vary significantly from one region to another. Drought is a temporary condition; it differs from aridity, which is restricted to low rainfall regions and is a permanent feature of climate. The extent of drought events depends upon the degree of moisture deficiency, and the duration and size of the affected area. Typically, droughts occur as regional events and often affect more than one city and county.

Droughts are common in Gilliam County and the surrounding region. Droughts appear to be recurring and they can have a profound effect on the economy, particularly the hydro-power and agricultural sectors. Agricultural industry and fire response services are particularly vulnerable to drought events. Although drought may not cause significant impacts to non-farming communities, the financial impact affects the economic stability of the county. The environmental consequences also are far-reaching. In recent years, the state has addressed drought emergencies through the Oregon Drought Council. This interagency (state/federal) council meets to discuss forecasts and to advise the Governor as the need arises.

Drought impacts include damaged grain crops, reduced yields, herd health problems, and reduced productivity or water development projects.

**Location/Extent**

All of Gilliam County is subject to a drought hazard, particularly since the community has predominantly an agricultural based economy. However, droughts primarily impact the agricultural industry and increase the risk of wildfire hazards. The drinking water supply is rarely impacted.

**History**

Table 2.4 identifies significant droughts and includes “state of drought emergency” declarations for Gilliam County from 1995 to 2018. Emergency declarations are determined by the governor of the state in order to address ongoing drought, low water conditions, and weather patterns that have the potential to cause local adverse natural and economic conditions in the county. When drought emergencies are declared, state agencies, including the Department of

---

Agriculture, Department of Water Resources, and Oregon Emergency Management, provide assistance and seek federal resources available to mitigate conditions throughout the county.

### Table 2.4: Drought History in Gilliam County

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1904 to 1905</td>
<td>A statewide drought period for approximately 18 months.</td>
</tr>
<tr>
<td>1917 to 1931</td>
<td>A 15 year dry period in Oregon punctuated by brief wet spells in 1920, 1921, and 1927.</td>
</tr>
<tr>
<td>1939 to 1941</td>
<td>Three year period of intense drought in Oregon.</td>
</tr>
<tr>
<td>1959 to 1964</td>
<td>Drought period primarily affecting eastern Oregon.</td>
</tr>
<tr>
<td>1977</td>
<td>A Federal Emergency Declaration was made on April 29, 1977 for 19 counties in Oregon including Gilliam County due to drought conditions.</td>
</tr>
<tr>
<td>2001</td>
<td>Governor John Kitzhaber issued a state of drought emergency in Gilliam County on May 30, 2001. Executive Order No. 01-06 was issued due to conditions caused by drought, low water conditions, and energy shortages in the western states.</td>
</tr>
<tr>
<td>2005</td>
<td>Governor Theodore Kulongoski issued a state of drought emergency for six counties in Oregon including Gilliam County on April 7, 2005. Executive Order No. 05-05 was issued due to drought and low water conditions.</td>
</tr>
<tr>
<td>2008</td>
<td>Governor Theodore Kulongoski issued a state of drought emergency in Gilliam County on September 24, 2008. Executive Order No. 08-23 was issued due to conditions caused by drought and severe weather.</td>
</tr>
<tr>
<td>2013</td>
<td>Five counties affected statewide, including Gilliam and Morrow Counties; County judge declared emergency.</td>
</tr>
<tr>
<td>2015</td>
<td>Drought emergency declared in 20 out of 36 Oregon counties; declaration maintained from July through December. Condon drinking water supply impacted; wells throughout County did not recharge</td>
</tr>
</tbody>
</table>

Source: Oregon.gov, Governor John Kitzhaber, Media, Executive Orders; Oregon State Natural Hazards Mitigation Plan 2015; Gilliam County NHMP Steering Committee, April 2018

The Surface Water Supply Index (SWSI) from the Natural Resources Conservation Service is an index of current water conditions throughout the state. The index utilizes parameters derived from snow, precipitation, reservoir and stream flow data gathered monthly from key stations. The lowest SWSI value, -4.2, indicates extreme drought conditions. The highest SWSI value, +4.2, indicates extreme wet conditions. An average water supply ranges from +1.5 to -1.5. Figure 9 below shows the monthly history of SWSI values from April 1981 to March 2017 for the Umatilla and John Day Basin, which includes Gilliam County.7

Probability and Vulnerability

According to the Gilliam County Natural Hazards Mitigation Plan Steering Committee, the probability of drought recurrence in the county is high (meaning several events are likely in the next 35 years) and county vulnerability is moderate (meaning that between 1-10% of the population and property would be impacted by an average event. History suggests that droughts occur in Gilliam County every 3-6 years, making them a common hazard.

Climate models for Oregon suggest, future regional climate changes include increases in temperature around 0.2-1°F per decade in the 21st Century, along with warmer and drier summers, and some evidence that extreme precipitation will increase in the future. Increased droughts may occur in Gilliam County under various climate change scenarios as a result of various factors, including reduced snowpack, rising temperatures, and likely reductions in summer precipitation.\(^8\)

The direct effects of drought include crop damage or failure, livestock death or decreased production, wildfire, impaired productivity of forest land, damage to fish habitat, loss of wetlands, and decreased air quality. Drought is also associated with insect infestation, disease, and wind erosion. Indirect effects to society are measured by the economic and physical hardships brought on by drought and by the increased stress on residents of a drought-stricken area. The economic impact of drought is estimated between $6 and $8 billion annually in the United States. These costs primarily affect agricultural, forestry, fisheries, recreation and tourism, transportation and energy sectors. Potential impacts to community water supplies and farming are the greatest threats in Gilliam County.

\(^8\) Oregon Natural Hazard Mitigation Plan, Region 5 Risk Assessment.
All parts of Gilliam County are susceptible to drought, however, the following areas and issues are of particular concern:

- Agriculture
- Drinking water system
- Residential and community wells in rural areas
- Fire response capabilities

**Earthquake**

**Significant Changes since Previous Plan:**

This section has been updated to include information from the Oregon Resilience Plan and loss estimates from DOGAMI. Maps depicting expected shaking from both local and Cascadia Subduction earthquake events have been added. Subsections detailing history, probability, and vulnerability have been added.

**Characteristics**

The geographic position of this region makes it susceptible to earthquakes from three sources: subduction zone, intraplate, and crustal events. All types of earthquakes in the region have some tie to the subducting, or diving, of the dense, oceanic Juan de Fuca Plate under the lighter continental North American Plate. There is also a link between the subducting plate and the formation of volcanoes some distance inland from the offshore subduction zone. Given its location, Gilliam County is most susceptible to crustal earthquakes, with less potential for impacts from subduction or intraplate events. This suggests that the County can most likely expect shorter duration events with low levels of ground shaking and limited liquefaction. Table 2.5 describes the faults located within the County.

**Table 2.5: Faults Located in Gilliam County**

<table>
<thead>
<tr>
<th>Name</th>
<th>Class</th>
<th>Fault ID</th>
<th>Primary County, State</th>
<th>Length (km)</th>
<th>Time of most recent deformation</th>
<th>Slip-rate category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arlington-Shutler Butte fault</td>
<td>A</td>
<td>847</td>
<td>Gilliam County, Oregon</td>
<td>52</td>
<td>Middle and Late Quaternary (&lt;750 ka)</td>
<td>Less than 0.2 mm/yr</td>
</tr>
<tr>
<td>Columbia Hills structures</td>
<td>B</td>
<td>568</td>
<td>Gilliam County, Oregon</td>
<td>160</td>
<td>Quaternary (&lt;1.6 Ma)</td>
<td>Less than 0.2 mm/yr</td>
</tr>
<tr>
<td>Unnamed faults northwest of Condon</td>
<td>B</td>
<td>814</td>
<td>Gilliam County, Oregon</td>
<td>22</td>
<td>Quaternary (&lt;1.6 Ma)</td>
<td>Less than 0.2 mm/yr</td>
</tr>
<tr>
<td>Unnamed fault southeast of Condon</td>
<td>C</td>
<td>Not Mapped</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: U.S. Geological Survey (USGS), Quaternary Fault and Fold Database, The Dalles 1° X 2° Sheet

---

9 [Oregon Natural Hazard Mitigation Plan, Region 5 Risk Assessment](#)
Location/Extent

There is an inactive part of a fault system that passes within a half-mile of Condon. The largest recorded earthquake registered 1.9 to 4.1 in 2000.10

Areas within Gilliam County typically have low ground shake amplification, very low liquefaction susceptibility, and moderate earthquake-induced landslide susceptibility. Areas identified with higher ground shake amplification, liquefactions, and earthquake-induced landslides are located along the John Day River valley as well as in northern portions of the county near the Columbia River. There is no written history of previous significant earthquake occurrences documented in Gilliam County. Actual earthquake damage can vary significantly, depending on the nature and severity of the event, localized soils, and structural vulnerability. Most injuries result from flying/falling building contents and debris. Expected shaking, soft soil hazard areas, and previous earthquake epicenters can be seen in Figures 2.3, 2.4, and 2.5 below. Figure 2.2 shows identified faults located in Gilliam County and the surrounding area.

Figure 2.2: Regional Fault Map

![Regional Fault Map](image-url)

Source: U.S. Geological Survey (USGS), Quaternary Fault and Fold Database, The Dalles 1° X 2° Sheet11

---

10 Gilliam County Natural Hazards Mitigation Plan, 2013
11 https://earthquake.usgs.gov/hazards/qfaults/
Figure 2.3: Active Faults, Earthquake Epicenters, and Expected Shaking from Crustal Event

Source: Oregon HazVu: Statewide Geohazards Viewer (DOGAMI), accessed on 5/23/2018

Figure 2.4: Gilliam County Liquefaction/Soft Soil Hazard

Source: Oregon HazVu: Statewide Geohazards Viewer (DOGAMI), accessed on 5/23/2018
Strong ground shaking can also cause landslides and reactivate dormant landslides. Commonly, slopes that are marginally stable prior to an earthquake become unstable and fail. Figure 2.6 shows landslide hazard in Gilliam County, including areas of landslide susceptibility and historic landslides.

**Figure 2.5: Gilliam County Expected Shaking (CSZ event)**

Source: Oregon HazVu: Statewide Geohazards Viewer (DOGAMI), accessed on 5/23/2018

**Figure 2.6: Gilliam County Landslide Hazard**

Source: Oregon HazVu: Statewide Geohazards Viewer (DOGAMI), accessed on 5/23/2018
History

Region 5 has experienced many earthquakes, although they rarely reach magnitudes greater than 2.5M. In the past century, Gilliam County has experienced 83 earthquakes greater than 2.5M, but only 7 larger than 3.5M and one larger than 4.0M.\textsuperscript{12} Earthquake events between 1971 and 2008 can be seen in Figure 2.3. Earthquake events in the Cascade range are listed in Table 2.6.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Size (M)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximate years: 1400 BCE*, 1050 BCE, 600 BCE, 400. 750, 900</td>
<td>Offshore Cascadia Subduction Zone (CSZ)</td>
<td>Probably 8.0-9.0</td>
<td>Based on studies of earthquake and tsunami at Willapa Bay, Washington. These are the mid-points of the age ranges for these six events.</td>
</tr>
<tr>
<td>Jan. 1700</td>
<td>CSZ</td>
<td>About 9.0</td>
<td>On January 26, 1700, an approximately 9.0 earthquake generated a tsunami that struck Oregon, Washington, and Japan. Destroyed Native American villages along the coast.</td>
</tr>
<tr>
<td>Mar. 1893</td>
<td>Umatilla, OR</td>
<td>5.7</td>
<td>Occurred on March 7, 1893.</td>
</tr>
<tr>
<td>Jul. 1936</td>
<td>Milton-Freewater, OR</td>
<td>6.1</td>
<td>The earthquake occurred on July 16, 1936. There were two foreshocks and many aftershocks felt. Damages were approximately $100,000 (1936 dollars).</td>
</tr>
<tr>
<td>Jan. 1951</td>
<td>Hermiston, OR</td>
<td>Damage unknown.</td>
<td></td>
</tr>
<tr>
<td>Apr. 1976</td>
<td>Near Maupin, OR</td>
<td>4.8</td>
<td>Sounds described as distant thunder, sonic booms, and strong wind.</td>
</tr>
<tr>
<td>n/a</td>
<td>Mayville, Lonerock</td>
<td>n/a</td>
<td>Felt by some, very low magnitude</td>
</tr>
<tr>
<td>n/a</td>
<td>Arlington, Matney Loop</td>
<td>n/a</td>
<td>Reported by local news, felt by few.</td>
</tr>
</tbody>
</table>

Source: Oregon State NHMP, 2015; Gilliam County NHMP Steering Committee, April 2018

Probability and Vulnerability

The Gilliam County Natural Hazards Mitigation Plan Steering Committee determined that both probability and vulnerability for the County to earthquakes is \textit{moderate}. As seen in Figures 2.3 and 2.5, expected shaking from both local faults and a Cascadia event is \textit{moderate}, with limited areas of strong shaking. The very lower liquefaction potential decreases County risk.

The probability of a large Cascadia Subduction event occurring in the next 50 years ranges from 7-12%. The probability of a small or large (8.3M+) Cascadia Subduction event occurring in the next 50 years is 37-43%.\textsuperscript{13} In the event of a Cascadia Subduction quake, in the eastern zone, shaking will be mild, landslides and liquefaction sporadic, and damage generally light. However,


\textsuperscript{13} Oregon Natural Hazard Mitigation Plan, Region 5 Risk Assessment.
eastern Oregon can expect to wait at least 72 hours before major relief arrives, and 1 to 3 years before communities achieve 90% restoration of roads and services. The eastern region may also receive refugees from the coastal and valley regions of Oregon, where relief will arrive 1-2 weeks after an event, and resilience will be reached three years or later after an event.\textsuperscript{14}

The people and infrastructure along the I-84 corridor, which runs along the northern portion of the region, would be most vulnerable. This multimodal transportation corridor is vital to Oregon’s economy and includes a major interstate highway (I-84); two transcontinental rail lines, Union Pacific and Burlington Northern Santa Fe; the Columbia River inland water navigation; major electric power and gas lines; and communication conduits. Moderate shaking and higher liquefaction potential may disrupt transportation significantly. Damage to shipping channels and shore facilities, and failure of Columbia River bridges west of Region 5 may have long-term impacts on freight shipments into and out of Gilliam County.\textsuperscript{15}

\textbf{2007 Rapid Visual Survey}

In 2007, DOGAMI completed a rapid visual screening (RVS) of educational and emergency facilities in communities across Oregon, as directed by the Oregon Legislature in Senate Bill 2 (2005). RVS is a technique used by the Federal Emergency Management Agency (FEMA), known as FEMA 154, to identify, inventory, and rank buildings that are potentially vulnerable to seismic events. DOGAMI ranked each building surveyed with a ‘low,’ ‘moderate,’ ‘high,’ or ‘very high’ potential for collapse in the event of an earthquake. It is important to note that these rankings represent a probability of collapse based on limited observed and analytical data and are therefore approximate rankings. To fully assess a building’s potential for collapse, a more detailed engineering study completed by a qualified professional is required, but the RVS study can help to prioritize which buildings to survey. Buildings with a ‘high’ or ‘very high’ potential for collapse are listed below. Additional information can be found within the RVS study on DOGAMI’s website (\url{www.oregongeology.org}).

Economic losses due to earthquake events have been calculated for Gilliam County; however, the uncertainty in data is so high that results have limited application. In a 1999 Special Paper, DOGAMI estimated that less than 1% of Gilliam County infrastructure would suffer economic losses resulting from either a Cascadia Subduction Zone or crustal event. Damage to buildings will be slight to negligible.\textsuperscript{16}

\textsuperscript{14} Oregon Resilience Plan; February 2013; \url{http://www.oregon.gov/oem/Documents/Oregon_Resilience_Plan_Final.pdf}
\textsuperscript{15} Oregon Natural Hazard Mitigation Plan, Region 5 Risk Assessment.
\textsuperscript{16} DOGAMI, Special Papers: SP-29, Earthquake damage in Oregon Preliminary estimates of future earthquake losses (1999)
Table 2.7: Gilliam County Buildings Collapse Potential

<table>
<thead>
<tr>
<th>Facility</th>
<th>Address</th>
<th>Site ID*</th>
<th>Level of Collapse Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condon Public Safety</td>
<td>128 S Main St</td>
<td>Gill_fir01</td>
<td>X, X</td>
</tr>
<tr>
<td>City of Condon VFD/PD</td>
<td>200 N Main St</td>
<td>Gill_fir04</td>
<td>X</td>
</tr>
<tr>
<td>South Gilliam County RFPD*</td>
<td>221 S Oregon St</td>
<td>Gill_pol03</td>
<td>X</td>
</tr>
<tr>
<td>Gilliam County Sheriff’s Office</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Schools</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Condon Elementary School</td>
<td>220 S East St</td>
<td>Gill_sch04</td>
<td>X, X</td>
</tr>
<tr>
<td>Condon High School</td>
<td>210 E Bayard St</td>
<td>Gill_sch01</td>
<td>X, X</td>
</tr>
<tr>
<td>Arlington Public Safety</td>
<td>Hwy 19 and Columbia St</td>
<td>Gill_pol04</td>
<td>X</td>
</tr>
<tr>
<td>Oregon State Police</td>
<td>1500 Cottonwood St</td>
<td>Gill_fir02</td>
<td>X</td>
</tr>
<tr>
<td>North Gilliam County RFPD</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Schools</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Arlington Elementary School</td>
<td>1400 Main St</td>
<td>Gill_sch02</td>
<td>X, X</td>
</tr>
<tr>
<td>Arlington High School</td>
<td>1200 Main St</td>
<td>Gill_sch03</td>
<td>X, X</td>
</tr>
</tbody>
</table>


Flood

Significant Changes since Previous Plan:

Information regarding NFIP policies and claims was added to the plan. A probability and vulnerability subsection was added. A map of the 100 year floodplain was added to the Location and Extent section.

Characteristics

The most common type of flooding is associated with unseasonably warm weather during the winter months coupled with rainfall that can quickly melt snow. This condition, often referred to as rain-on-snow, has produced devastating floods throughout the region. The warm winter weather events most often occur from December through February and can ultimately affect the entire county. Gilliam County is also subject to flash floods, primarily during the spring and summer months. Brief periods of intense rain and/or hail can deposit up to inch of rain in just a few minutes, occurring sometimes without warning. Other flood events are linked to normal seasonal snowmelt and run-off from agricultural fields.
There are several rivers in the region that produce natural extreme flood conditions. Surprisingly, the Columbia River is not one of them, nor is the John Day River. The Columbia River is regulated by upstream dams, so it does not present much of a problem. This is partly reflected in the federal flood insurance rate maps for the various communities along the river. However, a swollen Columbia River can back up tributary streams to the point where they constitute a significant hazard. This has occurred on a number of occasions. The John Day River (tributary of the Columbia River) is confined to fairly deep canyons with small floodplains. Consequently, it does not present the flood problems associated with other smaller rivers.

**Location/Extent**

A majority of Gilliam County is subject to a variety of flood conditions. Areas particularly susceptible to flooding can include the Columbia River, Lower Rock Creek, Middle Rock Creek, Upper Rock Creek, Thirtymile Creek, Hay Canyon, Condon (city), and Lonerock (city). The principle flood source for Gilliam County is Thirty Mile Creek.

The flood hazard is primarily located with the 100 year and 500 year flood zones on the FEMA flood insurance rate maps. The probability of the hazard occurring within these zones is 1 in 100 years and 1 in 500 years. Base flood elevations have also been determined for the 100 year flood zone. The extent of the hazard can be viewed spatially on the flood hazard maps (FIRM). Figure 2.7 depicts the 100 year floodplain in Gilliam County.

**Figure 2.7: 100 year Flood Plain (1984 data)**
History

Riverine Floods:

Significant floods have occurred along the John Day River. The United States Geological Survey (USGS) McDonald Ferry gauge site is located along the John Day River on the Sherman County and Gilliam County border. The highest recorded gage height at the site crested in December 1964 following significant rain throughout the Pacific Northwest. The “Christmas Day Flood” as it is commonly referred to crested at 13.59-ft at the McDonald Ferry site. The flood did not cause any damage to buildings but washed out several roads in Gilliam County leaving the area isolated for several days. Table 2.9 identifies historical flood records above major flood stage, 11.5 feet, at the USGS gauge site in Service Creek. According to the Northwest Forecast Center, there is an approximately 32-34% likelihood of peak flows surpassing flood stages.\(^{17}\)

Table 2.9: Historical Flood Records, John Day River at Service Creek, 1984-2015

<table>
<thead>
<tr>
<th>Date</th>
<th>Gage Height (ft)</th>
<th>Streamflow (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984-04-17</td>
<td>11.41</td>
<td>16,400</td>
</tr>
<tr>
<td>1985-04-11</td>
<td>10.43</td>
<td>14,300</td>
</tr>
<tr>
<td>1986-02-23</td>
<td>13.77</td>
<td>25,400</td>
</tr>
<tr>
<td>1989-05-10</td>
<td>12.50</td>
<td>20,900</td>
</tr>
<tr>
<td>1991-05-20</td>
<td>13.59</td>
<td>24,200</td>
</tr>
<tr>
<td>1993-03-24</td>
<td>13.04</td>
<td>22,300</td>
</tr>
<tr>
<td>1996-02-09</td>
<td>14.02</td>
<td>25,800</td>
</tr>
<tr>
<td>1997-01-01</td>
<td>16.49</td>
<td>35,200</td>
</tr>
<tr>
<td>1998-03-24</td>
<td>10.02</td>
<td>12,900</td>
</tr>
<tr>
<td>1999-03-01</td>
<td>10.29</td>
<td>13,700</td>
</tr>
<tr>
<td>2005-05-17</td>
<td>10.69</td>
<td>14,800</td>
</tr>
<tr>
<td>2006-01-01</td>
<td>10.58</td>
<td>14,500</td>
</tr>
<tr>
<td>2008-05-18</td>
<td>11.08</td>
<td>16,000</td>
</tr>
<tr>
<td>2009-04-22</td>
<td>10.14</td>
<td>13,300</td>
</tr>
<tr>
<td>2010-06-05</td>
<td>12.48</td>
<td>20,800</td>
</tr>
<tr>
<td>2011-05-16</td>
<td>15.23</td>
<td>31,800</td>
</tr>
<tr>
<td>2012-04-27</td>
<td>10.63</td>
<td>14,700</td>
</tr>
<tr>
<td>2014-C-10</td>
<td>12.61</td>
<td>21,100</td>
</tr>
</tbody>
</table>

Source: Northwest River Forecast Center, Peakflow, ENSO Summary, [https://www.nwrfc.noaa.gov/peak/peak_climo_summary.cgi?stn=SERO3&period=OND](https://www.nwrfc.noaa.gov/peak/peak_climo_summary.cgi?stn=SERO3&period=OND)

---

\(^{17}\) Probability of Historical Peaks, Northwest River Forecast Center, Peak Climatology, [https://www.nwrfc.noaa.gov/peak/peak_climotology.cgi?stn=SERO3](https://www.nwrfc.noaa.gov/peak/peak_climotology.cgi?stn=SERO3)
Flash Floods:

Flash Floods as a result of severe weather have historically occurred throughout Gilliam County. Most flash flood incidents occur in the summer months. Table 2.8 identifies flash floods that have affected the City of Condon due to significant rainfall in short period of time. The community of Blaylock also experienced flooding in 2016, but specific details were not recorded.\(^\text{18}\) It is likely that other flash flood events have occurred but were not documented.

**Table 2.8: Historical Flash Flood, Gilliam County**

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Damages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul-1998</td>
<td>City of Condon</td>
<td>2.25 inches of rain is less than two hours. Heavy rain caused flooding in basements and downtown businesses.</td>
</tr>
<tr>
<td>Aug-2003</td>
<td>City of Condon</td>
<td>1.12 inches of rain in 15 minutes. $7,000.00 worth of property damage caused by thunderstorm and flooding.</td>
</tr>
</tbody>
</table>

Source: Gilliam County Natural Hazards Mitigation Plan, 2013

**Probability and Vulnerability**

The Gilliam County Natural Hazards Mitigation Plan Steering Committee that the probability of flood events is high, and the vulnerability to flooding is moderate. This is due to the lack of development in the flood zones. While floods occur regularly, they primarily occur in remote rivers with steep banks.

Gilliam County and the incorporated Cities of Condon and Arlington participate in the National Flood Insurance Program (NFIP) and are required to regulate floodplain development. Any structure built in the floodplain after 1974 must meet NFIP requirements for elevation and flood proofing. Gilliam County and the incorporated jurisdictions use FEMA developed floodplain maps as the basis for implementing floodplain regulations. The policies in action and claims made within Gilliam County are described below in Table 2.10.

**National Flood Insurance Program (NFIP)**

Risk Assessment - §201.6(c)(2)(ii): “All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods.”\(^\text{19}\)

Flood Insurance Rate Maps in Gilliam County, the City of Arlington and the City of Condon are current as of September 24, 1984. The City of Lonerock has not been mapped for floodplain purposes, nor does it participate in the National Flood Insurance Program (NFIP). Table 2.8 shows that as of February 2018 there were four NFIP policies in force with a total value of over $1.1 million. Between 1978 and February 2018, there was one NFIP claim in Gilliam County.

As of February 2018, Gilliam County, the City of Arlington, and the City of Condon have zero repetitive flood loss properties. Neither Gilliam County nor any of the cities have had a

\(^{18}\) Gilliam County NHMP Steering Committee,

Community Assistance Visit (CAV). In addition, neither Gilliam County nor any of the cities are members of the Community Rating System (CRS).

Table 2.10: NFIP Summary Table

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>FIRM Date</th>
<th>NFIP Status</th>
<th># NFIP Policies</th>
<th>Total Coverage</th>
<th># NFIP Claims</th>
<th>Total Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td>9/24/1984</td>
<td>P</td>
<td>4</td>
<td>1,105,000</td>
<td>1</td>
<td>$ 1,156</td>
</tr>
<tr>
<td>Arlington</td>
<td>9/24/1984</td>
<td>P</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Condon</td>
<td>9/24/1984</td>
<td>P</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lonerock</td>
<td>NA</td>
<td>NP</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Source: Dave Lentzner, Department of Land Conservation and Development, Personal Communication, February 2018; ^ P = Participating, NP = Not Participating

Volcanic Event

Significant Changes since Previous Plan:
A probability and vulnerability section was added to this section. No other changes were made.

Characteristics

Gilliam County is situated east of the Cascade Mountain Range, which historically derived from volcanic activity. Within this range of mountains are several active and potentially active volcanoes. Mount St. Helens, an active volcano in this chain, erupted violently in 1980 and began erupting steam and ash again during fall 2004 and spring 2005. Mount Hood, Mount Jefferson, and Mount Adams are all potentially active volcanoes close to the region. Volcanic activity can produce many types of hazardous events including landslides, fallout of tephra (volcanic ash), lahars, pyroclastic flows, and lava flows. Pyroclastic flows are fluid mixtures of hot rock fragments, ash and gases that can move down the flanks of volcanoes at speeds of 50 to more than 150 kilometers per hour (30 to 90 miles per hour). Lahars or volcanic debris flows are water-saturated mixtures of soil and rock fragments and can travel very long distances (over 100 km) and travel as fast as 80 kilometers per hour (50 miles per hour) in steep channels close to a volcano. These hazards can affect very small local zones (only meters across) to areas hundreds of kilometers downwind. Location/Extent

Ash fallout from an eruption in the Cascade Mountain Range can affect the entire county. Table 2.11 identifies prominent volcanoes in the Cascade Mountain Range west of Gilliam County.

20 Dave Lentzner, Department of Land Conservation and Development, Personal Communication, February 2018
22 Ibid.
23 Ibid.
Table 2.11: Prominent Volcanoes

<table>
<thead>
<tr>
<th>Name</th>
<th>Elevation</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mt. Jefferson</td>
<td>10,495 ft</td>
<td>Composite volcano</td>
</tr>
<tr>
<td>Mt. Washington</td>
<td>7,796 ft</td>
<td>Mafic volcano</td>
</tr>
<tr>
<td>North Sister</td>
<td>10,085 ft</td>
<td>Mafic volcano</td>
</tr>
<tr>
<td>Middle Sister</td>
<td>10,047 ft</td>
<td>Composite volcano</td>
</tr>
<tr>
<td>South Sister</td>
<td>10,358 ft</td>
<td>Composite volcano</td>
</tr>
<tr>
<td>Broken Top</td>
<td>9,152 ft</td>
<td>Composite volcano</td>
</tr>
<tr>
<td>Mt. Bachelor</td>
<td>9,065 ft</td>
<td>Mafic volcano</td>
</tr>
<tr>
<td>Newberry Crater</td>
<td>7,984 ft</td>
<td>Composite volcano</td>
</tr>
<tr>
<td>Mt. Thielsen</td>
<td>9,187 ft</td>
<td>Basalt/andesite shield volcano</td>
</tr>
<tr>
<td>Crater Lake</td>
<td>8,926 ft</td>
<td>Overlapping shield and composite volcanoes</td>
</tr>
</tbody>
</table>
(Mt. Mazama)  | (Mt. Scott)|                            |
| Mount McLaughlin | 9,496 ft | Mafic volcano               |

Source: USGS/Cascades Volcano Observatory

History

Mount Hood’s eruptive history can be traced to late Pleistocene times (15,000–30,000 years ago) and will no doubt continue. The most recent series of events (1760–1810) consisted of small lahars and debris avalanches; steam explosions and minor tephra falls occurred between 1859 and 1865. Mount Hood’s recent history also includes ashfalls, dome building, lahars, pyroclastic flows, and steam explosions. Regional volcanic history is described in Table 2.13.

Table 2.12: Volcanic history in the Cascade Range

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>About 4,000 to 3,000 YBP</td>
<td>Sand Mountain, central Cascades</td>
<td>Lava flows and cinder cones in Sand Mountain field.</td>
</tr>
<tr>
<td>About 3,000 to 1,500 YBP</td>
<td>Belknap Volcano, central Cascades</td>
<td>Lava flows and tephra.</td>
</tr>
<tr>
<td>About 1,500 YBP</td>
<td>Timberline eruptive period, Mount Hood</td>
<td>Lava dome, pyroclastic flows, lahars, and tephra.</td>
</tr>
<tr>
<td>About 1,300 YBP</td>
<td>Newberry Volcano, central Oregon</td>
<td>Eruption of Big Obsidian flow.</td>
</tr>
<tr>
<td>1760–1810</td>
<td>Crater Rock/Old Maid Flat on Mount Hood</td>
<td>Pyroclastic flows in upper White River; lahars in Old Maid Flat; dome building at Crater Rock.</td>
</tr>
</tbody>
</table>

Source: Oregon State Natural Hazards Mitigation Plan, 2015
Probability and Vulnerability

Mount St. Helens remains a probable source of ashfall. It has repeatedly produced voluminous amounts of this material and has erupted much more frequently in recent historical time than any other Cascade volcano. The location, size, and shape of the area affected by ashfall are determined by the vigor and duration of the eruption and the wind direction. Because wind direction and velocity vary with both time and altitude, it is impossible to predict the direction and speed of ash transport more than a few hours in advance.

Geoscientists have provided some estimates of future activity in the vicinity of Crater Rock, a well-known feature on Mount Hood. They estimate a 1 in 300 chance that some dome activity will take place in a 30-year period (1996-2026). For comparison, the 30-year probability of a house being damaged by fire in the United States is about 1 in 90. The probability of 1 cm or more of tephra fall-out from eruptions anywhere in the Cascade Range in Gilliam County is 1 in 1,000.24

The Gilliam County Natural Hazard Mitigation Plan Steering Committee determined that the probability of a volcano event is very low, and the vulnerability from a volcano event is moderate. It is unlikely that Gilliam County would be affected by lahars or pyroclastic flows directly, but ashfall would be a problem.

Persons with respiratory problems are endangered, transportation, communications, and other lifeline services are interrupted, drainage systems become overloaded/clogged, buildings can become structurally threatened, and the economy takes a major hit when a region is impacted by ash fall (tephra fallout). Any future eruption of a nearby volcano (e.g., Hood, St. Helens, or Adams) occurring during a period of easterly winds would likely have adverse consequences for the county.

Wildfire

Significant Changes since Previous Plan:

A probability and vulnerability section was added to plan, as well as information regarding land management and response to wildfires. Additional wildfires have been added to the history table.

Characteristics

Gilliam County contains a diverse set of wildfire hazard and risk situations. Conditions throughout the county are conducive to large and fast moving wildfires. The Columbia Gorge serves as a funnel for east and west winds, where direction depends solely on the pressure gradient, and wind speeds can reach 80 mph.

Land ownership and resultant management and suppression capabilities and protocols in this area also affect the potential for wildfires. In Region 5 of Oregon, the most significant land ownership falls to federal agencies, and includes forested and wilderness areas. Federal lands in

24 Oregon Natural Hazard Mitigation Plan, NHMP Region 5: Mid-Columbia, 2015.
this area are characterized by dense stands, heavy underbrush, and ladder fuels, increasing the potential for wildfires. County, state, and private lands contribute to the remainder. These lands have a variety of management practices resulting in a mix of stand conditions and resultant fire potential. Regardless of ownership, the majority of the forestlands in Region 5 are historically prone to wildfire. As the number of dwellings extends into these areas the potential for ignition and losses increases. Many of these communities in the Wildland Urban Interface (WUI) fall just outside of any agency’s primary protection coverage, which reduces their likelihood of surviving a wildfire.

**Location/Extent**

Gilliam County is subject to countywide wildfire hazard due to frequent droughts, summer weather, terrain, crops, and natural vegetation. Areas where wheat and other crops and natural vegetation are close to population centers, including Arlington and Condon, are particularly hazardous.\(^{25}\)

Several Wildland Urban Interface (WUI) areas exist with the potential for property and human life loss during a wildfire event. Following are conditions and concerns identified in the Gilliam County Community Wildfire Protection Plan (2007) that are found in portions of the County which contribute to the wildfire threat and potential for catastrophic losses:

- The John Day River Canyon with numerous side canyons, all with very steep slopes.
- Large remote areas with no or limited vehicle access.
- Residential developments next to areas with heavy fuel loads. Some homes in these areas do not have adequate defensible space around them.
- Climatic and topographic conditions conducive for large wildfires. Hot and dry conditions exist during the fire season throughout the county. Some portions, especially in the Columbia River Gorge area, have frequent high winds which can contribute to fast moving fires that are difficult to control. Much of the county has moderate to steep slopes, which add to the rate of wildfire spread and suppression difficulty.
- Large agricultural areas planted to mainly grain plus significant Conservation Reserve Program (CRP) fields. Both of these agricultural types have the potential for fast moving fires, which can destroy valuable crops in short periods of time.
- Risk factors for starting wildfires. A major railroad and Interstate Highway 84 along the Columbia River represent significant ignition sources. Lightning has ignited frequent fires in the recent past. Power lines, debris burning, and equipment use also add to the risk. Most wildfires in the county are human caused.
- Unprotected areas and fire districts with limited resources. Portions of the county do not fall within an organized fire district.

Vegetation throughout the county consists mainly of grass/sagebrush type with scattered cultivated fields. There are virtually no native trees with the exception of a few areas containing

---

junipers and ponderosa pine in the southeast part of the county. Much of the farmland is in dry-
land crops with a few irrigated fields along creek bottoms. There are several significant risk
factors including the railroad and interstate highway along the Columbia River. Housing density
is low with the exception of the incorporated cities of Arlington and Condon. Suppression
response time to most areas in the County is more than 20 minutes. It is important to note that
while the overall risk rating for the County is considered high, the on-the-ground conditions vary
considerably because of slope, aspect and elevation differences. There are steep hillsides along
the John Day River and its side canyons which present conditions for extreme fire behavior and
long flame lengths. Further, during windy conditions in the hot dry periods of summer, the risk is
considered much higher than during the rest of the year. Importantly, cultivated fields of grain
and CRP lands contain high fuel loads and are subject to fast moving and extreme fire
behavior.26

History

Table 2.13 describes historical fires in Gilliam County.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Damages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>Gilliam County</td>
<td>40,000 acres burned in Gilliam County</td>
</tr>
<tr>
<td>Jul-1998</td>
<td>Central Gilliam County</td>
<td>Lightning caused fire ten miles north of Condon. Second lightning fire caused another fire a day later.</td>
</tr>
<tr>
<td>Jul-1998</td>
<td>Blalock</td>
<td>A range fire near Blalock when a bird caused an arch between two power lines. During repairs, a line sparked and caused a second fire that burned a couple hundred acres of wheat, several outbuildings, and grain storage facilities.</td>
</tr>
<tr>
<td>2000</td>
<td>Gilliam County, Morrow County</td>
<td>The Willow Creek Fire destroyed 27,000 acres in Gilliam County and Morrow County.</td>
</tr>
<tr>
<td>Oct-2004</td>
<td>Gilliam County, Morrow County, Umatilla County</td>
<td>$6,000.00 in property damage throughout the three counties.</td>
</tr>
<tr>
<td>Jun-2005</td>
<td>Gilliam County, Morrow County, Umatilla County</td>
<td>$113,000.00 in crop damage throughout the three counties.</td>
</tr>
<tr>
<td>May-2005</td>
<td>Gilliam County, Morrow County, Umatilla County</td>
<td>$10,000.00 in property damage throughout the three counties.</td>
</tr>
<tr>
<td>Jun-2005</td>
<td>Gilliam County, Morrow County, Umatilla County</td>
<td>$500,000.00 in property damage throughout the three counties.</td>
</tr>
<tr>
<td>2011</td>
<td>Buckhorn</td>
<td>27,000 acres burned in one week; lightning ignition</td>
</tr>
<tr>
<td>July 2014</td>
<td>South Gilliam County (Richmond Road)</td>
<td>27,000 acres burned; $400,000 in property damages</td>
</tr>
</tbody>
</table>

26 Gilliam County Community Wildfire Protection Plan, 2007
## Probability and Vulnerability

The Gilliam County NHMP Steering Committee determined that the probability of wildfires in the County is **high**, and the vulnerability to wildfires is **moderate**. Wildfires occur annually, but they rarely impact people. More often, they consume **grain fields** and utility infrastructure. All communities in Gilliam County are considered part of the Wildland Urban Interface areas.\(^27\)

Weather patterns can produce summer lightning storms that start many fires. These multiple starts can put a strain on the firefighting resources spread across the County. With the drying of fuels over time and the low relative humidity factored in, the probability for large fires can significantly increase during these lightning events. The number of days per season that forest fuels are capable of producing a significant fire event is also important to consider. It is likely that increasing temperatures due to climate change will increase the likelihood of wildfires in Gilliam County.

Disruption to the municipal water supply and irrigation water supply from wildfires would negatively impact all of the residents and agricultural operators that depend on this resource by reducing water quality and availability. Roads, bridges, and evacuation routes could be compromised, limiting the ability of firefighters to reach the fire as well as inhibiting evacuation procedures. Utilities including Bonneville Power Administration Power lines, Portland General Electric and Northwest Natural Gas electrical and gas distribution lines and communication infrastructure are also at risk.

The economic stability of Gilliam County is dependent on a major interstate highway (I-84). Closures can also be expected in the face of low or no visibility secondary to wildfire or inclement winter weather. Additional economic sectors that could be affected by wildfire are agriculture, forest products, tourism, manufacturing, recreation, and power generation.

For more information on wildfire risk areas and protection strategies, see the [Gilliam County Wildfire Protection Plan].(http://www.oregon.gov/ODF/Documents/Fire/CWPP/GilliamCounty.pdf)\(^28\)

\(^27\) Oregon Department of Forestry Statewide Forest Assessment, September 2006
\(^28\) Gilliam County Wildfire Protection Plan, 2007:
Windstorm

Significant Changes since Previous Plan:
Several new history events were added to this section. A Probability and Vulnerability section was added as well.

Characteristics - Windstorm

A windstorm is generally a short duration event involving straight-line winds and/or gusts in excess of 50 mph. The Columbia Gorge is the most significant east-west gap in the mountains between California and Canada. It serves as a funnel for east and west winds, where direction depends solely on the pressure gradient. High winds in this area of Oregon are well-known making it a popular wind surfing destination and magnet for large-scale wind-energy producers. Once set in motion, the winds can attain speeds of 80 mph, halt truck traffic, and damage structures and facilities.

Gilliam County, particularly the northern section of the county near the Columbia River, regularly experiences extreme wind events. The persistent high winds that occur along the Columbia River Gorge have resulted in the application of special building code standards for many of the counties in the region. All manufactured homes in Region 5 (which includes Gilliam County) that are within 30 miles of the Columbia River must meet special anchoring (i.e., tie-down) standards (Section 307: Wind Resistance). Note that none of the seven disaster declarations in Table 2.2 are windstorms.

Location/Extent

Countywide, with higher intensity in areas along the Columbia River and Interstate Highway 84 near Arlington, the flats between Arlington and Condon as well as areas between Condon and the City of Wasco (in Sherman County).

Characteristics – Tornado

Tornadoes normally descend from the large cumulonimbus clouds that characterize severe thunderstorms, but can also form from a single storm cloud. They form when a strong crosswind (sheer) intersects with strong warm updrafts in these clouds causing a slowly spinning vortex to form within a cloud. Eventually, this vortex may develop intensity and then descend to form a funnel cloud. When this funnel cloud touches the ground or gets close enough to the ground to affect the surface it becomes a tornado. Tornadoes are measured using the Enhanced Fujita Scale (EF) ranging from EF0 to EF5.

Location/Extent

All of Gilliam County is subject to a tornado. However, the flats between Arlington and Condon are particularly vulnerable. There are two tornadoes in Table 2.15 and they both happened more than 60 years ago.

History

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 2016</td>
<td>Dust storm impacted OR 19</td>
<td>Storm traveled 10 miles; significant property damage</td>
</tr>
<tr>
<td>November 2012</td>
<td>Wasco, Sherman, Umatilla, Gilliam, Morrow, Union, and Wallowa counties</td>
<td>74 mph winds caused $120,000 in property damage</td>
</tr>
<tr>
<td>January 2007</td>
<td>Gilliam Morrow, Sherman, Wasco, and Umatilla Counties</td>
<td>$5000 in property damage; wind speeds reached 64 mph</td>
</tr>
<tr>
<td>February 2005</td>
<td>Gilliam, Morrow, and Umatilla Counties</td>
<td>Strong windstorms caused $3,000 in property damage</td>
</tr>
<tr>
<td>October–December 2004</td>
<td>Gilliam, Morrow, and Umatilla Counties</td>
<td>Strong windstorms caused $500 in property damage</td>
</tr>
<tr>
<td>April 12, 1957</td>
<td>In the initial stages a long thin rope-like funnel descended from a heavy cumulonimbus cloud over southeastern Gilliam County nearly due west of Ione. It moved rapidly eastward into Morrow County and dissipated near Lexington in south central Morrow County.</td>
<td>The path varied from less than 100 yards to nearly a quarter-mile in width, with an overall length of 15 to 20 miles. The tornado crossed over open range and caused little damage. One telephone pole was pulled out of the ground and large quantities of dust and sagebrush were carried aloft. While hail was generally less than one-half inch in diameter, a few hailstones of over one inch in diameter was reported near Heppner. Fortunately, the hail fell in rangeland and little damage resulted. According to the Nation Weather Service (NWS), the tornado was rated an F0 (40 to 72-mph winds, 45 to 78-mph gusts) on the Fujita Scale, which was the scale used prior to 2006 when NWS unveiled the Enhanced Fujita Scale.</td>
</tr>
<tr>
<td>April 15, 1925</td>
<td>A poorly defined tornado occurred near Condon around 10:30 am</td>
<td>There was reported damage to warehouses, vehicles, and other buildings along the northeast track of the storm totally roughly $10,000.00.</td>
</tr>
</tbody>
</table>

Source: 2013 Gilliam County NHMP, 2015 Oregon State NHMP, Region 5 Risk Assessment
Probability and Vulnerability

The Gilliam County Natural Hazards Mitigation Plan Steering Committee determined County probability for a windstorm event is high, while County vulnerability for a windstorm is low.

High winds occur yearly in Gilliam County. Many buildings, utilities, and transportation systems are vulnerable to wind damage. This is especially true in open areas, such as natural grasslands or farmlands. Structures most vulnerable to high winds include insufficiently anchored manufactured homes and older buildings in need of roof repair. Table 2.15 shows the 1-minute average wind speeds that constitute significant wind events.

<table>
<thead>
<tr>
<th>Table 2.15 Probability of Severe Wind Events (Region 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region 5: Mid-Columbia Gorge</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Source: Oregon State Natural Hazard Mitigation Plan, 2015

Winter Storm

Significant Changes since Previous Plan:

Additional landslide information, including a landslide susceptibility map and an assessment of susceptible land within Gilliam County, was added to this section.

Gilliam County is known for severe weather situations including thunderstorms, rain storms, severe snow storms, ice storms, temperature drops, and landslides. Severe weather can cause transportation routes in and out of the county to become impassable. Severe weather can also cause power outages and flash flooding.

Characteristics – Winter Storm

Severe winter storms include snowstorms, rainstorms, ice storms, and temperature drops. Gilliam County annually experiences cold winter conditions. This is particularly true through the Columbia River Gorge where frigid air sometimes moves westward out of the Wallowa Mountains. During these periods, it is not unusual to receive snow or ice storms. This is advantageous in at least one respect in that in general, the region is prepared, and those visiting the region during the winter usually come prepared. However, there are occasions when preparation cannot meet the challenge. Drifting, blowing snow has brought highway traffic to a standstill. Windy and icy conditions have closed Oregon’s principal east-west transportation route, Interstate Highway 84, for hours. In these situations, travelers must seek accommodations, sometimes in communities where lodging is very limited. Furthermore, during winter heat, food, and the care of livestock are everyday concerns. Access to farms and ranches can be extremely difficult and present a serious challenge to local emergency managers.
Location/Extent

Areas and transportation routes along Interstate Highway 84 around Arlington are subject to deep drifting snow and zero visibility. Also, transportation routes along Oregon Route 206 from Wasco (Sherman County) to Condon and along Oregon Route 19 from Arlington to Fossil (Wheeler County) are particularly subject to deep drifting snow and zero visibility. Heavy snowfall can cause road closures, traffic accidents, and power outages from downed power lines. Winter storms occur throughout the County.

History

Of the seven disaster declarations for Gilliam County, listed in Table 2.16, five are for winter storms. The Gilliam County NHMP Steering Committee identified the following events as additional hazard history:

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 2017</td>
<td>Gilliam County</td>
<td>Rock Creek Bridge washed out</td>
</tr>
<tr>
<td>February-March 2016</td>
<td>Gilliam County</td>
<td>Record snowfall, 20 days of snow, OR 206 closed and public rescues necessary; County staff unable to access necessary equipment</td>
</tr>
<tr>
<td>January 2005</td>
<td>Gilliam, Morrow, and Umatilla</td>
<td>Severe weather caused 33 injuries.32</td>
</tr>
<tr>
<td>December 2003-February 2004</td>
<td>Statewide</td>
<td>During these storms, schools closed for a week and local store inventories significantly diminished</td>
</tr>
<tr>
<td>February 1986</td>
<td>Gilliam County</td>
<td>Winter storms lead to traffic accidents and broken power lines</td>
</tr>
<tr>
<td>December 1892</td>
<td>throughout northern Oregon Counties</td>
<td>15-30 inches of snowfall</td>
</tr>
</tbody>
</table>

Characteristics – Landslide/Debris Flow

The general term landslide refers to a range of geologic failures including slides, flows, falls, topples, and spreads. Most slope failures in Gilliam County are complex combinations of these distinct types, but the generalized groupings provide a useful means for framing discussion of slide characteristics, identification methods, and potential mitigation alternatives. These basic types are combined with the type of geologic material to form the common landslide names such as debris flow and rock fall.

Some landslides can move at rapid rates and thus pose life threats. These are commonly channelized debris flows, debris avalanches, and rock falls. These types of rapidly moving landslides are common throughout the region, especially along the steep slopes in the Columbia River Gorge. More information on landslides can be found in the Landslide Hazards in Oregon Fact Sheet.

---

31 Gilliam County NHMP Steering Committee, April 2018
32 Oregon Natural Hazards Mitigation Plan, 2015, Region 5 Risk Assessment
Location/Extent

Areas throughout Gilliam County may be affected by landslide and debris flows. Areas particularly susceptible to landslides include Condon Canyon, Blalock Canyon Road, Lonerock Road, Lost Valley Road, Quinton Canyon Road, Oregon Route 206, and Oregon Route 19. Figure 2.8 depicts landslide risk areas in Gilliam County; most landslide risk is in remote areas. The population centers of Arlington, Condon, and Lonerock are not threatened by landslides.

Figure 2.8 Gilliam County Landslide Susceptibility Area

Source: Oregon HazVu: Statewide Geohazards Viewer (DOGAMI), accessed on 4/16/2018

History - Landslides

December 2006 through January 2007, Gilliam County was one of 27 counties in Oregon that was declared a disaster by FEMA due to landslides caused by severe weather events. Each of the storm events produced record rainfall resulting in landslides. The storms and landslides caused damage to infrastructure and natural resources. FEMA declared this area a disaster on March 20, 2006 (DR -1632). Additional landslides occur but have not been documented.
Probability and Vulnerability

The Gilliam County Natural Hazards Mitigation Plan Steering Committee determined that both probability and vulnerability to winter storms is **high** for the County.

Landslides are more likely to happen in the general areas where landslides have occurred in the past, during heavy rainfall events, or a future earthquake. 31% of the land in Gilliam County has “high” or “very high” landslide susceptibility, 31.8% has “moderate” susceptibility, and 37.2% has “low” susceptibility.\(^3\)

The most likely impact of snow and ice events on Gilliam County are road closures limiting access/egress to/from some locations, especially roads to higher elevations. Winter storms with heavy wet snow or high winds and ice storms may also result in power outages from downed transmission lines and/or poles. Heavy hail has been known to damage structures as well. Winter storms which bring snow, ice and high winds can cause significant impacts on life and property. Deaths related to winter storms can occur as a result of traffic accidents on icy roads, and hypothermia from prolonged exposure to the cold. Low temperatures and temporary loss of home heating can be particularly hard on the elderly, young children and other vulnerable individuals. In the rural areas of Oregon severe winter storms can isolate small communities, farms, and ranches. Transportation infrastructure is particularly vulnerable to landslide hazards.

**Hazard Probability**

Probability is the likelihood of future occurrence within a specified period of time. Gilliam County evaluated the best available probability data to develop the probability scores presented below. For the purposes of this plan, the County utilized the Oregon Emergency Management Hazard Analysis methodology probability definitions to determine hazard probability. The definitions are:

- **LOW** = one incident likely within 75 to 100 years scores between 1 and 3 points
- **MEDIUM** = one incident likely within 35 to 75 years scores between 4 and 7 points
- **HIGH** = one incident likely within 10 to 35 years scores between 8 and 10 points

Table 2.17 presents the probability scores for each of the natural hazards present in Gilliam County. As shown in the table, the county identified winter storms, wildfires, and droughts as high probabilities. The county identified flood, windstorm, and earthquake with a medium probability and volcanic event with a low probability. The previous Probability Assessment, in the 2013 Gilliam County NHMP, identified drought, flood, and windstorms as high probability.

---

Table 2.17: Natural Hazard Probability Assessment Summary – Gilliam County

<table>
<thead>
<tr>
<th>Threat Event/Hazard</th>
<th>Severity</th>
<th>Weight Factor</th>
<th>Subtotal</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Storm</td>
<td>10</td>
<td>7</td>
<td>70</td>
<td>High</td>
</tr>
<tr>
<td>Wildfire</td>
<td>10</td>
<td>7</td>
<td>70</td>
<td>High</td>
</tr>
<tr>
<td>Drought</td>
<td>9</td>
<td>7</td>
<td>63</td>
<td>High</td>
</tr>
<tr>
<td>Flood</td>
<td>8</td>
<td>7</td>
<td>56</td>
<td>Medium</td>
</tr>
<tr>
<td>Windstorm</td>
<td>8</td>
<td>7</td>
<td>56</td>
<td>Medium</td>
</tr>
<tr>
<td>Earthquake</td>
<td>6</td>
<td>7</td>
<td>42</td>
<td>Medium</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>1</td>
<td>7</td>
<td>7</td>
<td>Low</td>
</tr>
</tbody>
</table>

Source: Gilliam County NHMP Steering Committee, Updated April 24, 2018.

Community Vulnerability

Community vulnerabilities are an important component of the NHMP risk assessment. For more in-depth information regarding specific community vulnerabilities, reference Volume II, Jurisdictional Addenda and Appendix B: Community Profile. Changes to population, economy, built environment, critical facilities, and infrastructure have not significantly influenced vulnerability in Gilliam County. New development has complied with the standards of the Oregon Building Code and the County’s development code includes their floodplain ordinance. Data sources for the following community vulnerability information can be found in Appendix C, Community Profile, unless otherwise noted below.

Population

The socio-demographic qualities of the community population such as language, race and ethnicity, age, income, and educational attainment are significant factors that can influence the community’s ability to cope, adapt to and recover from natural disasters. Historically, 80 percent of the disaster burden falls on the public.\(^{34}\) Of this number, a disproportionate burden is placed upon special needs groups, particularly children, the elderly, the disabled, minorities, and low-income persons. Population vulnerabilities can be reduced or eliminated with proper outreach and community mitigation planning. Several factors that are commonly considered variables in a community’s collective vulnerability to disaster are listed below, followed by Table 2.18 that outlines specific vulnerable populations and general county-wide concerns along with the hazards that are most likely to impact them.\(^{35}\)

Vulnerable Populations

One characteristic of disasters is that they can exceed the ability of emergency response agencies to provide assistance promptly. In a major disaster, members of the public may be on their own for several days to weeks in some cases. Individuals may need to go for several days without utilities and food and water sources. Disasters may also isolate individuals by damaging transportation routes. Not all people are able to respond to these conditions appropriately. Many people are in vulnerable populations that may have difficulty following official instructions.

---

\(^{34}\) Hazards Workshop Session Summary #16, *Disasters, Diversity, and Equity*, University of Colorado, Boulder (2000).

\(^{35}\) Gilliam County Natural Hazards Mitigation Plan, 2013
and taking protective actions. For instance, someone who is developmentally disabled or deaf may not be able to hear or understand instructions on sanitation, evacuation routes or shelter locations.

Vulnerable populations are those groups that possess specific characteristics that inhibit their ability to prepare for, respond to, or recover from a disaster. These include elderly and youth populations, transient populations, disabled and mentally ill populations, as well as low income populations. These groups are more heavily impacted because they may lack the necessary knowledge, skills, social support structures, or the mental and physical abilities necessary to take care of themselves. Historically, vulnerable populations present a special challenge to emergency managers and response agencies and they are more likely to be victims of a disaster. Fortunately, many people that fall into one of these categories have families, friends, neighbors, and other caretakers that will be able to assist them. But many of them do not have adequate support and those who do may not be able to rely on it in a major event.

**Elderly**

According to 2016 American Community Survey estimates from the U.S. Census Bureau, persons 65 and older made up 23.7% of the population in Gilliam County. Furthermore, out of the 788 household located in the County, 110 (14%) are occupied by individuals 65 or older who live alone. Nationwide, as the baby boomer generation enters their 60’s, the senior population is expected to dramatically increase. In Gilliam County there is one assisted living facility, as well as one apartment complex dedicated to independent senior housing.

**Assisted Living Facilities:**

- Summit Springs Assisted Living Facility
  - 133 S. Church Street
  - Condon, Oregon 97823
  - Licensed for 38 residents
  - Facilities: 23 apartments, 6 duplex cabins
  - Memory Care Unit Facility: 8 beds (separate from main building)

**Tourist/Travelers**

Travelers along Interstate Highway 84 are particularly vulnerable (historically) to numerous hazards, as are tourists who boat along the John Day River. Tourists are particularly vulnerable to disasters because they are usually unfamiliar with the hazards in the region and because they do not have the knowledge or the materials needed to take care of themselves in a disaster. For example, a typical tourist who is unfamiliar with Gilliam County may have difficulty locating evacuation routes or finding shelters. A light-traveling tourist would also not have their own supply of food, water, flashlights, radios, and other supplies that locals can use to take care of themselves in a disaster. Finally, tourists usually do not have a local support structure of family, friends, and neighbors that most of us rely on. In 2017, Gilliam County received 69,000 person overnight trips and 28,00 person day trips. A quarter of overnight visitors stay in private homes, and another quarter stay in hotels or motels. The remaining half stay in undetermined locations.
Tourism rates in Gilliam County have remained fairly stable, with a slight increase, over the past three years.

Disabled

According to 2016 American Community Survey (ACS) estimates from the U.S. Census Bureau, 431 (22.6%) persons five years of age or older in Gilliam County have some form of a disability (either mental, physical, or sensory). Of these, a majority (62%) are 75 years or older.

*Mental disability:* According to 2016 ACS estimates, 198 (11%) persons five years of age or older had some form of a mental disability. Mental disabilities are defined as having difficulty doing any of the following activities: learning, remembering, or concentrating.

*Physical disability:* According to 2016 ACS estimates, 188 (10.5%) persons five years of age or older had some form of a physical disability. Physical disabilities are defined as a condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying.

*Sensory disability:* According to 2016 ACS estimates, 160 (13.6%) persons five years of age or older had some form of a sensory disability. Sensory disabilities include long-lasting conditions such as blindness, deafness, or a severe vision or hearing impairment.

Low-Income

According to 2016 American Community Survey estimates, 88% of the total population in Gilliam County has income below the national poverty level. However, the Small Area Income and Poverty Estimates Program (SAIPE) of the U.S. Census Bureau estimates that 223 people (12%) live in poverty. Not having sufficient financial resources during and after a disaster can be a great disadvantage. Lower income people are more likely to live in mobile homes or other homes that are less able to resist damage from flooding, windstorms, and severe weather. Low-income people also tend to have the greatest difficulty recovering from a disaster.

---

36 Gilliam County Travel Impacts and Visitor Volume; Dean Runyan Associates; 2018; pg 109  
37 2012-2016 American Community Survey 5-year Estimates, Table S1810, U.S. Census Bureau  
38 Ibid  
40 2012-2016 American Community Survey 5-year Estimates, Table S1810, U.S. Census Bureau  
41 2016 Poverty and Median Household Income Estimates - Counties, States, and National; U.S. Census Bureau, Small Area Income and Poverty Estimates (SAIPE) Program; November 2017
Table 2.18: Vulnerable Populations in Gilliam County

<table>
<thead>
<tr>
<th>Gilliam County Asset Identification</th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travelers along Interstate Highway 84</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Tourists along John Day River and Columbia River</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>City of Arlington</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Columbia Hills Manor (senior apartments)</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day Care Center</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>City of Condon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summit Springs Village (Assisted Living Facility)</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summit Springs Village Memory Care Unit (Assisted Living Facility)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day Care Center</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Source: Oregon Partnership for Disaster Resilience and Gilliam County NHMP Steering Committee, Updated April 2018

Economy

Gilliam County is highly susceptible to economic disturbance from natural hazards. A substantial amount of the region’s economy is based off of agriculture, recreation, and environmental services that can be severely disrupted by various hazards. In Table 2.19 below, the Gilliam County NHMP Steering Committee identified specific economic issues along with the hazards that most likely impact them.

Table 2.19: Vulnerable Economies in Gilliam County

<table>
<thead>
<tr>
<th>Gilliam County Asset Identification</th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Waste Management of the Northwest:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous Waste Facility (Waste Management)</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Columbia Ridge Recycling and Landfill (Waste Management)</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Farms/Ranches (Agricultural land)</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Wind Farms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Industrial Park</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mid-Columbia Producers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Land-use and Development

To accommodate growth, communities engaged in mitigation planning should address infrastructure and service needs, specific engineering standards, and building codes. Eliminating or limiting development in hazard prone areas, such as floodplains, can reduce vulnerability to hazards, and the potential loss of life, injury, and property damage. Communities in the process of developing land for housing and industry need to ensure that land-use and protection goals are being met to prevent future risks.42 State law requires that cities and the county jointly manage Urban Growth Areas, delineated by a city’s Urban Growth Boundary (UGB) which identifies lands needed to meet population and economic demands for growth within a 20-year period.

Gilliam County has experienced significant development of windfarms, and solar farm is in the planning stages. The region has experienced insignificant residential development. Table 2.20 highlights recent land use and development in the county along with the hazards that are most likely to impact them.

Table 2.20: Vulnerable Land Use & Development in Gilliam County

<table>
<thead>
<tr>
<th>Gilliam County Asset Identification</th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TransCanada Gas Line</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cottonwood Canyon State Park</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wind Farms</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Oregon Partnership for Disaster Resilience and Gilliam County NHMP Steering Committee

---

42 State of Oregon Emergency Management Plan, Region 5: Mid-Columbia Regional Profile, February 2012
Environment

Natural capital is essential in sustaining all forms of life and plays an often underrepresented role in natural hazard community resiliency planning. With four distinct yet mild seasons, a diverse terrain and close proximity to national forests, Gilliam County historically has had to deal with habitual drought, flooding, and wildfires. By identifying potential hazards, temperature and precipitation patterns as well as natural capitals such as key river systems, Gilliam County can focus on key areas to better prepare, mitigate, and increase the resiliency of local communities. Table 2.21 below lists specific and general county-wide and city environmental concerns along with the hazards that are most likely to impact them.

Table 2.21: Vulnerable Environments in Gilliam County

<table>
<thead>
<tr>
<th>Gilliam County Asset Identification</th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burns County Park: Condon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cottonwood Recreation Site</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Farms/Ranches (Agricultural land)</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ground water</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J.S. Burres State Park</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>John Day River</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Fairgrounds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>City of Arlington</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earl Snell Memorial Park</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>City of Condon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condon City Park</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golf Course</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Source: Oregon Partnership for Disaster Resilience and Gilliam County NHMP Steering Committee

Critical Facilities and Infrastructure

Transportation networks, systems for power transmission, and critical facilities such as hospitals and police stations are all vital to the functioning of a county. Due to the fundamental role that infrastructure plays both pre- and post-disaster, it deserves special attention in the context of creating more resilient communities.43 2.22 below lists specific and general county-wide and city critical infrastructure and services concerns along with the hazards that are most likely to impact them.

43 State of Oregon Emergency Management Plan, Region 5: Mid-Columbia Regional Profile, February 2012
### Table 2.22: Vulnerable Critical Infrastructure & Services in Gilliam County

<table>
<thead>
<tr>
<th>Gilliam County Asset Identification</th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bridges (Cottonwood, Le Page, Arlington, Olex, Thirtymile, Lonerock, Upper Rock Creek, Willow Creek)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilliam County Courthouse/Sheriff’s Office: Condon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilliam County Sheriff Arlington Outpost (former Oregon State Police Station)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Union Pacific Railroad(s)</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utility Lines (Columbia Basin Electric, Pacific Power and Light)</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone Lines</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fiber Optic Cables</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highways (I-84, 206, 97)</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Arlington</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arlington Elementary School (built in 1963)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arlington High School (built in 1952)</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arlington Medical Clinic</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City Hall</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Gilliam Co. Rural Fire Protection District Station</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wastewater Treatment</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water System</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Condon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condon Elementary School (built in 1925)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condon High School (built in 1962)</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City Hall</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Gilliam Co. Rural Fire Protection District Station</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Gilliam County Medical Center</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frontier Regional (911)</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wastewater Treatment</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water System</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Lonerock</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lonerock Community Hall</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire Station/Outpost</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water System</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Gilliam County NHMP Steering Committee, Updated April 2018
Vulnerability Summary

Vulnerability is a measure of the exposure of the built environment to hazards. The exposure of community assets to hazards are critical in the assessment of the degree of risk a community has to each hazard. Identifying the facilities and infrastructure at risk from various hazards can assist the county in prioritizing resources for mitigation, and can assist in directing damage assessment efforts after a hazard event has occurred. The exposure of county assets to each hazard and potential implications are explained in each hazard sub-section.

Vulnerability can be described as the percentage of population and property likely to be affected under an “average” occurrence of the hazard. Gilliam County evaluated the best available vulnerability data to develop the vulnerability scores presented below. For the purposes of this plan, the County utilized the Oregon Emergency Management Hazard Analysis methodology vulnerability definitions to determine hazard probability. The definitions are:

- LOW = less than 1-percent affected scores between 1 and 3 points
- MEDIUM = between 1 and 10-percent affected scores between 4 and 7 points
- HIGH = more than 10-percent affected scores between 8 and 10 points

Table 2.23 presents the vulnerability scores for each of the natural hazards present in Gilliam County. As shown in the table, Gilliam County is most vulnerable to winter storms. Furthermore, the County identified the following hazards with medium vulnerability; drought, flood, volcanic event, and wildfire. Finally, the County identified earthquake and windstorm hazards as low vulnerability. For comparison it is interesting to note that in the 2013 vulnerability assessment, the County ranked drought as a high vulnerability hazard and earthquake as a moderate vulnerability hazard.

Table 2.23: Community Vulnerability Assessment Summary – Gilliam County

<table>
<thead>
<tr>
<th>Threat Event/Hazard</th>
<th>Severity</th>
<th>Weight Factor</th>
<th>Subtotal</th>
<th>Vulnerability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Storm</td>
<td>10</td>
<td>5</td>
<td>50</td>
<td>High</td>
</tr>
<tr>
<td>Drought</td>
<td>7</td>
<td>5</td>
<td>35</td>
<td>Medium</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>7</td>
<td>5</td>
<td>35</td>
<td>Medium</td>
</tr>
<tr>
<td>Flood</td>
<td>6</td>
<td>5</td>
<td>30</td>
<td>Medium</td>
</tr>
<tr>
<td>Wildfire</td>
<td>6</td>
<td>5</td>
<td>30</td>
<td>Medium</td>
</tr>
<tr>
<td>Earthquake</td>
<td>4</td>
<td>5</td>
<td>20</td>
<td>Low</td>
</tr>
<tr>
<td>Windstorm</td>
<td>4</td>
<td>5</td>
<td>20</td>
<td>Low</td>
</tr>
</tbody>
</table>

Source: Gilliam County NHMP Steering Committee, Updated April 2018

Risk Assessment

The Gilliam County NHMP Steering Committee updated the county hazard analysis matrix at a steering committee meeting held on April 24, 2018. Table 2.25 presents the entire updated hazard analysis matrix for Gilliam County. The hazards are listed in rank order from high to low. The table shows that hazard scores are influenced by each of the four categories combined. For local governments, conducting the hazard analysis is a useful step in planning for hazard...
mitigation, response, and recovery. The method provides the jurisdiction with sense of hazard rank and thus priorities, but does not predict the occurrence of a particular hazard.

With considerations for past historic events, the probability or likelihood of a particular hazard event occurring, the vulnerability to the community, and the maximum threat or worst case scenario, winter storm ranks as the top hazard threat to the county. Wildfire, drought, and flood make-up the next three highest ranked hazards, while volcanic event, windstorm, and earthquake make-up the lowest ranked hazards in the matrix. While droughts appear to occur more frequently and have a higher probability of occurring in the future, the impacts are not as potentially dangerous as wildfire and flood events. Overall, taking into account the relative probability or likelihood of a particular hazard event occurring, the potential for injuries or death, the physical impact to facilities as well as economic, ecologic, and social interruptions within the County, both the wildfire and winter storms rank higher than drought.

One would think that hazards with a more prominent history and a higher likelihood of occurring in the future should be ranked high. However, if such hazards do not have a high threat or vulnerability, the score will not change much. For example, the data indicates that windstorms occur more frequently in the County and have a higher probability of occurring in the future compared to an earthquake event hazard. However, since Gilliam County is potentially more vulnerable to earthquake events, especially in a worst case scenario event, the overall threat score for earthquake event is greater than that of windstorm. The hazard scores are influenced by not one or two of the categories but all four combined.

Table 2.24: Hazard Analysis Matrix – Gilliam County

<table>
<thead>
<tr>
<th>Hazard</th>
<th>History</th>
<th>Probability</th>
<th>Vulnerability</th>
<th>Maximum Threat</th>
<th>Total</th>
<th>Rank</th>
<th>Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Storm</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>240</td>
<td>1</td>
<td>High</td>
</tr>
<tr>
<td>Wildfire</td>
<td>10</td>
<td>10</td>
<td>6</td>
<td>8</td>
<td>200</td>
<td>2</td>
<td>High</td>
</tr>
<tr>
<td>Drought</td>
<td>8</td>
<td>9</td>
<td>7</td>
<td>8</td>
<td>194</td>
<td>3</td>
<td>High</td>
</tr>
<tr>
<td>Flood</td>
<td>7</td>
<td>8</td>
<td>6</td>
<td>7</td>
<td>170</td>
<td>4</td>
<td>Medium</td>
</tr>
<tr>
<td>Earthquake</td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>10</td>
<td>164</td>
<td>5</td>
<td>Medium</td>
</tr>
<tr>
<td>Windstorm</td>
<td>5</td>
<td>8</td>
<td>4</td>
<td>6</td>
<td>146</td>
<td>6</td>
<td>Low</td>
</tr>
<tr>
<td>Volcanic</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>8</td>
<td>124</td>
<td>7</td>
<td>Low</td>
</tr>
</tbody>
</table>

Source: Gilliam County Steering Committee, April 2018

**Multi-Jurisdictional Risk Assessment**

**Multi-jurisdictional Risk Assessment - §201.6(c) (2) (iii):** “For multi-jurisdictional plans, the risk assessment must assess each jurisdiction’s risks where they vary from the risks facing the entire planning area.”

The three incorporated cities in Gilliam County; Arlington, Condon, and Lonerock, each held local steering committee meetings and completed a hazard analysis to compare to the assessment completed by the Gilliam County NHMP Steering Committee. The multi-jurisdictional risk assessment information is located within the Risk Assessment section of each jurisdiction’s addendum, which is located in Volume II of this NHMP.
This section outlines Gilliam County's strategy to reduce or avoid long-term vulnerabilities to the identified hazards. Specifically, this section presents a mission and specific goals and actions, thereby addressing the mitigation strategy requirements contained in 44 CFR 201.6(c). The Natural Hazards Mitigation Plan Steering Committee reviewed and updated the goals and action items documented in this plan. Additional planning process documentation is in Appendix B Planning and Public Process.

Methods

The Gilliam County Natural Hazards Mitigation Steering Committee as well as stakeholders established Gilliam County’s mitigation goals and action items. The goals are based on the goals established by the State of Oregon 2015 Natural Hazards Mitigation Plan as well as the regional goals shared by Gilliam County, Sherman County, and Wheeler County. However, emphasis and language is specific to Gilliam County.

Mitigation Plan Goals

The plan goals help guide the direction of future activities aimed at reducing risk and preventing loss from natural hazards. Goals are designed to drive actions and they are intended to represent the general end toward which the County effort is directed. Goals identify how the County intends to work toward mitigating risk from natural hazards. The Cities of Arlington, Condon, and Lonerock agreed to these goals as well. The goals are guiding principles for the specific recommendations that are outlined in the action items. The goals listed here serve as checkpoints as agencies and organizations begin implementing mitigation action items.

Goal 1: Safety of life and the preservation of property.

Goal 2: Increased cooperation and collaboration between groups and agencies.

Goal 3: Motivate the public, private sector, and government agencies to mitigate against the effects of natural hazards through information and education.

Existing Mitigation Activities

Existing mitigation activities include current mitigation programs and activities that are being implemented by the community in an effort to reduce the community’s overall risk to natural hazards. Documenting these efforts can assist participating jurisdictions better understand risk and can assist in documenting successes. Listed below are mitigation action items identified in the previous version of the Gilliam County NHMP. The actions listed below are either completed, or partially completed with further activities to occur identified in Appendix A, Action Item Forms. The following descriptions comprise the status update of
the 2012/2013 mitigation actions. Table 3.1 lists mitigation actions that are being carried forward in the 2018 NHMP, including both previous and newly created actions.

**2012 Multi-Hazard Action Item #2** – *Reduce the effects of natural hazards on existing utility lines.*

- Columbia Basin Electric Cooperative and Pacific Power & Light annually perform tree-pruning and trimming of trees around power lines.
- Areas affecting both Primary (distribution) and Secondary (individual service connections) are serviced and cleared.
- These actions are required by Oregon Public Utility Commission and Oregon Real Estate Agency to reduce outages and insure continuity of electrical services.\(^1\)
- These activities help mitigate the effects from windstorm and severe weather/winter storm hazard events.

**2012 Multi-Hazard Action #3** – *Develop and maintain a comprehensive impact database on severe natural hazard events in Gilliam County.*

- Gilliam County Emergency Manager maintains a database of all state and federally declared disasters, significant wildfires, and County declared droughts.

**2012 Multi-Hazard Action Item #4** - *Seek funding for generators and satellite telephones for critical facilities.*

- Gilliam County applied for State Homeland Security Grant in 2008 to secure a generator for the Gilliam County Courthouse. The generator was installed in April 2010. The generator helps insure the facility is prepared for power outages during natural hazard events that may include: earthquake, severe weather/winter storm, and windstorm.
- Generator hook-ups were included in the new South Gilliam County Fire Hall built in 2012. The Fire Department plans to apply for funds to secure a generator for this facility.
- A generator was installed at the waste water plant in Condon in 2016.

**2012 Multi-Hazard Action Item #5** - *Identify opportunities to reduce existing barriers to interagency cooperation and work together to reduce risk and loss from natural hazards.*

State law (ORS Chapter 402) authorizes local governments to enter into Cooperative Assistance Agreements with public and private agencies in accordance with their needs. Personnel, supplies, and services may be used by a requesting agency if they granting agency cooperates and extends such services. Once entered into, Mutual Aid Agreements (MAAs) and Memorandums of Understanding (MOU) may require a local declaration to activate and allocated appropriate resources during an emergency situation. The following is a quick reference list of Mutual Aid Agreements entered into by Gilliam County.

\(^1\) Gilliam County Natural Hazards Mitigation Plan, 2013
• December 1999, Memorandum of Understanding between Sherman County Emergency Management and Gilliam County Emergency Management. This agreement provides that in the event of an emergency or disaster, either county, upon request of the other, shall make its resources available or otherwise provide assistance to the Emergency Operations Center. Further assistance with their capabilities as needed for response to emergency operation shall be available to the requesting county.

• January 2000, Memorandum of Understanding between Gilliam County Emergency Management and Wheeler County Emergency Management. This agreement provides that in the event of an emergency or disaster, either county, upon request of the other, shall make its resources available or otherwise provide assistance to the Emergency Operations Center. Further assistance with their capabilities as needed for response to emergency operation shall be available to the requesting county.

• November 2002, Intergovernmental Agreement Creating the Tri-County Communications Agency between Wheeler County, Gilliam County, and Sherman County. This agreement establishes the Tri-County Communications Agency.

• June 2006, Plain Language Memorandum of Understanding between Wheeler County Sheriff’s Office, Gilliam County Sheriff’s Office, City of Condon Police Department, Sherman County Sheriff’s Office, and Tri-County Communications Agency. This agreement provides that plain language will be used during radio transmissions in the event of a declared disaster.

• July 2006, City, County, or District Ambulance Service Mutual Aid Agreement between Sherman County Ambulance Service and Rufus Volunteer Ambulance Service, Mid-Columbia Fire and Rescue, Arlington Volunteer Ambulance Service, South Gilliam Ambulance Service, and South Wasco County Ambulance Service. This agreement provides that City, County, or District Ambulance personnel and/or equipment are furnished when assistance is requested and personnel and/or equipment are available.

• August 2006, City and Fire District Mutual Aid Agreement between Sherman County Fire Agencies of South Sherman Rural Fire Protection Department (RFPD), North Sherman RFPD, City of Rufus, City of Moro, Moro RFPD, Mid-Columbia Fire and Rescue, North Gilliam County Fire District, South Gilliam County Fire District, City of Arlington, City of Condon, and Klickitat County Fire Protection District. This agreement provides the city or fire district personnel and/or equipment are furnished when assistance is requested, and personnel and/or equipment are available.

• December 2006, Mutual Aid Cooperative Fire Protection Agreement between Rivers Division, Center Oregon Fire Management Services (Prineville District-BLM), Gilliam County Fire Protection Districts, Sherman County Fire Protection Districts, Wasco County Fire Protection Districts, and Wheeler County Fire Protection Districts. This agreement provided procedures in prevention, pre-suppression, and suppression of wildfires in reciprocal response areas.
2018 Multi-Hazard Action #1 (Synthesized from hazard specific outreach actions from both the 2008 and 2012 NHMPs) - Provide public information regarding natural hazards via website posting, social media, newsletter, mailings, and distributed flyers.

- The Gilliam County Emergency Management Coordinator annually supplies natural hazard brochures throughout various locations in Gilliam County.
- The brochures are intended to motivate the public, private sector, and government agencies to mitigate against and prepare for the effects of natural hazards.

2012 Flood Action Item #2 - Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.

- The Gilliam County Comprehensive Plan’s Goal 7: Areas Subject To Natural Hazards sets policies in order to comply with the NFIP.
- The Gilliam County Comprehensive Plan was amendment and adopted by the Gilliam County Court on October 19, 2011.
- Policies of Goal 7 include:
  1. The County will continue to comply with FEMA requirements in order to maintain eligibility for the Nation Flood Insurance Program.
  2. In order to preserve the flood-carrying capacity of stream channels and prevent damaging increases in flood heights, development in the floodway should be prohibited or strictly regulated.
  3. Development in the floodplain should be regulated to protect life and property and minimize private losses and public costs for rescue or repair of flood-damaged structure. Residence should be elevated at least one foot above the base flood elevation.
  4. Consideration should be given to development of flood control projects.

The information provided in Volume I, Section 2: Risk Assessment is to provide the basis and justification for the mitigation actions identified in this plan. This section, Section 3 Mitigation Strategy, describes the components that guide implementation of the identified mitigation strategies and is based on strategic planning principles. This section provides information on the process used to develop a mission, goals and mitigation action items. The action items are detailed recommendations for activities that local departments, citizens and others could engage in to reduce risk. This section also includes an explanation of how the County intends to incorporate the mitigation strategies outlined in the plan into existing planning mechanisms and programs such as the County comprehensive land use planning process, capital improvement planning process, and building codes enforcement and implementation.

Current Mitigation Plan Action Items

Short and long-term action items identified through the planning process are an important part of the mitigation plan. Mitigation action items are detailed recommendations for
activities that local departments, citizens and others could engage in to reduce risk. They address both multi-hazard (MH) and hazard-specific issues. Action items can be developed through a number of sources. The figure below illustrates some of these sources. A description of how the plan’s mitigation actions were developed for the original 2007 NHMP is provided below. 2007 actions were reviewed by the 2012 NHMP Steering Committee and several new actions were developed. Subsequent action items for the 2018 update were developed by the 2018 Steering Committee; the group also reviewed and updated the 2012 actions.

**Figure 3.1 Action Item Sources**

Source: Partnership for Disaster Resilience, 2006

Each action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. The worksheet components are described below. These action item worksheets are located in Appendix A.

**Rationale or Key Issues Addressed**

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Action items can be developed at any time during the planning process and can come from a number of sources, including participants in the planning process, noted deficiencies in local capability, or issues identified through the risk assessment. The rationale for proposed action items is based on the information
documented in Section 2, Risk Assessment and the Oregon NHMP’s Region 5: Regional Profile and Risk Assessment².

**Ideas for Implementation:**

The ideas for implementation offer a transition from theory to practice and serve as a starting point for this plan. This component of the action item is dynamic, since some ideas may prove to not be feasible, and new ideas may be added during the plan maintenance process. Ideas for implementation include such things as collaboration with relevant organizations, grant programs, tax incentives, human resources, education and outreach, research, and physical manipulation of buildings and infrastructure.

**Implementation through Existing Programs**

The Gilliam County multi-jurisdictional Natural Hazards Mitigation Plan includes a range of action items that, when implemented, will reduce loss from hazard events in the County. Within the plan, FEMA requires the identification of existing programs that might be used to implement these action items. Gilliam County currently addresses statewide planning goals and legislative requirements through its comprehensive land use plan, capital improvements plan, mandated standards and building codes. To the extent possible, Gilliam County and the participating jurisdictions will work to incorporate the recommended mitigation action items into existing programs and procedures.

Many of the Gilliam County multi-jurisdictional Natural Hazards Mitigation Plan’s recommendations are consistent with the goals and objectives of the County’s existing plans and policies. Where possible, Gilliam County will implement the recommended actions of the multi-jurisdictional Natural Hazard Mitigation Plan through existing plans and policies. Plans and policies already in existence have support from local residents, businesses, and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, and can adapt easily to changing conditions and needs.³ Implementing the Natural Hazards Mitigation Plan’s action items through such plans and policies increases their likelihood of being supported and implemented.

**Coordinating Organization:**

The coordinating organization is the public agency with the regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation.

**Internal and External Partners:**

The internal and external partner organizations listed in the Action Item Worksheets are potential partners recommended by the project Steering Committee but not necessarily contacted during the development of the plan. The coordinating organization should

---


contact the identified partner organizations to see if they are capable of and interested in participation. This initial contact is also to gain a commitment of time and/or resources toward completion of the action items.

Internal partner organizations are departments within the County or other participating jurisdiction that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External partner organizations can assist the coordinating organization in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations.

**Plan Goals Addressed:**

The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals, following implementation.

**Timeline:**

Action items include short, long-term and ongoing activities. Each action item includes an estimate of the timeline for implementation.

*Ongoing* actions items are activities that are currently in process and will continue to be implemented during the next planning period. Some portion of this action item may be completed, with other progress planned. When available, information regarding the schedule of implementation has been included (annually, quarterly, etc.).

*Short-term* action items are activities that may be implemented with existing resources and authorities in one to two years.

*Long-term* action items may require new or additional resources and/or authorities, and may take from two to five years to implement.

**Hazard Key**

For the purposes of this plan, the following abbreviations are used to refer to hazards:

- MH = Multi-Hazard
- DR = Drought Hazard
- FL = Flood Hazard
- EQ = Earthquake Hazard
- VE = Volcanic Event
- WF = Wildfire
- WD = Windstorm
- WS = Winter Storm (includes landslides)

Multi-Hazard actions relate to all natural hazards identified in the NHMP, even if the hazards do not have a specific mitigation action.
<table>
<thead>
<tr>
<th>Action Item</th>
<th>Action Item Title</th>
<th>Coordinating Organization</th>
<th>Partner Organizations</th>
<th>Timeline</th>
<th>Potential Funding Source</th>
<th>Goal 1</th>
<th>Goal 2</th>
<th>Goal 3</th>
<th>County</th>
<th>Arlington</th>
<th>Condon</th>
<th>Lonerock</th>
</tr>
</thead>
<tbody>
<tr>
<td>MH#2</td>
<td>Seek funding for the implementation of priority projects that reduce the vulnerability of critical public facilities in Gilliam County</td>
<td>Gilliam County Emergency Management</td>
<td>Cities of Arlington, Condon, and Lonerock; Gilliam County departments, Gilliam County NHMP Steering Committee, DOGAMI, OMD-OEM, FEMA</td>
<td>Long Term</td>
<td>Grants or local sources.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>MH#4</td>
<td>Seek funding for generators for critical facilities</td>
<td>Gilliam County Emergency Management</td>
<td>Cities of Arlington, Condon, and Lonerock, Public Utilities</td>
<td>Long Term</td>
<td>Homeland security grants</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DR#1</td>
<td>Improve long range water sources; Increase storage through deeper wells</td>
<td>City of Condon</td>
<td>SWCD, North Central Public Health</td>
<td>Long Term</td>
<td>Local sources</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Action Item</td>
<td>Action Item Title</td>
<td>Coordinating Organization</td>
<td>Partner Organizations</td>
<td>Timeline</td>
<td>Potential Funding Source</td>
<td>Goal 1</td>
<td>Goal 2</td>
<td>Goal 3</td>
<td>County</td>
<td>Arlington</td>
<td>Condon</td>
<td>Lonerock</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------</td>
<td>-------</td>
<td>-------</td>
<td>--------</td>
<td>-----------</td>
<td>--------</td>
<td>----------</td>
</tr>
<tr>
<td>EQ#1</td>
<td>Seek funding through the State Office of Emergency Management (OEM) and/or the Federal Emergency Management Agency (FEMA) to seismically retrofit critical facilities rated with either a very high or high collapse potential rate by the Department of Geology and Mineral Industries (DOGAMI).</td>
<td>Gilliam County Emergency Management</td>
<td>Cities of Arlington, Condon, and Lonerock, School Districts (SD 3, SD25J), Gilliam County Emergency Management, OMD-OEM, FEMA, DOGAMI</td>
<td>Long Term</td>
<td>Potential funding source: Business Oregon grant. Focus on courthouse and police station retrofit.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>FL#1</td>
<td>Coordinate with the State Floodplain Coordinator and the Department of Land Conservation and Development (DLCD) to obtain updated floodplain information for Gilliam County and the incorporated cities.</td>
<td>Gilliam County Planning Department</td>
<td>Cities of Arlington, Condon, and Lonerock, Gilliam County Emergency Management, DLCD, OMD-OEM, FEMA</td>
<td>Long Term</td>
<td>Local sources</td>
<td>X</td>
<td>X</td>
<td></td>
<td>x</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>WF#1</td>
<td>Provide Gilliam County Road Department with fire fighting training and equipment.</td>
<td>Gilliam County Road Department</td>
<td>Gilliam County, Public Works, Cities of Arlington, Condon, and Lonerock, Fire Districts, Local WUI Property Owners, ODF, State Fire Marshall, OMD-OEM, BLM, USFS, Utilities</td>
<td>Ongoing (annual)</td>
<td>Local sources</td>
<td>X</td>
<td>X</td>
<td></td>
<td>x</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>WF #2</td>
<td>Create firebreaks with fire resistant plantings around vulnerable facilities</td>
<td>Gilliam County Fire Services</td>
<td>SWCD, City of Arlington</td>
<td>Long Term</td>
<td>Local sources</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Source: Gilliam County NHMP Steering Committee, May 16, 2018
Table 3.2: 2018 Action Items: Cities of Arlington, Condon and Lonerock

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Action Item</th>
<th>Action Item Title</th>
<th>Coordinating Organization</th>
<th>Partner Organizations</th>
<th>Timeline</th>
<th>Potential Funding Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arlington</td>
<td>WF #1</td>
<td>Reduce wildfire fuel load through weed abatement projects and firebreaks</td>
<td>City of Arlington Public Works</td>
<td>North Gilliam County Fire Department</td>
<td>ST (1-3 years)</td>
<td>Local sources</td>
</tr>
<tr>
<td>Arlington</td>
<td>EQ #1</td>
<td>Source generators for city halls and schools (designated shelter sites)</td>
<td>City of Arlington</td>
<td>School district, Gilliam County Emergency Management</td>
<td>LT (3-5 years)</td>
<td>Federal and state grant funding</td>
</tr>
<tr>
<td>Arlington</td>
<td>WS #1</td>
<td>Public outreach to residents regarding sidewalk maintenance during freezing rain events</td>
<td>City of Arlington</td>
<td>Gilliam County Emergency Management</td>
<td>ST (1-3 years)</td>
<td>General fund</td>
</tr>
<tr>
<td>Condon</td>
<td>WS #1</td>
<td>Seeking funding for a generator for City Hall</td>
<td>City of Condon</td>
<td>Gilliam County Emergency Management</td>
<td>LT (3-5 years)</td>
<td>State or federal grants</td>
</tr>
<tr>
<td>Condon</td>
<td>WS #2</td>
<td>Conduct public outreach and notification about protecting pipes during extreme cold periods</td>
<td>City of Condon</td>
<td>Gilliam County Emergency Management</td>
<td>ST (1-3 years)</td>
<td>Local sources</td>
</tr>
<tr>
<td>Condon</td>
<td>WS #3</td>
<td>Seeking funding for more snow removal equipment</td>
<td>City of Condon Public Works</td>
<td>ODOT, Gilliam County Roads Department</td>
<td>LT (3-5 years)</td>
<td>Local sources</td>
</tr>
<tr>
<td>Condon</td>
<td>FL#1</td>
<td>Pursue more recent floodplain information; update floodplain maps</td>
<td>City of Condon</td>
<td>Department of Land Conservation and Development, Gilliam County Planning Department</td>
<td>Long Term</td>
<td>Grants; local sources</td>
</tr>
<tr>
<td>Jurisdiction</td>
<td>Action Item</td>
<td>Action Item Title</td>
<td>Coordinating Organization</td>
<td>Partner Organizations</td>
<td>Timeline</td>
<td>Potential Funding Source</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>-------------------------------</td>
<td>------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Lonerock</td>
<td>WF #1</td>
<td>Weed abatement; decrease wildfire risk through maintenance of yard and roadside vegetation</td>
<td>Volunteer Fire Department</td>
<td>City of Lonerock</td>
<td>Ongoing</td>
<td>Local sources</td>
</tr>
<tr>
<td>Lonerock</td>
<td>FL #1</td>
<td>Maintain and upgrade Lonerock Bridge; remove willows from creek bed and replace current bridge with free standing bridge</td>
<td>SWCD</td>
<td>Gilliam County Public Works</td>
<td>Long Term</td>
<td>State Funding (ODOT)</td>
</tr>
<tr>
<td>Lonerock</td>
<td>WS #1</td>
<td>Paving the “grade,” Lonerock Road, to reduce icy conditions and accidents in winter</td>
<td>Gilliam County Road Department</td>
<td>City of Lonerock</td>
<td>Short Term</td>
<td>Gilliam County Road Department</td>
</tr>
</tbody>
</table>

This page intentionally left blank.
This section details the formal process that will ensure that the Gilliam County multi-jurisdictional Natural Hazards Mitigation Plan remains an active and relevant document. The plan implementation and maintenance process includes a schedule for monitoring and evaluating the plan semi-annually, as well as producing an updated plan every five years. Finally, this section describes how the County and participating jurisdictions will integrate public participation throughout the plan maintenance and implementation process.

Implementing the Plan

After the Plan is locally reviewed, the Gilliam County Emergency Management Coordinator submits it to the State Hazard Mitigation Officer at Oregon Emergency Management. Oregon Emergency Management submits the plan to the Federal Emergency Management Agency (FEMA--Region X) for review. This review addresses the federal criteria outlined in the FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, the County will adopt the plan via resolution. At that point the County will gain eligibility for the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds, and Flood Mitigation Assistance program funds. Following County adoption, the participating jurisdictions should adopt the NHMP consistent with their jurisdiction specific information.

Convener

The Emergency Management Department will be responsible for overseeing the implementation and maintenance of the plan. There will be joint conveners from the Emergency Management and partners as listed in the Action Plans and other sections of the plan, depending on what action may be implemented. The emergency management personnel will work closely with the emergency management personnel from the other two counties in the region, Sherman County and Wheeler County. All three county Natural Hazards Mitigation Plans provide the following:

- Steering Committee meeting dates, times, locations, agendas, and member notification;
- Document outcomes of Committee meetings;
- Serve as a communication conduit between the Steering Committee and key plan stakeholders;
- Identify emergency management-related funding sources for natural hazard mitigation projects; and
- Utilize the Risk Assessment as a tool for prioritizing proposed natural hazard risk reduction projects.

Coordinating Body

The Steering Committee will serve as the coordinating body for the mitigation plan and will be responsible for the following tasks:
• Serving as the local evaluation committee for funding programs such as the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds, and Flood Mitigation Assistance program funds;
• Prioritizing and recommending funding for natural hazard risk reduction projects;
• Documenting successes and lessons learned;
• Evaluating and updating the Natural Hazards Mitigation Plan following a disaster;
• Evaluating and updating the Natural Hazards Mitigation Plan in accordance with the prescribed maintenance schedule; and
• Developing and coordinating ad hoc and/or standing subcommittees as needed.

Members

The following organizations were represented and served on the Steering Committee during the development of the Gilliam County multi-jurisdictional Natural Hazards Mitigation Plan:

• City of Arlington
• City of Condon
• City of Lonerock
• Gilliam County Assessor’s Office
• Gilliam County Emergency Management Department
• Gilliam County Fire Services (North Gilliam County and South Gilliam County Fire Districts)
• Gilliam County Planning Department
• Gilliam County Road Department
• Gilliam County Sheriff’s Office

To make the coordination and review of Gilliam County multi-jurisdictional Natural Hazards Mitigation Plan as broad and useful as possible, the coordinating body will engage additional stakeholders and other relevant hazard mitigation organizations and agencies to implement the identified action items. Specific organizations have been identified as either internal or external partners on the individual action item forms found in Section 3 – Mitigation Strategy and Appendix A.

Plan Maintenance

Plan maintenance is a critical component of the Natural Hazards Mitigation Plan. Proper maintenance of the plan ensures that this plan will maximize the County’s, Cities’, and special district’s efforts to reduce the risks posed by natural hazards. The Steering Committee and local staff are responsible for implementing this plan maintenance process, in addition to maintaining and updating the plan through a series of meetings outlined in the maintenance schedule below.

Semi-Annual Meetings

The Committee will meet on a semi-annual basis to complete the following tasks. During the first meeting the Committee will:

• Review existing action items to determine appropriateness for funding;
• Educate and train new members on the plan and mitigation in general;
• Identify issues that may not have been identified when the plan was developed; and
• Prioritize potential mitigation projects using the methodology described below.

During the second meeting of the year the Committee will:
• Review existing and new risk assessment data;
• Discuss methods for continued public involvement; and
• Document successes and lessons learned during the year.

The Gilliam County Emergency Management Department (convener) will be responsible for documenting the outcome of the semi-annual meetings as described in Appendix B Planning and Public Process. The process the Steering Committee (coordinating body) will use to prioritize mitigation projects is detailed in the section below. The plan’s format allows the county and participating jurisdictions to review and update sections when new data becomes available. New data can be easily incorporated, resulting in a NHMP that remains current and relevant to the participating jurisdictions.

Project Prioritization Process

The Disaster Mitigation Act of 2000 requires that jurisdictions identify a process for prioritizing potential mitigation actions. Potential mitigation activities often come from a variety of sources; therefore the project prioritization process needs to be flexible. Mitigation actions and projects may be identified by committee members, local government staff, other planning documents, or the NHMP Risk Assessment. Figure 4.1 illustrates the mitigation actions development and prioritization process. Proposed mitigation actions were not prioritized during this plan update because the small number of them did not necessitate prioritization. However, when the actions are reviewed and considered for implementation, the following process will be used.

**Figure 4.1: Action Item and Project Prioritization Process**

![Diagram of project prioritization process]

Source: Community Service Center’s Partnership for Disaster Resilience at the University of Oregon, 2008.
Step 1: Examine funding requirements

The first step in prioritizing the plan’s action items is to determine which funding sources are open for application. Several funding sources may be appropriate for the county’s proposed mitigation projects. Examples of mitigation funding sources include but are not limited to: FEMA’s Pre-Disaster Mitigation (PDM) competitive grant program, Flood Mitigation Assistance (FMA) program, Hazard Mitigation Grant Program (HMGP), National Fire Plan (NFP), Community Development Block Grants (CDBG), local general funds, and private foundations, among others. Please see Volume II, Appendix F: Grant Programs for a more comprehensive list of potential grant programs.

Because grant programs open and close on differing schedules, the coordinating body will examine upcoming funding streams’ requirements to determine which mitigation activities would be eligible. The coordinating body may consult with the funding entity, Oregon Emergency Management, or other appropriate state or regional organizations about project eligibility requirements. This examination of funding sources and requirements will happen during the coordinating body’s semi-annual plan maintenance meetings.

Step 2: Complete risk assessment evaluation

The second step in prioritizing the plan’s action items is to examine which hazards the selected actions are associated with and where these hazards rank in terms of community risk. The coordinating body will determine whether or not the plan’s risk assessment supports the implementation of eligible mitigation activities. This determination will be based on the location of the potential activities, their proximity to known hazard areas, and whether community assets are at risk. The coordinating body will additionally consider whether the selected actions mitigate hazards that are likely to occur in the future, or are likely to result in severe / catastrophic damages.

Step 3: Committee Recommendation

Based on the steps above, the coordinating body will recommend which mitigation activities should be moved forward. If the coordinating body decides to move forward with an action, the coordinating organization designated on the action item form will be responsible for taking further action and, if applicable, documenting success upon project completion. The coordinating body will convene a meeting to review the issues surrounding grant applications and to share knowledge and/or resources. This process will afford greater coordination and less competition for limited funds.

Step 4: Complete quantitative and qualitative assessment, and economic analysis

The fourth step is to identify the costs and benefits associated with the selected natural hazard mitigation strategies, measures or projects. Two categories of analysis that are used in this step are: (1) benefit/cost analysis, and (2) cost-effectiveness analysis using STAPLE/E (described below). Conducting benefit/cost analysis for a mitigation activity assists in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards provides decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects. Figure 4.2 shows decision criteria for selecting the appropriate method of analysis.
If the activity requires federal funding for a structural project, the Steering Committee will use a Federal Emergency Management Agency-approved cost-benefit analysis tool to evaluate the appropriateness of the activity. A project must have a benefit/cost ratio of greater than one in order to be eligible for FEMA grant funding.

For non-federally funded or nonstructural projects, a qualitative assessment will be completed to determine the project’s cost effectiveness.

The Steering Committee will consider using a multivariable assessment technique called STAPLE/E to prioritize these actions. STAPLE/E stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental. Assessing projects based upon these seven variables can help define a project’s qualitative cost effectiveness. The STAPLE/E technique has been tailored for use in natural hazard action item prioritization by the Partnership for Disaster Resilience at the University of Oregon’s Community Service Center. See Volume II, Appendix D: Economic Analysis for a description of the STAPLE/E evaluation methodology. The Steering Committee may decide to use another qualitative assessment method as needed.

**Continued Public Involvement & Participation**

The participating jurisdictions are dedicated to involving the public directly in the continual reshaping and updating of the Gilliam County multi-jurisdictional Natural Hazards Mitigation Plan. Although members of the Steering Committee represent the public to some extent, the public will also have the opportunity to continue to provide feedback about the plan.

Public participation was incorporated into every stage of the plan update process. All meetings were open to the public. Other forms of public involvement during the update process include:
• Post plan on the Gilliam County Emergency Management Website for comment (http://www.co.gilliam.or.us/departments/emergency/index.html)

• Post notices on the Gilliam County website noted above and as shown in Appendix B: Planning Process, that invite public to comment via online survey

• Implement various other outreach activities documented in this plan (See Section 3: Mitigation Strategy and Appendix B: Planning Process)

In addition to the involvement activities listed above, the final, approved version of the County’s multi-jurisdictional Natural Hazard Mitigation Plan will be posted on the Gilliam County Emergency Management website.

**Five-Year Review of Plan**

This plan will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. After this NHMP update, the Gilliam County Multi-jurisdictional Natural Hazards Mitigation Plan is due to be updated in 2023. The convener will be responsible for organizing the coordinating body to address plan update needs. The coordinating body will be responsible for updating any deficiencies found in the plan, and for ultimately meeting the Disaster Mitigation Act of 2000’s plan update requirements.

The following ‘toolkit’ can assist the convener in determining which plan update activities can be discussed during regularly-scheduled plan maintenance meetings, and which activities require additional meeting time and/or the formation of sub-committees.
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Plan Update Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the planning process description still relevant?</td>
<td>Modify this section to include a description of the plan update process. Document how the planning team reviewed and analyzed each section of the plan, and whether each section was revised as part of the update process. (This toolkit will help you do that).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have a public involvement strategy for the plan update process?</td>
<td>Decide how the public will be involved in the plan update process. Allow the public an opportunity to comment on the plan process and prior to plan approval.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have public involvement activities taken place since the plan was adopted?</td>
<td>Document activities in the “planning process” section of the plan update</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there new hazards that should be addressed?</td>
<td>Add new hazards to the risk assessment section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have there been hazard events in the community since the plan was adopted?</td>
<td>Document hazard history in the risk assessment section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have new studies or previous events identified changes in any hazard’s location or extent?</td>
<td>Document changes in location and extent in the risk assessment section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has vulnerability to any hazard changed?</td>
<td>Document changes in vulnerability in the risk assessment section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have development patterns changed? Is there more development in hazard prone areas?</td>
<td>Document changes in vulnerability in the risk assessment section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do future annexations include hazard prone areas?</td>
<td>Document changes in vulnerability in the risk assessment section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there new high risk populations?</td>
<td>Document changes in vulnerability in the risk assessment section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there completed mitigation actions that have decreased overall vulnerability?</td>
<td>Document changes in vulnerability in the risk assessment section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the plan document and/or address National Flood Insurance Program repetitive flood loss properties?</td>
<td>Document any changes to flood loss property status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the plan identify the number and type of existing and future buildings, infrastructure, and critical facilities in hazards areas?</td>
<td>1) Update existing data in risk assessment section, or 2) determine whether adequate data exists. If so, add information to plan. If not, describe why this could not be done at the time of the plan update. If yes, the plan update must address them: either state how deficiencies were overcome or why they couldn’t be addressed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the plan identify data limitations?</td>
<td>1) Update existing data in risk assessment section, or 2) determine whether adequate data exists. If so, add information to plan. If not, describe why this could not be done at the time of the plan update</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the plan identify potential dollar losses for vulnerable structures?</td>
<td>Document any updates in the plan goal section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are the plan goals still relevant?</td>
<td>Document whether each action is completed or pending. For those that remain pending explain why. For completed actions, provide a ‘success’ story.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is the status of each mitigation action?</td>
<td>Add new actions to the plan. Make sure that the mitigation plan includes actions that reduce the effects of hazards on both new and existing buildings.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there new actions that should be added?</td>
<td>If not, add this action to meet minimum NFIP planning requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there an action dealing with continued compliance with the National Flood Insurance Program?</td>
<td>Document these changes in the plan implementation and maintenance section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are changes to the action item prioritization, implementation, and/or administration processes needed?</td>
<td>Document these changes in the plan implementation and maintenance section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you need to make any changes to the plan maintenance schedule?</td>
<td>Document these changes in the plan implementation and maintenance section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is mitigation being implemented through existing planning mechanisms (such as comprehensive plans, or capital improvement plans)?</td>
<td>If the community has not made progress on process of implementing mitigation into existing mechanisms, further refine the process and document in the plan.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Oregon Partnership for Disaster Resilience (2010).
This page intentionally left blank.
Volume II:
Jurisdictional Addenda
This page left intentionally blank.
Purpose

This document serves as the City of Arlington' Addendum to the Gilliam County Multi-Jurisdictional Natural Hazards Mitigation Plan (NHMP). This addendum supplements information contained in Volume I (Basic Plan) of this NHMP, which serves as the foundation for this jurisdiction’s addendum, and Volume III (Appendices), which provides additional information (particularly regarding participation and mitigation strategy). This addendum meets the following requirements:

- Multi-jurisdictional Plan Adoption §201.6(c)(5),
- Multi-jurisdictional Participation §201.6(a)(3),
- Multi-jurisdictional Mitigation Strategy §201.6(c)(3)(iv), and
- Multi-Jurisdictional Risk Assessment §201.6(c)(2)(iii).

Plan Process, Participation, and Adoption

This section of the NHMP addendum addresses 44 CFR 201.6(c)(5), Plan Adoption, and 44 CFR 201.6(a)(3), Participation.

In January 2018, the Department of Land Conservation and Development (DLCD) partnered with the University of Oregon’s Institute for Policy Research and Engagement (IPRE): the Oregon Partnership for Disaster Resilience (OPDR) and the Resource Assistance for Rural Environments (RARE) program, and Gilliam County and the Cities, including City of Arlington, Condon, and Cascade Locks, to update their NHMP, which expired December 16, 2017. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY16 Pre-Disaster Mitigation Competitive Grant Program. After funding was awarded in July 2017 to DLCD for two PDM 16 grants (PDMC-PL-10-2016-003 and PDMC-PL-10-2016-005), a regional kickoff meeting for all eight counties involved in the PDM 16 grants was held on July 18, 2017.

To be eligible to receive certain pre- and post-disaster natural hazard mitigation funds from FEMA, local governments must have a current, FEMA-approved NHMP. NHMPs must be updated and re-approved every five years. By developing this addendum to the Gilliam County NHMP, locally adopting it, and having it approved by FEMA, the City of Arlington will regain eligibility for FEMA Hazard Mitigation, Pre-Disaster Mitigation, and Flood Mitigation Assistance grant program funds.

The Gilliam County NHMP, and Arlington addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. A project Steering Committee guided the process of developing the plan. For more information on the composition of the Steering Committee see the Acknowledgements, Plan Summary, and Plan Process (Volume III, Appendix B).
The City Recorder of Arlington is the designated local convener and will take the lead in implementing, maintaining, and updating the addendum to the NHMP in collaboration with the designated convener of the Gilliam County NHMP (County Emergency Management).

Representatives from the City of Arlington Steering Committee convened on the following occasions (see Appendix B for more information):

- April 24, 2018 - Gilliam County NHMP Project Initiation Meeting
- May 16, 2018 – Gilliam County NHMP Second Meeting
- May 29, 2018 – Arlington Steering Committee Meeting #1

The City’s addendum reflects decisions decided upon at the plan update meeting and during subsequent work and communication with NHMP Update Coordinator.

The Arlington Steering Committee was comprised of the following representatives:

- Convener: Pam Rosenbalm, City Recorder, City of Arlington
- Chris Fitzsimmons, Gilliam County Emergency Management
- Brian Foster, City of Arlington Public Works
- Nicolia Mehrling, NHMP Update Coordinator, Resource Assistance for Rural Environments

Public participation was achieved with the establishment of the Steering Committee, which was comprised of City officials representing different organizations and sectors. The Steering Committee was closely involved throughout the development of the plan and served as the local oversight body for the plan’s development. In addition, community members outside of the Steering Committee were provided an opportunity for comment via the plan review process (see Appendix B for more information).

The Gilliam County NHMP was approved by FEMA on [Month] [Day], 2018 and the Arlington addendum was adopted via resolution on [Month] [Day], 2018. This NHMP is effective through [Month] [Day], 2023.

**Mitigation Strategy**

This section of the NHMP addendum addresses 44 CFR 201.6(c)(3(iv), Mitigation Strategy.

During the 2018 Gilliam County update process the County and local Steering Committees re-evaluated the Mitigation Action Items. Following the review, mitigation actions were updated, noting what accomplishments had been made, and whether the actions were still relevant and if existing language needed to change; any new action items were identified at this time (see Appendix B for more information). Each jurisdiction developed a list of priority actions. The City’s priority actions are listed below in Table ARL-1 Arlington Priority Action Items.

Because this is the first formal addendum for the City of Arlington, all of the 2018 mitigation actions were created during this update.
Table ARL-1 Arlington Priority Action Items

<table>
<thead>
<tr>
<th>Action Item #</th>
<th>Description</th>
<th>Managing Department/Agency</th>
<th>Timeline</th>
<th>Potential Funding Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WF #1</td>
<td>Reduce wildfire fuel load through weed abatement projects and firebreaks</td>
<td>City of Arlington Public Works</td>
<td>ST (1-3 years)</td>
<td>Local sources</td>
</tr>
<tr>
<td>EQ #1</td>
<td>Source generators for City hall and schools (designated shelter sites)</td>
<td>City of Arlington Administration</td>
<td>LT (3-5 years)</td>
<td>Federal and state grant funding</td>
</tr>
<tr>
<td>WS #1</td>
<td>Public outreach to residents regarding sidewalk maintenance during freezing rain events</td>
<td>City of Arlington and Gilliam County Emergency Management</td>
<td>ST (1-3 years)</td>
<td>General fund</td>
</tr>
</tbody>
</table>

Source: City of Arlington NHMP Steering Committee, 2018.
EQ=Earthquake, WF=Wildfire, WS = Winter Storm

Plan Implementation and Maintenance

The City Council will be responsible for adopting the City of Arlington addendum to the Gilliam County NHMP. This addendum designates a coordinating body and a convener to oversee the development and implementation of action items. Because the City addendum is part of the county’s multi-jurisdictional NHMP, the City will look for opportunities to partner with the county. The City’s Steering Committee will convene after re-adoption of the City of Arlington addendum on an annual schedule; the county is meeting on a semi-annual basis and will provide opportunities for the Cities to report on NHMP implementation and maintenance during their meetings. The City Recorder will serve as the convener and will be responsible for assembling the Steering Committee (coordinating body). The Steering Committee will be responsible for:

- identifying new risk assessment data,
- reviewing status of mitigation actions,
- identifying new actions, and
- seeking funding to implement the City’s mitigation strategy (actions).

The convener will also remain active in the county’s implementation and maintenance process (see Volume I, Section 4 for more information).

The City will utilize the same prioritization process as the county (See Volume I, Section 4: Plan Implementation and Maintenance and Volume IV, Appendix C: Economic Analysis of Natural Hazard Mitigation Projects for more information).
Implementation through Existing Programs

Many of the recommendations in the Natural Hazards Mitigation Plan are consistent with the goals and objectives of the City’s existing plans and policies. Where possible, the City of Arlington will implement the recommended actions in the NHMP through existing plans and policies. Plans and policies already in existence have support from local residents, businesses, and policy makers.

Arlington’s acknowledged comprehensive plan is the Arlington Comprehensive Plan. The Oregon Land Conservation and Development Commission first acknowledged the plan in 2003. The City implements the plan through building codes and zoning ordinances drafted by the State of Oregon. The City has six full time staff, including four public works employees. The City contracts for planning and engineering services.

Funding resources available to the City of Arlington include:

- General funds
- Authority to levy taxes for specific purposes
- Wind Farm community service fee
- Incur debt through bonds
- ODOT funds for state highway maintenance
- Utility fees
- Host fees for waste treatment facility and chemical waste facility

Any of these funds may be applied to mitigation actions. Recent infrastructure upgrades were funded through City bond measures. See Appendix E – Grant Programs for additional financial resources.

Arlington currently has the following plans, programs, and policies that relate to natural hazard mitigation.

Table ARL-3 Legal and Regulatory Resources Available for Hazard Mitigation

<table>
<thead>
<tr>
<th>Regulatory Tool</th>
<th>Name</th>
<th>Effects on Hazard Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plans</td>
<td>Waste water treatment plan (2006)</td>
<td>25 year plan, accounts for natural risks and could be used to mitigate an extreme flood event.</td>
</tr>
<tr>
<td></td>
<td>Weed Abatement (2017)</td>
<td>Reduces wildfire fuel load around the City.</td>
</tr>
<tr>
<td></td>
<td>Comprehensive Plan (2011)</td>
<td>Guides development for the City in accordance with state standards.</td>
</tr>
<tr>
<td>Programs</td>
<td>Mutual Aid Agreements</td>
<td>Provides personnel and equipment for emergency management, especially fire response.</td>
</tr>
</tbody>
</table>


**Continued Public Participation**

Keeping the public informed of the City’s efforts to reduce the City’s risk to future natural hazards events is important for successful plan implementation and maintenance. The City is committed to involving the public in the plan review and updated process. See Volume I, Section 4, for more information.

**Plan Maintenance**

The Gilliam County Multi-Jurisdictional Natural Hazards Mitigation Plan and City addendum will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the county plan update process, the City will also review and update its addendum. The convener will be responsible for convening the Steering Committee to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state, or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the plan was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community’s demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the plan accurately address the impacts of this event?

These questions will help the Steering Committee determine what components of the mitigation plan need updating. The Steering Committee will be responsible for updating any deficiencies found in the plan.

**Risk Assessment**

This section of the NHMP addendum addresses 44 CFR 201.6(b)(2) - Risk Assessment. In addition, this chapter can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards. Assessing natural hazard risk has three phases:

**Phase 1:** Identify hazards that can impact the jurisdiction. This includes an evaluation of potential hazard impacts – type, location, extent, etc.

**Phase 2:** Identify important community assets and system vulnerabilities. Example vulnerabilities include people, businesses, homes, roads, historic places and drinking water sources.
Phase 3: Evaluate the extent to which the identified hazards overlap with, or have an impact on, the important assets identified by the community.

The local level rationale for the identified mitigation strategies (action items) is presented herein, and within Section 2, Risk Assessment, and Appendix C, Community Profile. The risk assessment process is graphically depicted in Figure CLA-1 below. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

**Figure ARL-1 Understanding Risk**

![Understanding Risk](image)

**Hazard Analysis Methodology**

This NHMP utilizes a hazard analysis methodology that was first developed by FEMA circa 1983, and gradually refined by the Oregon Military Department’s Office of Emergency Management (OEM) over the years.

The methodology produces scores that range from 24 (lowest possible) to 240 (highest possible). Vulnerability and probability are the two key components of the methodology. Vulnerability examines both typical and maximum credible events, and probability endeavors to reflect how physical changes in the jurisdiction and scientific research modify the historical record for each hazard. Vulnerability accounts for approximately 60% of the total score, and probability approximately 40%.

This method provides the jurisdiction with a sense of hazard priorities, or relative risk. It doesn't predict the occurrence of a particular hazard, but it does "quantify" the risk of one hazard compared with another. By doing this analysis, planning can first be focused where the risk is greatest.

In this analysis, severity ratings, and weight factors, are applied to the four categories of history, vulnerability, maximum threat (worst-case scenario), and probability as shown in the table below. See Volume I, Section 2 (Risk Assessment) for more information.
Hazard Analysis

The Arlington Steering Committee developed their hazard vulnerability assessment (HVA), using the county’s HVA as a reference. Changes from the county’s HVA were made where appropriate to reflect distinctions in vulnerability and risk from natural hazards unique to Arlington, which are discussed throughout this addendum.

Table ARL-4 shows the HVA matrix for Arlington showing each hazard listed in order of rank and risk level from high to low. For local governments, conducting the hazard analysis is a useful step in planning for hazard mitigation, response, and recovery. The method provides the jurisdiction with sense of hazard priorities, but does not predict the occurrence of a particular hazard.

Two chronic hazards (winter storm and wildfires) rank as the top hazard threats to the City. Earthquake hazards (including crustal faults and a Cascadia Subduction Zone event), and floods comprise the next highest ranked hazards, while drought, volcano, and windstorm hazards comprise the lowest ranked hazards.

Table ARL-4 Hazard Analysis Matrix – Arlington

<table>
<thead>
<tr>
<th>Hazard</th>
<th>History</th>
<th>Probability</th>
<th>Vulnerability</th>
<th>Maximum Threat</th>
<th>Total</th>
<th>Rank</th>
<th>Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildfire</td>
<td>10</td>
<td>10</td>
<td>8</td>
<td>10</td>
<td>230</td>
<td>1</td>
<td>High</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>6</td>
<td>10</td>
<td>8</td>
<td>10</td>
<td>222</td>
<td>2</td>
<td>High</td>
</tr>
<tr>
<td>Earthquake</td>
<td>1</td>
<td>6</td>
<td>8</td>
<td>9</td>
<td>174</td>
<td>3</td>
<td>Medium</td>
</tr>
<tr>
<td>Flood</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>162</td>
<td>4</td>
<td>Medium</td>
</tr>
<tr>
<td>Drought</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td>10</td>
<td>149</td>
<td>5</td>
<td>Low</td>
</tr>
<tr>
<td>Volcanic</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td>10</td>
<td>149</td>
<td>6</td>
<td>Low</td>
</tr>
<tr>
<td>Windstorm</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>9</td>
<td>140</td>
<td>7</td>
<td>Low</td>
</tr>
</tbody>
</table>

Source: Arlington NHMP Steering Committee, 2018.

Table ARL-5 categorizes the probability and vulnerability scores from the hazard analysis for the City and compares the results to the assessment completed by the Gilliam County NHMP Steering Committee (areas of differences are noted with bold text within the City ratings). The City ranked their vulnerability to wildfire, earthquake, drought, and volcano hazard events as higher than the county, and their probability of droughts, floods, and windstorms as lower. The rationales for these differences in vulnerability and probability are explained in each hazard subsection below. City specific hazard extent, location, and history is described below as well.
### Table ARL-5 Probability and Vulnerability Comparison

<table>
<thead>
<tr>
<th>Hazard</th>
<th>City of Arlington</th>
<th>Gilliam County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Storm</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Wildfire</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Drought</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Flood</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Windstorm</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Volcano</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: Arlington NHMP Steering Committee and Gilliam County NHMP Steering Committee, 2018.

**Hazard Probability:**

Compared to Gilliam County, the hazard analysis for the City of Arlington identified zero hazards with *higher* probability.

The City of Arlington and Gilliam County identified *equal* probability for future occurrences to four hazards that include:

- Winter Storm
- Volcanic Event
- Wildfire
- Earthquake

The hazard analysis for the City of Arlington identified *lower* probability for the remaining three hazards compared to Gilliam County:

- Drought
- Windstorm
- Flood

Based on historic events, the City of Arlington rated the probability of future occurrences for these three hazards lower than the county.

Although droughts commonly occur throughout Gilliam County and the surrounding region, the hazard has had little or no effect of the City. The City has neither restricted water usage because of a drought nor requested assistance from other jurisdictions to respond to a drought. Therefore, the probability of a drought hazard impacting the City is lower than the County.

The Columbia River is regulated by upstream dams, so the potential for flooding does not present much of a problem compared to the tributaries of the river. This is partly reflected
in the federal flood insurance rate map for the City. Therefore, the probability for flood in the City is lower than the County.

Although the City regularly experiences winds, wind speeds rarely rise to destructive or dangerous speeds. In previous years, wind storms caused power outages and property damage due to downed power lines and trees, but infrastructure upgrades have mitigated the impact.

Hazard Vulnerability:

Compared to Gilliam County, the hazard analysis for the City of Arlington identified higher vulnerability to four hazards that include:

- Earthquake
- Volcanic Event
- Wildfire
- Drought

The northern part of Gilliam County, which includes the City of Arlington, generally has higher ground shake amplification, liquefactions, and earthquake-induced landslides than the rest of the county. Also, both schools in the City of Arlington have a high or very high collapse potential rating, and a majority of the infrastructure in the City is aging. Therefore, the City has a higher vulnerability to earthquake than the County.

The City experienced ash fallout in 1980 from the eruption of Mount St. Helens. Ash fallout can disrupt or damage transportation systems, electrical systems, water systems, and wastewater systems, and can also effect populations, particularly people with chronic respiratory problems. Arlington is closer to the active volcanoes in the Cascade Range than other communities in Gilliam County. Because of these concerns, the City has a higher vulnerability to a volcanic event than the County.

Because the City is located near heavy fuel loads and is built on steep slopes, the City is more vulnerable to the wildfire hazard compared to the County.

The City of Arlington and Gilliam County identified equal vulnerability for the remaining three hazards that include:

- Drought
- Flood
- Severe Weather/Winter Storm

The hazard analysis for the City of Arlington identified zero hazards with lower vulnerability compared to Gilliam County.

Representatives from the City of Arlington expressed concern about two hazards in particular; severe weather/winter storm and wildfire. Tourists along with local residents could potentially be at risk during severe weather, especially heavy ice and snow storms during the winter months. Interstate Highway 84 and Oregon Route 19 can become impassable and shut down during severe winter storms, cutting the City off to the outside. The concern is if the City became isolated for several days and lost power, many residents would be in extreme danger.
The City also expressed concern for wildfires fueled by strong winds in the Columbia Gorge that frequently threatening the city during warm, dry summer months. Much of the City of Arlington is built on steep slopes which can help fuel fire when coupled with high winds, particularly during drought conditions. In addition, already limited fire protection could become overwhelmed during a wildfire since the local rural fire protection district is entirely made up of volunteers, some of which may not in the immediate area to help assist during an event. Because of these concerns, the City of Arlington determined that severe weather/winter storm and wildfire are the top two natural hazards.

Summary

Figure ARL-6 presents a summary of the hazard analysis for the City of Arlington and compares the results to the assessment completed by Gilliam County.

The City rated their threat from earthquake, volcanic, and wildfire hazards as higher than the county, and their threat from drought, flood, windstorm, and winter storm hazards as lower than the county.

Figure ARL-6 Overall Hazard Analysis Comparison–Gilliam County/Arlington

Source: City of Arlington NHMP Steering Committee and Gilliam County NHMP Steering Committee, 2018

Community Asset Identification

This section provides information on City specific assets. For additional information on the characteristics of Arlington, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix C, Community Profile. Many of these community characteristics can affect how natural hazards impact communities and how communities choose to plan for natural hazard mitigation. Considering the City specific assets during the planning process can assist in identifying appropriate measures for natural hazard mitigation.

It should be noted that Census data can be inaccurate at the small City level.
Community Characteristics

Arlington is located at the northern border of Gilliam County and the state of Oregon, where the Columbia River divides Oregon and Washington. Interstate-84 passes through Arlington east-west, and State Highway 19 is the major north-south route connecting Arlington with Condon, the County seat. Arlington contains about 1.78 square miles, 0.62 of which is water (26%).\(^1\) The climate of Arlington is semi-arid, characterized by dry, warm summers and cold winters; the average monthly temperatures range from 55-91 degrees in July and August, and 28-42 degrees in December and January. The City receives approximately 8.9 inches of rain and 9.7 inches of snow each year.\(^2\) Monthly precipitation is about 1-1.5 inches during the wetter months of November – March, and average less than 0.5 inches during the drier months of June - September. The City is located on a slight slope just south of the Columbia River. It was relocated in 1958 when the John Day Dam construction inundated the original city site.\(^3\) As such, the majority of Arlington houses (80%) were built after 1960; 40% were built after 1990, and likely have low seismic vulnerability. Of the 249 housing units in Arlington, 16.1% are vacant.\(^4\) Local officials on the Steering Committee note that vacant housing rates have dropped significantly in past few years, especially rental housing, and that current vacancy rates are likely lower than 16%. Workers employed seasonally at wind farms often commute from other communities.\(^5\) Some new development has occurred since the previous plan update, including an eight unit apartment complex and a two house subdivision, but the population remains very stable.

Economy

The median household income in Arlington is $40,375, very similar that of Gilliam County as a whole and significantly lower than the state of Oregon ($53,270).\(^6\) Arlington’ primary industries are Construction; and Professional, Scientific, and Management, Administrative and Waste Management Services. The City contains a waste management facility that serves the metro area of Portland. Retail trade, along with Educational Services, and Health Care and Social Assistance create roughly 22% of local jobs as well.\(^7\) The unemployment rate is 17%, more than twice that of the County overall, indicating lower economic resiliency.\(^8\) Again, local officials estimate the true unemployment rate to be significantly lower than 17%.\(^9\) While the area is home to many wind farms, including Shephard’s Flat, the world’s largest windfarm, none are located on city property.\(^10\)

\(^1\) Social Explorer Tables: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer T3; U.S. Census Bureau
\(^4\) Social Explorer Tables: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer T96; U.S. Census Bureau
\(^5\) City of Arlington NHMP Steering Committee, 5/29/2018
\(^6\) ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Table 57; U.S. Census Bureau
\(^7\) ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Table 49; U.S. Census Bureau
\(^8\) Social Explorer Tables: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Table T37; U.S. Census Bureau
\(^9\) City of Arlington NHMP Steering Committee, 5/29/2018
\(^10\) Arlington Community Chamber of Commerce, retrieved 5/22/2018; http://www.visitarlingtonoregon.com/
Population Characteristics

The total population of Arlington is 610 people.\textsuperscript{11} 17.7\% of the Arlington population is over 65 years old, and 25.9\% is under 18 years old. A high percentage of children indicates a vulnerable population requiring extra services in a disaster situation. 13.7\% of Arlington residents identify as Hispanic or Latino. A third of the population (33\%) lives below the federal poverty level, the majority of which are working age residents.\textsuperscript{12} Interestingly, 20\% of residents moved the County within the past year.

Asset Inventory

Creating an asset inventory is the first step of a vulnerability analysis. Assets that may be affected by hazard events include population, residential and nonresidential buildings, critical facilities, and infrastructure.

The asset inventory delineates the City’s existing building and infrastructure assets in detail in Table ARL-8.

\textbf{Table ARL-6 Arlington Critical Facilities and Infrastructure}

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Facility Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arlington Elementary School (built in 1963)</td>
<td>Educational</td>
</tr>
<tr>
<td>Arlington High School (built in 1952)</td>
<td>Educational</td>
</tr>
<tr>
<td>Arlington Medical Clinic</td>
<td>Care Facility</td>
</tr>
<tr>
<td>City Hall</td>
<td>Government</td>
</tr>
<tr>
<td>North Gilliam County Rural Fire Protection District Station</td>
<td>Emergency Response</td>
</tr>
<tr>
<td>Wastewater Treatment</td>
<td>Utilities</td>
</tr>
<tr>
<td>Water System</td>
<td>Utilities</td>
</tr>
<tr>
<td>North Gilliam County Medic Building</td>
<td>Care Facility</td>
</tr>
</tbody>
</table>

Source: City of Arlington Steering Committee, May 2018

See hazard sections below and Section 2, \textit{Risk Assessment}, for potential hazard vulnerabilities to these facilities.

\textsuperscript{11} Portland State University Population Research Center; Certified Population Estimates, July 2017

\textsuperscript{12} ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Tables 114, 115, 116; U.S. Census Bureau
Hazard Characteristics

Please review the Risk Assessment (Volume I, Section 2) for additional information on these hazards.

Drought

The Steering Committee determined that the City’s probability for drought is low (which is lower than the county’s rating) and that their vulnerability to drought is high (which is higher than the county’s rating).

Volume I, Section 2, Risk Assessment, describes the characteristics of drought hazards, as well as the location and extent of a potential event. Moderate droughts occur regularly in Gilliam County, primarily impacting the agricultural industry and increasing the risk of wildfire. These droughts rarely impact City water supply, leading to insignificant drought history and low probability. However, if a drought did occur, the Arlington Steering Committee estimates that more than 10% of the population would be impacted due to rationing, indicating a high vulnerability.

Arlington’ primary water supply comes from local groundwater sources and is stored in reservoirs totaling 1,950,000 gallon storage capacity. Water is treated with chlorine. In general, water supply is available and sufficient. Drought declarations have occurred due to the water needs of agricultural and livestock operations in the area. The City has never experienced a lack of water for residents’ needs or rationed water.13

Earthquake

The Steering Committee determined that the City’s probability for an earthquake event is moderate (which is the same as the county’s rating) and that their vulnerability is high (which is higher than the county’s rating). While Gilliam County will experience moderate shaking overall, the City of Arlington will experience moderate to strong shaking.

Volume I, Section 2, Risk Assessment, describes the characteristics of earthquake hazards, history, as well as the location and extent of a potential event. Generally, an event that affects the county is likely to affect Arlington slightly more, according to the expected shaking studies conducted by DOGAMI. The liquefaction potential in Arlington is low to none, although areas on the slopes above Arlington may experience moderate liquefaction. Expected shaking is moderate to strong for a local event and moderate for a Cascadia Subduction Zone event. The causes and characteristics of an earthquake event are described within the county’s plan, as well as the location and extent of potential hazards. Previous occurrences are well-documented within the county’s plan. Local residents do not recall experiencing earthquake shaking in the area. The community impacts described by the county would occur in Arlington to a similar extent, with slightly more collapse potential due to stronger shaking. Earthquake-induced damages are difficult to predict, and depend on the size, type, and location of the earthquake, as well as site-specific building and soil characteristics. Presently, it is not possible to accurately forecast the location or size of

13 City of Arlington Steering Committee, 5/29/2018
earthquakes, but it is possible to predict the behavior of soil at any particular site. Arlington has little soft-soil hazard, although land adjacent to the municipal airport is moderately susceptible (Figure ARL-2).

**Figure ARL-2 Expected Shaking and Soft Soils**

![Image of Expected Shaking and Soft Soils](image)

Source: [Oregon HazVu: Statewide Geohazards Viewer (DOGAMI)](https://hazvu.oregon.gov/), accessed on 5/22/2018

As noted in the Community Profile approximately 60% of residential buildings were built prior to 1990, which increases the City’s vulnerability to the earthquake hazard because building codes were different. Information on specific public buildings’ (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2007, is shown in Table ARL-9; each “X” represents one building within that ranking category. Of the facilities evaluated by DOGAMI using RVS, two (2) have a very high (100% chance), and two (2) have a high (>10%) collapse potential. In addition to building damages, utility (electric power, water, wastewater, natural gas) and transportation systems (bridges, pipelines) may experience some damage.

<table>
<thead>
<tr>
<th>Table ARL-9 Rapid Visual Survey Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facility</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Public Safety</td>
</tr>
<tr>
<td>Oregon State Police^</td>
</tr>
<tr>
<td>North Gilliam County RFPD^^</td>
</tr>
<tr>
<td>Schools</td>
</tr>
<tr>
<td>Arlington Elementary School</td>
</tr>
<tr>
<td>Arlington High School</td>
</tr>
</tbody>
</table>

Source: DOGAMI 2007. Open File Report 0-07-02. Statewide Seismic Needs Assessment Using Rapid Visual Assessment. **^** – Site ID is referenced on the RVS Gilliam County Map; ^Oregon State Police facility has been renamed the Gilliam County Sheriff’s Office; ^^^ Indicates building has been retrofit or rebuilt since 2007 Rapid Visual Assessment
Flood

The Steering Committee determined that the City’s probability for flood is moderate (which is lower than the county’s rating) and that their vulnerability to flood is moderate (which is the same as the county’s rating). This difference in probability is due to residents personal experiences of flood events, which is that they rarely occur and almost never rise to the level of property damage.

Volume I, Section 2, Risk Assessment, describes the causes and characteristics of flooding hazards within the region, as well as previous flooding occurrences. General flood-related community impacts are described within the Flood Hazard Annex of Gilliam County’s Natural Hazards Mitigation Plan. Portions of Arlington have areas of floodplains (special flood hazard areas). These include areas along the Columbia River and John Day highway/Hwy 19/China Ditch, especially Earl Snell Memorial Park (see Figure ARL-4 and Attachment A, Map ARL-3). However, damage from floods has been historically negligible. The entire community would be impacted if a severe flood affected the waste water treatment plant; other impacts are minimal.

**Figure ARL-4 Special Flood Hazard Area**

![Special Flood Hazard Area](image)

Source: [Oregon HazVu: Statewide Geohazards Viewer (DOGAMI) accessed on 5/22/2018](link)

**National Flood Insurance Program (NFIP)**

FEMA has not modernized the Arlington Flood Insurance Rate Maps (FIRMs); the FIRMs are the originals from 1984. Table ARL-10 shows that as of February 2018, Arlington has 0 National Flood Insurance Program (NFIP) policies in force. Neither Arlington nor Gilliam County is not a member of the Community Rating System (CRS). There has been a total of one (1) paid claim in the County, and none in the City of Arlington. The Community...
Repetitive Loss record for Arlington identifies no Repetitive Loss Properties\textsuperscript{14} and no Severe Repetitive Loss Properties\textsuperscript{15}.

**Table ARL-10 Flood Insurance Detail**

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Effective FIRM and FIS</th>
<th>NFIP Policies</th>
<th>Insurance in Force</th>
<th>Total Paid Claims</th>
<th>Total Paid Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td>9/24/1984</td>
<td>4</td>
<td>$1,105,000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Arlington</td>
<td>9/24/1984</td>
<td>0</td>
<td>$ -</td>
<td>0</td>
<td>$1,156</td>
</tr>
</tbody>
</table>

Source: Dave Lentzer, Department of Land Conservation and Development, personal communication, February 2018.

**Volcanic Event**

The Steering Committee determined that the City’s probability for volcanic event is low (which is the same as the county’s rating) and that their vulnerability to volcanic event is high (which is higher than the county’s rating). This higher vulnerability is due to Arlington’s closer proximity to Mt. Hood and Mt. St. Helens.

Volume I, Section 2, Risk Assessment, describes Arlington’s risk to volcanic events. Generally, an event that affects the county is likely to affect Arlington as well. The causes and characteristics of a volcanic event are described within the county’s plan, as well as the location and extent of potential hazards. Previous occurrences are well-documented within the county’s plan, and the community impacts described by the county would generally be the same for Arlington as well. Arlington is very unlikely to experience anything more than volcanic ash during a volcanic event. When Mt. Saint Helens erupted in 1980, Arlington experience significant ash fall.

**Wildfire**

The Steering Committee determined that the City’s probability for wildfire is high (which is the same as the county’s rating) and that their vulnerability to wildfire is high (which is higher than the county’s rating). The City is more vulnerable to wildfire due to residential properties on steep slopes on both borders of the City.

Volume I, Section 2, Risk Assessment, describes the causes and characteristics of wildfires, as well as the county and City’s history of wildfire events. Small to moderate wildfires occur

\textsuperscript{14} A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP.

\textsuperscript{15} A Severe Repetitive Loss (SRL) property is a single family property (consisting of 1 to 4 residences) that is covered under flood insurance by the NFIP and has incurred flood-related damage for which 4 or more separate claims payments have been paid under flood insurance coverage, with the amount of each claim payment exceeding $5,000 and with cumulative amount of such claims payments exceeding $20,000; or for which at least 2 separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.
every one-three years on the western slopes of the City. In the past 12 years, fires have destroyed two homes and threatened evacuations several times. The location and extent of wildfires vary depending on fuel, topography, and weather conditions, but Arlington is surrounded by dry grasses and frequently experiences dry, hot, windy summers, resulting in high wildfire likelihood.

The potential community impacts and vulnerabilities described in the county’s NHMP are generally accurate for the City as well. Gilliam County developed a Community Wildfire Protection Plan (CWPP) in 2007, which describes how summer weather, terrain, crops and natural vegetation of Gilliam County lends itself to the ongoing problem of wildfires throughout the County.

The Gilliam County CWPP provides some risk and vulnerability information related to Arlington that has been incorporated into this plan as applicable.\footnote{Gilliam County Wildfire Protection Plan, 2007.}

**Windstorm**

The Steering Committee determined that the City’s probability for windstorm is moderate (which is lower than the county’s rating) and that their vulnerability to windstorm is moderate (which is the same as the county’s rating).

Volume I, Section 2, *Risk Assessment*, describes the causes and characteristics of windstorms, as well as the location and extent of windstorm hazards. The region’s (and City’s) history of events is adequately described within the county’s plan as well. Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and snow. For the purposes of this plan, windstorms are considered an individual hazard, distinct from winter storms. Alone, they have much lower potential to affect the City.

Gilliam County’s plan describes the impacts caused by windstorms, including power outages, downed trees, and storm-related debris. Although Arlington experiences near constant winds, the wind speeds rarely rise to an emergency level. Wind events rarely cause utility or property related damages.

*Please review the Risk Assessment (Volume I, Section 2) for additional information on this hazard.*

**Winter Storm (includes landslides)**

The Steering Committee determined that the City’s probability for winter storm is high (which is the same as the county’s rating) and that their vulnerability to winter storm is high (which is the same than the county’s rating).

Volume I, Section 2, *Risk Assessment*, describes the causes and characteristics of winter storms, as well as the location and extent of winter storm hazards. The region’s (and City’s) history of events is adequately described within the county’s plan. Severe winter storms can consist of rain, freezing rain, ice, snow, extreme cold, and wind. They originate from frigid air moving west from the Wallowa Mountains. These storms are most common from
November through March and occur every 2-3 years. The most common impact to Arlington is freezing rain, which disrupts traffic and causes accidents. Storms are rarely associated with flooding or landslides.

Major winter storms can and have occurred in the Arlington area, and while they typically do not cause significant damage, they are frequent and have the potential to impact economic activity. Interstate-84 is closed due to winter storm impacts annually, usually outside of the County or City boundaries. The City may experience diminished food and fuel supplies in the event of a closure. Historically, the City experienced annual power outages due to winter storms, but recent infrastructure upgrades have reduced power outage instances.

Like Gilliam County, Arlington does not experience significant landslides or consider them a substantial hazard. Landslide susceptibility exposure for Arlington is shown in Figure ARL-5 and Map CLA-5 (Attachment A). Approximately 63.1% of Arlington has Low landslide susceptibility, 25.2% has moderate, and 11.7% has high landslide susceptibility. The highest risk areas are on the eastern and western slopes on the borders of the City.

**Figure ARL-5 Landslide Susceptibility Exposure**

![Figure ARL-5 Landslide Susceptibility Exposure](image)

Source: [Oregon HazVu: Statewide Geohazards Viewer (DOGAMI) accessed on 5/22/2018](#)

Potential landslide-related impacts are described within the county’s NHMP, and include infrastructural damages, economic impacts (due to isolation and/or arterial road closures), property damages, and obstruction to evacuation routes. Roads outside of Arlington are occasionally impacted by rockfall.

---

Purpose

This document serves as the City of Condon’ Addendum to the Gilliam County Multi-Jurisdictional Natural Hazards Mitigation Plan (MNHMP, NHMP). This addendum supplements information contained in Volume I (Basic Plan) of this NHMP, which serves as the foundation for this jurisdiction’s addendum, and Volume III (Appendices), which provides additional information (particularly regarding participation and mitigation strategy). This addendum meets the following requirements:

- Multi-jurisdictional Plan Adoption §201.6(c)(5),
- Multi-jurisdictional Participation §201.6(a)(3),
- Multi-jurisdictional Mitigation Strategy §201.6(c)(3)(iv), and
- Multi-Jurisdictional Risk Assessment §201.6(c)(2)(iii).

Plan Process, Participation, and Adoption

This section of the NHMP addendum addresses 44 CFR 201.6(c)(5), Plan Adoption, and 44 CFR 201.6(a)(3), Participation.

In January 2018, the Department of Land Conservation and Development (DLCD) partnered with the University of Oregon’s Institute for Policy Research and Engagement (IPRE): the Oregon Partnership for Disaster Resilience (OPDR) and the Resource Assistance for Rural Environments (RARE) program, and Gilliam County and the Cities, including City of Arlington, Condon, and Cascade Locks, to update their NHMP, which expired December 16, 2017. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY16 Pre-Disaster Mitigation Competitive Grant Program. After funding was awarded in July 2017 to DLCD for two PDM 16 grants (PDMC-PL-10-2016-003 and PDMC-PL-10-2016-005), a regional kickoff meeting for all eight counties involved in the PDM 16 grants was held on July 18, 2017.

To be eligible to receive certain pre- and post-disaster natural hazard mitigation funds from FEMA, local governments must have a current, FEMA-approved NHMP. NHMPs must be updated and re-approved every five years. By developing this addendum to the Gilliam County NHMP, locally adopting it, and having it approved by FEMA, the City of Arlington will regain eligibility for FEMA Hazard Mitigation, Pre-Disaster Mitigation, and Flood Mitigation Assistance grant program funds.

The Gilliam County NHMP, and Condon addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. The project Steering Committee guided the process of developing the plan. For more information on the composition of the Steering Committee see the Acknowledgements, Plan Summary, and Plan Process (Volume III and Appendix B).
The Public Works Superintendent is the designated local convener and will take the lead in implementing, maintaining, and updating the addendum to the NHMP in collaboration with the designated convener of the Gilliam County NHMP (County Emergency Management).

Representatives from the City of Condon Steering Committee convened on the following occasions (see Appendix B for more information):

- April 24, 2018 - Gilliam County NHMP Project Initiation Meeting
- May 16, 2018 – Gilliam County NHMP Second Meeting
- May 30, 2018 – Condon Steering Committee Meeting #1

The City’s addendum reflects decisions decided upon at these NHMP meetings and during subsequent work and communication with NHMP Update Coordinator.

The Condon Steering Committee was comprised of the following representatives:

- Convener: Gibb Wilkins, City of Condon Public Works Superintendent
- Chris Fitzsimmons, Gilliam County Emergency Management
- Kathryn Greiner, City of Condon Administrator
- Nicolia Mehrling, NHMP Update Coordinator, Resource Assistance for Rural Environments

Public participation was achieved with the establishment of the Steering Committee, which was comprised of city officials representing different organizations and sectors. The Steering Committee was closely involved throughout the development of the plan and served as the local oversight body for the plan’s development. In addition, community members outside of the Steering Committee were provided an opportunity for comment via the plan review process (see Appendix B for more information).

The Gilliam County NHMP was approved by FEMA on [Month] [Day], 2018 and the Condon addendum was adopted via resolution on [Month] [Day], 2018. This NHMP is effective through [Month] [Day], 2023.

**Mitigation Strategy**

This section of the NHMP addendum addresses 44 CFR 201.6(c)(3)(iv), *Mitigation Strategy*.

During the 2018 Gilliam County NHMP update process the County and local Steering Committees re-evaluated the existing Mitigation Action Items. Following the review, mitigation actions were updated, noting what accomplishments had been made, and whether the actions were still relevant and if existing language needed to change. New action items were identified at this time (see Appendix B for more information). Each jurisdiction developed a list of priority mitigation actions. The City’s priority actions are listed below in Table CN-1 Condon Priority Action Items.

Because this is the first formal addendum for the City of Condon, all of the 2018 mitigation actions were created during this update.
<table>
<thead>
<tr>
<th>Action Item #</th>
<th>Description</th>
<th>Managing Department/Agency</th>
<th>Timeline</th>
<th>Potential Funding Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS #1</td>
<td>Seeking funding for a generator for City Hall</td>
<td>City of Condon</td>
<td>LT (3-5 years)</td>
<td>State or federal grants</td>
</tr>
<tr>
<td>WS #2</td>
<td>Conduct public outreach and notification about protecting pipes during extreme cold periods</td>
<td>City of Condon</td>
<td>ST (1-3 years)</td>
<td>Local sources</td>
</tr>
<tr>
<td>WS #3</td>
<td>Seeking funding for more snow removal equipment</td>
<td>City of Condon Public Works</td>
<td>LT (3-5 years)</td>
<td>Local sources</td>
</tr>
<tr>
<td>FL#1</td>
<td>Pursue more recent flood plain information; update flood plain maps</td>
<td>City of Condon</td>
<td>LT (3-5 years)</td>
<td>Grants; local sources</td>
</tr>
</tbody>
</table>

Source: City of Condon NHMP Steering Committee, May 2018.
WS = Winter Storm, FL = Flood
Plan Implementation and Maintenance

The City Council will be responsible for adopting the City of Condon addendum to the Gilliam County NHMP. This addendum designates a coordinating body and a convener to oversee the development and implementation of action items. Because the city addendum is part of the county’s multi-jurisdictional NHMP, the city will look for opportunities to partner with the county. The city’s steering committee will convene after re-adoption of the City of Condon addendum on an annual schedule; the county is meeting on a semi-annual basis and will provide opportunities for the cities to report on NHMP implementation and maintenance during their meetings. The City of Condon Public Works Superintendent will serve as the convener and will be responsible for assembling the steering committee (coordinating body). The steering committee will be responsible for:

- identifying new risk assessment data,
- reviewing status of mitigation actions,
- identifying new actions, and
- seeking funding to implement the city’s mitigation strategy (actions).

The convener will also remain active in the county’s implementation and maintenance process (see Volume I, Section 4 for more information).

The city will utilize the same prioritization process as the county (See Volume I, Section 4: Plan Implementation and Maintenance and Volume III, Appendix C: Economic Analysis of Natural Hazard Mitigation Projects for more information).

Implementation through Existing Programs

Many of the recommendations in the Natural Hazards Mitigation Plan are consistent with the goals and objectives of the city’s existing plans and policies. Where possible, the City of Condon will implement the NHMP’s recommended actions through existing plans and policies. Plans and policies already in existence have support from local residents, businesses, and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, allowing them to adapt to changing conditions and needs. Implementing the NHMP’s action items through such plans and policies increases their likelihood of being supported and implemented.

Condon’ acknowledged comprehensive plan is the Condon Comprehensive Plan, which was most recently updated in 2015. The City implements the plan through the City Zoning Ordinances. Condon currently has the following plans, programs, and policies that relate to natural hazard mitigation. For a complete list visit the city website:
### Table CN-3 Legal and Regulatory Resources Available for Hazard Mitigation

<table>
<thead>
<tr>
<th>Regulatory Tool</th>
<th>Name</th>
<th>Effects on Hazard Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plans</td>
<td>Comprehensive Plan (2015)</td>
<td>Includes goals and policies that provide specific direction in making &quot;quasi-judicial&quot; land use decisions; i.e., decisions that require judgment in the application of general policies to specific situations, such as zone changes, annexations, conditional use permits and major variances.</td>
</tr>
<tr>
<td></td>
<td>Water system master plan (2017)</td>
<td>Provides a description and analysis of water system and outlines planned improvements, including the addition of fire hydrants and a generator to power hydrants.</td>
</tr>
<tr>
<td></td>
<td>Strategic Broadband Plan (2016)</td>
<td>Provides a description and analysis of current and desired communications capacities.</td>
</tr>
<tr>
<td></td>
<td>Wastewater Collection Master Plan (2016)</td>
<td>Provides a description and analysis of sewer system and outlines planned improvements.</td>
</tr>
<tr>
<td></td>
<td>Public Works Standards Plan</td>
<td>Provides guidelines for infrastructure improvement and maintenance.</td>
</tr>
<tr>
<td>Policies (Municipal Codes)</td>
<td>City Ordinances</td>
<td>Guides community development, including within floodplains and regarding weed abatement and snowstorms response.</td>
</tr>
</tbody>
</table>

### Table CN-4 Administrative and Technical Resources for Hazard Mitigation

<table>
<thead>
<tr>
<th>Staff/Personnel Resources</th>
<th>Department/Division Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Six City Council members and Mayor</td>
<td>Elected Office</td>
</tr>
<tr>
<td>Three member planning commission</td>
<td>Appointed/election volunteer commission</td>
</tr>
<tr>
<td>Staff with knowledge of land management guidelines and development practices</td>
<td>City Administrator/Planner</td>
</tr>
<tr>
<td>City engineer</td>
<td>Contracted on as necessary basis</td>
</tr>
</tbody>
</table>
### Table CN-5 Financial Resources for Hazard Mitigation

<table>
<thead>
<tr>
<th>Financial Resources</th>
<th>Effect on Hazard Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>General funds</td>
<td>Yes</td>
</tr>
<tr>
<td>Authority to levy taxes for specific purposes</td>
<td>Yes</td>
</tr>
<tr>
<td>Incur debt through general obligation bonds</td>
<td>No</td>
</tr>
<tr>
<td>Grants (state)</td>
<td>Yes</td>
</tr>
<tr>
<td>Collected fees: Water, sewer, host fees, Windmill SIP fees</td>
<td>No</td>
</tr>
</tbody>
</table>

Note: See Appendix E – Grant Programs for additional financial resources.

### Continued Public Participation

Keeping the public informed of the city’s efforts to reduce the city’s risk to future natural hazards events is important for successful plan implementation and maintenance. The city is committed to involving the public in the plan review and updated process. See Volume I, Section 4, for more information.

### Plan Maintenance

The Gilliam County Multi-Jurisdictional Natural Hazards Mitigation Plan and city addendum will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the county plan update process, the city will also review and update its addendum. The convener will be responsible for convening the steering committee to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state, or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the plan was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community’s demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the plan accurately address the impacts of this event?

These questions will help the steering committee determine what components of the mitigation plan need updating. The steering committee will be responsible for updating any deficiencies found in the plan.
Risk Assessment

This section of the NHMP addendum addresses 44 CFR 201.6(b)(2) - Risk Assessment. In addition, this chapter can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards. Assessing natural hazard risk has three phases:

**Phase 1:** Identify hazards that can impact the jurisdiction. This includes an evaluation of potential hazard impacts – type, location, extent, etc.

**Phase 2:** Identify important community assets and system vulnerabilities. Example vulnerabilities include people, businesses, homes, roads, historic places and drinking water sources.

**Phase 3:** Evaluate the extent to which the identified hazards overlap with, or have an impact on, the important assets identified by the community.

The local level rationale for the identified mitigation strategies (action items) is presented herein, and within Section 2, Risk Assessment, and Appendix B, Community Profile. The risk assessment process is graphically depicted in Figure CLA-1 below. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

**Figure CN-1 Understanding Risk**

![Understanding Risk Diagram](image_url)

**Community Asset Identification**

This section provides information on city specific assets. For additional information on the characteristics of Condon, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix C, Community Profile. Many of these community characteristics can affect how natural hazards impact communities and how communities choose to plan for natural hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for natural hazard mitigation.
Community Characteristics

Condon is located in south-central Gilliam County where highways 19 and 206 intersect, in an area dominated by wheat fields and grass farms. State Highway 19 is the major north-south route connecting Arlington with Condon, while State Highway 206 connects Condon with communities to the east and west. Condon is about 0.83 square miles, and has an elevation of 2,800 feet.\(^1\)\(^,\)\(^2\) The climate of Condon is characterized by dry, warm summers and cold winters; the average monthly temperatures range from 49-84 degrees in July and August, and 22-39 degrees in December and January. The city receives approximately 13.3 inches of rain and 29 inches of snow each year\(^3\). Monthly precipitation is about 1-1.5 inches during the wetter months of November – March, and average about 0.5 inches during the drier months of June - September. The city’s topography is primarily flat and open, and one creek runs through city boundaries.

Condon is the County seat, and contains most county services, including the pharmacy, agriculture extension services, Department of Health and Human Services, and Gilliam County Sheriff’s Office. Of note, Condon contains the County’s primary grocery store. Groceries are delivered twice each week, if I-84 closes, truck deliveries are disrupted and grocery stocks ran low.

Economy

The median household income in Condon is $36,875, slightly lower than that of Gilliam County and significantly lower than the state (53,270).\(^4\) Condon’ primary industries are Educational services, health care and social assistance; and Transportation and Warehousing. Arts, recreation, entertainment, accommodation and food service, along with Public Administration create roughly 20% of local jobs as well.\(^5\) The unemployment rate is low: 3.6%.

Population Characteristics

The total population of Condon is 556 people.\(^6\) 39% of the Condon population is over 65 years old, and 15.5% is under 18 years old. Roughly a fifth of the population (21.5%) lives below the federal poverty level.\(^7\) It should be noted that Census data can be inaccurate at the small city level. 90% of the population lives in the same house as a year ago, and almost ten percent moved within the County or within the State, indicating high stability. The City is experiencing higher incoming migration than in previous years, indicated by quick house sales. The majority of Condon houses were built before 1990 (72%) and 42% were built

---

\(^1\) Social Explorer Tables: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer T3; U.S. Census Bureau
\(^2\) Gilliam County Wildfire Protection Plan, 2007
\(^3\) Western Regional Climate Center, “Condon, OR (35175)”. Retrieved May 22, 2018. https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?or1765
\(^4\) ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Table 57; U.S. Census Bureau
\(^5\) ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Table 49; U.S. Census Bureau
\(^6\) ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Table 1; U.S. Census Bureau
\(^7\) ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Tables 114, 115, 116; U.S. Census Bureau
before 1960, indicating high seismic vulnerability. Of the 400 housing units in Condon, 28.5% are vacant.  

**Asset Inventory**

Asset inventory is the first step of a vulnerability analysis. Assets that may be affected by hazard events include population, residential and nonresidential buildings, critical facilities, and infrastructure.

The asset inventory delineates the City’s existing building and infrastructure assets in detail in Table CN-8.

**Table CN-8 Condon Critical Facilities and Infrastructure**

<table>
<thead>
<tr>
<th>Facility</th>
<th>Facility Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condon Elementary School (built in 1925)</td>
<td>Educational</td>
</tr>
<tr>
<td>Condon High School (built in 1962)</td>
<td>Educational</td>
</tr>
<tr>
<td>City Hall</td>
<td>Government</td>
</tr>
<tr>
<td>South Gilliam County Rural Fire Protection District Station</td>
<td>Emergency Response</td>
</tr>
<tr>
<td>South Gilliam County Medical Center</td>
<td>Care Facility</td>
</tr>
<tr>
<td>Frontier Regional (911)</td>
<td>Emergency Response</td>
</tr>
<tr>
<td>Wastewater Treatment</td>
<td>Utilities</td>
</tr>
<tr>
<td>Water System</td>
<td>Utilities</td>
</tr>
<tr>
<td>Cell towers</td>
<td>Communication</td>
</tr>
</tbody>
</table>

Source: Condon Steering Committee, May 2018

See hazard sections below and Section 2, *Risk Assessment*, for potential hazard vulnerabilities to these facilities.

**Hazard Analysis**

**Hazard Analysis Methodology**

This NHMP utilizes a hazard analysis methodology that was first developed by FEMA circa 1983, and gradually refined by the Oregon Military Department’s Office of Emergency Management (OEM) over the years.

The methodology produces scores that range from 24 (lowest possible) to 240 (highest possible). Vulnerability and probability are the two key components of the methodology. Vulnerability examines both typical and maximum credible events, and probability endeavors to reflect how physical changes in the jurisdiction and scientific research modify the historical record for each hazard. Vulnerability accounts for approximately 60% of the total score, and probability approximately 40%.

---

8 Social Explorer Tables: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer T96; U.S. Census Bureau
This method provides the jurisdiction with a sense of hazard priorities, or relative risk. It doesn't predict the occurrence of a particular hazard, but it does "quantify" the risk of one hazard compared with another. By doing this analysis, planning can first be focused where the risk is greatest.

In this analysis, severity ratings, and weight factors, are applied to the four categories of history, vulnerability, maximum threat (worst-case scenario), and probability as shown in the table below. See Volume I, Section 2 (Risk Assessment) for more information.

City of Condon Hazard Analysis

The Condon steering committee developed their hazard vulnerability assessment (HVA), using the county’s HVA as a reference. Changes from the county’s HVA were made where appropriate to reflect distinctions in vulnerability and risk from natural hazards unique to Condon, which are discussed throughout this addendum.

Table CN-6 shows the HVA matrix for Condon showing each hazard listed in order of rank from high to low. For local governments, conducting the hazard analysis is a useful step in planning for hazard mitigation, response, and recovery. The method provides the jurisdiction with sense of hazard priorities, but does not predict the occurrence of a particular hazard.

Only one chronic hazards (winter storms) ranks as the top hazard threat to the City of Condon. The Earthquake, drought, and windstorm hazards comprise the next highest ranked hazards, while flood, volcano, and wildfire hazards comprise the lowest ranked hazards.

### Table CN-6 Hazard Analysis Matrix – Condon

<table>
<thead>
<tr>
<th>Hazard</th>
<th>History</th>
<th>Probability</th>
<th>Vulnerability</th>
<th>Maximum Threat</th>
<th>Total</th>
<th>Rank</th>
<th>Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Storm</td>
<td>8</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td>231</td>
<td>1</td>
<td>High</td>
</tr>
<tr>
<td>Drought</td>
<td>3</td>
<td>8</td>
<td>4</td>
<td>8</td>
<td>162</td>
<td>2</td>
<td>Medium</td>
</tr>
<tr>
<td>Earthquake</td>
<td>1</td>
<td>6</td>
<td>3</td>
<td>10</td>
<td>159</td>
<td>3</td>
<td>Medium</td>
</tr>
<tr>
<td>Windstorm</td>
<td>5</td>
<td>8</td>
<td>4</td>
<td>6</td>
<td>146</td>
<td>4</td>
<td>Medium</td>
</tr>
<tr>
<td>Volcanic</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>8</td>
<td>124</td>
<td>5</td>
<td>Low</td>
</tr>
<tr>
<td>Flood</td>
<td>4</td>
<td>8</td>
<td>3</td>
<td>4</td>
<td>119</td>
<td>6</td>
<td>Low</td>
</tr>
<tr>
<td>Wildfire</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>106</td>
<td>7</td>
<td>Low</td>
</tr>
</tbody>
</table>

Source: Condon NHMP Steering Committee, 2018.

Table CN-7 categorizes the probability and vulnerability scores from the hazard analysis for the city and compares the results to the assessment completed by the Gilliam County NHMP Steering Committee (areas of differences are noted with **bold** text within the city ratings). The city ranked their vulnerability to earthquakes and floods as lower than the county, and probability of wildfire as lower.
Table CN-7 Probability and Vulnerability Comparison

<table>
<thead>
<tr>
<th>Hazard</th>
<th>City of Condon</th>
<th>Gilliam County</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probability</td>
<td>Vulnerability</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Wildfire</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Drought</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Flood</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Windstorm</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Volcano</td>
<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Source: Condon NHMP Steering Committee and Gilliam County NHMP Steering Committee, 2018.

Hazard Probability:

Compared to Gilliam County, the hazard analysis for the City of Condon identified zero hazards with higher probability.

The City of Condon and Gilliam County identified equal probability for future occurrences of hazards that include:

- Severe Weather/Winter Storm
- Volcanic Event
- Windstorm
- Drought
- Earthquake
- Flood

The hazard analysis for the City of Condon identified lower probability of Wildfire hazard compared to Gilliam County. Although droughts commonly occur throughout Gilliam County and the surrounding region, the hazard has had little or no effect of the City. The City has neither restricted water usage because of a drought nor requested assistance from other jurisdictions to respond to a drought. Therefore, the probability of a drought hazard impacting the City is lower than the County.

Because there is no written history of previous earthquake occurrences documented in Gilliam County, the City rated the probability of an earthquake as low.

Because the City’s elevation (approximately 2,000-feet), terrain, and location on the flats of the Columbia Plateau, the probability of a flood is less likely in the City compared to other parts of Gilliam County.

Because the City is located in a flat area with good defensible space and low wildfire history, the probability of wildfire is lower than other areas within Gilliam County.
Community Vulnerability:
Compared to Gilliam County, the hazard analysis for the City of Condon identified higher vulnerability to no hazards. The City of Condon and Gilliam County identified equal vulnerability to the following hazards:

- Winter Storm
- Wildfire
- Drought
- Windstorm
- Volcano

The City experienced ash fallout in 1980 from the eruption of Mount St. Helens. Ash fallout can disrupt or damage transportation systems, electrical systems, water systems, and wastewater systems, and can also effect populations, particularly people with chronic respiratory problems.

Flash flooding during the dry, summer months can also impact the City of Condon. The City also has a high percentage of elderly population compared to the county.

Because of its elevation and location, the City of Condon regularly experiences windstorms, some of which have the potential to cause injuries and damage to property. The hazard analysis for the City of Condon identified the remaining two hazards with lower vulnerability compared to Gilliam County:

- Earthquake
- Flood

Areas throughout Gilliam County, particularly the northern part, generally have higher ground shake amplification, liquefactions, and earthquake-induced landslides than the City of Condon. Also, because there is no written history of previous earthquake occurrences documented in Gilliam County, the city rated the vulnerability of an earthquake lower than the county.

The City rated the vulnerability to wildfire low based off of previous events that have occurred and the impacts they had to the City.

Hazard Comparison Summary

Figure CN-6 presents a summary of the hazard analysis for the City of Condon and compares the results to the assessment completed by Gilliam County. The city rated their threat from all hazards as either lower than or the same as the county.
Hazard Characteristics

Please review the Risk Assessment (Volume I, Section 2) for additional information on each hazard.

Drought

The steering committee determined that the city’s probability for drought is high (which is the same as the county’s rating) and that their vulnerability to drought is moderate (which is the same as the county’s rating).

Volume I, Section 2, Risk Assessment, adequately describes the characteristics of drought hazards, as well as the location and extent of a potential event. Moderate droughts occur regularly in Gilliam County, primarily impacting the agricultural industry and increasing the risk of wildfire. Residents recall one instance, ten-fourteen years ago, during which water was rationed for a month. Otherwise, droughts have had no affect on the city.

Condon’ primary water supply comes from surface affected groundwater. The City contains eight wells and spring, with a total storage capacity of 850,000 gallons. Condon does not have a water treatment plan, but treats water with chlorine. In general, water supply is available and sufficient.

Earthquake

The steering committee determined that the city’s probability for an earthquake event is moderate (which is the same as the county’s rating) and that their vulnerability is low (which is lower than the county’s rating).
Volume I, Section 2, *Risk Assessment*, adequately describes the characteristics of earthquake hazards, history, as well as the location and extent of a potential event. Generally, an event that affects the county is likely to affect Condon similarly. Some residents recall experiencing mild tremors. The liquefaction potential in Condon is low to none, and expected shaking is moderate for both a CSZ and local events. The causes and characteristics of an earthquake event are appropriately described within the county’s plan, as well as the location and extent of potential hazards. Previous occurrences are well-documented within the county’s plan. The community impacts described by the county would occur in Condon to a similar extent.

Earthquake-induced damages are difficult to predict, and depend on the size, type, and location of the earthquake, as well as site-specific building and soil characteristics. Presently, it is not possible to accurately forecast the location or size of earthquakes, but it is possible to predict the behavior of soil at any particular site. In many major earthquakes, damages have primarily been caused by the behavior of the soil. Condon has no soft-soil hazard, so damage potential is low.

**Figure CLA-2 Expected Shaking and Soft Soils**

As noted in the community profile approximately 72% of residential buildings were built prior to 1990, which increases the city’s vulnerability to the earthquake hazard. Information on specific public buildings’ (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2006, is shown in Table CN-9; each “X” represents one building within that ranking category. Of the facilities evaluated by DOGAMI using RVS, two (2) have a very high (100% chance), one (1) has a high (>10%), and one (1) has a moderate (1-10%) collapse potential. Of note, the South Gilliam County Rural Fire Protection District has been rebuilt since the DOGAMI RVS inspection. Also, the City of Condon, VFD/PD is now an unused building.
Table CLA-9 Rapid Visual Survey Scores

<table>
<thead>
<tr>
<th>Facility</th>
<th>Address</th>
<th>Site ID*</th>
<th>Level of Collapse Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low (&lt; 1%)</td>
</tr>
<tr>
<td>Public Safety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Condon VFD/PD</td>
<td>128 S Main St</td>
<td>Gill_fir01</td>
<td>X,X</td>
</tr>
<tr>
<td>South Gilliam County RFPD*</td>
<td>200 N Main St</td>
<td>Gill_fir04</td>
<td>X</td>
</tr>
<tr>
<td>Gilliam County Sheriff’s Office</td>
<td>221 S Oregon St</td>
<td>Gill_pol03</td>
<td>X,X</td>
</tr>
<tr>
<td>Schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condon Elementary School</td>
<td>220 S East St</td>
<td>Gill_sch04</td>
<td>X,X</td>
</tr>
<tr>
<td>Condon High School</td>
<td>210 E Bayard St</td>
<td>Gill_sch01</td>
<td>X,X</td>
</tr>
</tbody>
</table>


"**" – Site ID is referenced on the RVS Gilliam County Map

"***" Indicates building has been retrofit or rebuilt since 2007 Rapid Visual Assessment

Flood

The steering committee determined that the city’s probability for flood is high (which is the same as the county’s rating) and that their vulnerability to flood is low (which is lower than the county’s rating).

Volume I, Section 2, Risk Assessment, adequately describes the causes and characteristics of flooding hazards within the region, as well as previous flooding occurrences. General flood-related community impacts are adequately described within the Flood Hazard Annex of Gilliam County’s Natural Hazards Mitigation Plan. Portions of Condon have areas of floodplains (special flood hazard areas). These include areas along Condon Canyon drainage ditch (see Figure CN-4). However, damage from floods has been negligible historically.

Flood impacts in Condon have included minimal road damage and no property damage. Flooding occurs every five to ten years, and every five years the city experiences flash floods that wash down Main Street. However, the City has good drainage so impacts are negligible. The primary impact is the labor needed to move mud off of paved roads.9

9 City of Condon Steering Committee, May 2018
Figure CN-4 Special Flood Hazard Area

Source: Oregon HazVu: Statewide Geohazards Viewer (DOGAMI) accessed on 5/22/2018

National Flood Insurance Program (NFIP)
FEMA has not modernized the Condon Flood Insurance Rate Maps (FIRMs); the FIRMs are the originals from 1983. Table CN-10 shows that as of February 2018, Condon has no National Flood Insurance Program (NFIP) policies in force. Neither Condon nor Gilliam County is not a member of the Community Rating System (CRS). There has been a total of one (1) paid claim in the County, and none in the City of Condon. The Community Repetitive Loss record for Condon identifies no Repetitive Loss Properties\(^\text{10}\) and no Severe Repetitive Loss Properties\(^\text{11}\).

Table CN-10 Flood Insurance Detail

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Effective FIRM and FIS</th>
<th>NFIP Policies</th>
<th>Insurance in Force</th>
<th>Total Paid Claims</th>
<th>Total Paid Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td>9/24/1984</td>
<td>4</td>
<td>$1,105,000</td>
<td>1</td>
<td>$1,156</td>
</tr>
<tr>
<td>Condon</td>
<td>9/24/1984</td>
<td>0</td>
<td>$0</td>
<td>0</td>
<td>$0</td>
</tr>
</tbody>
</table>

Source: Dave Lentzer, Department of Land Conservation and Development, February 2018.

\(^{10}\) A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP.

\(^{11}\) A Severe Repetitive Loss (SRL) property is a single family property (consisting of 1 to 4 residences) that is covered under flood insurance by the NFIP and has incurred flood-related damage for which 4 or more separate claims payments have been paid under flood insurance coverage, with the amount of each claim payment exceeding $5,000 and with cumulative amount of such claims payments exceeding $20,000; or for which at least 2 separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.
Volcanic Event

The steering committee determined that the city’s probability for volcanic event is low (which is the same as the county’s rating) and that their vulnerability to volcanic event is moderate (which is the same as the county’s rating).

Volume I, Section 2, Risk Assessment, adequately describes Condon’ risk to volcanic events. Generally, an event that affects the county is likely to affect Condon as well. The causes and characteristics of a volcanic event are appropriately described within the county’s plan, as well as the location and extent of potential hazards. Previous occurrences are well-documented within the county’s plan, and the community impacts described by the county would generally be the same for Condon as well. Condon is very unlikely to experience anything more than volcanic ash during a volcanic event. When Mt. Saint Helens erupted in 1980, Condon received ash fall that caused minor property damage.

Wildfire

The steering committee determined that the city’s probability for wildfire is low (which is lower than the county’s rating) and that their vulnerability to wildfire is moderate (which is the same as the county’s rating).

Volume I, Section 2, Risk Assessment, adequately describes the causes and characteristics of wildfires, as well as the county and city’s history of wildfire events. Only rarely have wildfires come into or near the City of Condon. Wildfires threaten the city once every twenty to thirty years. Residents maintain good defensible space. Fires from other locations do affect air quality in Condon; the 2017 fires caused residents to stay indoors for a week. The location and extent of wildfires vary depending on fuel, topography, and weather conditions; dry vegetation and constant wind heighten Condon’s risk, but flat topography and good defensible space lower risk as well.

The potential community impacts and vulnerabilities described in the county’s NHMP are generally accurate for the city as well. Gilliam County developed a Community Wildfire Protection Plan (CWPP) in 2007, which describes how summer weather, terrain, crops and natural vegetation of Gilliam County lends itself to the ongoing problem of wildfires throughout the County.

The Gilliam County CWPP provides some risk and vulnerability information related to Condon that has been incorporated into this plan as applicable.  

Windstorm

The steering committee determined that the city’s probability for windstorm is high (which is the same as the county’s rating) and that their vulnerability to windstorm is moderate (which is the same as the county’s rating).

Volume I, Section 2, Risk Assessment, adequately describes the causes and characteristics of windstorms, as well as the location and extent of windstorm hazards. The region’s (and city’s) history of events is adequately described within the county’s plan as well. Because

---

windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and snow. For the purposes of this plan, windstorms are considered an individual hazard, distinct from winter storms. Alone, they have much lower potential to affect the City. Windstorm events have damaged roofs and downed trees, and occasionally broken utility poles. Condon experiences wind related power outages twice annually.

Gilliam County’s plan adequately describes the impacts caused by windstorms, including power outages, downed trees, and storm-related debris.

Due to the nature of the hazard, it is impossible to predict the location or extent of future events with any probability, although it can be assumed that all residential and critical facilities and infrastructure within Condon are at risk.

**Winter Storm (includes landslides)**

The steering committee determined that the city’s probability for winter storm is **high** (which is the same as the county’s rating) and that their vulnerability to winter storm is **high** (which is the same than the county’s rating).

Volume I, Section 2, *Risk Assessment*, adequately describes the causes and characteristics of winter storms, as well as the location and extent of winter storm hazards. In general, Condon experiences more rain and higher severity of winter storm impacts. The region’s (and city’s) history of events is adequately described within the county’s plan. Severe winter storms can consist of rain, freezing fog, freezing rain, ice, snow, extreme cold, sleet, and wind. These storms are most common from November through March and are an annual to biannual occurrence.

Major winter storms can and have occurred in the Condon area, and while they typically do not cause significant damage, they are frequent and have the potential to impact economic activity by keeping residents from their jobs. The most common impact of winter storms is property damage in the form of frozen pipes. In decades past, Condon experienced several day long power outages, but recent upgrades to electrical infrastructure solved the issue. Currently, power outages occur once yearly for an average of twenty minutes. Tree limbs may break and damage property as a result of winter storms, and snow drifts can overburden roofs. County and state roads close every few years due to snow drifts. A primary vulnerability of residents is the distance to medical facilities, especially given the significant elderly population.

In 1975 and 1995, the City experienced brief, intense hailstorms, both during summer. The hailstorms lasted 10-15 minutes, and deposited hail that was large enough to damage property. After the 1995 event, the majority of City residents replaced their roofs. Windows were broken as well. While these events occurred during summer, they constitute the severe weather conditions associated with winter storms.

Like Gilliam County, Condon does not experience significant landslides or consider them a substantial hazard. Landslide susceptibility exposure for Condon is shown in Figure CN-5.
Approximately 94.8% of Condon has Low landslide susceptibility. The remaining 5.2% is rated “moderate.”

**Figure CN-5 Landslide Susceptibility Exposure**

Source: Oregon HazVu: Statewide Geohazards Viewer (DOGAMI) accessed on 5/22/2018

Potential landslide-related impacts are described within the county’s NHMP, and include infrastructural damages, economic impacts (due to isolation and/or arterial road closures), property damages, and obstruction to evacuation routes.

---

This page left intentionally blank.
CITY OF LONEROCK
ADDENDUM

Purpose

This document serves as the City of Lonerock’s Addendum to the Gilliam County Multi-Jurisdictional Natural Hazards Mitigation Plan (NHMP). This addendum supplements information contained in Volume I (Basic Plan) of this NHMP, which serves as the foundation for this jurisdiction’s addendum, and Volume III (Appendices), which provides additional information (particularly regarding participation and mitigation strategy). This addendum meets the following requirements:

- Multi-jurisdictional Plan Adoption §201.6(c)(5),
- Multi-jurisdictional Participation §201.6(a)(3),
- Multi-jurisdictional Mitigation Strategy §201.6(c)(3)(iv), and
- Multi-Jurisdictional Risk Assessment §201.6(c)(2)(iii).

Plan Process, Participation, and Adoption

This section of the NHMP addendum addresses 44 CFR 201.6(c)(5), Plan Adoption, and 44 CFR 201.6(a)(3), Participation.

In January 2018, the Department of Land Conservation and Development (DLCD) partnered with the University of Oregon’s Institute for Policy Research and Engagement (IPRE): the Oregon Partnership for Disaster Resilience (OPDR) and the Resource Assistance for Rural Environments (RARE) program, and Gilliam County and the Cities, including City of Arlington, Condon, and Cascade Locks, to update their NHMP, which expired December 16, 2017. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY16 Pre-Disaster Mitigation Competitive Grant Program. After funding was awarded in July 2017 to DLCD for two PDM 16 grants (PDMC-PL-10-2016-003 and PDMC-PL-10-2016-005), a regional kickoff meeting for all eight counties involved in the PDM 16 grants was held on July 18, 2017.

To be eligible to receive certain pre- and post-disaster natural hazard mitigation funds from FEMA, local governments must have a current, FEMA-approved NHMP. NHMPs must be updated and re-approved every five years. By developing this addendum to the Gilliam County NHMP, locally adopting it, and having it approved by FEMA, the City of Arlington will regain eligibility for FEMA Hazard Mitigation, Pre-Disaster Mitigation, and Flood Mitigation Assistance grant program funds.

The Gilliam County NHMP, and Lonerock addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. The project Steering Committee guided the process of developing the plan. For more information on the composition of the Steering Committee see the Acknowledgements, Plan Summary, and Plan Process (Volume III and Appendix B).
The Mayor of Lonerock is the designated local convener and will take the lead in implementing, maintaining, and updating the addendum to the NHMP in collaboration with the designated convener of the Gilliam County NHMP (County Emergency Management).

Representatives from the City of Lonerock Steering Committee convened on the following occasions (see Appendix B for more information):

- April 24, 2018 - Gilliam County NHMP Project Initiation Meeting
- May 16, 2018 – Gilliam County NHMP Second Meeting
- May 30, 2018 – Lonerock Steering Committee Meeting

The City’s addendum reflects decisions decided upon at these NHMP meetings and during subsequent work and communication with NHMP Update Coordinator.

The Lonerock Steering Committee was comprised of the following representatives:

- Convener: Paul Odell, Mayor of Lonerock
- Chris Fitzsimmons, Gilliam County Emergency Management
- Karen Odell, Citizen
- Jim Crandall, Citizen
- Aletta Clark, Citizen
- Nicolia Mehrling, NHMP Update Coordinator, Resource Assistance for Rural Environments

Public participation was achieved with the establishment of the Steering Committee, which was comprised of city officials and citizens representing different organizations and sectors. The Steering Committee was closely involved throughout the development of the plan and served as the local oversight body for the plan’s development. In addition, community members outside of the Steering Committee were provided an opportunity for comment via the plan review process (see Appendix B for more information).

The Gilliam County NHMP was approved by FEMA on [Month] [Day], 2018 and the Lonerock addendum was adopted via resolution on [Month] [Day], 2018. This NHMP is effective through [Month] [Day], 2023.

**Mitigation Strategy**

This section of the NHMP addendum addresses 44 CFR 201.6(c)(3)(iv), *Mitigation Strategy*. During the 2018 Gilliam County NHMP update process the County and local Steering Committees re-evaluated the existing Mitigation Action Items. Following the review, actions were updated, noting what accomplishments had been made, and whether the actions were still relevant and if existing language needed to change. New action items were identified at this time (see Appendix B for more information). Each jurisdiction developed a list of priority mitigation actions. The City’s priority actions are listed below in Table LNR-1 Lonerock Priority Action Items.

Because this is the first formal addendum for the City of Lonerock, all of the 2018 mitigation actions were created during this update.
<table>
<thead>
<tr>
<th>Action Item #</th>
<th>Description</th>
<th>Managing Department/Agency</th>
<th>Timeline</th>
<th>Potential Funding Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WF #1</td>
<td>Weed abatement; decrease wildfire risk through maintenance of yard and roadside vegetation</td>
<td>Volunteer Fire Department</td>
<td>Ongoing</td>
<td>Local sources</td>
</tr>
<tr>
<td>FL #1</td>
<td>Maintain and upgrade Lonerock Bridge; remove willows from creek bed and replace current bridge with free standing bridge</td>
<td>SWCD</td>
<td>Estimated bridge replacement 2019-2022</td>
<td>State Funding (ODOT)</td>
</tr>
<tr>
<td>WS #1</td>
<td>Paving the “grade,” Lonerock Road, to reduce icy conditions and accidents in winter</td>
<td>Gilliam County Road Department</td>
<td>ST (1-3 years)</td>
<td>Gilliam County Road Department</td>
</tr>
</tbody>
</table>

Source: City of Lonerock NHMP Steering Committee, May 2018.
WF=Wildfire, FL=Flood, WS=Winter Storm
Plan Implementation and Maintenance

The City Council will be responsible for adopting the City of Lonerock addendum to the Gilliam County NHMP. This addendum designates a coordinating body and a convener to oversee the development and implementation of action items. Because the City of Lonerock’s addendum is part of the County’s multi-jurisdictional NHMP, the City will look for opportunities to partner with the County. The City’s steering committee will convene after re-adoptions of the City of Lonerock addendum on an annual schedule; the County is meeting on a semi-annual basis and will provide opportunities for the Cities to report on NHMP implementation and maintenance during their meetings. The City Mayor will serve as the convener and will be responsible for assembling the Steering Committee (coordinating body). The steering committee will be responsible for:

- identifying new risk assessment data,
- reviewing status of mitigation actions,
- identifying new actions, and
- seeking funding to implement the city’s mitigation strategy (actions).

The convener will also remain active in the County’s implementation and maintenance process (see Volume I, Section 4 for more information).

The City will utilize the same prioritization process as the county (See Volume I, Section 4: Plan Implementation and Maintenance and Volume IV, Appendix C: Economic Analysis of Natural Hazard Mitigation Projects for more information).

Implementation through Existing Programs

Lonerock relies on the County and State plans, codes, and ordinances to guide and regulate development. Implementing the NHMP’s action items through such plans and policies increases their likelihood of being supported and implemented. Lonerock currently has the following plans, programs, and policies that relate to natural hazard mitigation:

- Planning Commission (at County)
- Building Codes (at County)
- Transportation Plan (at County)

The City of Lonerock’s personnel are primarily volunteers. One part time administrator supports the volunteer city council. Fire and police services are also volunteer-based. Mapping, planning, and building is conducted by County staff, state personnel, or contracted consultants. The City’s income includes host fees from waste management facilities, water fees, and the cigarette/alcohol tax.

Continued Public Participation

Keeping the public informed of the City’s efforts to reduce the City’s risk to future natural hazards events is important for successful plan implementation and maintenance. The City is committed to involving the public in the plan review and updated process. See Volume I, Section 4, for more information.
Plan Maintenance

The Gilliam County Multi-Jurisdictional Natural Hazards Mitigation Plan and the City addendums for Arlington, Lonerock and Condon will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the County plan update process, the City will also review and update its addendum. The convener will be responsible for convening the Steering Committee to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state, or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the plan was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community’s demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the plan accurately address the impacts of this event?

These questions will help the Steering Committee determine what components of the mitigation plan need updating. The Steering Committee will be responsible for updating any deficiencies found in the plan.

Risk Assessment

This section of the NHMP addendum addresses 44 CFR 201.6(b)(2) - Risk Assessment. In addition, this chapter can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards. Assessing natural hazard risk has three phases:

**Phase 1:** Identify hazards that can impact the jurisdiction. This includes an evaluation of potential hazard impacts – type, location, extent, etc.

**Phase 2:** Identify important community assets and system vulnerabilities. Example vulnerabilities include people, businesses, homes, roads, historic places and drinking water sources.

**Phase 3:** Evaluate the extent to which the identified hazards overlap with, or have an impact on, the important assets identified by the community.

The local level rationale for the identified mitigation strategies (action items) is presented herein, and within Section 2, Risk Assessment, and Appendix B, Community Profile. The risk assessment process is graphically depicted in Figure CLA-1 below. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.
Community Asset Identification

This section provides information on City specific assets. For additional information on the characteristics of Lonerock, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix C, Community Profile. Many of these community characteristics can affect how natural hazards impact communities and how communities choose to plan for natural hazard mitigation. Considering the City specific assets during the planning process can assist in identifying appropriate measures for natural hazard mitigation. For all Community Characteristics, it should be noted that census data can be inaccurate at the small city level.

Community Characteristics

Lonerock is located at the south eastern border of Gilliam County at 2800 feet elevation. The City lies in a valley and is surrounded by ranches and wheat fields; the area includes some sparsely wooded sections. No major highways pass through or near the City, and Lonerock is 21 miles from Condon, the County seat. The City is located on 1.01 square miles.\(^1\) The climate of Lonerock is characterized by dry, warm summers and cold winters; the average monthly temperatures fall approximately five degrees below nearby Condon’s, which range from 49-84 degrees in July and August, and 22-39 degrees in December and January.\(^2\) Of the 18 housing units in Lonerock, 8, or 45% are vacant.\(^3\)

---

\(^1\) 2017 Population Estimates, Population Research Center, Portland State University; 7/1/2017
\(^3\) Social Explorer Tables: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer T96; U.S. Census Bureau
Economy

The median household income in Lonerock is $16,250, significantly lower than Gilliam County ($40,556) and the State of Oregon ($53,270). Agriculture, fishing, hunting, mining and construction the vast majority of jobs for the City. The unemployment rate is not able to be measured on a the small scale of Lonerock. However, local officials confirm that few to no jobs exist in Lonerock, and most employed residents commute elsewhere for work.

Population Characteristics

According the Population Research Center of Portland State University, the total population of Lonerock is 20 people. Local officials estimate that approximately 12 residents are full-time, while the remainder lives in Lonerock part time. Two thirds, 67% of the Lonerock population is over 65 years old. According to American Community Survey estimates, no residents are under 35 years of age. A majority of the population (73%) lives below the federal poverty level, the majority of which are working age residents. The City has very high geographic stability, with nearly 100% of residents residing in the same house as one year ago.

Asset Inventory

Asset inventory is the first step of a vulnerability analysis. Assets that may be affected by hazard events include population, residential and nonresidential buildings, critical facilities, and infrastructure.

The asset inventory delineates the City’s existing building and infrastructure assets in detail in Table LNR-4.

Table LNR-4 Lonerock Critical Facilities and Infrastructure

<table>
<thead>
<tr>
<th>Facility</th>
<th>Facility Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lonerock Community Hall</td>
<td>Community</td>
</tr>
<tr>
<td>Fire Station/Outpost</td>
<td>Emergency Response</td>
</tr>
<tr>
<td>Water System</td>
<td>Utilities</td>
</tr>
<tr>
<td>Lonerock Bridge</td>
<td>Bridge / Transportation</td>
</tr>
</tbody>
</table>

Source: Lonerock Steering Committee, May 2018

See hazard sections below and Section 2, Risk Assessment, for potential hazard vulnerabilities to these facilities.

---

4 ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Table 57; U.S. Census Bureau
5 ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Table 49; U.S. Census Bureau
6 ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Table 1; U.S. Census Bureau
7 ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Tables 114, 115, 116; U.S. Census Bureau
Hazard Analysis Methodology

This NHMP utilizes a hazard analysis methodology that was first developed by FEMA circa 1983, and gradually refined by the Oregon Military Department’s Office of Emergency Management (OEM) over the years.

The methodology produces scores that range from 24 (lowest possible) to 240 (highest possible). Vulnerability and probability are the two key components of the methodology. Vulnerability examines both typical and maximum credible events, and probability endeavors to reflect how physical changes in the jurisdiction and scientific research modify the historical record for each hazard. Vulnerability accounts for approximately 60% of the total score, and probability approximately 40%.

This method provides the jurisdiction with a sense of hazard priorities, or relative risk. It doesn’t predict the occurrence of a particular hazard, but it does “quantify” the risk of one hazard compared with another. By doing this analysis, planning can first be focused where the risk is greatest.

In this analysis, severity ratings, and weight factors, are applied to the four categories of history, vulnerability, maximum threat (worst-case scenario), and probability as shown in the table below. See Volume I, Section 2 (Risk Assessment) for more information.

Hazard Analysis

The Lonerock Steering Committee developed their hazard vulnerability assessment (HVA), using the county’s HVA as a reference. Changes from the county’s HVA were made where appropriate to reflect distinctions in vulnerability and risk from natural hazards unique to Lonerock, which are discussed throughout this addendum.

Table LNR-2 shows the HVA matrix for Lonerock showing each hazard listed in order of rank from high to low. For local governments, conducting the hazard analysis is a useful step in planning for hazard mitigation, response, and recovery. The method provides the jurisdiction with sense of hazard priorities, but does not predict the occurrence of a particular hazard.

The Lonerock Steering Committee agreed that few hazards significantly affected the community. The community is highly self-sufficient, and determined most hazards as moderate or low risk. Winter storm hazard is the highest ranked hazard, and wildfire, flood, and earthquake hazards comprise the next ranked hazards. Windstorm, volcano, and drought hazards comprise the lowest ranked hazards.
Table LNR-2 Hazard Analysis Matrix – Lonerock

<table>
<thead>
<tr>
<th>Hazard</th>
<th>History</th>
<th>Probability</th>
<th>Vulnerability</th>
<th>Maximum Threat</th>
<th>Total</th>
<th>Rank</th>
<th>Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Storm</td>
<td>10</td>
<td>10</td>
<td>4</td>
<td>7</td>
<td>180</td>
<td>1</td>
<td>High</td>
</tr>
<tr>
<td>Wildfire</td>
<td>6</td>
<td>8</td>
<td>5</td>
<td>7</td>
<td>163</td>
<td>2</td>
<td>Medium</td>
</tr>
<tr>
<td>Flood</td>
<td>7</td>
<td>8</td>
<td>2</td>
<td>8</td>
<td>160</td>
<td>3</td>
<td>Medium</td>
</tr>
<tr>
<td>Earthquake</td>
<td>1</td>
<td>6</td>
<td>5</td>
<td>8</td>
<td>149</td>
<td>4</td>
<td>Medium</td>
</tr>
<tr>
<td>Windstorm</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>112</td>
<td>5</td>
<td>Low</td>
</tr>
<tr>
<td>Volcanic</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>59</td>
<td>6</td>
<td>Low</td>
</tr>
<tr>
<td>Drought</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>49</td>
<td>7</td>
<td>Low</td>
</tr>
</tbody>
</table>

Source: Lonerock NHMP Steering Committee, 2018.

Table LNR-3 categorizes the probability and vulnerability scores from the hazard analysis for the City and compares the results to the assessment completed by the Gilliam County NHMP Steering Committee (areas of differences are noted with bold text within the city ratings). The City ranked their vulnerability to a winter storm, drought, flood and windstorm event as lower than the County and the probability of drought and windstorm as lower than the County.

Table LNR-3 Probability and Vulnerability Comparison

<table>
<thead>
<tr>
<th>Hazard</th>
<th>City of Lonerock</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probability</td>
<td>Vulnerability</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Wildfire</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Drought</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Flood</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Windstorm</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Volcano</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

Source: Lonerock NHMP Steering Committee and Gilliam County NHMP Steering Committee, 2018.

**Hazard Probability:**

Compared to Gilliam County, the hazard analysis for the City of Lonerock identified zero hazards with *higher* probability.

The City of Lonerock and Gilliam County identified *equal* probability for future occurrences to four hazards that include:
• Severe Weather/Winter Storm
• Volcanic Event
• Wildfire
• Earthquake
• Flood

The hazard analysis for the City of Lonerock identified lower probability to the remaining three hazards compared to Gilliam County:

• Drought
• Windstorm

The City has two wells, three springs, and four fire hydrants. Therefore, the probability of a drought impacting residents is lower compared to the County.

Because there is no written history of previous earthquake occurrences documented in Gilliam County, the City rated the probability of an earthquake as low.

Community Vulnerability:

Compared to Gilliam County, the hazard analysis for the City of Lonerock identified higher vulnerability to zero hazards.

Because the population of Lonerock is accustomed to self-sufficiency, they rely on external services to a lesser extent than the rest of the County.

The City of Lonerock and Gilliam County identified equal vulnerability to two hazards:

• Wildfire
• Earthquake

The hazard analysis for the City of Lonerock identified the following hazards with lower vulnerability compared to Gilliam County:

• Flood
• Volcanic Event
• Windstorm
• Drought
• Winter Storm

Summary

Figure LNR-6 presents a summary of the hazard analysis for the City of Lonerock and compares the results to the assessment completed by Gilliam County.

The city rated their threat from every hazard as lower than the County, and their threat from drought and volcanic hazards as significantly lower than the County.
Hazard Characteristics

Please review the Risk Assessment (Volume I, Section 2) for additional information on each hazard.

Drought

The steering committee determined that the city’s probability for drought is low (which is lower than the county’s rating) and that their vulnerability to drought is low (which is lower than the county’s rating).

Volume I, Section 2, Risk Assessment, adequately describes the characteristics of drought hazards, as well as the location and extent of a potential event. Moderate droughts occur regularly in Gilliam County, primarily impacting the agricultural industry and increasing the risk of wildfire.

Lonerock’s primary water supply comes from two wells and three springs, with a total storage capacity for 90,000 gallons. The City does not have a water treatment plan, but they test water quarterly. In general, water supply is available and sufficient. One significant drought in the 1970’s affected water supply to the extent that water was rationed among residents occasionally over a several year period. While droughts affect surrounding agricultural industry, impacts on City residents are rare and minimal.
Earthquake

The Steering Committee determined that the City’s probability for an earthquake event is **moderate** (which is the same as the county’s rating) and that their vulnerability is **moderate** (which is the same as the county’s rating).

Volume I, Section 2, *Risk Assessment*, adequately describes the characteristics of earthquake hazards, history, as well as the location and extent of a potential event. Generally, an event that affects the County is likely to affect Lonerock to a similar degree. The liquefaction potential in Lonerock is moderate, which is slightly higher than Gilliam County overall, and expected shaking from both a Cascadia Subduction Zone and a crustal event ranges from moderate to strong.

The causes and characteristics of an earthquake event are appropriately described within the County’s plan, as well as the location and extent of potential hazards. Previous occurrences are well-documented within the County’s plan. The community impacts described by the County would occur in Lonerock to a similar extent. The majority of Lonerock houses (70%) were built before 1990 and 30% were built before 1960, and indicating moderate seismic vulnerability. However, Lonerock does not have critical emergency or government infrastructure.

Earthquake-induced damages are difficult to predict, and depend on the size, type, and location of the earthquake, as well as site-specific building and soil characteristics. Presently, it is not possible to accurately forecast the location or size of earthquakes, but it is possible to predict the behavior of soil at any particular site. Lonerock’s soft soil hazard locations can be seen in Figure LNR-2. Expected shaking from Cascadia Subduction Zone earthquake can be seen in Figure LNR-3.

**Figure LNR-2 Expected Shaking and Soft Soils**

![Expected Shaking and Soft Soils](image)

Source: [Oregon HazVu: Statewide Geohazards Viewer (DOGAMI), accessed on 5/22/2018](#)
Information on specific public buildings’ (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2007, found no critical public safety, government, or school facilities in the City of Lonerock. Utility (electric power, water, wastewater, natural gas) and transportation systems (bridges, pipelines) outside of the City may experience some damage, impacting electricity. However, most residents are prepared for periods of isolation.

Flood

The Steering Committee determined that the City’s probability for flood is high (which is the same as the County’s rating) and that their vulnerability to flood is low (which is lower than the County’s rating).

Volume I, Section 2, Risk Assessment, adequately describes the causes and characteristics of flooding hazards within the region, as well as previous flooding occurrences. General flood-related community impacts are adequately described within the Flood Hazard Annex of Gilliam County’s Natural Hazards Mitigation Plan. Lonerock has one creek, Lonerock Creek, passing through the City. The Creek level rises every two-three years, and occasionally washes over the road. It does not rise to the extent it halts traffic, damages the bridge, or damages residents. Flooding can isolate the community when Highway 206 or other bridges in the County get washed out. One significant flood event, in 1996, flooded several houses. They have since been elevated. Lonerock has negligible flood hazard risk as seen in Figure LNR-4.
National Flood Insurance Program (NFIP)

Flood Insurance Rate Maps in Gilliam County, the City of Arlington and the City of Condon are current as of September 24, 1984. The City of Lonerock has not been mapped for floodplain purposes, nor does it participate in the National Flood Insurance Program (NFIP). 

Volcanic Event

The Steering Committee determined that the City’s probability for volcanic event is low (which is the same as the county’s rating) and that their vulnerability to volcanic event is low (which is lower than the county’s rating).

Volume I, Section 2, Risk Assessment, adequately describes Lonerock’ risk to volcanic events. Generally, an event that affects the county is likely to affect Lonerock as well. The causes and characteristics of a volcanic event are appropriately described within the county’s plan, as well as the location and extent of potential hazards. Previous occurrences are well-documented within the county’s plan, and the community impacts described by the county would generally be the same for Lonerock as well. Lonerock is very unlikely to experience anything more than volcanic ash during a volcanic event. When Mt. Saint Helens erupted in 1980, Lonerock received some light ashfall, but no significant impact.

8 Dave Lentzer, Department of Land Conservation and Development, personal communication, February 2018.
Wildfire

The steering committee determined that the City’s probability for wildfire is high (which is the same as the County’s rating) and that their vulnerability to wildfire is moderate (which is the same as the County’s rating).

Volume I, Section 2, Risk Assessment, adequately describes the causes and characteristics of wildfires, as well as the county and city’s history of wildfire events. Fires occur annually in close proximity to Lonerock, and have limited impact on the community. Residents experience lowered air quality from smoke. No significant fires have impacted the City.

The location and extent of wildfires vary depending on fuel, topography, and weather conditions; however Lonerock is a high risk area. The City is surrounded by steeply sloped canyons and dry grasses, and experiences constant low winds and hot summers. Residents actively eliminate tall grasses and weeds and maintain defensible space around property. The most common ignition cause for wildfires is lightning.

The potential community impacts and vulnerabilities described in the County’s NHMP are generally accurate for the City as well. Gilliam County developed a Community Wildfire Protection Plan (CWPP) in 2007, which describes how summer weather, terrain, crops and natural vegetation of Gilliam County lends itself to the ongoing problem of wildfires throughout the County. The City of Lonerock maintains an active volunteer firefighting team, and recently installed four fire hydrants. The hydrants, with accompanying hoses, can reach all properties within the City.

The Gilliam County CWPP provides some risk and vulnerability information related to Lonerock that has been incorporated into this plan as applicable.\(^9\)

Windstorm

The Steering Committee determined that the City’s probability for windstorm is moderate (which is lower than the County’s rating) and that their vulnerability to windstorm is low (which is lower than the County’s rating).

Volume I, Section 2, Risk Assessment, adequately describes the causes and characteristics of windstorms, as well as the location and extent of windstorm hazards. The region’s (and city’s) history of events is adequately described within the County’s plan as well. Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and snow. For the purposes of this plan, windstorms are considered an individual hazard, distinct from winter storms. Alone, they have much lower potential to affect the City. Lonerock experiences a constant breeze. Winds rarely reach 40-50 miles per hour. Occasionally, winds blow over trees or break limbs. The utility infrastructure is will mitigated, and residents are prepared for brief power outages. Gilliam County’s plan adequately describes the impacts caused by windstorms, including power outages, downed trees, and storm-related debris. Utility disruptions are secondary results.

Winter Storm (includes landslides)

The Steering Committee determined that the City’s probability for winter storm is high (which is the same as the county’s rating) and that their vulnerability to winter storm is moderate (which is lower than the County’s rating).

Volume I, Section 2, Risk Assessment, adequately describes the causes and characteristics of winter storms, as well as the location and extent of winter storm hazards. In general, Lonerock experiences winter storms to a similar extent as the County. The region’s (and city’s) history of events is adequately described within the county’s plan. Severe winter storms can consist of rain, freezing rain, freezing fog, ice, snow, extreme cold, sleet, and wind. These storms are most common from November/December through March/April, though their duration is highly variable. Winter storms are an annual occurrence.

Major winter storms can and have occurred in the Lonerock area, and while they typically do not cause significant damage, they are frequent. The most common impact is that roads become impassable due to snow drifts. Power outages for several hours are common; brown outs (power intermittently on and off) are common when utility lines are shaken to remove ice. The City has gravity flow water, landline telephones, and adequate food storage in case of isolation.

Like Gilliam County, Lonerock does not experience significant landslides or consider them a substantial hazard. Landslide susceptibility exposure for Lonerock is shown in Figure LNR-5. Approximately 15% of Lonerock has low landslide susceptibility, 69% has moderate, and 16% has high landslide susceptibility. The highest risk areas are on the eastern and western borders of the City.

Figure LNR-5 Landslide Susceptibility Exposure

Potential landslide-related impacts are described within the county’s NHMP, and include economic impacts (due to isolation and/or arterial road closures) and obstruction to evacuation routes.

Volume III:
Mitigation Resources
This page left intentionally blank.
APPENDIX A: ACTION ITEM FORMS

Introduction

There are nine mitigation actions listed for Gilliam County, and all of them are detailed in this appendix of action item forms. Several of the mitigation actions are also applicable to the Cities of Arlington, Condon, and Lonerock. There are ten total mitigation actions for the three Cities. The mitigation actions for the County are also listed in Table 3.1 and the Cities are also in Table 3.2, both tables are in Section 3 Mitigation Strategy.

Multi-Hazard

There are four multi-hazard mitigation actions. The natural hazards of volcano and windstorm do not have hazard-specific mitigation actions but they are included in these multi-hazard actions.

1) Provide public information regarding natural hazards via website posting, social media, newsletter, mailings, and distributed flyers.
   
   **Status:** Developed during the 2018 NHMP Update as a combination of the drought, flood, earthquake, wildfire, windstorm, winter storm, and volcano mitigation actions for public outreach and education.

2) Seek funding for the implementation of priority projects that reduce the vulnerability of critical public facilities in Gilliam County.
   
   **Status:** Deferred and Modified from 2013 NHMP

3) Develop and maintain a comprehensive impact database on severe natural hazard events in Gilliam County.
   
   **Status:** Completed, Deferred and Modified from 2013 NHMP

4) Seek funding for generators for critical facilities.
   
   **Status:** Completed, Deferred, and Modified from 2013 NHMP
## Multi-Hazard #1

<table>
<thead>
<tr>
<th>Proposed Action Item: MH#1</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Provide public information regarding natural hazards via website posting, social media, newsletter, mailings, and distributed flyers. | Goal 1: Safety of life and property  
Goal 2: Increased cooperation and collaboration between groups and agencies  
Goal 3: Motivate the public, private sector, and government agencies to mitigate against the effects of natural hazards through information and education |

### Rationale for Proposed Action Item:

Understanding of a hazard risks, empowers the public to use their resources more effectively to prepare for it. With limited agency resources available, it is necessary for the residents and general public to be able to respond. A community’s response capabilities can have a significant impact on the damage a hazard has on a community. The three incorporated cities in Gilliam County – Arlington, Condon, and Lonerock - have limited resources and rely on the County for certain services and public facilities. Because the Cities rely so heavily upon the County to provide services, this action is considered to be a multi-jurisdictional action because it benefits both the County and all the participating cities.

### Ideas for Implementation:

- Educate the public on what to do in a flood including such information as not driving through flooded roads.
- Educate the public on water conservation, erosion control, and drought resistance plants.
- Educate the public on what to do in a wildfire, 30 foot fuel reduction and debris removal around homes, and fire resistant roof, shelter and shrubs.
- Educate the public regarding staying indoors during extreme hazard events.
- Have information regarding volcanoes readily available to residents of the County and general public.
- Educate the public on what to do prior to and during severe weather, windstorm, and winter storm events.
- Educate the public regarding earthquakes, and make sure citizens know which buildings are deemed shelters.

### Coordinating Organization:

Gilliam County Emergency Management

### Internal Partners:

- Cities of Arlington, Condon, and Lonerock Fire Departments, Public Works, Oregon Watermaster District 21, Gilliam County Fire Services

### External Partners:

- DOGAMI; OMD-OEM; FEMA; OSU Extension Service, Farm Service Agency, Natural Resources Conservation Service

### Potential Funding Sources:

- Local Sources

### Timeline:

- Ongoing (quarterly)

### Form Submitted by:

Gilliam County Emergency Management

### Action Item Status:

Deferred and Modified from 2013 NHMP, and retained for 2018
## Multi-Hazard #2

<table>
<thead>
<tr>
<th>Proposed Action Item: MH#2</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Seek funding for the implementation of priority projects that reduce the vulnerability of critical public facilities in Gilliam County | Goal 1: Safety of life and the preservation of property  
Goal 2: Increased cooperation and collaboration between groups and agencies |

### Rationale for Proposed Action Item:

Gilliam County is vulnerable to a number of natural hazards that can affect public facilities. By completing an inventory of public facilities that are vulnerable to natural hazards, the County can identify its overall level of vulnerability and mitigate their risk.

The Disaster Mitigation Act of 2000 requires communities to identify and analyze mitigation measures specifically actions and projects addressing the effects of hazards on existing buildings and infrastructure [201.6(c)(3)(ii)]. This inventory of public facilities that are vulnerable to natural hazards will allow the County to meet this requirement.

The three incorporated cities in Gilliam County – Arlington, Condon, and Lonerock - have limited resources and rely on the County for certain services and public facilities. Because the Cities rely so heavily upon the County to provide services, this action is considered to be a multi-jurisdictional action because it benefits both the County and all the participating Cities.

### Ideas for Implementation:

- The Cities should coordinate with the County to identify critical facilities in their communities and seek funding for mitigation projects that will reduce risk in each community.
- Utilize outcomes of DOGAMI’s efforts on Senate Bill 2 seismic hazard inventory and risk assessment: [http://www.oregongeology.org/rvs/default.htm](http://www.oregongeology.org/rvs/default.htm)
- Identify specific vulnerabilities to public facilities for each natural hazard, especially those constructed of unreinforced masonry that is vulnerable to earthquakes.
- Prioritize facilities based on vulnerability and critical services in emergency situations.
- Identify actions communities can take to reduce a facility’s vulnerability to a natural hazard.
- Upgrade structures at the County fairgrounds and secure generator hookups for fairgrounds.
- Upgrade infrastructure for water systems in county.

### Coordinating Organization:

- Gilliam County Emergency Management

### Internal Partners:

- Cities of Arlington, Condon, and Lonerock; Gilliam County departments, Gilliam County NHMP Steering Committee

### External Partners:

- DOGAMI; OMD-OEM; FEMA

### Potential Funding Sources:

- Seismic Rehabilitation Grant Program, Homeland Security Grants, HMPG, Local sources

### Timeline:

- Long Term

### Form Submitted by:

- Gilliam County Emergency Management

### Action Item Status:

- Deferred and Modified from 2013 NHMP, retained for 2018
## Multi-Hazard #3

<table>
<thead>
<tr>
<th>Proposed Action Item: MH#3</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Develop and maintain a comprehensive impact database on severe natural hazard events in Gilliam County. | Goal 1: Safety of life and property  
Goal 2: Increased cooperation and collaboration between groups and agencies |

### Rationale for Proposed Action Item:

Each natural hazard can also pose significant risks to the public, especially in certain high-risk areas in the County. Compiling an impact database will allow Gilliam County to better prepare itself and the public to use precaution in potentially hazardous areas.

The Disaster Mitigation Act of 2000 requires the documentation of previous hazard occurrences [201.6(c)(2)(i)]. Creating this database allows the communities to quickly update the hazard history portion of the mitigation plan required during the five year update process.

Because the Cities rely so heavily upon the County to provide services, this action is considered to be a multi-jurisdictional action because it benefits both the County and all the participating Cities. A coordinated effort will reduce the vulnerability of the services and facilities that the incorporated communities depend on and help the County as a whole be better prepared to mitigate the effects of natural hazards.

### Ideas for Implementation:

- Document future events including impacts and losses;
- Identify public infrastructure and facilities subject to closures due to snowfall and ice hazards during winter storms; and
- Develop partnerships between utility providers and county and city public works agencies to document known hazard areas and minimize risks.

### Coordinating Organization:

| Gilliam County Emergency Management |

### Internal Partners:

- Cities of Arlington, Condon, and Lonerock;
- GIS; Planning; Public Works

### External Partners:

- Public Utilities; Oregon Watermaster District 21; OSU Extension Service; Farm Service Agency; National Weather Service; Natural Resources Conservation Service

### Potential Funding Sources:

- Local Sources

### Timeline:

- Ongoing

### Form Submitted by:

- Gilliam County Emergency Management

### Action Item Status:

- Deferred and Modified from 2013 NHMP
## Multi-Hazard #4

<table>
<thead>
<tr>
<th>Proposed Action Item: MH#4</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seek funding for generators and satellite telephones for critical facilities.</td>
<td>Goal 1: Safety of life and property</td>
</tr>
</tbody>
</table>

### Rationale for Proposed Action Item:

The Steering Committee identified the need for generators at the County fairgrounds and the South Gilliam County Fire Department. Because the Cities rely so heavily upon the County to provide services, this action is considered to be a multi-jurisdictional action because it benefits both the County and all the participating Cities. A frequent impact from natural hazards, including winter storms, windstorms, and wildfires, is power outages resulting from damaged power lines. It is also likely that the community may lose access to fuel resources in the event of a major hazard elsewhere in the state.

### Ideas for Implementation:

- Seek funding source for emergency back-up generators (NOTE: FEMA mitigation programs will NOT fund generators).
- Identify all critical facilities without generators.
- Prioritize need for generators at critical facilities.

<table>
<thead>
<tr>
<th>Coordinating Organization:</th>
<th>Gilliam County Emergency Management</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Internal Partners:</th>
<th>External Partners:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cities of Arlington, Condon, and Lonerock</td>
<td>Public Utilities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potential Funding Sources:</th>
<th>Timeline:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeland Security Grants</td>
<td>Long term</td>
</tr>
</tbody>
</table>

### Form Submitted by:

Gilliam County

### Action Item Status:

Completed, Deferred, and Modified from 2013 NHMP
Drought

In the 2013 NHMP there were two drought mitigation actions; now there is one for the 2018 NHMP.

1) Include information regarding droughts in a brochure of natural hazards and mail/make available to county residents and the public.
   
   **Status:** Completed, Eliminated; Incorporated into Multi-Hazard #1

2) Improve long range water sources; Increase storage through deeper wells
   
   **Status:** Developed during 2018 NHMP Update
### Drought #1

<table>
<thead>
<tr>
<th>Proposed Action Item: DR#1</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve long range water sources; Increase storage through deeper wells</td>
<td>Goal 1: Safety of life and property</td>
</tr>
</tbody>
</table>

#### Rationale for Proposed Action Item:

Drought situations cause critical water shortages for humans, animals and vegetation. Some areas of Gilliam County have experienced dry wells or decreasing aquifers.

#### Ideas for Implementation:

- Identify appropriate sites for wells
- Create RFP for project construction
- Seek funding from City and County public bodies

#### Coordinating Organization:
City of Condon

#### Internal Partners:
- Gilliam County Public Works

#### External Partners:
- Oregon Watermaster District 21; SWCD, North Central Public Health

#### Potential Funding Sources:

- Local Sources

#### Timeline:
- Long Term

**Form Submitted by:** Gilliam County Emergency Management

**Action Item Status:** Developed during 2018 NHMP Update
Earthquake

In the 2013 NHMP there were two drought mitigation actions; now there is one for the 2018 NHMP.

1) Make available to county residents and the public information regarding earthquakes.

   Status: Completed, Eliminated; Incorporated into Multi-Hazard #1

2) Seek funding through the State Office of Emergency Management (OEM) and/or the Federal Emergency Management Agency (FEMA) to seismically retrofit critical facilities rated with either a very high or high collapse potential rate by the Department of Geology and Mineral Industries (DOGAMI).

   Status: Completed, Deferred and Modified from 2013 NHMP
Earthquake #1

<table>
<thead>
<tr>
<th>Proposed Action Item: EQ#2</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Seek funding through the State Office of Emergency Management (OEM) and/or the Federal Emergency Management Agency (FEMA) to seismically retrofit critical facilities rated with either a very high or high collapse potential rate by the Department of Geology and Mineral Industries (DOGAMI). | Goal 1: Safety of life and the preservation of property  
Goal 2: Increased cooperation and collaboration between groups and agencies |

Rationale for Proposed Action Item:

DOGAMI completed the seismic needs assessment in August 2006 for Gilliam County. Three critical facilities were rated with Very High (100-percent) collapse potentials while two other critical facilities were rated with High (greater than 10-percent) collapse potentials.
The South Gilliam County Fire Hall was rebuilt, while other facilities are still in need of retrofits or replacement.

Ideas for Implementation:

Seek funding through various grant programs to seismically retrofit the critical facilities rated with high collapse potential ratings.
Prioritize courthouse and police station retrofit.

Coordinating Organization: Gilliam County Planning Department

Internal Partners:
Cities of Arlington, Condon, and Lonerock; School Districts (SD 3, SD25J); Gilliam County Emergency Management

External Partners:
OMD-OEM, FEMA, DOGAMI

Potential Funding Sources:
Seismic Rehabilitation Grant Program (OEM)

Timeline:
Long Term

Form Submitted by: Gilliam County Emergency Management

Action Item Status: Deferred, Modified from 2013 NHMP, retained for 2018
**Flood**

There is one mitigation action for flood.

1) Coordinate with the State Floodplain Coordinator and the Department of Land Conservation and Development (DLCD) to obtain updated floodplain information for Gilliam County and the incorporated cities.

**Status:** Deferred and Modified from 2013 NHMP

---

**Flood #1**

<table>
<thead>
<tr>
<th>Proposed Action Item: FL #1</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Coordinate with the State Floodplain Coordinator and the Department of Land Conservation and Development (DLCD) to obtain updated floodplain information for Gilliam County and the incorporated cities. | Goal 1: Safety of life and property  
Goal 2: Increased cooperation and collaboration between groups and agencies |

**Rationale for Proposed Action Item:**

The County is operating with flood plain information from 1984. Updated flood plain maps would benefit the planning department and zoning regulations to be more accurate. The County cannot fund this project independently.

**Ideas for Implementation:**

Maintain active relationship with flood plain coordinator at DLCD. DLCD and DOGAMI are mapping floodplains throughout Oregon, beginning with highest priority counties. Gilliam County is not high priority.

**Coordinating Organization:** Gilliam County Planning Department  
**Internal Partners:** Gilliam County; Cities of Arlington, Condon, and Lonerock;  
**External Partners:** DLCD, DOGAMI, FEMA  
**Potential Funding Sources:** DLCD project  
**Timeline:** Long Term  
**Form Submitted by:** Gilliam County  
**Action Item Status:** Deferred and Modified from 2008 NHMP, retained for 2018
Wildfire

There are two mitigation actions for wildfire.

1) Provide Gilliam County Road Department with firefighting training and equipment

   Status: Completed, Deferred and Modified from 2013 NHMP

2) Include information regarding wildfires in a brochure of natural hazards and mail/make available to county residents and the public so they know what to do and how they can help those responsible for taking action.

   Status: Completed, Eliminated; Incorporated into Multi-Hazard #1
**Wildfire #1**

<table>
<thead>
<tr>
<th>Proposed Action Item: WF#1</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Provide Gilliam County Road Department with firefighting training and equipment. | Goal 1: Safety of life and property  
Goal 2: Increased cooperation and collaboration between groups and agencies  
Goal 3: Motivate the public, private sector, and government agencies to mitigate against the effects of natural hazards through information and education |

**Rationale for Proposed Action Item:**

In a self-completed hazard analysis, Gilliam County reported itself as being highly vulnerable to wildfire as well as a high probability of future wildfire events. Implementing the CWPP can assist Gilliam County in identifying mitigation partnerships, methods, and activities specifically for reducing its wildfire risk. A community’s response capabilities can have a significant impact on the impact wildfire has on a community. Because the Cities rely so heavily upon the County to provide services, this action is considered to be a multi-jurisdictional action because it benefits both the County and all the participating Cities.

**Ideas for Implementation:**

- Identify appropriate training for Road Department Staff.
- Seek funding to support training.
- Identify appropriate funding source for the purchase of firefighting equipment such as fire pants, shirts, fire shelters, and web gear. Potential funding sources may include DHS’ Assistance to Firefighters Grant.
- Continue annual trainings on fire shelters and secure larger shelters.

**Coordinating Organization:**

Gilliam County Road Department

**Internal Partners:**

- Gilliam County; Public Works; Cities of Arlington, Condon, and Loneroock; Fire Districts; Local WUI Property Owners

**External Partners:**

- ODF; State Fire Marshall; OMD-OEM; BLM; USFS; Utilities

**Potential Funding Sources:**

- Local Sources

**Timeline:**

- Ongoing

**Form Submitted by:**

Gilliam County

**Action Item Status:**

Deferred and Modified from 2008 NHMP, retained for 2018
### Wildfire #2

<table>
<thead>
<tr>
<th>Proposed Action Item: WF#2</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Create firebreaks with fire resistant plantings around vulnerable facilities | Goal 1: Safety of life and property  
Goal 2: Increased cooperation and collaboration between groups and agencies |

#### Rationale for Proposed Action Item:

In a self-completed hazard analysis, Gilliam County reported itself as being highly vulnerable to wildfire as well as a high probability of future wildfire events. Implementing the CWPP can assist Gilliam County in identifying mitigation partnerships, methods, and activities specifically for reducing its wildfire risk. Implementing the CWPP can also assist Gilliam County in identifying mitigation partnerships, methods, and activities specifically for reducing its WUI fire risk. Natural local vegetation increases fire risk; fire breaks greatly reduce risk.

#### Ideas for Implementation:

- Plant fire resistant vegetation around city boundaries in WUI areas.
- Enhance collaboration between internal and external partner agencies.
- Secure project funding.

#### Coordinating Organization:

| Gilliam County Fire Services |

#### Internal Partners:

- SWCD, City of Arlington

#### External Partners:

- Federal Emergency Management Agency, National Fire Protection Association (NFPA)

#### Potential Funding Sources:

- Local sources

#### Timeline:

- Long Term

#### Form Submitted by:

- Gilliam County Fire Services

#### Action Item Status:

- Developed during the 2018 NHMP update process
This page intentionally left blank.
This appendix describes the changes made to the 2013 Gilliam NHMP Natural Hazards Mitigation Plan (NHMP) during the 2018 plan update process.

Project Background

Gilliam County collaborated with the Department of Land Conservation and Development (DLCD), and the University of Oregon’s Institute for Policy Research and Engagement (IPRE) through the Resource Assistance for Rural Environments (RARE) and the Oregon Partnership for Disaster Resilience (OPDR), to update the 2013 Gilliam County NHMP. The Disaster Mitigation Act of 2000 requires communities to update their NHMPs every five years to remain eligible for Hazard Mitigation Assistance (HMA) funds through the Pre-Disaster Mitigation (PDM) program, Flood Mitigation Assistance (FMA) program, and the Hazard Grant Mitigation Program (HMGP). Steering Committee members from Gilliam County and participating Cities met to update their NHMP. Participating Cities are the Cities of Arlington, Condon, and Lonerock. Major changes to the 2013 NHMP are documented and summarized in this appendix.

2018 Plan Update Changes

The sections below only discuss major changes made to the 2013 NHMP during the 2018 plan update process. Major changes include the replacement or deletion of large portions of text, changes to the plan’s organization, updated hazard risk and vulnerability assessment, and new mitigation action items. If a section is not mentioned then it can be assumed that no significant changes occurred.

Table B-1 lists the 2013 Gilliam County NHMP plan section names and the corresponding 2018 section names, as updated. This appendix will use the 2018 plan update section names to reference any changes, additions, or deletions within the plan. The changes are described sequentially in the text following Table B-1.
Table B-1 Changes to Plan Organization

<table>
<thead>
<tr>
<th>2012 Gilliam County NHMP</th>
<th>2018 Gilliam County NHMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume I: Basic Plan</td>
<td>Volume I: Basic Plan</td>
</tr>
<tr>
<td>Executive Summary</td>
<td>Executive Summary</td>
</tr>
<tr>
<td>Introduction</td>
<td>Introduction</td>
</tr>
<tr>
<td>Risk Assessment</td>
<td>Risk Assessment</td>
</tr>
<tr>
<td>Mitigation Strategy</td>
<td>Mitigation Strategy</td>
</tr>
<tr>
<td>Implementation and Maintenance</td>
<td>Implementation and Maintenance</td>
</tr>
<tr>
<td></td>
<td>Volume II: City Addenda</td>
</tr>
<tr>
<td></td>
<td>City of Arlington Addendum</td>
</tr>
<tr>
<td></td>
<td>City of Condon Addendum</td>
</tr>
<tr>
<td></td>
<td>City of Lonerock Addendum</td>
</tr>
<tr>
<td>Volume II: Appendices</td>
<td>Volume III: Appendices</td>
</tr>
<tr>
<td>Appendix A: Action Item Forms</td>
<td>Appendix A: Action Item Forms</td>
</tr>
<tr>
<td>Appendix B: Planning and Public Process</td>
<td>Appendix B: Planning and Public Process</td>
</tr>
<tr>
<td>Appendix C: Community Profile</td>
<td>Appendix C: Community Profile</td>
</tr>
<tr>
<td>Appendix D: Economic Analysis of Mitigation Actions</td>
<td>Appendix D: Economic Analysis</td>
</tr>
<tr>
<td>Appendix E: Survey Report</td>
<td>Appendix E: Survey Report</td>
</tr>
<tr>
<td>Appendix F: Grant Programs</td>
<td>Appendix F: Grant Programs</td>
</tr>
</tbody>
</table>

Front Pages

Acknowledgements have been updated to include the 2018 project partners and planning participants.

The FEMA approval letter, review tool, and County and City resolutions of adoption are included. *(will be included with the final version of the NHMP)*

Volume I: Multi-Jurisdictional Natural Hazards Mitigation Plan

Volume I provides the overall plan framework for the 2018 NHMP update, including the following sections:

Executive Summary

The 2018 NHMP includes an updated plan summary that provides information about the purpose of natural hazards mitigation planning, key points from the NHMP update process, and describes how the plan will be implemented.

Section 1: Introduction

Section 1 introduces the concept of natural hazards mitigation planning and answers the question, “Why develop a mitigation plan?” Additionally, Section 1 summarizes the 2018 plan update process, and provides an overview of how the plan is organized.

Section 2: Risk Assessment

Section 2, Risk Assessment, consists of three phases: hazard identification, vulnerability assessment, and risk analysis. Hazard identification involves the identification of hazard...
geographic extent, its intensity, and probability of occurrence. The second phase attempts to predict how different types of property and population groups will be affected by the hazard. The third phase involves estimating the damage, injuries, and costs likely to be incurred in a geographic area over a period of time. Changes to Section 2 include the following updates to:

- Hazard characteristics, probability, and vulnerability information.
- Population vulnerability trends and significant statistics.
- National Flood Insurance Program (NFIP) information.
- The Hazard Vulnerability Analysis tool.

**Section 3: Mitigation Strategy**

This section provides the basis and justification for the mission, goals, and mitigation actions identified in the NHMP. Major changes to Section 3 include the following:

Mission and Goals were reviewed and compared with the State NHMP Mission and Goals, changes were made and are described in the meeting notes, included in this section.

The Gilliam County Steering Committee met to review the previous NHMP action items. Steering Committee members provided updates and edits to the mitigation actions where applicable including the revision and consolidation of existing actions, managing department/agency designations, timeframe, and potential funding sources. See Tables B-2 and B-3 for changes for the County and Cities mitigation actions.

A list of prioritized actions for the County and Cities is included in Section 3, tables Table 3.1 and 3.2. New action items are based upon current needs based upon the community risk assessment. Current activity for institutionalized mitigation activities was described and is included in Section 3.

The 2013 Mitigation Actions are listed below, including the progress achieved since the 2013 update, the 2018 status of the action item, and the rationale for that status. New Mitigation Actions developed during the 2018 update are listed after the 2012 actions. See Section 3 Mitigation Strategy for mitigation actions that the 2018 NHMP has identified to move forward (the results of the retain, modify, delete discussion).

**Key:**

- **Action Item:** Identifies Action Item according to 2013 item number. Hazards are indicated by the following abbreviations;
  - MH = Multi-Hazard
  - DR = Drought Hazard
  - FL = Flood Hazard
  - EQ = Earthquake Hazard
  - VL = Volcanic Event
  - WF = Wildfire
  - WD = Windstorm
  - SW = Severe Storm/Winter Storm (Note: 2013 NHMP used “Severe Storm” designation, while the 2018 NHMP uses “Winter Storm Designation”
• Action Title: Short descriptor of mitigation action

• Progress/Update: An overview of the progress made since 2013 for the listed mitigation action

• Status: Steering Committee determination on whether to defer, modify or eliminate 2013 actions in the 2018 plan.

• For the purposes of this plan “defer” indicates action was retained without changes; these actions remain priorities of the County and project partners, timelines, and implementation remains the same.

• “Modify” indicates that the action remains priority, and some element of the project has been updated (for instance, implementation focus, timeline, or project lead), and the action title remains consistent with the 2013 title.

• “Eliminate” indicates an action is not included in the 2018 update.

• Status Comments: The rationale supporting the Steering Committee status determination.

Table B-2: 2013 Mitigation Action Updates

<table>
<thead>
<tr>
<th>2013 Action Item</th>
<th>2013 Action Item Title</th>
<th>2018 Update/Progress</th>
<th>2018 Status</th>
<th>2018 Status Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>MH#1</td>
<td>Seek funding for the implementation of priority projects that reduce the vulnerability of critical public facilities in Gilliam County.</td>
<td>Improved facilities include Arlington community center, Arlington and Condon fire stations. Improvements funded through taxes and SIP funding.</td>
<td>Modify</td>
<td>Infrastructure improvements remain a priority. Emergency services are adequate. Next focus on fairgrounds, which serve as incident command post, and water systems.</td>
</tr>
<tr>
<td>MH#2</td>
<td>Reduce the effects of natural hazards on existing utility lines.</td>
<td>Utility poles were coated with fire resistant materials, adjacent fuels were cleaned away, rocks were distributed around the base of poles.</td>
<td>Eliminate</td>
<td>Completed. Ongoing actions are responsibility of utility companies and are routine maintenance.</td>
</tr>
<tr>
<td>MH#3</td>
<td>Develop and maintain a comprehensive impact database on severe natural hazard events in Gilliam County.</td>
<td>Impact database developed and maintained by Emergency Manager, includes declared disasters and wildfire incidents.</td>
<td>Defer</td>
<td>This action enhances County awareness of hazard history and impacts. System is adequate.</td>
</tr>
<tr>
<td>2013 Action Item</td>
<td>2013 Action Item Title</td>
<td>2018 Update/Progress</td>
<td>2018 Status</td>
<td>2018 Status Comments</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------</td>
<td>----------------------</td>
<td>-------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>MH#4</td>
<td>Seek funding for generators and satellite telephones for critical facilities.</td>
<td>Generator sourced for County courthouse, wastewater plant, Arlington dispatch, and Summer Springs.</td>
<td>Defer/Modify</td>
<td>This action remains a priority, with focus shifting to other facilities. Generators still sought for South County fire station. Fairgrounds should be wired for a future generator. Eliminate satellite phones, they are not necessary.</td>
</tr>
<tr>
<td>MH#5</td>
<td>Identify opportunities to reduce existing barriers to interagency cooperation and work together to reduce risk and loss from natural hazards.</td>
<td>Mutual aid routinely happens; the Tri-County region operates collaborative exercises and shares a fire defense board. Frontier Regional dispatch serves the region and supports cooperation.</td>
<td>Eliminate</td>
<td>This action has been sufficiently completed. Interagency cooperation will continue both formally and informally due to joint emergency response efforts.</td>
</tr>
<tr>
<td>DR#1</td>
<td>Include information regarding droughts in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Relevant hazard information is included in County newsletter and preparedness flyers.</td>
<td>Defer/Modify</td>
<td>Public outreach remains important. Methods will include online media as well as print media. This action is being consolidated with other public outreach actions into MH #1.</td>
</tr>
<tr>
<td>EQ#1</td>
<td>Include information regarding earthquakes in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Relevant hazard information is included in County newsletter and preparedness flyers.</td>
<td>Defer/Modify</td>
<td>Public outreach remains important. Methods will include online media as well as print media. This action is being consolidated with other public outreach actions into MH #1.</td>
</tr>
<tr>
<td>EQ#2</td>
<td>Seek funding through the State Office of Emergency Management (OEM) and/or the Federal Emergency Management Agency (FEMA) to seismically retrofit critical facilities rated with either a very high or high collapse potential rate by the Department of</td>
<td>School district buildings retrofit</td>
<td>Defer</td>
<td>Potential funding source: Business Oregon grant. Focus on courthouse and police station retrofit.</td>
</tr>
<tr>
<td>2013 Action Item</td>
<td>2013 Action Item Title</td>
<td>2018 Update/Progress</td>
<td>2018 Status</td>
<td>2018 Status Comments</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------</td>
<td>----------------------</td>
<td>-------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>FL#1</td>
<td>Include information regarding flooding in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Relevant hazard information is included in County newsletter and preparedness flyers.</td>
<td>Defer/Modify</td>
<td>Public outreach remains important. Methods will include online media as well as print media. This action is being consolidated with other public outreach actions into MH #1.</td>
</tr>
<tr>
<td>FL#2</td>
<td>Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.</td>
<td>Continued compliance occurring. Compliance is complicated by outdated FIRM maps.</td>
<td>Eliminate</td>
<td>Compliance is routine action executed by County Planning and Building Departments.</td>
</tr>
<tr>
<td>FL#3</td>
<td>Coordinate with the State Floodplain Coordinator at the Department of Land Conservation and Development (DLCD) to update FEMA Flood Insurance Rate Maps (FIRMs) for Gilliam County and the incorporated cities.</td>
<td>Request was made; the budget for updating floodplain maps was infeasible. Statewide updates are on a set timeline.</td>
<td>Defer</td>
<td>Updated floodplain information remains useful to Gilliam County. New methods for obtaining information will be explored.</td>
</tr>
<tr>
<td>WSH#1</td>
<td>Include information regarding severe weather/winter storms in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Relevant hazard information is included in County newsletter and preparedness flyers.</td>
<td>Defer/Modify</td>
<td>Public outreach remains important. Methods will include online media as well as print media. This action is being consolidated with other public outreach actions into MH #1.</td>
</tr>
<tr>
<td>2013 Action Item</td>
<td>2013 Action Item Title</td>
<td>2018 Update/Progress</td>
<td>2018 Status</td>
<td>2018 Status Comments</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------</td>
<td>----------------------</td>
<td>-------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>VH#1</td>
<td>Include information regarding volcanoes in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Relevant hazard information is included in County newsletter and preparedness flyers.</td>
<td>Defer/Modify</td>
<td>Public outreach remains important. Methods will include online media as well as print media. This action is being consolidated with other public outreach actions into MH #1.</td>
</tr>
<tr>
<td>WF#1</td>
<td>Provide Gilliam County Road Department with fire fighting training and equipment.</td>
<td>Fire shelter trainings and equipment provided. Radios upgraded.</td>
<td>Modify</td>
<td>This action remains a priority for the County. The timeline was specified to include annual trainings and equipment upgrades as needed.</td>
</tr>
<tr>
<td>WF#2</td>
<td>Include information regarding wildfires in a brochure of natural hazards and mail/make available to county residents and the public so they know what to do and how they can help those responsible for taking action.</td>
<td>Relevant hazard information is included in County newsletter and preparedness flyers.</td>
<td>Defer/Modify</td>
<td>Public outreach remains important. Methods will include online media as well as print media. This action is being consolidated with other public outreach actions into MH #1.</td>
</tr>
<tr>
<td>WD#1</td>
<td>Include information regarding wind storms in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Relevant hazard information is included in County newsletter and preparedness flyers.</td>
<td>Defer/Modify</td>
<td>Public outreach remains important. Methods will include online media as well as print media. This action is being consolidated with other public outreach actions into MH #1.</td>
</tr>
</tbody>
</table>

Source: Gilliam County Steering Committee, May 2018
Table B-3 New Mitigation Actions (2018)

<table>
<thead>
<tr>
<th>2018 Action Item</th>
<th>2018 Action Item Title</th>
<th>Coordinating Organization</th>
<th>Partner Organizations (Internal and External)</th>
<th>Time-line</th>
<th>Potential Funding Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR#1</td>
<td>Improve long range water sources; Increase storage through deeper wells</td>
<td>City of Condon</td>
<td>SWCD, North Central Public Health</td>
<td>Long Term</td>
<td>Local sources</td>
</tr>
<tr>
<td>WF #2</td>
<td>Create firebreaks with fire resistant plantings around vulnerable facilities</td>
<td>Gilliam County Fire Services</td>
<td>SWCD, City of Arlington</td>
<td>Long Term^</td>
<td>Local sources</td>
</tr>
</tbody>
</table>

^For this NHMP, “long term” indicates a project will require 3-5 years or longer, due to a need for additional funding, political capital, or other resources. 
Source: Gilliam County NHMSC, May 2018

Please see Section 3, Mitigation Strategy, for a full list of 2018 mitigation actions, included previously developed and retained actions as well as new actions. Actions for both the County and Cities are described in Tables 3.1 and 3.2.

Section 4: Plan Implementation and Maintenance

The Natural Hazards Mitigation Steering Committee (NHMSC) informally met several times since the previous version of this NHMP. Progress towards action items is documented in Section 3 (above). The NHMSC agreed to meet semi-annually and the Gilliam County Emergency Management Department will be the convener of these meetings, as well as the entity responsible for coordinating implementation and future updates. The NHMSC will discuss options to integrate the NHMP into other planning documents (including the comprehensive plan) and revisit funding options during their semi-annual meetings.

Volume II: Jurisdictional Addenda

The previous version of the NHMP did not include jurisdictional addenda. Jurisdictional Risk Assessments and Mitigation Actions were incorporated into Section 2 and Section 3. The Cities of Arlington, Condon, and Lonerock participated and formed Steering Committees to inform the Jurisdictional Addenda.

Volume III: Mitigation Resources

Appendix A: Action Item Forms

This appendix details background, implementation steps, benefits, costs, and importance for the high and medium priority actions included in the 2018 NHMP. Action item forms were either updated from the previous plan or developed as part of this plan update.
Appendix B: Planning and Public Process

This planning and public process appendix reflects changes made to the Gilliam County NHMP and documents the 2018 planning and public process.

Appendix C: Community Profile

The community profile has been updated to include more recent data. Information from the State of Oregon NHMP (February 2015) was added.

Appendix D: Economic Analysis

Minimal updates were made to this section.

Appendix E: Survey Results

The public outreach survey used and responses collected during the 2018 NHMP update is detailed in this appendix.

Appendix F: Grant Programs

Some of the previously provided resources were deemed unnecessary since this material is covered within the Oregon NHMP. Updates were made to the remaining grant programs and resources.

Appendix G: Oregon Climate Change Research Institute (OCCRI) Report

This appendix describes predicted changes to weather patterns and natural hazard indicators for Hood River County and Oregon based on aggregated climate models. Several climate metrics that relate to natural hazards are calculated for historical and mid-21st century periods under two future emissions scenarios that result in varying future temperature increases for the State of Oregon.
Public Participation Process

Gilliam County is dedicated to directly involving the public in the review and update of the natural hazard mitigation plan. Although members of the Steering Committee represent the public to some extent, the residents of Gilliam County were also given the opportunity to provide feedback about the Plan.

Gilliam County made the draft NHMP available via the County Emergency Management’s website for public comment from May 2, 2018 through the FEMA review period. After FEMA approval, the final NHMP will be posted on the County’s Emergency Management website.

Public Involvement Summary

Gilliam County announced the plan update on the County Sherriff’s and Planning websites, the County Facebook, the City of Condon website, and the North Gilliam County Fire District Facebook. The purpose of the notice was to inform the public that an update to the NHMP was occurring and to provide an opportunity for the public to learn more about the update and comment. The notice was posted to the County websites on May 2, 2018, the City of Condon website on May 15, 2018, and the Fire District Facebook on May 2, 2018. The notice remained posted on all the websites throughout the NHMP planning process. The draft NHMP was added on July 16, 2018, and remained there until FEMA approval, at which point the final NHMP was posted. Screen shot images of the notices for each jurisdiction are included below in Figures B 1-4. The notices included a short online survey for residents to answer. The survey and responses can be found in Appendix E. The text included in the public notice is as follows:

> Gilliam County is updating the Natural Hazards Mitigation Plan. Mitigation plans outline community risk to natural hazards and potential actions the County can take to reduce risks to people, property and the local economy BEFORE the next wildfire or winter storm, etc. strikes. The Cities of Arlington, Lonerock, and Condon are creating locally specific action plans as well.

Please help us out by completing this SHORT survey (less than 5 minutes!): https://www.surveymonkey.com/r/FCPY388

If you are interested in learning more or providing input, contact Nicolia Mehrling at nicolia.mehrling@co.hood-river.or.us. You can see the former version of the plan, adopted in 2013, here, at the Gilliam County Emergency Management web page. Drafts of the new plan will be posted as soon as they are available.

Twenty-six residents responded to the online survey; their answers are detailed in Appendix F. A second survey was handed out at an outreach event. Six residents answered this survey. The questions and 32 responses are detailed in Appendix E. Members of the Steering Committee provided edits and updates to the NHMP.

The RARE participant presented to the Fire Department and Ambulance Services volunteer group on May 16, 2018.
Finally, the NHMP Update Coordinator presented at the following public meetings for the County:

**Gilliam County Court Public Meeting: August 2018**

On August 1, 2018 Gilliam County staff briefed the Gilliam County Court on the updated Gilliam County Multi-Jurisdictional Natural Hazards Mitigation Plan.

**City of Arlington City Council Public Meeting: August 2018**

On August 8, 2018 the NHMP Update Coordinator briefed the Arlington City Council on the updated Gilliam County Multi-Jurisdictional Natural Hazards Mitigation Plan.

**City of Condon City Council Public Meeting: August 2018**

On August 1, 2018 the NHMP Update Coordinator briefed the Condon City Council on the updated Gilliam County Multi-Jurisdictional Natural Hazards Mitigation Plan.

**City of Lonerock City Council Public Meeting: August 2018**

On August 13, 2018 the NHMP Update Coordinator briefed the Lonerock City Council on the updated Gilliam County Multi-Jurisdictional Natural Hazards Mitigation Plan.

**Figure B-1: Gilliam County Notice Dated May 2, 2018**

![Image of the Gilliam County Notice Dated May 2, 2018]
Figure B-2: Gilliam County Notice Dated May 2, 2018 (Facebook)

Figure B-3: North Gilliam County Fire District Notice Dated May 2, 2018
Figure B-4: City of Condon Notice Dated May 15, 2018
Gilliam County Steering Committee

Steering Committee members possessed familiarity with the Gilliam County community and how it’s affected by natural hazard events. The Steering Committee guided the update process through several steps including goal confirmation and prioritization, mitigation action item review and development and information sharing to update the plan and to make the plan as comprehensive as possible. Members from the Cities of Arlington and Condon Steering Committees also participated in the County Steering Committee meeting that met on the following dates:

Meeting #1: Kickoff, Risk Assessment, Hazard Analysis, April 24, 2018
Meeting #2: Mitigation Strategies, Implementation and Maintenance, May 16, 2018

In addition, each City held Steering Committee meetings as indicated below:

Arlington Steering Committee Meeting #1; May 29, 2018
Condon Steering Committee Meeting #1; May 30, 2018
Lonerock Steering Committee Meeting #1; May 30, 2018

For a list of meeting attendees see the individual City addendum within Volume II.

The County’s and Cities’ NHMP reflects decisions decided upon at the plan update meetings, during subsequent work and communication internally between Steering Committee members and other staff, and externally with DLCD staff and the RARE coordinator.

The following pages provide copies of meeting agendas, meeting notes, and sign-in sheets from County Steering Committee meetings, as well as the meetings with the Cities of Arlington, Condon, and Lonerock. The topics and processes of these meetings are described below.

Gilliam County Plan Update Introductory Meeting (July 2017)

After PDM funding in two grants was awarded to DLCD in July 2017, a regional kickoff meeting for all eight counties involved in the grant was hosted by DLCD and held on July 18, 2017. After that, DLCD and Gilliam County began the specifics of the NHMP update. On March 7, 2018, the Gilliam County NHMP Convener and the RARE participant met for an introductory meeting and to provide an overview of the plan update process. The purpose of these meetings was to (1) give an overview of the plan update process, (2) identify strategies for community involvement during the update process, (3) discuss the role of DLCD and the RARE participant during the update process, and (4) discuss the role of each City and the update process for the City specific information.

Gilliam County Risk Assessment Meeting (April 2018)

On April 24, 2018, the Natural Hazards Mitigation Steering Committee (NHMSC) met for a work session to go over and update the County’s hazard analysis and risk assessment. The purpose of the meeting was to (1) review and update the mitigation plan’s mission statement and goals, (2) gather and update hazard history and probability and vulnerability estimates for each of the hazards identified in the County, (3) update the hazard analysis matrix for each of the hazards, (4) identify community vulnerabilities for each hazard.
addressed in the plan, and (5) identify the relative risk for each hazard likely to affect the County. Using information gathered from this meeting, the RARE participant updated the hazard analysis to include total threat scores, and used these scores to identify hazards that pose the biggest threats to the County. All of the information gathered at this meeting was used to update the Risk Assessment and Hazard Analysis portion of the plan.

**Gilliam County Mitigation Strategy (May 2018)**

On May 16, 2018, NHMSC met once again to review and update the mitigation strategy and plan implementation, and the maintenance schedule. The purpose of the first half of the work session was to (1) determine the status and progress of action items in the 2013 mitigation plan, and (2) discuss new action items for the 2018 plan update. The purpose of the second half of the work session was to, (1) identify a convener and coordinating body for continued plan implementation, (2) review and update the method and schedule for monitoring and evaluating the plan, (3) discuss the process for prioritizing mitigation action items, (4) review and edit the finalized sections of the NHMP.

**City of Arlington Risk Assessment Meeting (May 2018)**

On May 29, 2018, the RARE participant, the Gilliam County Emergency Management Coordinator, and representatives from the City of Arlington met to complete a risk assessment for the City through a hazard analysis exercise. The purpose of the meeting was to (1) gather hazard history, probability, and vulnerability estimates for each of the hazards identified in the plan, (2) create the hazard analysis matrix for each of the hazards, (3) identify community vulnerabilities for each hazard addressed in the plan, and (4) compare probability and vulnerability results to the hazard analysis completed by the Gilliam County NHMSC.

**City of Condon Risk Assessment Meeting (May 2018)**

On May 30, 2018, the RARE participant, the Gilliam County Emergency Management Coordinator, and representatives from the City of Condon met to complete a risk assessment for the City through a hazard analysis exercise. The purpose of the meeting was to (1) gather hazard history, probability, and vulnerability estimates for each of the hazards identified in the plan, (2) create the hazard analysis matrix for each of the hazards, (3) identify community vulnerabilities for each hazard addressed in the plan, and (4) compare probability and vulnerability results to the hazard analysis completed by the Gilliam County NHMSC.

**City of Lonerock Risk Assessment Meeting (May 2018)**

On May 30, 2018, the RARE participant, the Gilliam County Emergency Management Coordinator, members of the public, and representatives from the City of Lonerock met to complete a risk assessment for the City through a hazard analysis exercise. The purpose of the meeting was to (1) gather hazard history, probability, and vulnerability estimates for each of the hazards identified in the plan, (2) create the hazard analysis matrix for each of the hazards, (3) identify community vulnerabilities for each hazard addressed in the plan, and (4) compare probability and vulnerability results to the hazard analysis completed by the Gilliam County NHMSC.
Welcome & Introductions (10 minutes)

Natural Hazards Mitigation Planning (30 minutes)
Emergency management Mitigation
Natural Hazards Mitigation Plan Overview (NHMP Info Sheet)
NHMP Funding/PDM Grant (Cost Share Form)
NHMP Update Process
Planning Process and Schedule (Project Schedule)
Steering Committee Role (Roster)

Community Profile Update (30 minutes)
Updates in development, plans, policy since previous plan?
Critical Infrastructure, Critical Facilities, and Lifelines? (Critical Infrastructure List)
Assets? (County Assets List)

Mission and Goals Update (10 minutes)
Review 2013 goals (NHMP excerpt)
Review mitigation actions (NHMP except)

OCCRI Report – Meghan Dalton @ 11:30 am (OCCRI Handout) (10 minutes)

Hazard Vulnerability Analysis (HVA) (60 min)
Hazard History Review (Hazard History Tables)
Any changes since previous plan?
Work Session (HVA Worksheet)

Public Outreach (15 min)
Identify strategy and timeline

Next Steps (10 min)
Set next meeting date and city addenda meeting dates
Data that would be useful to include? (Hazard or community related?)
Point person for planning information

Materials
Gilliam County 2013 NHMP: Introduction, Hazard Annexes, Risk Assessment
Meeting Agenda; NHMP Info Sheet; Cost Share Form; Project Schedule; SC Roster; OCRRI Handout; Page iv
Excerpted from 2013 NHMP; Hazard History Tables; HVA Worksheet; Critical Infrastructure List; County Assets List
Welcome and Introductions

In attendance:
Brian Foster, City of Arlington Public Works
Gibb Wilkins, Assistant, City of Condon Public Works
Chet Wilkins, Assessor, Gilliam County Assessor's Office
Susie Anderson, Planner, Gilliam County Planning Department
Bill Wagenaar, Road Master, Gilliam County Road Department
Gary Bettencourt, Sheriff, Gilliam County Sheriff's Office
Shannon Coppock, Coordinator, Gilliam County Fire Services
Chris Fitzsimmons, Coordinator, Gilliam County Emergency Management
Tanya Wray, PHEP, North Central Public Health District
Nicolia Mehrling, NHMP Update Coordinator, RARE Americorps

Absent:
Paul O'Dell, Mayor, City of Lonerock
Jordan Maley, Agent, OSU Extension

As part of the introductions, each person noted their familiarity with Natural Hazards Mitigation Plans (NHMPs) and any previous participation in a NHMP update. Most Steering Committee members participated in the previous plan update.

Natural Hazards Mitigation Plan Project (20 minutes)
Hazard mitigation and the Natural Hazards Mitigation Plan (NHMP)
NHMP Overview (NHMP Info Sheet)
NHMP Funding/PDM Grant (Cost Share Form)
NHMP Update Process
Planning Process and Schedule (Project Schedule)
Steering Committee (Roster)

Nicolia provided all in attendance with handouts related to this Steering Committee meeting. Nicolia is the RARE Americorps Volunteer responsible for the Gilliam County NHMP Update.

The NHMP Info Sheet explains what is a NHMP, what the process involves, and identifies the eight counties funded by the Pre-Disaster Mitigation (PDM) 16 grant to update their NHMPs.
Nicolia explained the role of mitigation in emergency preparedness. Mitigation is action focusing on preventing emergencies or reducing their effects. Mitigation increases the community’s ability to adapt to changing conditions, and withstand and recover from hazard disruptions. Mitigation is more cost effective than response and recovery. It is a proactive way to REDUCE or ELIMINATE long-term risk to life and property. Mitigation example include infrastructure projects (retrofits, earthquake strapping), education and outreach, policy changes and code reviews, and many others.

Nicolia explained the three types of grants that are available for counties with a NHMP:

**Pre-Disaster Mitigation (PDM) Program**: Provides funding for hazard mitigation planning, and the implementation of mitigation projects prior to a disaster event. PDM 16 funds this project.

**Hazard Mitigation Grant Program (HMGP)**: Provides funding to implement long-term hazard mitigation measures after a major disaster declaration (5 declarations in Oregon since previous plan).

**Flood Mitigation Assistance (FMA) Program**: Property owners who participate in the FMA program must have a flood insurance policy on the structure to be mitigated that is current at the time of application and maintained through award.

*Emergency Management Performance Grant (EMPG)*: OEM requires current NHMP as part of performance measure to receive funds.

Nicolia explained the collaboration supporting this update. The update is funded by FEMA, through OEM, administered by DLCD. Nicolia herself is a volunteer with RARE, a program of the University of Oregon. The county is responsible for an in-kind cost share for the PDM 16 grants that funds this update. The Cost Share Forms track hours dedicated to this update. All non-federally funded position hours spent on the update can be included, as well as resource contributions like photocopying, printing, etc. Nicolia distributed Cost Share Forms and requested that participants track their hours outside of official meetings. The forms will be collected at a the final project meeting.

Nicolia provided an overview of the essential pieces of a NHMP:

- **Hazards Profile**: Description of local hazards to help the SC make decisions about hazard priority.
- **Community Profile**: Overview of physical, natural, demographic, and social community characteristics, intended to highlight vulnerabilities.
- **Risk Assessment**: Identification of priority risks based on hazard and community information.
- **Mitigation Strategy**: Set of actions the community prioritizes to respond to risks.
- **Policy Crosswalk**: Plan to integrate hazards into other county plans and policies.
- **City Addendums**: Specific information and mitigation actions for the incorporated cities.

Nicolia provided a project schedule demonstrating the expected project timeline and expected dates of completion. The schedule includes at least two Steering Committee meetings, meetings with the Cities of Arlington, Lonerock, and Condon, and public outreach efforts. The expected completion of this project will be August 2018.
Nicolia described the expectations of Steering Committee members. They are expected to provide technical advice and policy direction. They will review drafts, provide information, and make high-level decisions regarding NHMP content. The group was invited to recruit more Steering Committee members, but all agreed that the major County stakeholders were present.

Community Profile Update (30 minutes)
Updates in development, plans, policy since previous plan?
Critical Infrastructure, Critical Facilities, and Lifelines? (Critical Infrastructure List)
Assets? (County Assets List)

The Steering Committee noted a new Gas Line Plan for the TransCanada pipeline/natural gas distribution and a new Emergency Safety Plan. They noted that Red Cross is no longer present in the County.

Vulnerable populations were mentioned, including the growing number of senior citizens and the migrant wind farm employees. A significant number of Gilliam workers commute into or out of the County.

Nicolia explained the Critical Infrastructure, Essential Infrastructure, and County Assets lists and requested that Steering Committee members review and provide feedback. For the most part, little change has occurred in the County. Notably, the number and acreage of wind farms has increased. A new, 1200 solar farm is proposed. A new community center and fire station in Arlington was built. An improved, better equipped fire hall was built in Condon. The group also noted a TransCanada gas line was developed which passes through the County. Additionally, an extensive network of fiber optic underground cables has been installed throughout the County. Chris noted that telephone infrastructure is critical in emergency situations because 911 uses it to contact residents. Day care centers in Arlington and Condon were added to population assets, as was the County fairgrounds. Arlington has a new reservoir and water supply facility, and new water and sewer for the airport. Condon has added a backup generator to the water facility. Condon is building a 2 duplex housing subdivision. A large building for fiber infrastructure is planned to be built in Condon.

Mission and Goals Update (10 minutes)
Review 2013 goals (NHMP excerpt)
Review mitigation actions (NHMP except)

Nicolia provided the 2013 NHMP goals, with the State NHMP goals for comparison. The Steering Committee requested that “industry” be added to the first goal of preserving property. The goals were approved by consensus.

OCCRI Report – Meghan Dalton @ 11:30 am (OCCRI Handout)

Meghan Dalton of OCCRI called into the meeting and walked Steering Committee members through a provided handout that explains the types of data and graphics an upcoming OCCRI report will include. The report is predicting changes to natural hazards due to future
climate variability. Gilliam County can expect more “fire days” (a higher risk of wildfire), among other changes. The full report will be released later this year.

Hazard Vulnerability Analysis (HVA) (60 min)
Hazard History Review (Hazard History Tables)
Any changes since previous plan?
Work Session (HVA Worksheet)

The group reviewed the 2013 hazard history tables and discussed recent hazards. They noted that landslides only accompany winter storms and are not a standalone hazard. Similarly, floods are primarily a compounding factor of winter storms. They noted that many wildfires in the county are not associated with the WUI, but still create hazardous conditions and require a County response. In a 2017 fire, $1.2 million in utility poles were lost due to a wildfire. Most declared disasters occur because they are a contiguous county with other counties experience more severe impacts.

The group noted recent storm events during which they couldn’t source the equipment they needed and some County infrastructure was destroyed. Several hazard history events were added including winter storms in 2016 and 2017, drought in 2016, floods in 2006 and 2017, a dust storm in 2016, wildfires in 2011, 2015, 2016, and 2017, and small, local earthquake events.

The group concurred that vulnerability was difficult to estimate because they County has few people/property. The population areas are very far from each other; as a result, any hazard that severely impacts one community would leave the others untouched. Overall, the group felt that natural hazards were not a significant risk to their communities.

The Steering Committee reviewed and updated the Hazard Vulnerability Analysis from 2015 using the OEM methodology (originally developed by FEMA), described in the Hazard Analysis Worksheet. The hazard rankings remain similar to their previous priorities. Wildfire rose in priority to 2nd, between winter storms and droughts. Volcanic events dropped to lowest priority for the County, below earthquakes and windstorms. The group discussed how a Cascadia event was likely to occur, but would not physically damage much Gilliam County infrastructure. However, they agreed the County may experience an influx of earthquake refugees in such an event.
The 2018 Hazard Analysis results are described in the table below.

<table>
<thead>
<tr>
<th>Hazard</th>
<th>History</th>
<th>Probability</th>
<th>Vulnerability</th>
<th>Maximum Threat</th>
<th>Total</th>
<th>Rank</th>
<th>Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Weather</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>240</td>
<td>1</td>
<td>High</td>
</tr>
<tr>
<td>Wildfire</td>
<td>10</td>
<td>10</td>
<td>6</td>
<td>8</td>
<td>200</td>
<td>2</td>
<td>High</td>
</tr>
<tr>
<td>Drought</td>
<td>8</td>
<td>9</td>
<td>7</td>
<td>8</td>
<td>194</td>
<td>3</td>
<td>High</td>
</tr>
<tr>
<td>Flood</td>
<td>7</td>
<td>8</td>
<td>6</td>
<td>7</td>
<td>170</td>
<td>4</td>
<td>Medium</td>
</tr>
<tr>
<td>Earthquake</td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>10</td>
<td>164</td>
<td>5</td>
<td>Medium</td>
</tr>
<tr>
<td>Windstorm</td>
<td>5</td>
<td>8</td>
<td>4</td>
<td>6</td>
<td>146</td>
<td>6</td>
<td>Low</td>
</tr>
<tr>
<td>Volcanic</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>8</td>
<td>124</td>
<td>7</td>
<td>Low</td>
</tr>
</tbody>
</table>

Public Outreach (10 min)

Outreach is a key requirement from FEMA in NHMPs. The steering committee agreed to post notices to the County and City websites. Using Facebook pages was suggested, as well as submitting an article to the County newspaper. Adding the fire chief and ambulance services director to the stakeholder group was suggested. Nicolia will present to the volunteer fire fighters group. No other outreach methods were suggested. All the outreach efforts that SC members make will be documented in a timeline and included in the NHMP.

Next Steps (5 min)

Nicolia will provide the meeting notes, and updated materials: Critical Infrastructure, Mission and Goals, Assets, Hazards Vulnerability Analysis.

Chris will schedule meetings with City officials for Lonerock, Arlington, and Condon for the weeks of May 21-June7.

The next meeting is scheduled for May 16th, 9-12pm, and will focus on Mitigation Strategy and Implementation and Maintenance.

Materials
- Gilliam County 2013 NHMP: Introduction, Hazard Annexes, Risk Assessment
- Meeting Agenda; NHMP Info Sheet; Cost Share Form; Project Schedule; SC Roster; OCRRI Handout; Page iv Excerpted from 2013 NHMP; Hazard History Tables; HVA Worksheet; Critical Infrastructure List; County Assets List
Gilliam County NHMP Update
Steering Committee Meeting #2 Agenda

Wednesday May 16, 2018  South Gilliam County Fire Hall
9:00 AM – 12:00 PM  220 North Main Street
Condon, OR

I. Welcome & Introductions (5 min)

II. Steering Committee (20 min)
Sign Cost Share Forms (Cost Share Form)
Public Outreach update and posting NHMP info on the websites

III. Mitigation Actions (80 min)
Review 2013 list of actions, update with status, and identify (modify, delete, add) actions for 2017-2018 NHMP (Mitigation Actions Tables)
Add additional action items
Definitions of Mitigation Actions Timelines (On back of Agenda)
Supply implementation steps, costs, and potential funding sources

IV Implementation and Maintenance (20 minutes)
Review 2012 Maintenance plan, conveners, and process (Implementation and Maintenance Handout)
Adjust and Improve

V. Meeting 1 Review (15 minutes)
HVA (Hazard Analysis Summary)
Mission and Goals
Critical Infrastructure/Assets (Critical Infrastructure and Assets Lists)

VI. Next Steps (10 min)

Meeting Notes and Follow up
Drafts to review: Hazard Annexes, Community Profile, Risk Assessment, Mitigation Strategy
City Addendum Meetings

Materials
Meeting Agenda; Cost Share Form; Implementation and Maintenance Handout; Hazard Analysis Summary;
and Mitigation Actions Tables

Mitigation Actions Timeline
Action items include both short and long-term activities. Each action item includes an estimate of the timeline for implementation. Short-term action items (ST) are activities that may be implemented with existing resources and authorities in one to two years. Long-term action items (LT) may require new or additional resources and/or authorities, and may take from one to five years to implement. Ongoing action items are activities that are currently being performed and will continue into the foreseeable future.
### Gilliam County Natural Hazards Mitigation Plan

**Steering Committee Meeting**

**Wednesday, May 16, 2018, 9 am – 12 pm**

**South County Fire Hall**

N Main Street, Condon, OR

#### PLEASE SIGN IN (Sign your name or add to the list)

<table>
<thead>
<tr>
<th>Full Signature</th>
<th>Name</th>
<th>Title</th>
<th>Representing</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Brian Foster</td>
<td></td>
<td>City of Arlington Public Works</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gibb Wilkins</td>
<td>Assistant</td>
<td>City of Condor Public Works</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paul O'Dell</td>
<td>Mayor</td>
<td>City of Lonesock</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chet Wilkins</td>
<td>Assessor</td>
<td>Gilliam County Assessor’s Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Susie Anderson</td>
<td>Planner</td>
<td>Gilliam County Planning Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dewey Kennedy</td>
<td>Road Master</td>
<td>Gilliam County Road Department</td>
<td>988-5216</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gary Bettencourt</td>
<td>Sheriff</td>
<td>Gilliam County Sheriff’s Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shannon Coppock</td>
<td>Coordinator</td>
<td>Gilliam County Fire Services</td>
<td>541-884-6855</td>
<td><a href="mailto:shannon.coppock@gmail.com">shannon.coppock@gmail.com</a></td>
</tr>
<tr>
<td></td>
<td>Chris Fitzsimmons</td>
<td>Coordinator</td>
<td>Gilliam County Emergency Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jordan Maley</td>
<td>Agent</td>
<td>OSU Extension</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tanya Wray</td>
<td>PHED</td>
<td>North Central Public Health District</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Renee Heidy</td>
<td>Manager</td>
<td>Frontier Regional</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nicolia Mehrling</td>
<td>NHMP Coordinator</td>
<td>Gilliam County/ILCD/JSC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Gilliam County NHMP Update

Steering Committee Meeting #2

Wednesday May 16, 2018        South Gilliam County Fire Hall
9:00 AM – 12:00 PM        220 North Main Street
                              Condon, OR

Meeting Minutes

I.  Welcome & Introductions (5 min)

II. Steering Committee (20 min)

Steering Committee members returned completed costshare forms. Nicolia distributed cost
share forms to those who needed them. Chris will seek payroll documentation for steering
committee members. Chris and Shannon confirmed the NHMP update notice was posted to
the County website and facebook page, the City of Condon website, and the Fire Services
Facebook page. Nicolia will write a public announcement for the County newspaper. The
project timeline was updated and shared. The group agreed that County judge and City
council presentations would occur in August. City meeting dates were confirmed.

III. Mitigation Actions (80 min)

The Steering Committee reviewed the 2013 actions and shared what updates or progress
had occurred. Several buildings, including the fire station, community center, and school
had been rebuilt or retrofit. Several facilities had gained generators or generator hookups.
The group acknowledged the rise in significance of the fairgrounds, which would serve as
incident command post in a disaster situation. They decided to prioritize generator hookups,
improved water system, and general structural enhancements for the fairgrounds. Several
mitigation actions were noted as completed or institutionalized to the point of becoming
routine maintenance, including protecting utilities from fire damage, maintaining an impact
database, and seeking updated floodplain information. The County noted that updated
FIRM maps were financially infeasible at this point, but the state was methodically updating
all FIRM maps for each County. Within 5-10 years, the Gilliam maps should be completed.

The Steering Committee generated two new action items: long range water system
development in the City of Condon and wildfire protection through the planting of fire
resistant foliage in Arlington.

Detailed implementation information, including lead organization, funding options and
timelines for each mitigation action were identified. The Steering Committee decided not to
prioritize the actions because they had only ten, and prioritization wasn’t necessary.
IV. Implementation and Maintenance (20 minutes)

The Steering Committee reviewed the 2013 Implementation and Maintenance process and made two minor changes. The expectation of GIS data integration and update was removed, because the County does have GIS staff. The public notice website was changed from Planning to Emergency Management because the NHMP is managed by Emergency Management.

V. Meeting 1 Review (15 minutes)

The Steering Committee reviewed and affirmed the Hazard Vulnerability Analysis, the 2018 Mission and Goals, and the updated Critical Infrastructure and Assets Lists.

VI. Next Steps (10 min)

Nicolia will provide meeting notes and update mitigation actions for confirmation. Nicolia will provide drafts of the Risk Assessment, Hazard Annexes, Community Profile, Mitigation Strategy as they are ready. City addendum meetings will occur 5/29 and 5/30.

Materials

Meeting Agenda; Cost Share Form; Implementation and Maintenance Handout; Hazard Analysis Summary; and Mitigation Actions Tables
Arlington City Addendum

NHMP Update

Steering Committee Meeting Agenda

May 29, 2018  City Hall, 500 W 1st St
10 am – 12 pm  Arlington, OR

Welcome and Introductions (5 minutes)

Hazard Identification (20 minutes)
Review County Hazard Identification
Complete Jurisdiction Specific Hazard Inventories

Review Existing Vulnerability Information (30 minutes)
Review County Identified Vulnerabilities
Identify Jurisdiction Specific Assets and Vulnerabilities (Local Capabilities Worksheet)
City specific plans, policies, programs
City specific physical, social, economic vulnerabilities
City Specific Critical Facilities and Infrastructure (Critical Facilities List)

Jurisdiction Specific Risk Assessment (15 minutes)
Review/ Revise City Specific Hazard Vulnerability Assessment (HVA)

Jurisdiction Specific Mitigation Strategy (30 minutes)
Review Process and County Strategy
Develop Jurisdiction Specific Actions (Mitigation Action Table)
Prioritize Mitigation Actions

Overview of Implementation and Maintenance (10 minutes)
Name Convener and Coordinating Body Responsibilities (Draft Addendum)

Next Steps (10 minutes)
Prepare final draft of the NHMP for Review by City, County, DLCD, and the Public
Submit to OMD-Office of Emergency Management; OEM submits to FEMA
Formal adoption by City Council after FEMA approval

Materials
Gilliam County NHMP Drafts: Hazard Annex, Community Profile, Risk Assessment, Mitigation Strategy; Meeting Agenda; Local Capabilities Worksheet; Critical Infrastructure List; Mitigation Action Table; HVA Worksheet; Arlington City Addendum (Draft)
Condon City Addendum
NHMP Update
Steering Committee Meeting

May 30, 2018  City Hall, 128 S. Main Street
2 - 4 pm  Condon, OR

AGENDA

Welcome and Introductions (5 minutes)

Hazard Identification (20 minutes)
Review County Hazard Identification
Complete Jurisdiction Specific Hazard Inventories

Review Existing Vulnerability Information (30 minutes)
Review County Identified Vulnerabilities
Identify Jurisdiction Specific Assets and Vulnerabilities (Local Capabilities Worksheet)
City specific plans, policies, programs
City specific physical, social, economic vulnerabilities
City Specific Critical Facilities and Infrastructure (Critical Facilities List)

Jurisdiction Specific Risk Assessment (15 minutes)
Review/ Revise City Specific Hazard Vulnerability Assessment (HVA)

Jurisdiction Specific Mitigation Strategy (30 minutes)
Review Process and County Strategy
Develop Jurisdiction Specific Actions (Mitigation Action Table)
Prioritize Mitigation Actions

Overview of Implementation and Maintenance (10 minutes)
Name Convener and Coordinating Body Responsibilities (Draft Addendum)

Next Steps (10 minutes)
Prepare final draft of the NHMP for Review by City, County, DLCD, and the Public
Submit to OMD-Office of Emergency Management; OEM submits to FEMA
Formal adoption by City Council after FEMA approval

Materials
Gilliam County NHMP Drafts: Hazard Annex, Community Profile, Risk Assessment, Mitigation Strategy; Meeting Agenda; Local Capabilities Worksheet; Critical Infrastructure List; Mitigation Action Table; HVA Worksheet; Condon City Addendum (Draft)
Lonerock City Addendum
NHMP Update
Steering Committee Meeting

May 30, 2018 Community Hall
10 am - 12 pm Lonerock, OR

AGENDA

Welcome and Introductions (5 minutes)

Hazard Identification (20 minutes)
Review County Hazard Identification
Complete Jurisdiction Specific Hazard Inventories

Review Existing Vulnerability Information (30 minutes)
Review County Identified Vulnerabilities
Identify Jurisdiction Specific Assets and Vulnerabilities (Local Capabilities Worksheet)
City specific plans, policies, programs
City specific physical, social, economic vulnerabilities
City Specific Critical Facilities and Infrastructure (Critical Facilities List)

Jurisdiction Specific Risk Assessment (15 minutes)
Review/ Revise City Specific Hazard Vulnerability Assessment (HVA)

Jurisdiction Specific Mitigation Strategy (30 minutes)
Review Process and County Strategy
Develop Jurisdiction Specific Actions (Mitigation Action Table)
Prioritize Mitigation Actions

Overview of Implementation and Maintenance (10 minutes)
Name Convener and Coordinating Body Responsibilities (Draft Addendum)

Next Steps (10 minutes)
Prepare final draft of the NHMP for Review by City, County, DLCD, and the Public
Submit to OMD-Office of Emergency Management; OEM submits to FEMA
Formal adoption by City Council after FEMA approval

Materials
Gilliam County NHMP Drafts: Hazard Annex, Community Profile, Risk Assessment, Mitigation Strategy; Meeting Agenda; Local Capabilities Worksheet; Critical Infrastructure List; Mitigation Action Table; HVA Worksheet; Lonerock City Addendum (Draft)
2013 Plan Update
Project Background

In September 2011, Gilliam County partnered with the Oregon Partnership for Disaster Resilience (OPDR) (now referred to as the Institute for Policy, Research and Engagement or IPRE) and Resources Assistance for Rural Environments (RARE) to update the 2008 Gilliam County NHMP. RARE and OPDR met with members of the Gilliam County NHMP Steering Committee in November 2011, February 2012, and May 2012 to update the content within the county’s NHMP. The RARE participant also met with each city (Arlington, Condon, and Lonerock) in April 2012 to update content and conduct a hazard analysis for each city’s jurisdiction. RARE, OPDR, and the Gilliam County NHMP Steering Committee made several changes to the 2008 NHMP, summarized below.

2012 Plan Update Changes

Table B-4 below lists the 2008 plan section names and the corresponding 2012 section names as updated. The 2012 plan update section names are used here to reference any changes, additions, or deletions within the plan.

<table>
<thead>
<tr>
<th>2008 Gilliam County NHMP</th>
<th>2012 Gilliam County NHMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume I:</td>
<td>Volume I:</td>
</tr>
<tr>
<td>Executive Summary</td>
<td>Executive Summary</td>
</tr>
<tr>
<td>Section 1: Introduction</td>
<td>Section 1: Introduction</td>
</tr>
<tr>
<td>Section 2: Community Sensitivity and Resilience</td>
<td>Section 2: Risk Assessment</td>
</tr>
<tr>
<td>Section 3: Risk Assessment Summary</td>
<td>Section 3: Goals and Action Items</td>
</tr>
<tr>
<td>Section 4: Mission, Goals, and Action Items</td>
<td>Section 5: Plan Implementation and Maintenance</td>
</tr>
<tr>
<td>Section 5: Plan Implementation and Maintenance</td>
<td>Section 4: Plan Implementation and Maintenance</td>
</tr>
<tr>
<td>Volume II:</td>
<td>Volume II:</td>
</tr>
<tr>
<td>Identifying and Assessment of Communities at Risk</td>
<td>Section 2: Risk Assessment</td>
</tr>
<tr>
<td>Map of County Assets</td>
<td>Section 2: Risk Assessment (Text/ No Map)</td>
</tr>
<tr>
<td>Resolutions</td>
<td>Table of Contents</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume III:</td>
<td>Volume III:</td>
</tr>
<tr>
<td>Appendix A: Resource Directory</td>
<td>Appendix A: Action Item Forms</td>
</tr>
<tr>
<td>Appendix B: Steering Committee and Public Meetings</td>
<td>Appendix B: Planning and Public Process</td>
</tr>
<tr>
<td>Appendix C: Household Risk Perception Survey</td>
<td>Appendix D: Economic Analysis</td>
</tr>
<tr>
<td>Appendix D: Regional Profile</td>
<td>Removed. Link provided to on-line resource.</td>
</tr>
<tr>
<td>Appendix E: Ecotourism Analysis of Mitigation Actions</td>
<td>Appendix E: Regional Hazard Mitigation Public Opinion Survey</td>
</tr>
<tr>
<td>Appendix F: Existing Plans and Policies</td>
<td>Appendix F: Grant Programs</td>
</tr>
<tr>
<td>Appendix G: Open for Business Training</td>
<td>Removed</td>
</tr>
</tbody>
</table>

1. Most of Section 1 includes new information that replaces out of date text found in the 2008 NHMP. The new text defines mitigation, gives examples of mitigation strategies, and describes the federal mitigation funding programs for which Gilliam County is eligible to apply.

2. OPDR and the plan update coordinator replaced methodology information with text that summarized the development of the 2008 NHMP and added new text to describe the 2012 plan update process, including plan update meetings, public outreach efforts, and final plan review and adoption processes.

Major changes to Section 2 include the following:
Severe Weather was added to the NHMP as a part of the Winter Storm hazard category. The Steering Committee agreed that it was appropriate to include Severe Weather because many of the federal disasters declared for the county have been severe weather related. Landslide/Debris Flow was removed as a separate hazard from the 2008 NHMP, but instead was included as a part of the Severe Weather/Winter Storm hazard category. The Steering Committee determined that landslides are generally secondary hazards, therefore should not be categorized as a separate hazard altogether. Most landslides/debris flows that occur in Gilliam County are secondary hazards caused by severe weather related incidents. The NHMP Steering Committee updated in the Hazard Analysis for Gilliam County using the Oregon Emergency Management Hazard Analysis Methodology. The vulnerability rating for drought increased from medium to high. The probability and vulnerability for earthquake also increased from low to medium. In addition, the probability of a flood hazard increased from medium to high, and the vulnerability increased from low to medium. The Steering Committee evaluated volcano hazard for the 2012 update and rated the probability of a volcanic event as low and the vulnerability to the hazard as medium. The county completed a Relative Risk Exercise and used the scores to more accurately define hazard risks in the county, and to supplement previously developed Total Threat Scores.

An overview of Gilliam County hazards was developed that summarizes information about the seven hazards identified by the NHMP Steering Committee. Community Vulnerability has been added to the section including a listing of community assets and issues that fall under Populations, Economies, Land Use and Development, Critical Infrastructure, and Environment categories. New to the Risk Assessment section for the 2012 update is individual Risk Assessments for the three incorporated cities in Gilliam County that include: the City of Arlington, City of Condon, and City of Lonerock.

Major changes to Section 3 include the following:

The Gilliam County NHMP Steering Committee reviewed the 2008 plan’s goals and modified them with the goals currently identified in Section 3. One goal, Goal 1: Ability to respond effectively and swiftly, was deleted from the plan entirely. Goal 2: Safety of life and property, was modified and Goal 3: Increased cooperation and collaboration between groups and agencies, was determined to still be appropriate for the 2012 update. A new goal was established in the 2012 NHMP update with influence from the State of Oregon’s NHMP. The Gilliam County NHMP Steering Committee added State Goal 7: Motivate the public, private sector, and government agencies to mitigate against the effects of natural hazards through information and education, to the Gilliam County NHMP. Several other tables and figures in the section were modified during the plan update.

On May 30, 2012, the Gilliam County NHMP Steering Committee met to review the 2008 NHMP action items. The committee reviewed and identified which of the 2008 NHMP’s 24 action items had been completed and whether they should be deleted or deferred. Most of the action items that were deferred were modified in some way to make them more achievable, accurate, or actionable.

Major developments from the Planning Implementation and Maintenance update steering committee meeting involved the following:
• The committee agreed to change the current co-convener structure to a single convener, in which the Gilliam County Emergency Management Department is responsible for the NHMP duties listed in the section.

Changes to Volume II: Mitigation Resources include the following:

• Appendix A is new to the Gilliam County NHMP and lists the plan’s action items and the current status.
• The community profile consists of new, updated data accessed from the 2010 Census from the U.S. Census Bureau as well as other Federal, State, and Local resources. The entire section has been updated and modified in terms of scope and information, expanding from six pages to 51 pages.
• Appendix E provides a summary report of the survey administered to community stakeholders in the fall of 2011 during the early stages of the Wheeler County NHMP Update. This appendix replaces the 2008 NHMP’s tables and summaries from the previous regional survey.
2008 Plan Development Process

In Fall 2005, the Oregon Natural Hazards Workgroup at the University of Oregon’s Community Service Center partnered with the Department of Geology and Mineral Industries (DOGAMI) and the Mid-Columbia Gorge Region (Gilliam, Gilliam, Morrow, Sherman, Umatilla, Wasco, and Gilliam) counties to develop a Pre-Disaster Mitigation Planning Grant proposal. FEMA awarded the Mid-Columbia Gorge Region grant to support the development of the natural hazard mitigation plans for the seven counties in the region.

The planning process used to create Gilliam County’s Natural Hazards Mitigation Plan was developed using a planning process created by the Community Service Center’s Oregon Natural Hazard Workgroup at the University of Oregon. The planning process was designed to: (1) result in a plan that is DMA 2000 compliant; (2) coordinate with the State’s plan and activities of the Partners for Disaster Resistance & Resilience; and (3) build a network of jurisdictions and organizations that can play an active role in plan implementation. The planning process included the review and incorporation, if appropriate, of existing plans, studies, reports and technical information. In general, the following regional resources were reviewed and local resources have been cited throughout the plan.

State of Oregon Natural Hazard Mitigation Plan – Regional Profiles and Hazard Assessments; Oregon Technical Resource Guide; Oregon Natural Hazards Workgroup Training Manual; The Oregon Atlas; The Oregon Weather Book; Gilliam County Comprehensive Plan; Gilliam County Zoning Ordinance; North Central Oregon: Strategic Plan for Tourism; and Region 5 Household Preparedness Survey Report

Steering Committee

The Gilliam County Steering Committee was comprised of individuals best suited to guide the county through the planning process and ensure that the mitigation plan is fully implemented once adopted.

Its mission was to ensure proper development and implementation of the county natural hazards mitigation plan by:

- setting goals;
- establishing subcommittee work groups to address specific needs;
- ensuring public, private and federal participation;
- distributing and presenting the plan;
- facilitating public discussion/involvement;
- developing implementation activities; and
- coordinating plan maintenance and implementation strategies.

Through raising awareness and citizen involvement, the Committee’s end goal was to make hazard mitigation a part of the community’s routine decision-making process.
A Steering Committee was developed to assist in developing the plan. The committee included:

- City of Lonerock Mayor, Floyd Parrott
- Gilliam County Sheriff, Gary Bettencourt
- City of Condon Public Works, Larry Duffy
- Gilliam County Appraiser, Dave Messenger
- City of Arlington Public Works, Brian Foster
- Gilliam County Extension Agent, Jordan Malay
- Gilliam County Planning Director, Susie Anderson
- Gilliam County Road Master, Dewey Kennedy
- ODOT Supervisor, Andy Anderson
- Gilliam County Emergency Management Coordinator, Chris Fitzsimmons

As part of the regional PDM grant, ONHW implemented a region wide household preparedness survey. The survey gauged household knowledge of mitigation tools and techniques and assessed household disaster preparedness.
The following section describes Gilliam County from a number of perspectives in order to help define and understand the sensitivity and resilience to natural hazards. Sensitivity and resilience indicators are identified through the examination of community capitals that include natural environment, socio-demographic capacity, regional economy, physical infrastructure, community connectivity, and political capital.

Sensitivity factors can be defined as those community assets and characteristics that may be impacted by natural hazards (e.g., special populations, economic factors, and historic and cultural resources). Community resilience factors can be defined as the community’s ability to manage risk and adapt to hazard event impacts by way of the governmental structure, agency missions and directives, as well as through plans, policies, and programs.

The information in this section represents a snapshot in time of the current sensitivity and resilience factors in the County when the plan was developed. The community capitals information below, along with the hazard assessments located in Section 2: Risk Assessment, should be used as the local level rationale for the risk reduction action items identified in Appendix A, Action Item Forms and Section 3, Mitigation Strategy. The identification of actions that reduce Gilliam County’s sensitivity and increase its resilience assist in reducing overall risk, which displayed as the area of overlap in Figure C.1 below.

**Figure C.1 Understanding Risk**

![Diagram: Understanding Risk](source)

Source: The Institute for Policy Research and Engagement (IPRE), University of Oregon
Why Plan for Natural Hazards in Gilliam County?

Natural hazards impact citizens, property, the environment, and the economy of Gilliam County. Droughts, earthquakes, flooding, severe weather, volcanoes, wildfires, windstorms, and winter storms have exposed Gilliam County residents and businesses to the financial and emotional costs from impacts and for recovering after natural disasters. The risk associated with natural hazards increases as more people move to areas affected by natural hazards. The inevitability of the occurrence of natural hazards within Gilliam County creates an urgent need to develop strategies, coordinate resources, and increase public awareness to reduce risk and prevent loss from future natural hazard events. Identifying risks posed by natural hazards and developing strategies to reduce the impact of a hazard event can assist in protecting life and property of citizens and communities. Local residents and businesses should work together with the County to keep the Natural Hazards Mitigation Plan updated. The Natural Hazards Mitigation Plan addresses the potential impacts of hazard events and allows the County to apply for certain funding from FEMA for pre and post disaster mitigation projects that would otherwise not be available if the County did not have an approved Natural Hazards Mitigation Plan.

Natural Environment Capacity

Geography

Gilliam County claims approximately 1,223 square miles of land and water.\(^1\) Elevation ranges from about 250 feet along the Columbia River to about 3,600 feet near the border of the Blue Mountain section.\(^2\) Located in north central Oregon, Gilliam County lies in the Columbia Plateau, which also known as the Columbia Basin. A majority of the County is a plain that was covered by molten basalt and then uplifted. Topography is mainly the result of erosion and stream cutting in the basalt. The two major waterway systems in the county are the Columbia River, which forms the northern border with the State of Washington, and the John Day River, which forms the western border with neighboring Sherman County. The major drainages to the Columbia River watershed include: Quinton Creek, Blalock Canyon, Alkali Canyon, Eightmile Canyon, Fourmile Canyon, and Willow Creek. In addition, the major drainages to the John Day River watershed in the county include: Rock Creek, Thirty mile Creek, Hay Creek, Ferry Canyon, Lonerock Creek, and Lost Valley Creek.\(^3\) Figure C.2 illustrates physiographic provinces throughout the State of Oregon.

---

1 Gilliam County Website.  http://www.co.gilliam.or.us/history/index.html.
Figure C.2: Physiographic Provinces in Oregon

Deschutes-Columbia Plateau

Gilliam County lies mainly within the Columbia Plateau physiographic province. The Deschutes-Columbia Plateau is predominantly a volcanic province covering approximately 63,000 square miles in Oregon, Washington, and Idaho. The plateau is surrounded on all sides by mountains; the Okanogan Highlands to the north, the Cascade Range to the west, the Blue Mountains to the south, and the Clearwater Mountains to the east. Almost 200 miles long and 100 miles wide, the Columbia Plateau merges with the Deschutes basin lying between the High Cascades and Ochoco Mountains. The province slopes gently northward toward the Columbia River with elevations up to 3,000 feet along the south and west margins down to a few hundred feet along the river. The three ecoregions of the Columbia Plateau located in Gilliam County include: the Pleistocene Lake Basing, the Deschutes/John Day Canyons, and the Umatillia Plateau. Figure C.3 identifies the three ecoregions encompassed within the county.

Figure C.3: Ecoregions in Gilliam County

Pleistocene Lake Basins\(^5\): the Pleistocene Lake Basins once contained vast temporary lakes that were created by flood waters from glacial lakes Missoula and Columbia. In Oregon, the flood waters accumulated from the eastern entrance of the Columbia River Gorge upstream to the Wallula Gap to form ancient Lake Condon. Today, the region is the driest and warmest part of the Columbia Plateau with mean annual precipitation varying from seven to 10 inches. Native vegetation consists of bunchgrass and sagebrush. Major irrigation

projects provide Columbia River water to this region, allowing the conversion of large areas into agriculture. The City of Arlington is located in this region of the County.

**Umatilla Plateau**\(^6\): the nearly level to rolling, treeless Umatilla Plateau ecoregion is underlain by basalt and veneered with loess deposits. Areas with thick loess deposits are farmed for dry land winter wheat, or irrigated alfalfa and barley. In contrast, rangeland dominates more rugged areas where loess deposits are thinner or nonexistent. Mean annual precipitation is nine to 15 inches and increases with increasing elevation. In uncultivated areas, moisture levels are generally high enough to support grasslands of bluebunch wheatgrass and Idaho fescue without associated sagebrush. The City of Condon and the City of Lonerock are both located within this region of the County.

**Deschutes/John Day Canyons**\(^7\): deeply cut into basalt, the Deschutes/John Day Canyons fragment a lightly populated portion of the Umatilla Plateau. Canyon depths up to 2,000 feet create drier conditions than on the plateau above. In the canyons, bunchgrasses, Wyoming big sagebrush, and cheatgrass grow on rocky, colluvial soil. Riparian vegetation in narrow reaches is often limited to a band of white alder at the water line; broader floodplains and gravel bars are dominated by introduced species, such as reed canarygrass, sweetclover, and teasel. The rivers support Chinook salmon and steelhead runs.

**Rivers**

**Columbia River Basin**

The Columbia River Basin is North America’s fourth largest, draining a 259,000 square mile basin that includes territory in seven states (Oregon, Washington, Idaho, Montana, Nevada, Wyoming and Utah) and one Canadian province. The river flows for more than 1,200 miles, from the base of the Canadian Rockies in southeastern British Columbia to the Pacific Ocean at Astoria, Oregon, and Ilwaco, Washington. The Columbia River Basin includes a diverse ecology that ranges from temperate rain forests to semi-arid plateaus, with precipitation levels from six inches to 110 inches per year. Furthermore, the Columbia is a snow-charged river that seasonally fluctuates in volume. Its annual average discharge is 160 million acre-feet of water with the highest volumes between April and September and the lowest from December to February. From its source at 2,650 feet above sea level, the river drops an average of more than two feet per mile, but in some sections it falls nearly five feet per mile.\(^8\)

The Columbia River Basin is the most hydroelectrically developed river system in the world.\(^9\) The Federal Columbia River Power System (FCRPS) encompasses the operations of 14 major dams and reservoirs on the Columbia and Snake rivers, operated as a coordinated system. In addition, the U.S. Army Corps of Engineers operates nine of 10 major federal projects on the Columbia and Snake rivers. These federal projects are a major source of power in the

---

\(^8\) Center for Columbia River History. “Columbia River”. Written by: Bill Lang Professor of History Portland State University, Former Director, Center for Columbia River History. http://www.ccrh.org/river/history.htm.
\(^9\) Center for Columbia River History. “Columbia River”. Written by: Bill Lang Professor of History Portland State University, Former Director, Center for Columbia River History. http://www.ccrh.org/river/history.htm.
region, and provide flood control, navigation, recreation, fish and wildlife, municipal and industrial water supply, and irrigation benefits.\textsuperscript{10

John Day River\textsuperscript{11

The John Day River basin drains nearly 8,100 square miles of central and northeast Oregon. It is one of the nation’s longest free-flowing river systems. Elevations range from 265 feet at the confluence with the Columbia River to over 9,000 feet at the headwaters in the Strawberry Mountain Range. The river has no dams to control water flow; therefore flow levels fluctuate widely in relation to snow pack and rainfall. The John Day River system is under designation of two important river preservation programs; the National Wild and Scenic Rivers Act and the Oregon Scenic Waterways Act. Together, these two acts, one a federal program and one a state program, provide protection for the natural, scenic, and recreational values of river environments.

The Bureau of Land Management (BLM) in partnership with The Confederated Tribes of the Warm Springs, Oregon Department of State Lands, Oregon Parks and Recreation Department, Oregon Department of Fish and Wildlife, and the John Day Coalition of Counties (making up the John Day River Interagency Planning Team) has responsibility for managing the 147-mile John Day Wild and Scenic River from Service Creek in Wheeler County to Tumwater Falls.\textsuperscript{12

John Day Scenic Waterway\textsuperscript{13 which includes:

The John Day River from its confluence with Parrish Creek downstream to Tumwater Falls;
The North Fork John Day River from the boundary of the North Fork John Day Wilderness (near river mile 76), as constituted on December 8, 1988, downstream to river mile 20.2 (northern boundary of the south one-half of Section 20, Township 8 South, Range 28 East, Willamette Meridian);
The Middle Fork John Day River from its confluence with Crawford Creek (near river mile 71) downstream to the confluence of the Middle Fork John Day River with the North Fork John Day River; and
The South Fork John Day River from the Post-Paulina road crossing (near river mile 35) downstream to the northern boundary of the Murderer’s Creek Wildlife Area, as constituted on December 8, 1988 (near river mile 6).

Climate

Temperature, Precipitation and Snowfall

Situated on the east side of the Cascade Mountains, Gilliam County features a hybrid climate and has four distinct seasons and low annual precipitation. The Columbia Gorge serves as a natural channel for normal eastward migration for air masses from the Pacific. These air masses tend to modify extreme temperatures during both the summer and winter seasons. As a result, rarely do abnormally hot or abnormally cool spells persist for more than a few days at a time. Extremely cold conditions can be felt throughout Gilliam County during the winter months when a large easterly flow of air brings in cold continental air. The coldest months are generally January and December when the average winter temperature (°F) ranges from the low 20s in Condon to the low 30s in Arlington. July and August are generally the warmest months with the average temperatures (°F) ranging between the lows 80s in Condon and low 90s in Arlington. Extreme temperatures (°F) historically have reached 100 to 115 throughout the county.

Strong marine influences also reflect the occurrence of precipitation, most of which occurs from winter storms during the winter months from November through February. The precipitation is in the form of rain in the lower elevations and snow in the higher ridges and peaks. Heavy showers can be found in the summer months from thunderstorms. Arlington, which sits in the Columbia Gorge and therefore is susceptible to high winds, receives less than nine inches of annual precipitation, while Condon receives over 13 inches per year. The majority of summer winds come from the west, while winter winds can come from either the west or east and can be strong enough to cause damage.

During the winter season, Condon receives an average of 28.7 inches of snow while snowfall totals in Arlington averages 8.9 inches annually. Table C.1 highlights the monthly averages and extremes for temperatures in the City of Condon according to the Western Regional Climate Center. In addition, Table C.2 highlights the monthly averages and extremes for temperatures in the City of Arlington according to the Western Regional Climate Center.

---

16 Western Regional Climate Center
Table C.1: Monthly Averages and Extremes, Condon, Oregon, 1981-2018

<table>
<thead>
<tr>
<th>Month</th>
<th>Maximum Temperature (deg F)</th>
<th>Minimum Temperature (deg F)</th>
<th>Precipitation (inches)</th>
<th>Snowfall (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>37.7</td>
<td>22.6</td>
<td>1.54</td>
<td>8.7</td>
</tr>
<tr>
<td>February</td>
<td>42.6</td>
<td>25.9</td>
<td>1.14</td>
<td>5.7</td>
</tr>
<tr>
<td>March</td>
<td>50.3</td>
<td>29.6</td>
<td>1.13</td>
<td>2.9</td>
</tr>
<tr>
<td>April</td>
<td>57.6</td>
<td>33.2</td>
<td>1.16</td>
<td>1.1</td>
</tr>
<tr>
<td>May</td>
<td>65.8</td>
<td>39.0</td>
<td>1.35</td>
<td>0.1</td>
</tr>
<tr>
<td>June</td>
<td>73.7</td>
<td>44.5</td>
<td>1.11</td>
<td>0.0</td>
</tr>
<tr>
<td>July</td>
<td>83.6</td>
<td>49.9</td>
<td>0.42</td>
<td>0.0</td>
</tr>
<tr>
<td>August</td>
<td>82.6</td>
<td>49.4</td>
<td>0.45</td>
<td>0.0</td>
</tr>
<tr>
<td>September</td>
<td>73.2</td>
<td>43.4</td>
<td>0.68</td>
<td>0.1</td>
</tr>
<tr>
<td>October</td>
<td>61.3</td>
<td>35.9</td>
<td>1.08</td>
<td>0.3</td>
</tr>
<tr>
<td>November</td>
<td>46.9</td>
<td>29.4</td>
<td>1.68</td>
<td>3.2</td>
</tr>
<tr>
<td>December</td>
<td>39.3</td>
<td>24.2</td>
<td>1.55</td>
<td>6.7</td>
</tr>
<tr>
<td>Annual</td>
<td>59.5</td>
<td>35.6</td>
<td>13.29</td>
<td>28.7</td>
</tr>
</tbody>
</table>

Source: Western Regional Climate Center; https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?or1765

Table C.2: Monthly Averages and Extremes, Arlington, Oregon, 1893-2018

<table>
<thead>
<tr>
<th>Month</th>
<th>Maximum Temperature (deg F)</th>
<th>Minimum Temperature (deg F)</th>
<th>Precipitation (inches)</th>
<th>Snowfall (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>40.6</td>
<td>28.0</td>
<td>1.43</td>
<td>5.0</td>
</tr>
<tr>
<td>February</td>
<td>47.2</td>
<td>31.1</td>
<td>1.00</td>
<td>1.4</td>
</tr>
<tr>
<td>March</td>
<td>56.9</td>
<td>36.1</td>
<td>0.73</td>
<td>0.2</td>
</tr>
<tr>
<td>April</td>
<td>65.9</td>
<td>41.6</td>
<td>0.53</td>
<td>0.0</td>
</tr>
<tr>
<td>May</td>
<td>74.7</td>
<td>48.7</td>
<td>0.59</td>
<td>0.0</td>
</tr>
<tr>
<td>June</td>
<td>81.9</td>
<td>55.2</td>
<td>0.49</td>
<td>0.0</td>
</tr>
<tr>
<td>July</td>
<td>90.6</td>
<td>61.2</td>
<td>0.15</td>
<td>0.0</td>
</tr>
<tr>
<td>August</td>
<td>89.3</td>
<td>60.3</td>
<td>0.20</td>
<td>0.0</td>
</tr>
<tr>
<td>September</td>
<td>80.2</td>
<td>52.2</td>
<td>0.35</td>
<td>0.0</td>
</tr>
<tr>
<td>October</td>
<td>66.0</td>
<td>42.5</td>
<td>0.65</td>
<td>0.0</td>
</tr>
<tr>
<td>November</td>
<td>50.5</td>
<td>34.7</td>
<td>1.25</td>
<td>0.8</td>
</tr>
<tr>
<td>December</td>
<td>41.8</td>
<td>30.0</td>
<td>1.50</td>
<td>2.3</td>
</tr>
<tr>
<td>Annual</td>
<td>65.5</td>
<td>43.5</td>
<td>8.85</td>
<td>9.7</td>
</tr>
</tbody>
</table>

Source: Western Regional Climate Center, NCDC Monthly Tabular Data, 1893-2018

Land Cover

In Gilliam County, about 93-percent (851,577 acres) of the land is privately owned, five-percent (46,672 acres) is owned by Bureau of Land Management (BLM) and just over one-percent (11,391 acres) is owned by the Army Corps of Engineers.\(^17\) Table C.3 describes the land ownership throughout Gilliam County. Most of the land owned by BLM is adjacent to the John Day River and the tributaries, and a majority of the private land in the county is agricultural land, pasture and grasslands, or rangeland.

---

### Table C.3: Land Ownership in Gilliam County

<table>
<thead>
<tr>
<th>Land Owner</th>
<th>Number of Acres</th>
<th>Percent of County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>851,577</td>
<td>92.9%</td>
</tr>
<tr>
<td>Port of Arlington</td>
<td>51</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>Gilliam County</td>
<td>133</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>State of Oregon</td>
<td>1,886</td>
<td>0.2%</td>
</tr>
<tr>
<td>Bureau of Land Management</td>
<td>46,672</td>
<td>5.1%</td>
</tr>
<tr>
<td>Bonneville Power Administration</td>
<td>82</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>Army Corps of Engineers</td>
<td>11,391</td>
<td>1.2%</td>
</tr>
<tr>
<td>Confederated Tribes of Warm Springs</td>
<td>4,630</td>
<td>0.5%</td>
</tr>
<tr>
<td>Other</td>
<td>34</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>916,456</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>


### Synthesis

This natural environment capacity section is composed of elements known as natural capital. Natural capital is essential in sustaining all forms of life including human life and plays an often under represented role in community resiliency to natural hazards. With four distinct mild seasons, a diverse terrain and the county’s proximity to the Columbia Gorge, Gilliam County historically has dealt with widespread heavy rain and thunderstorm events followed by flash flooding, as well as seasonal brushfires. By identifying these natural capitals such as key river systems, as well as temperature and precipitation patterns, Gilliam County can recognize key hazard areas to better prepare, mitigate, and increase the resiliency of each community.
Socio Demographic Capacity

Population

According to Portland State University’s Population Research Center, the population of Gilliam County in 2017 totaled 1,995 and averaged 1.6 persons per square mile. While the population in the State of Oregon is growing at an average annual rate of 1.2%, Gilliam County population is barely increasing, with a growth rate of 0.2%. The rural county is currently the third least populated in the State of Oregon. The population in 2017 was slightly larger than neighboring Sherman County and Wheeler County, both of which experienced declines in population since 2000. Table C.4 describes the population change in Gilliam County and the adjacent counties.

Table C.4: Population Changes, 2000-2017

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td>1,915</td>
<td>1,995</td>
<td>80</td>
<td>4.2%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Morrow County</td>
<td>10,995</td>
<td>11,890</td>
<td>895</td>
<td>8.1%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Sherman County</td>
<td>1,934</td>
<td>1,800</td>
<td>-134</td>
<td>-6.9%</td>
<td>-0.4%</td>
</tr>
<tr>
<td>Wasco County</td>
<td>23,791</td>
<td>27,100</td>
<td>3,309</td>
<td>13.9%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Wheeler County</td>
<td>1,547</td>
<td>1,480</td>
<td>-67</td>
<td>-4.3%</td>
<td>-0.3%</td>
</tr>
<tr>
<td>Oregon</td>
<td>3,421,399</td>
<td>4,141,100</td>
<td>719,701</td>
<td>21.0%</td>
<td>1.2%</td>
</tr>
</tbody>
</table>


Arlington, Condon, and Lonerock are three incorporated cities in Gilliam County, all of which are classified as “rural.” To be considered an urban area, the territory identified according to criteria must encompass at least 2,500 people, at least 1,500 of which reside outside institutional group quarters. The Census Bureau identifies two types of urban areas: Urbanized Areas (UAs) of 50,000 or more people and Urban Clusters (UCs) of at least 2,500 and less than 50,000 people. “Rural” encompasses all population, housing, and territory not included within an urban area. All three cities each have total populations of less than 2,500 people and are considered “rural.” In fact, the entire county has a population lower than 2,500.

Roughly 680 people live in unincorporated areas of the County, about equal to the populations of Arlington and Condon. These unincorporated communities include Blalock, Clem, Mayville, Mikkalo, Olex, Rock Creek, and Thirtymile, which are dispersed throughout the County. As seen in Table C.5, unincorporated areas are experiencing more growth than incorporated areas of the County.

---

18 Population Estimates and Reports, Portland State University Population Research Center, July 2017
Table C.5 below describes the population change since 2000 within each city and the unincorporated County areas. Arlington, which is located along the Columbia River and Interstate Highway 84 in the northern part of the County, is the only city of the three that experienced significant increase. The population in Condon, the county seat, remained fairly consistent, and Lonerock decreased by nearly 5 percent since 2010, and more than 10 percent since 2000. Overall, 66% of the County’s population resides in the three incorporated cities.

Table C.5: Population Changes, 2000-2017

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td>1,871</td>
<td>1,995</td>
<td>124</td>
<td>6.6%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Arlington</td>
<td>586</td>
<td>610</td>
<td>24</td>
<td>4.1%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Condon</td>
<td>682</td>
<td>685</td>
<td>3</td>
<td>0.4%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Lonerock</td>
<td>21</td>
<td>20</td>
<td>-1</td>
<td>-4.8%</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>582</td>
<td>680</td>
<td>98</td>
<td>16.8%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Gilliam County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Population Estimates, Portland State University Population Research Center, July 2017

Table C.6 displays predicted growth trends over the next several decades in Gilliam County. Most of the expected population growth for the County will occur in Arlington, which is already the most densely populated UGB area within Gilliam County. For more information on expected trends, including changes in age, race, and household composition, see the Coordinated Population Forecast for Gilliam County report from the Portland State University Population Research Center.

Table C.6 Gilliam County Population Growth Forecast

<table>
<thead>
<tr>
<th>Area/Year</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td>2,046</td>
<td>2,129</td>
<td>2,206</td>
<td>2,287</td>
</tr>
<tr>
<td>Arlington UGB</td>
<td>729</td>
<td>798</td>
<td>866</td>
<td>939</td>
</tr>
<tr>
<td>Condon UGB</td>
<td>700</td>
<td>710</td>
<td>717</td>
<td>724</td>
</tr>
<tr>
<td>Lonerock UGB</td>
<td>19</td>
<td>17</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>Outside UGB Area</td>
<td>598</td>
<td>604</td>
<td>608</td>
<td>611</td>
</tr>
</tbody>
</table>


Population size itself is not an indicator of vulnerability. More important is the location, composition and capacity of the population within the community. Research by social-scientists demonstrates that human capital indices such as age, race, education, income, health and safety can affect the integrity of a community. Therefore, these human capitals can impact community resilience to and their ability to recover from natural disasters.

Age

The age profile of an area has a direct impact both on what actions are prioritized for mitigation and how response to hazard incidents is carried out. Figure C.4 illustrates the
current and projected percentage of population by age groups within the County. Currently, roughly a fourth (23.7%) of the population in the County is over the age of 65, which is significantly higher compared to only 15.9% of the population in the entire state. In addition, Portland State University’s Population Research Center projects that the percent of the County’s population under the age of 14 and over the age of 65 will increase over the next decade. The elderly population is anticipated to reach 41.4% of the County population by 2035. These numbers suggest that the County may want to consider focusing on hazard mitigation and preparedness actions that are feasible for elderly populations and provide support to this segment of the population to implement these actions.

**Figure C.4: Gilliam County Percent of Population by Age, 2016, 2035, 2066**

Age ranges also vary among the cities within the County. Figure C.5 illustrates the percentage of population by various age groups in each city within the County. The City of Arlington has a much higher percentage of residents under the age of 20 and a lower percentage of residents over the age of 60 compared to the Cities of Condon and Lonerock. In fact, 23-percent of the population in Arlington is under the age of 20, whereas more than 40-percent of the residents in both Condon and Lonerock are over the age of 60. School age children rarely make decisions about emergency management. Therefore, a larger youth population in an area will increase the importance of outreach to schools and parents on effective ways to teach children about fire safety, earthquake response, and evacuation plans. Children are also more vulnerable to the heat and cold, have few transportation options and require assistance to access medical facilities.

Furthermore, older populations may also have special needs prior to, during and after a natural disaster. The elderly population may require special consideration due to increased sensitivities to heat and cold, possible reliance upon transportation for medications, and comparative difficulty in making home modifications that reduce risk to hazards. Older populations may also require assistance in evacuation due to limited mobility or health issues and can lack the social and economic resources needed for post-disaster recovery.

---

20 State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile.
Other high risk populations include households where persons age 65 or older who live alone as well as single parent households with children under 18. Table C.6 describes the high risk populations in each jurisdiction within the County. In fact, over a quarter of the households in the City of Condon and a third of the households in the City of Lonerock are occupied by individuals 65 or older who live alone. Additionally, 9% of the households in the County are occupied by single parents with children under the age of 18 with the highest percent (22%) located in the City of Arlington. These populations will likely require additional support during a disaster and could result in strains on the system if strategies to mitigate these population vulnerabilities are not implemented.

### Table C.6: High Risk Households in Gilliam County

<table>
<thead>
<tr>
<th>Household Type</th>
<th>Gilliam County</th>
<th>Arlington</th>
<th>Condon</th>
<th>Lonerock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households with individuals under 18</td>
<td>206</td>
<td>72</td>
<td>38</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>[26%]</td>
<td>[35%]</td>
<td>[13%]</td>
<td>[0%]</td>
</tr>
<tr>
<td>Single householder with own children under 18</td>
<td>73</td>
<td>45</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>[9%]</td>
<td>[22%]</td>
<td>[3%]</td>
<td>[0%]</td>
</tr>
<tr>
<td>Householder 65 years and over living alone</td>
<td>110</td>
<td>16</td>
<td>81</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>[14%]</td>
<td>[8%]</td>
<td>[28%]</td>
<td>[30%]</td>
</tr>
</tbody>
</table>

Source: Social Explorer Tables: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Tables 18 and 167; U.S. Census Bureau

### Race

The impact following a disaster in terms of losses and the ability of the community to recover may also vary among minority population groups. Studies have shown that racial
and ethnic minorities can be more vulnerable to natural disaster events. This is not reflective of individual characteristics; instead, historic patterns of inequality along racial or ethnic divides have often resulted in minority communities that are more likely to have inferior building stock, degraded infrastructure, or less access to public services. Table C.7 describes the population in Gilliam County by race and ethnicity.

Table C.7: Race and Ethnicity in Gilliam County

<table>
<thead>
<tr>
<th>Race</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>1,913</td>
<td></td>
</tr>
<tr>
<td>One Race</td>
<td>1,913</td>
<td>100.0%</td>
</tr>
<tr>
<td>White</td>
<td>1,818</td>
<td>95.0%</td>
</tr>
<tr>
<td>Black or African American</td>
<td>6</td>
<td>0.3%</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>54</td>
<td>3%</td>
</tr>
<tr>
<td>Asian</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Native Hawaiian and other Pacific Islander</td>
<td>10</td>
<td>0.5%</td>
</tr>
<tr>
<td>Other race</td>
<td>25</td>
<td>1%</td>
</tr>
<tr>
<td>Two or more races</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hispanic or Latino Origin</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>1,913</td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino (of any race)</td>
<td>186</td>
<td>10%</td>
</tr>
<tr>
<td>Not Hispanic or Latino</td>
<td>1727</td>
<td>90%</td>
</tr>
</tbody>
</table>

Source: Source: Social Explorer Tables: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Tables 13 and 14; U.S. Census Bureau

The U.S. Census reports that 5% of the Gilliam County population identifies with a non-white race. Just less than 10% of the population identifies as Hispanic or Latino. It is important to identify specific ways to support all segments of the community through hazard preparedness and response. Connecting to historically disenfranchised populations through trusted sources or providing preparedness handouts and presentations in the languages spoken by the population can increase community resilience.

### Education

Educational attainment of community residents is also an influencing factor in socio demographic capacity. Table C.8 describes the education attainment throughout the county. Compared to the state, Gilliam County has roughly the same percentage of high school graduates, but almost half the percentage of college graduates with a Bachelor’s degree or higher (14% less).

Education can influence the ability to access resources, while lack of resources may constrain the ability to understand warning information (Cutter et al., 2003). Therefore, levels of education within the region should be considered when designing hazard outreach materials to local communities.²²

---

²² State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile.
Table C.8: Education Attainment

<table>
<thead>
<tr>
<th>Gilliam County</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population 25 and over</td>
<td>1,337</td>
<td></td>
</tr>
<tr>
<td>High school graduate or higher</td>
<td>1,202</td>
<td>90%</td>
</tr>
<tr>
<td>Bachelor’s degree or higher</td>
<td>228</td>
<td>17%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oregon</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population 25 and over</td>
<td>2,755,786</td>
<td></td>
</tr>
<tr>
<td>High school graduate or higher</td>
<td>2,479,288</td>
<td>90%</td>
</tr>
<tr>
<td>Bachelor’s degree or higher</td>
<td>866,373</td>
<td>31%</td>
</tr>
</tbody>
</table>

Source: Social Explorer Tables: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer T25; U.S. Census Bureau

Educational attainment often reflects higher income and therefore higher self-reliance. Widespread educational attainment is also beneficial for the regional economy and employment sectors as there are potential employees for professional, service and manual labor workforces. An oversaturation of either highly educated residents or low educational attainment can both have negative effects on the resiliency of the community.

Income

Household income and poverty status levels are indicators of socio demographic capacity and the stability of the local economy. Household income can be used to compare economic areas as a whole, but does not reflect how the income is divided among the residents in the area. Table C.9 shows the median household incomes in Gilliam County and the surrounding communities. In 2016 the median household income across Gilliam County equaled $45,728; this is slightly lower in comparison to the state’s level. County median incomes remained essentially the same from 2010 to 2016.

Table C.9: Median Household Income, 2016

<table>
<thead>
<tr>
<th>Median Household Incomes in Region 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
</tr>
<tr>
<td>Gilliam</td>
</tr>
<tr>
<td>Hood River</td>
</tr>
<tr>
<td>Morrow</td>
</tr>
<tr>
<td>Sherman</td>
</tr>
<tr>
<td>Umatilla</td>
</tr>
<tr>
<td>Wasco</td>
</tr>
<tr>
<td>$57,379</td>
</tr>
<tr>
<td>$45,728</td>
</tr>
<tr>
<td>$53,941</td>
</tr>
<tr>
<td>$53,588</td>
</tr>
<tr>
<td>$57,216</td>
</tr>
<tr>
<td>$49,667</td>
</tr>
<tr>
<td>$50,562</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, Small Area Estimates Branch, 2016

Income is a resiliency indicator as higher incomes are often associated with increased self-reliance and ability to prepare oneself if an emergency does occur. Low-income populations

23 State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile.
may require additional assistance following a disaster because they may not have the savings to withstand economic setbacks, and if work is interrupted, housing, food, and necessities become a greater burden. As seen in Table C.6, Gilliam County has the lowest median household income of the surrounding region. Additionally, low-income households are more reliant upon public transportation, public food assistance, public housing, and other public programs, all which can be impacted in the event of a natural disaster. Table C.10 identifies both the number and the percentage of individuals living below the poverty level. In 2018, the poverty guideline for a family of four equaled income levels at or below $25,100.\textsuperscript{24} Poverty limits the ability of households to engage in household level mitigation activities. In addition, the higher the poverty rate, the increased assistance the community will likely need in the event of a disaster in the form of sheltering, medical assistance and transportation. Notably, the poverty estimates as a percentage are relatively lower in Gilliam County compared to state and national averages.

### Table C.10: Estimated Number of Residents Living in Poverty

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td>211</td>
<td>213</td>
<td>64</td>
<td>19</td>
</tr>
<tr>
<td>Gilliam County</td>
<td>11%</td>
<td>11%</td>
<td>18%</td>
<td>4%</td>
</tr>
<tr>
<td>Oregon</td>
<td>16%</td>
<td>16%</td>
<td>22%</td>
<td>20%</td>
</tr>
<tr>
<td>United States</td>
<td>15%</td>
<td>13%</td>
<td>22%</td>
<td>23%</td>
</tr>
</tbody>
</table>


Additionally, the number of school children eligible to receive free or reduced lunch has increased by 26.1-percent from 2103 to 2017. In fact, more than half of the students in Gilliam County qualify for the lunch program. For comparison, Table C.11 describes the status of Oregon’s (all counties) children in terms of the percent of children eligible to receive free or reduced lunch.

### Table C.11: Free or Reduced Lunch Eligibility

<table>
<thead>
<tr>
<th>Percent of children eligible to receive free/reduced lunch during the school year</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>32.6%</td>
<td>52.6%</td>
<td>62.0%</td>
<td>58.9%</td>
<td>58.7%</td>
</tr>
</tbody>
</table>

Source: Children First for Oregon, Status of Oregon’s Children, 2013-2017

The County has also seen an increase since 2005 in the number of individuals enrolling in assistance programs. Figure C.7 illustrates the growing dependence in recent years on public assistance in Gilliam County. In 2017, on average 270 people per month were

receiving Food Stamps. This figure has dramatically increased from 2008 when there were only 118 enrolled in the program.\textsuperscript{25} Furthermore, the number of people receiving cash assistance as a part of Temporary Assistance to Needy Families (TANF) has also dramatically increased from three in early 2008 to 54 in January of 2018.\textsuperscript{26} The TANF program provides cash assistance to low-income families with children while they strive to become self-sufficient with the goal of reducing the number of families living in poverty, through employment and community resources.\textsuperscript{27} The current maximum monthly benefit for a family of three is $506.

**Health Insured**

Individual and community health play an integral role in community resiliency. It is recognized that those who lack health insurance have higher vulnerability to hazards and will likely require additional community support and resources. Table C.11 identifies health insurance coverage across Gilliam County. The Census Bureau estimates in 2016 that the number of uninsured residents in Gilliam County equaled 283, roughly 14.9%, which is about 4.5% higher than the state percentage.\textsuperscript{28}

**Synthesis**

Socio demographic capacity is a significant indicator of community hazard resiliency. The characteristics and qualities of the community population such as age, race, education, income, health and safety are significant factors that can influence the community’s ability to cope, adapt to and recover from natural disasters. Gilliam County is characterized by a larger elderly population, a small school age population, and a predominately white population. Almost a quarter of the population has a disability, including half the senior population, which results in a significant group of people with high vulnerability.\textsuperscript{29} The current status of socio demographic capacity indicators can have long term impacts on the economy and stability of the community ultimately affecting future resiliency of the community.

\textsuperscript{25} Oregon Department of Human Services; SNAP County Tables January-December 2017
\textsuperscript{26} State of Oregon Department of Human Services, State of Oregon Public Assistance Data by County, January 2018
\textsuperscript{28} Social Explorer Tables: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer Table 145; U.S. Census Bureau
\textsuperscript{29} State of Oregon Natural Hazards Mitigation Plan, 2015. Region 5 Mid Columbia Gorge Risk Assessment
Regional Economic Capacity

Economic resilience to natural disasters is far more complex than merely restoring employment or income to the local community. Building a resilient economy requires an understanding of how the component parts of employment sectors, workforce, resources, and infrastructure are interconnected in the existing economic picture. Once any inherent strengths or systematic vulnerabilities become apparent, both the public and private sectors can take action to increase the resilience of the local economy.

Regional Affordability

The evaluation of regional affordability supplements the identification of socio-demographic capacity indicators, i.e. economic diversity, and is a critical analysis tool to understanding the economic status of a community. This information can capture the likelihood of individuals’ ability to prepare for hazards, through retrofitting homes or purchasing insurance. Regional affordability is a mechanism for generalizing the abilities of community residents to get back on their feet without Federal, State or local assistance.

Economic Diversity

Economic diversity is a general indicator of an area’s fitness for weathering difficult financial times. Business activity in Gilliam County and other eastern Oregon counties is fairly homogeneous and consists mostly of basic industries.

Economic diversity is a general indicator of an area’s fitness for weathering difficult financial times. One method for measuring economic diversity is through use of the Herfindahl Index, a formula that compares the composition of county and regional economies with those of states or the nation as a whole. Using the Herfindahl Index, a diversity ranking of 1 indicates the county with the most diverse economic activity compared to the state as a whole, while a ranking of 36 corresponds with the least diverse county economy. The table below describes the Herfindahl Index Scores for counties in the region; Gilliam County and neighboring counties are among the least economically diverse in the state. Employment and industry has remained fairly stable over the past decade.  

Table C.12: Regional Herfindahl Indexes

<table>
<thead>
<tr>
<th>County</th>
<th>Employment</th>
<th>Number of Industries</th>
<th>State Rank</th>
<th>Employment</th>
<th>Number of Industries</th>
<th>State Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam</td>
<td>522</td>
<td>47</td>
<td>34</td>
<td>539</td>
<td>41</td>
<td>34</td>
</tr>
<tr>
<td>Clackamas</td>
<td>127,242</td>
<td>267</td>
<td>1</td>
<td>140,827</td>
<td>274</td>
<td>1</td>
</tr>
<tr>
<td>Hood River</td>
<td>11,663</td>
<td>169</td>
<td>33</td>
<td>12,016</td>
<td>171</td>
<td>31</td>
</tr>
<tr>
<td>Morrow</td>
<td>3,981</td>
<td>91</td>
<td>36</td>
<td>4,783</td>
<td>93</td>
<td>36</td>
</tr>
<tr>
<td>Sherman</td>
<td>434</td>
<td>31</td>
<td>35</td>
<td>526</td>
<td>34</td>
<td>35</td>
</tr>
<tr>
<td>Umatilla</td>
<td>22,290</td>
<td>184</td>
<td>10</td>
<td>23,275</td>
<td>189</td>
<td>14</td>
</tr>
<tr>
<td>Wasco</td>
<td>9,506</td>
<td>160</td>
<td>32</td>
<td>9,783</td>
<td>161</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: Oregon Employment Department

30 Oregon Employment Department, Nick Beleiciks, personal communication, 5/28/2018
While illustrative, economic diversity is not a guarantor of economic vitality or resilience. The economic distress measure is based on indicators of decreasing new jobs, average wages and income, and is associated with an increase of unemployment. According to Business Oregon, Gilliam County was categorized as “distressed” in 2017.\textsuperscript{31}

**Employment and Wages**

According to the Oregon Employment Department, Gilliam County experienced a decline in unemployment from 2010 to 2018 that reflected national trends. In fact, unemployment dropped as low as 3.2-percent in April of 2018.\textsuperscript{32} Figure C.8 compares the unemployment rate in Gilliam County to that of the state and nation. In addition, Table C.13 describes the annual unemployment changes throughout the region since 2007. Gilliam County and the surrounding region has recovered from the 2008 economic decline more slowly than the state as a whole.

**Figure C.8: Unemployment Rate (Seasonally Adjusted)**

![Unemployment Rate Graph](image)

Source: Oregon Employment Department, Labor Force Data, Seasonally Adjusted Data 2006-2018, qualityinfo.org

**Table C.13: Regional Annual Unemployment (Annual Average)**

<table>
<thead>
<tr>
<th>County</th>
<th>2009</th>
<th>2011</th>
<th>2013</th>
<th>2015</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td>6.9%</td>
<td>9.7%</td>
<td>9.5%</td>
<td>6.4%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Morrow County</td>
<td>9.4%</td>
<td>8.2%</td>
<td>7.7%</td>
<td>5.7%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Sherman County</td>
<td>9.1%</td>
<td>11.1%</td>
<td>9.3%</td>
<td>6.1%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Wasco County</td>
<td>9.1%</td>
<td>8.8%</td>
<td>7.6%</td>
<td>5.6%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Wheeler County</td>
<td>9.1%</td>
<td>8.5%</td>
<td>6.3%</td>
<td>5.2%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Oregon</td>
<td>11.3%</td>
<td>9.5%</td>
<td>7.9%</td>
<td>5.6%</td>
<td>4.1%</td>
</tr>
</tbody>
</table>

Source: Oregon Employment Department, Labor Force Data, Seasonally Adjusted Data 2007-2018

\textsuperscript{31} Distressed Areas in Oregon, 2018; Business Oregon; http://www.oregon4biz.com/Publications/Distressed-List/
\textsuperscript{32} Oregon Employment Department, Kale Donnelly, personal communication, 5/21/2018
As opposed to measurements of the labor force and total employment, covered employment provides a quarterly count of all employees covered by Unemployment Insurance. Table C.14 displays the covered employment and payroll figures for Gilliam County in 2016.

Table C.14: County Covered Employment (2017)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Payroll Employment</td>
<td>119</td>
<td>811</td>
<td>100%</td>
<td>$39,395</td>
<td>-5%</td>
<td>11%</td>
</tr>
<tr>
<td>Total private coverage</td>
<td>94</td>
<td>564</td>
<td>70%</td>
<td>$42,491</td>
<td>-10%</td>
<td>12%</td>
</tr>
<tr>
<td>Natural resources and mining</td>
<td>14</td>
<td>48</td>
<td>6%</td>
<td>$38,112</td>
<td>41%</td>
<td>11%</td>
</tr>
<tr>
<td>Agriculture, forestry, fishing &amp; hunting</td>
<td>14</td>
<td>48</td>
<td>6%</td>
<td>$38,112</td>
<td>41%</td>
<td>11%</td>
</tr>
<tr>
<td>Construction</td>
<td>5</td>
<td>22</td>
<td>3%</td>
<td>$61,142</td>
<td>-82%</td>
<td>16%</td>
</tr>
<tr>
<td>Trade, transportation and utilities</td>
<td>22</td>
<td>136</td>
<td>17%</td>
<td>$38,112</td>
<td>-11%</td>
<td>6%</td>
</tr>
<tr>
<td>Financial activities</td>
<td>6</td>
<td>16</td>
<td>2%</td>
<td>$32,862</td>
<td>7%</td>
<td>4%</td>
</tr>
<tr>
<td>Professional and business services</td>
<td>10</td>
<td>187</td>
<td>23%</td>
<td>$62,001</td>
<td>38%</td>
<td>13%</td>
</tr>
<tr>
<td>Administrative and waste services</td>
<td>4</td>
<td>171</td>
<td>21%</td>
<td>$64,558</td>
<td>58%</td>
<td></td>
</tr>
<tr>
<td>Waste management and remediation service</td>
<td>4</td>
<td>171</td>
<td>21%</td>
<td>$64,558</td>
<td>58%</td>
<td>9%</td>
</tr>
<tr>
<td>Education and health services</td>
<td>9</td>
<td>50</td>
<td>6%</td>
<td>$21,702</td>
<td>-24%</td>
<td>15%</td>
</tr>
<tr>
<td>Leisure and hospitality</td>
<td>10</td>
<td>48</td>
<td>6%</td>
<td>$13,578</td>
<td>-6%</td>
<td>17%</td>
</tr>
<tr>
<td>Other services</td>
<td>14</td>
<td>28</td>
<td>3%</td>
<td>$17,150</td>
<td>-18%</td>
<td>9%</td>
</tr>
<tr>
<td>Total all government</td>
<td>25</td>
<td>248</td>
<td>31%</td>
<td>$32,195</td>
<td>7%</td>
<td>5%</td>
</tr>
<tr>
<td>Total federal government</td>
<td>5</td>
<td>13</td>
<td>2%</td>
<td>$43,000</td>
<td>30%</td>
<td>-6%</td>
</tr>
<tr>
<td>Total state government</td>
<td>3</td>
<td>14</td>
<td>2%</td>
<td>$28,037</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Total local government</td>
<td>17</td>
<td>222</td>
<td>27%</td>
<td>$31,679</td>
<td>7%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Source: Oregon Employment Department, Gilliam County 2016 Payroll and Employment

In 2016, there were 71 employment establishments operating in Gilliam County, and 60 (84.5%) percent of those establishments had fewer than 20 employees. 59% had between one and four employees. The prevalence of small businesses in the County is a partial indication of sensitivity to natural hazards, because small businesses are typically more susceptible to financial uncertainty. If a business is financially unstable before a natural hazard event, it is likely to be more adversely affected. This can have long-term economic consequences, including job loss and decreased economic productivity. Gilliam County 2016 Payroll and Employment.

33 Gilliam County 2016 Payroll and Employment
34 County Business Patterns By Employment Size Class; U.S. Census Bureau Table CB1600A13; 2016
disaster occurs, financial losses (resulting from both damage caused and the recovery process) may have a bigger impact than they would for larger and more financially stable businesses.  

Industry

Major Regional Industry

Key industries are those that represent major employers and are significant revenue generators. Different industries face distinct vulnerabilities to natural hazards, as illustrated by the industry specific discussions below. Identifying key industries in the region enables communities to target mitigation activities towards those industries’ specific sensitivities. It is important to recognize that the impact that a natural hazard event has on one industry can reverberate throughout the regional economy.

This is of specific concern when the businesses belong to the basic sector industry. Basic sector industries are those that are dependent on sales outside of the local community. The farm and ranch, information, and wholesale trade industries are all examples of basic industries. Non-basic sector industries are those that are dependent on local sales for their business, such as retail trade, construction, and health and social assistance.

Employment by Industry

Economic resilience to natural disasters is particularly important for the major employment industries in the region. If these industries are negatively impacted by a natural hazard, such that employment is affected, the impact will be felt throughout the regional economy. Thus, understanding and addressing the sensitivities of these industries is a strategic way to increase the resiliency of the entire regional economy. The economy is based mainly on agriculture, with an average farm size of about 4,200 acres. Wheat, barley, and beef cattle are the principal crops. The largest individual employers in the County are two subsidiaries of Waste Management Inc., Chemical Waste Management of the Northwest and Oregon Waste Systems, Inc., which are regional state-of-the-art waste disposal landfills.

The Union Pacific railroad line and Interstate Highway 84 that both run across the northern part of the County provide good opportunities for the transportation of manufactured and agricultural goods. In addition, the region’s proximity to the Columbia River and the high desert terrain provide year-round sporting and tourism activities.

Agriculture

According to 2012 Census of Agriculture by the U.S. Department of Agriculture, 170 farms were located in Gilliam County totaling 723,405 acres of land. In 2012 Gilliam County ranked

35 State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile
36 State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile
37 State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile
38 State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile
fourth in production of wheat in the State of Oregon, after Umatilla, Morrow, and Sherman Counties. Gilliam produced 2,880,000 bushels of wheat in 2016 and planted 83,500 acres\textsuperscript{40}

**Covered Employment**

Table C.15 identifies employment in Gilliam County by industry. As of 2017, the three industries with the most employees include agriculture (14.4%), transportation/warehousing/utilities (14.9%) and professional and business services (13.1%).\textsuperscript{41} Notably, the professional and business services industry includes the two subsidiaries of Waste Management Inc. located in the county, Chemical Waste Management of the Northwest and Oregon Waste Systems, Inc., which are regional state-of-the-art waste disposal landfills.\textsuperscript{42}

The Oregon Employment Department found little change in Gilliam County employment between 2007 and 2017; in 2007 total nonfarm employment was 700 jobs, and in 2017 the county counted 790 jobs. However, the number of jobs rose to over 1,500 in 2008 and then dropped between 2008 and 2013 before leveling off. Notably, government still makes up almost a third employment in the County, primarily at the local level. Table C.15 identifies employment changes from 2001 to 2010 in Gilliam County.

**Table C.15: Covered Employment Changes, 2001-2010**

<table>
<thead>
<tr>
<th>Industry</th>
<th>Employment 2010</th>
<th>Employment 2017</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Private Coverage</td>
<td>670</td>
<td>564</td>
<td>-16%</td>
</tr>
<tr>
<td>Natural Resources and Mining</td>
<td>23</td>
<td>48</td>
<td>109%</td>
</tr>
<tr>
<td>Construction</td>
<td>166</td>
<td>22</td>
<td>-87%</td>
</tr>
<tr>
<td>Trade, transportation, utilities</td>
<td>161</td>
<td>136</td>
<td>-16%</td>
</tr>
<tr>
<td>Professional and business services</td>
<td>142</td>
<td>187</td>
<td>32%</td>
</tr>
<tr>
<td>Administrative and water services</td>
<td>123</td>
<td>171</td>
<td>39%</td>
</tr>
<tr>
<td>Education and health services</td>
<td>73</td>
<td>50</td>
<td>-32%</td>
</tr>
<tr>
<td>Leisure and hospitality</td>
<td>38</td>
<td>48</td>
<td>26%</td>
</tr>
<tr>
<td>Other services</td>
<td>32</td>
<td>28</td>
<td>-13%</td>
</tr>
<tr>
<td>Total Government</td>
<td>226</td>
<td>248</td>
<td>10%</td>
</tr>
<tr>
<td>Total All Ownerships</td>
<td>811</td>
<td>896</td>
<td>10%</td>
</tr>
</tbody>
</table>


Expected change in the region can be seen in Table C.X, which includes employment in Gilliam, Hood River, Sherman, Wasco, and Wheeler Counties. Employment is expected to moderately increase across most industries.

\textsuperscript{40} Oregon Agripedia 2016, USDA, National Agricultural Statistics Service; https://www.oregon.gov/ODA/shared/Documents/Publications/Administration/Agripedia.pdf

\textsuperscript{41} Social Explorer Tables: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer T49; U.S. Census Bureau

\textsuperscript{42} Oregon Blue Book. “Gilliam County”. History and general information.
Labor and Commute Shed

Most natural hazards can happen at any time during the day or night. It may be possible to give advance warning to residents and first responders who can take immediate preparedness and protection measures, but the variability of hazards is one part of why they can have such varied impact. A snow storm during the work day will have different impacts than one that comes during the night. During the day, a hazard has the potential to segregate the population by age or type of employment (e.g., school children at school, office workers in downtown areas). This may complicate some aspects of initial response such as transportation or the identification of wounded or missing. Conversely, a hazard at midnight may occur when most people are asleep and unable to receive an advance warning through typical communication channels. The following labor shed and commute shed analysis is intended to document where County residents work and where people who work in Gilliam County reside.

As shown in Table C.16 below, overall the workforce is somewhat mobile between Morrow, Multnomah and Umatilla Counties. While 48.6% of Gilliam employees live in the County, there are also a significant number of workers who commute to locations outside the county to work. Overall, 55.3% of workers who live in Gilliam County work in other counties. 51.4% of Gilliam County employees live outside of the County. It is possible that these workers do not physically commute every day or on a regular basis and instead telecommute or otherwise have remote locations.

Table C.17 below tells the statistical story about where workers live who are employed in Gilliam County. The location outside of Gilliam County where the highest numbers of workers commute from is Umatilla County (7.5%), followed closely by Morrow County (6.6%). However, a substantial number of workers also commute from across the border in Washington (6.9%).

In summary, the labor shed analysis and commute shed analysis reveal that there is a great deal of commuting and worker exchange between communities in the region. While 55.3% of Gilliam County residents maintain employment outside of the County, 51.4% of Gilliam County workers reside elsewhere.
### Table C.16*: Work Destination Report, 2015: Where Workers are Employed Who Live in Gilliam County

<table>
<thead>
<tr>
<th>Location</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td>351</td>
<td>44.7%</td>
</tr>
<tr>
<td>Condon</td>
<td>123</td>
<td>15.6%</td>
</tr>
<tr>
<td>Lonerock</td>
<td>49</td>
<td>6.2%</td>
</tr>
<tr>
<td>Arlington</td>
<td>30</td>
<td>3.8%</td>
</tr>
<tr>
<td>Morrow County</td>
<td>58</td>
<td>7.4%</td>
</tr>
<tr>
<td>Boardman</td>
<td>9</td>
<td>1.3%</td>
</tr>
<tr>
<td>Heppner</td>
<td>20</td>
<td>2.5%</td>
</tr>
<tr>
<td>Multnomah County</td>
<td>46</td>
<td>5.9%</td>
</tr>
<tr>
<td>Portland</td>
<td>37</td>
<td>4.7%</td>
</tr>
<tr>
<td>Umatilla County</td>
<td>46</td>
<td>5.9%</td>
</tr>
<tr>
<td>Hermiston</td>
<td>27</td>
<td>3.4%</td>
</tr>
<tr>
<td>Deschutes County</td>
<td>28</td>
<td>3.6%</td>
</tr>
<tr>
<td>Bend</td>
<td>18</td>
<td>2.3%</td>
</tr>
<tr>
<td>Union County</td>
<td>22</td>
<td>2.8%</td>
</tr>
<tr>
<td>Marion County</td>
<td>21</td>
<td>2.7%</td>
</tr>
<tr>
<td>Wasco County</td>
<td>21</td>
<td>2.7%</td>
</tr>
<tr>
<td>Benton County, WA</td>
<td>19</td>
<td>2.4%</td>
</tr>
<tr>
<td>Washington County</td>
<td>17</td>
<td>2.2%</td>
</tr>
<tr>
<td>All Other Locations</td>
<td>157</td>
<td>20%</td>
</tr>
<tr>
<td>Total Primary Jobs</td>
<td>786</td>
<td>100.0%</td>
</tr>
</tbody>
</table>


### Table C.17*: Home Destination Report, 2015: Where Workers Live Who are Employed in Gilliam County

<table>
<thead>
<tr>
<th>Location</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilliam County</td>
<td>351</td>
<td>48.6%</td>
</tr>
<tr>
<td>Arlington</td>
<td>101</td>
<td>14.0%</td>
</tr>
<tr>
<td>Condon</td>
<td>123</td>
<td>17.0%</td>
</tr>
<tr>
<td>Umatilla County</td>
<td>54</td>
<td>7.5%</td>
</tr>
<tr>
<td>Pendleton</td>
<td>15</td>
<td>2.1%</td>
</tr>
<tr>
<td>Morrow County</td>
<td>48</td>
<td>6.6%</td>
</tr>
<tr>
<td>Clackamas County</td>
<td>28</td>
<td>3.9%</td>
</tr>
<tr>
<td>Benton County, WA</td>
<td>28</td>
<td>3.9%</td>
</tr>
<tr>
<td>Wasco County</td>
<td>26</td>
<td>3.6%</td>
</tr>
<tr>
<td>The Dalles</td>
<td>14</td>
<td>1.9%</td>
</tr>
<tr>
<td>Wheeler County</td>
<td>20</td>
<td>2.8%</td>
</tr>
<tr>
<td>Klickitat County, WA</td>
<td>18</td>
<td>2.5%</td>
</tr>
<tr>
<td>Washington County</td>
<td>15</td>
<td>2.1%</td>
</tr>
<tr>
<td>Marion County</td>
<td>13</td>
<td>1.8%</td>
</tr>
<tr>
<td>All Other Locations</td>
<td>121</td>
<td>16.8%</td>
</tr>
<tr>
<td>Total Primary Jobs</td>
<td>677</td>
<td>100.0%</td>
</tr>
</tbody>
</table>


### Synthesis

Regional economic capacity refers to the present financial resources and revenue generated in the community to achieve a higher quality of life. Forms of economic capital include income equality, housing affordability, economic diversification, employment, and industry. The current and anticipated financial conditions of a community are strong determinants of community resilience, as a strong and diverse economic base increases the ability of individuals, families and the community to absorb disaster impacts for a quick recovery.

Considering its comparatively high poverty rate, and the moderate diversity of its economy (though dependent on several basic industries for revenue generation), Gilliam County may experience a difficult time in recovering from a natural disaster than other communities.
with a more diverse economic base and higher incomes. In addition, it is important to consider what might happen to the economy if the largest revenue generators and employers (construction, trade, transportation and utilities, as well as professional and business services), were heavily impacted by a disaster. To an extent, and to the benefit of Gilliam County, these particular industries are a mix of basic and non-basic industries, dependent on both external markets and local residents.

It is imperative, however, that Gilliam County continues to recognize that economic diversification is a long-term issue. More immediate strategies and actions to reduce vulnerability from an economic perspective should focus on risk management for the County’s dominant industries (e.g. business continuity planning) as well as the dependence on main transportation arteries.

\footnote{State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile.}
Built Capacity

Housing Building Stock

Housing characteristics are an important factor in natural hazard mitigation planning, as some housing types tend to be less disaster resistant than others, and therefore warrant special attention. Table C.23 identifies the type of housing structures most common throughout Gilliam County. The vast majority of housing structures in Gilliam County are single family homes, which account for 81% of the housing units. Of particular interest are the number of mobile homes and other non-permanent housing structures, which account for 14% of the housing structures in the county. Mobile structures are particularly vulnerable to certain natural hazards, in particular windstorms, and special attention should be given to securing the structures as they are typically more prone to damage than wood-frame construction. Also, it is important to consider multi-unit structures, as they are more vulnerable to the impacts from natural disasters due to the increased number of people living in close proximity. In short, a structural weakness in a multi-unit structure will have an amplified impact on the population. In Gilliam County, 5% of the housing units have two or more units.

Table C.18: Housing Type Summary

<table>
<thead>
<tr>
<th>Housing Type</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 unit</td>
<td>850</td>
<td>80.9%</td>
</tr>
<tr>
<td>2 to 4 units</td>
<td>21</td>
<td>2.0%</td>
</tr>
<tr>
<td>5 to 9 units</td>
<td>5</td>
<td>0.5%</td>
</tr>
<tr>
<td>10 to 19 units</td>
<td>8</td>
<td>0.8%</td>
</tr>
<tr>
<td>20 or more units</td>
<td>17</td>
<td>1.6%</td>
</tr>
<tr>
<td>Mobile home</td>
<td>146</td>
<td>13.9%</td>
</tr>
<tr>
<td>Boat, RV, van, etc.</td>
<td>4</td>
<td>0.4%</td>
</tr>
<tr>
<td>Total housing units</td>
<td>1,051</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer T97; U.S. Census Bureau

Age of housing is another characteristic that influences a structure’s vulnerability to hazards. Generally the older a home is, the greater the risk of damage from natural disasters. This is because stricter building codes have only been implemented in recent decades, following improved scientific understanding of plate tectonics and earthquake risk. In 1974 a statewide Unified Building Code was adopted as a means to bring the building criteria for every city and county under one all-inclusive code. Under this code, the first provisions for seismic design criteria were implemented. Since the first adoption in 1974, there have been ten revisions to the code to enhance and improve the safety of building and the citizens who occupy them. In fact, according to the State of Oregon Building Codes Division, structural

44 State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile.
safety has increased more than 225-percent based on the minimum loading criteria base-shear factors since code were first adopted in 1974.46

Thus knowing the age of the structure is helpful in targeting outreach regarding retrofitting and insurance for owners of older structures. Table C.19 describes the age of the housing units throughout the County. According to the U.S. Census Bureau, roughly 62% of the housing units in the County were built prior to 1980; roughly the time when the first seismic codes were implemented statewide. Most Gilliam County homes are manufactured (not site-built).

Table C.19: Housing Units, Year Built

<table>
<thead>
<tr>
<th>Year Built</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built 2014 or Later</td>
<td>7</td>
<td>0.9%</td>
</tr>
<tr>
<td>Built 2010 to 2013</td>
<td>12</td>
<td>1.5%</td>
</tr>
<tr>
<td>Built 2000 to 2009</td>
<td>72</td>
<td>9.1%</td>
</tr>
<tr>
<td>Built 1990 to 1999</td>
<td>158</td>
<td>20.1%</td>
</tr>
<tr>
<td>Built 1980 to 1989</td>
<td>52</td>
<td>6.6%</td>
</tr>
<tr>
<td>Built 1970 to 1979</td>
<td>78</td>
<td>9.9%</td>
</tr>
<tr>
<td>Built 1960 to 1969</td>
<td>65</td>
<td>8.3%</td>
</tr>
<tr>
<td>Built 1950 to 1959</td>
<td>102</td>
<td>12.9%</td>
</tr>
<tr>
<td>Built 1940 to 1949</td>
<td>56</td>
<td>7.1%</td>
</tr>
<tr>
<td>Built 1939 or Earlier</td>
<td>186</td>
<td>23.6%</td>
</tr>
<tr>
<td>Occupied Housing Units</td>
<td>788</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer T171; U.S. Census Bureau

Mitigation and preparedness planning should also consider type of occupancy when developing outreach projects or educational campaigns. Residents who own their own home are more likely to take steps to reduce the impact of natural hazards through mitigation or insurance methods. Renters may be less invested in physical improvements to the unit; as a result outreach around personal preparedness or renters insurance would benefit this population. As demonstrated in Table C.20 below, approximately 26.1-percent of the housing units in Gilliam County are renter-occupied.

Table C.20: Housing Occupancy Summary

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupied housing units</td>
<td>788</td>
<td>75.0%</td>
</tr>
<tr>
<td>Owner-occupied units</td>
<td>501</td>
<td>63.6%</td>
</tr>
<tr>
<td>Renter-occupied units</td>
<td>287</td>
<td>36.4%</td>
</tr>
<tr>
<td>Vacant housing units</td>
<td>263</td>
<td>25.0%</td>
</tr>
<tr>
<td>Vacant units (for seasonal, recreational or occasional use)</td>
<td>196</td>
<td>75.0%</td>
</tr>
<tr>
<td>Total housing units</td>
<td>1,051</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: ACS 2016 (5-Year Estimates) (SE), ACS 2016 (5-Year Estimates), Social Explorer T94; U.S. Census Bureau

---

46 State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile.
Physical Infrastructure

Physical infrastructure such as dams, roads, bridges, railways and airports support Gilliam County communities and economies. Critical facilities are facilities that are critical to government response and recovery activities; however the term may also refer to facilities or infrastructure that could cause serious secondary impacts when disrupted. Many things can be counted as critical infrastructure and facilities depending on the social, environmental, economic and physical makeup of the area under consideration. Some examples include: agriculture and food systems, communications facilities, critical manufacturing, emergency services, energy generation and transmission, government facilities, healthcare and public health facilities, information technology transportation systems; and water. Due to the fundamental role that physical infrastructure plays both in pre and post-disaster, they deserve special attention in the context of creating resilient communities.

Roads and Bridges

The Gilliam County Road Department maintains 428 miles of road. Of those miles 310 are gravel road and 118 miles of pavement. The region’s major expressway is Interstate Highway 84. The interstate runs east/west through northern Gilliam County and is the main passage for automobiles, trucks, and buses traveling along the Columbia River. Other major highways that service the region include:

- Oregon Route 19 runs north/south and connects Arlington at I-84 with Condon and continues south to Fossil in Wheeler County.
- Oregon Route 74 is located in the northeast corner of the county. The highway begins at the connection with Interstate Highway 84 in Gilliam County and travels southeast about eight miles before crossing into Morrow County.
- Oregon Route 206 by and large runs east/west and connects Condon with Wasco in Sherman County and Heppner in Morrow County.

Daily transportation infrastructure capacity in the Columbia Gorge region is only moderately stressed by maintenance, congestion and oversized loads; however peak loads and congestion can materialize during holiday seasons and major construction projects, but can also fluctuate by season. Natural hazards tend to further disrupt automobile traffic and create gridlock; this is of specific concern in periods of evacuation during an emergency.

The existing condition of bridges in the region is also a factor that affects risk from natural hazards. Bridge failure can have immediate and long term implications in the response and recovery of a community. Incapacitated bridges can disrupt traffic and exacerbate economic losses due to the inability to transport products and services in and out of the area. Table C.26 highlights the number of distressed bridges in Gilliam County. Of the 17 county bridges, two are structurally deficient: the Lemon Bridge and Lonerock Bridge. The Lemon Bridge is scheduled to be removed and the Lonerock Bridge has received funding to

48 State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile.
49 Dewey Kennedy, Gilliam County Road Master. June 14, 2018
be replaced. The classification of a distressed bridge does not imply the bridge is unsafe; however in the event of seismic activity these bridges are of higher vulnerability to failure.

Rail Ways

Railroads are major providers of regional and national cargo trade flows. A Union Pacific Railroad line runs through Gilliam County and is limited to a stretch of tracks that follow I-84 and the Columbia River on the northern border of the County. A short line is operated by The Palouse River & Coulee City Railroad and runs approximately 11.5 miles from Arlington to the Columbia Ridge Landfill and Recycling Center.\(^{50}\) Rails are sensitive to icing from winter storms that can occur in the Columbia Gorge region. For industries in the region that utilize rail transport, these disruptions in service can result in economic losses. The potential for rail accidents caused by natural hazards can also have serious implications for the local communities if hazardous materials are involved.

Airports

There are four airports located in Gilliam County, two are public and two are privately owned. The Arlington Municipal Airport near Arlington has public access and averages 76 aircraft operations a month; mostly for local general aviation.\(^{51}\) The state owned Condon State Pauling Field Airport near Condon also has public access and averages 76 aircraft operations a week; mostly for transient general aviation purposes.\(^{52}\) Access to these airports faces the potential for closure from a number of natural hazards, including wind and winter storms common to the region.\(^{53}\)

Power Plants

The main source of power production in the County is generated through wind energy. Gilliam County has experienced a significant growth in the number of wind farms since 2005. There are a total of 457 wind turbines now operating in the county with a total generating capacity of 722.1 megawatts of energy. Table C.21 identifies the inventory of wind farm projects in Gilliam County. Nine of these projects began operating in 2006 or later and five more have either been approved or are in the permitting process. It is important to note that a few of these projects cross jurisdictional boundaries into Morrow County including Willow Creek, Shepherds Flat Central – S. Hulbert and Shepherds Flat South – Horseshow Bend, as well as Saddle Butte Wind – Four Mile Wind, which has been approved.

---

\(^{53}\) State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile.
### Table C.21: Wind Farm Inventory

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Turbines[45]</th>
<th>Capacity</th>
<th>Developer(s)</th>
<th>Operating Status</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condon</td>
<td></td>
<td>24.6 MV</td>
<td>SeaWest</td>
<td>Operating</td>
<td>2001</td>
</tr>
<tr>
<td>Condon II</td>
<td>42</td>
<td>25.2 MW</td>
<td>SeaWest</td>
<td>Operating</td>
<td>2002</td>
</tr>
<tr>
<td>Leaning Juniper</td>
<td>67</td>
<td>100.5 MW</td>
<td>PacifiCorp, PPM Energy</td>
<td>Operating</td>
<td>2006</td>
</tr>
<tr>
<td>Rattlesnake Rd Wind Phase I</td>
<td>49</td>
<td>102.9 MW</td>
<td>Horizon Wind</td>
<td>Operating</td>
<td>2008</td>
</tr>
<tr>
<td>Pebble Springs Wind</td>
<td>47</td>
<td>98.7 MW</td>
<td>Iberdrola</td>
<td>Operating</td>
<td>2009</td>
</tr>
<tr>
<td>Wheat Field Wind Farm</td>
<td>46</td>
<td>96.6 MW</td>
<td>EDP Renewables</td>
<td>Operating</td>
<td>2009</td>
</tr>
<tr>
<td>Willow Creek</td>
<td>48 (18)</td>
<td>72 MW</td>
<td>Invenergy</td>
<td>Operating</td>
<td>2009</td>
</tr>
<tr>
<td>Leaning Juniper II</td>
<td>117</td>
<td>201.6 MW</td>
<td>Avangrid</td>
<td>Operating</td>
<td>2011</td>
</tr>
<tr>
<td>Shepherds Flat North – N. Hulbert</td>
<td>106</td>
<td>265 MW</td>
<td>Caithness Energy</td>
<td>Operating</td>
<td>2012</td>
</tr>
<tr>
<td>Shepherds Flat Central – S. Hulbert</td>
<td></td>
<td>290 MW</td>
<td>Caithness Energy</td>
<td>Operating</td>
<td>2012</td>
</tr>
<tr>
<td>Shepherds Flat South - Horseshoe Bend</td>
<td>290 MW</td>
<td>Caithness Energy</td>
<td>Operating</td>
<td>2012</td>
<td></td>
</tr>
<tr>
<td>Horn Butte Wind Project</td>
<td></td>
<td>78 MW</td>
<td>Invenergy</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>Montague Wind Power Facility</td>
<td></td>
<td>404 MW</td>
<td>Iberdrola</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>Baseline Wind Energy Facility</td>
<td></td>
<td>500 MW</td>
<td>First Wind</td>
<td>In Permitting Process</td>
<td></td>
</tr>
<tr>
<td>Rock Creek Wind</td>
<td></td>
<td>550 MW</td>
<td>RES Americas</td>
<td>In Permitting Process</td>
<td></td>
</tr>
<tr>
<td>Saddle Butte Wind –</td>
<td></td>
<td>399 MW</td>
<td>Columbia Wind/Caithness</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>Four Mile Wind</td>
<td></td>
<td>900 MW</td>
<td>Diversified Wind, Gamesa</td>
<td>Proposed</td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td>457</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


### Utility Lifelines

Utility lifelines are the resources that the public relies on daily, (i.e., electricity, fuel and communication lines). If these lines fail or are disrupted, the essential functions of the community can become severely impaired. Utility lifelines closely relate to physical infrastructure, (i.e., dams and power plants) as they transmit the power generated from these facilities.
The network of electricity transmission lines running through Gilliam County are operated by Pacific Power and Light (PacifiCorp), Bonneville Power Administration and the Wasco Electric Cooperative. These three entities primarily facilitate local energy production and distribution throughout the area.

Pacific Power (PacifiCorp)

PacifiCorp serves 1.9 million customers in Southern Washington, Oregon, Northern California, Eastern Idaho, Utah and Wyoming, including Gilliam County and other communities in the Columbia Gorge. PacifiCorp has 64,000 miles of distribution line and approximately 16,500 miles of transmission lines.\(^\text{54}\) PacifiCorp consists of two business units, aggregating up to PacifiCorp:

- **Pacific Power**, which delivers electricity to customers in Oregon, Washington and California, is headquartered in Portland, Oregon. Pacific Power provides services to the City of Arlington in Gilliam County.\(^\text{55}\)

- **Rocky Mountain Power**, which delivers electricity to customers in Utah, Wyoming and Idaho, is headquartered in Salt Lake City, Utah.\(^\text{56}\)

Columbia Basin Electric Cooperative\(^\text{57}\)

Columbia Basin Electric serves over 3,500 members throughout a service area of approximately 3,000 square miles in five counties, including Gilliam County. The Cooperative serves residential, commercial, industrial and irrigation customers throughout the county, including the cities of Condon and Lonerock. The Cooperative has two offices, one of which is located at 402 S. Main Street in Condon.

Wasco Electric Cooperative

The Wasco Electric Cooperative engages in energy transmission and distribution, providing electric service to over 3,000 members with 1,685 miles of lines and ten substations to serve portions of Gilliam, Wasco, Jefferson, Sherman, and Wheeler Counties.\(^\text{58}\)

Bonneville Power Administrative\(^\text{59}\)

- The Bonneville Power Administrative (BPA) is a federal nonprofit agency based in the Pacific Northwest. BPA markets wholesale electrical power from 31 federal hydro projects in the Columbia River Basin, one nonfederal nuclear plant and several other small nonfederal power plants. About 28% of the power used in the Northwest comes from BPA.

• BPA also operates and maintains about three-fourths of the high-voltage transmission (15,215 circuit miles) in the service territory, which includes California, Idaho, Montana, Nevada, Oregon, Utah, Washington and Wyoming. Several of these lines run through Gilliam County.

Natural Gas Transmission

Gas Transmission Northwest Corporation (GTN), which is operated by TransCanada Corporation, transports natural gas to energy markets along 1,353 miles of pipe from the Canada-Idaho border to the Oregon-California border. A section of this pipeline bisects Gilliam County. The pipeline system is designed to carry 2,900 million cubic feet of natural gas per day.

Landfills and Waste Facilities

Gilliam County is also home to two Waste Management landfills and disposal facilities, both located on Cedar Springs Lane approximately eight miles south of Arlington.

Columbia Ridge Recycling and Landfill

The facility receives nonhazardous solid wastes from a variety of sources throughout the northwest, including Portland, Oregon and Seattle, Washington. Solid wastes are delivered by waste collection vehicles, transfer vehicles and rail cars (gondolas). The facility operates a transfer station, where the waste is sent to this facility (nonhazardous landfill) or the adjoining Chemical Waste Management or the Northwest facility (hazardous landfill and treatment facility).

Seattle City Light contracts for renewable energy from the gas power plant at the Columbia Ridge Landfill. The power plant captures methane gas created by decomposing garbage and uses it to fuel turbines that produce electricity. The plant is designed to produce 12.8 average megawatts of electricity.

Chemical Waste Management of the Northwest (Hazardous Waste Facility)

The facility can accept a wide range of hazardous and nonhazardous wastes at the site for landfiling, storage, transfer, evaporative treatment, bioremediation, and/or stabilization. The facility is permitted to accept inorganics, asbestos, PCBs, medical waste, pesticides, and most petroleum industry waste. PCBs are managed using storage, transfer, drain and flush, immobilization, stabilization and landfiling. The facility is not permitted to accept scrap metals, organic solvents, construction debris, radioactive materials, sewage or biological sludges, or used oil, among others.

Water Supply and Wastewater Treatment

The cities of Arlington and Condon both provide community water and sewer service to residents of each city.

**City of Arlington**:

- **Water Supply**: Wells (3)
- **Operator**: The City of Arlington operates two wells
  - Army Corps of Engineers operates one well
- **Wastewater Treatment System**:
  - **Operator**: City of Arlington
  - **Age of System**: 1962

**City of Condon**:

- **Water Supply**: Wells (8), spring
- **Operator**: City of Condon
- **Age/Capacity of System**:
  - **Well Number** | **Year Drilled** | **Depth** | **Pumping Rate**
  - #1  | 1947 | 80 ft | 63 gpm
  - #2  | 1950 | 120 ft | 55 gpm
  - #3  | 1962 | 74 ft | 130 gpm
  - #4  | 1967 | 90 ft | 55 gpm
  - #5  | 1968 | 174 ft | 150 gpm
  - #6  | 1999 | 93 ft | 90 gpm
  - #7  | 1999 | 98 ft | 50 gpm
  - #8  | 1999 | 44 ft | 107 gpm
  - Spring | N/A | N/A | 120 gpm
  - **Total** | | | 820 gpm

*GPM - gallons per minute

Notes: All eight wells and spring discharge into a 109,000 gallon wet well. Two 125 horsepower (hp) turbines discharge into an eight inch line that connects to an 850,000 gallon above ground storage, and then is gravity fed to the city’s distribution system.

**Wastewater Treatment System**:

- **Operator**: City of Condon
- **Age of System**:
  - Treatment plant – 1997
  - Collection system – 1951
- **Capacity of System**:
  - Pump #1 – 250 gpm
  - Pump #2 – 250 gpm
  - Lagoon Storage – 23 million gallons

Notes: 38.8 acres of irrigated (reclaimed water), and center pivot Alfalfa cut and bailed by a local rancher.

---

64 Brian Foster, City of Arlington Public Works.
65 Aaron Fitzsimmons, City of Condon Public Works.
City of Lonerock:
Water Supply: Wells (2)
Operator: The City of Lonerock

Telecommunications

A number of telecommunication providers are available in Gilliam County. According to Oregon Public Utility Commission, the following companies provide services to the county: AT&T Mobility LLC, CenturyLink, Gorge Networks, HughesNet, J & N Cable Systems, Inc., Level 3 Communications, LLC, New Edge Network, Inc., SawNet, Sprint, StarBand Communications, TDS Telecom, Verizon Wireless, and WildBlue Communications, Inc.66

Public-Safety Access Point

Tri-County Communications is the call center responsible for answering emergency calls for police, firefighting, and ambulance services in Gilliam, Sherman, and Wheeler Counties. The call center is stationed at 135 S. Main Street in Condon.

Critical Facilities

Critical facilities are those facilities that are essential to government response and recovery activities (e.g., hospitals, police, fire and rescue stations, school districts and higher education institutions).67 The interruption or destruction of any of these facilities would have a debilitating effect on incident management. Critical facilities in Gilliam County are identified in Table C.22 below and specifically named in Table 2.22 in Volume I, Section 2 Risk Assessment.

Table C.22: Critical Facilities

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>County Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals (# of beds)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Sheriff’s/Police Offices</td>
<td>3</td>
</tr>
<tr>
<td>Fire and Rescue Stations</td>
<td>3</td>
</tr>
<tr>
<td>Dams</td>
<td>0</td>
</tr>
<tr>
<td>County Road Bridges</td>
<td>18</td>
</tr>
<tr>
<td>School Districts (# of schools)</td>
<td>2 (4)</td>
</tr>
<tr>
<td>Airports</td>
<td>4</td>
</tr>
<tr>
<td>Public Airports</td>
<td>2</td>
</tr>
<tr>
<td>Private Airports</td>
<td>2</td>
</tr>
</tbody>
</table>

Hospitals

There is no hospital located in Gilliam County, only medical clinics. Nearby hospitals include the Pioneer Memorial Hospital in Heppner and the Mid-Columbia Medical Center in The Dalles.

67 State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia Regional Profile.
City of Arlington: Arlington Medical Center is located in Arlington and provides primary care.

City of Condon: South Gilliam County Medical Center is located in Condon and provides primary care.

City of Lonerock: No medical centers located in Lonerock.

Police

The Oregon State Police and the Gilliam County Sheriff’s Office serve Gilliam County. The City of Condon Police Department also provides services within the city limits.

Fire and Rescue

Gilliam County has two Rural Fire Protection Districts and the cities of Arlington and Condon each have their own Fire Department. Volunteers serve all of the districts and fire departments. The Arlington Fire Department and the North Gilliam County Rural Fire District operate essentially as one department and share the same fire chief and fire fighters. The Condon Fire Department and the South Gilliam County Rural Fire District have their own facilities but share the same chief and fire fighters, although it is their goal to eventually combine their equipment under one roof. The North Gilliam County Rural Fire Protection District contains about 370 square miles (30.3-percent of the county) while the South District has 788 square miles (64.4-percent). Oregon Department of Forestry Protection District services fourteen square miles of Gilliam County in the southeast part of the County and contains the City of Lonerock.

School Districts

Gilliam County has two school districts, the Arlington School District and the Condon School District. Four schools are located in the County, two elementary schools and two high schools. The North Central Education Service District also provides educational services in the county.

Dependent Facilities

In addition to the critical facilities mentioned in Table C.24, there are other facilities that are vital to the continued delivery of health services and may significantly impact the public’s ability to recover from emergencies. Assisted living centers are important to identify within the community because of the dependent nature of the residents. Such facilities can also serve as secondary medical facilities during an emergency, as they are equipped with nurses, medical supplies and beds. Summit Springs Village, located in Condon, is the only assisted living facility in Gilliam County. The facility is licensed for 38 residents and is comprised of 23 apartments and six duplex cabins. In addition, the Summit Springs Village

---

Memory Care Facility is located separate from the main building. This licensed facility has a capacity of eight beds.

**Synthesis**

Built capacity refers to the built environment and infrastructure that supports a community. The various forms of built capital mentioned throughout this section, play significant roles in the event of a disaster. Physical infrastructure, including utility and transportation lifelines, are critical to maintain during a disaster and are essential for proper functioning and response. Community resilience is directly affected by the quality and quantity of built capital and lack of or poor condition of infrastructure can negatively affect a community’s ability to cope, respond and recover from a natural disaster. Initially following a disaster, communities may experience isolation from surrounding cities and counties due to infrastructure failure. These conditions force communities to rely on local and immediate resources.
Community Connectivity Capacity

Social Organizations

Social systems can be defined as community organizations and programs that provide social and community-based services, such as health care or housing assistance, to the public. In planning for natural hazard mitigation, it is important to know what social systems exist within the community because of their existing connections to the public. Often, actions identified by the plan involve communicating with the public or specific subgroups within the population (e.g. elderly, children, low income). The County can use existing social systems as resources for implementing such communication-related activities because these service providers already work directly with the public on a number of issues, one of which could be natural hazard preparedness and mitigation.

The following table highlights organizations that are active within the community and may be potential partners for implementing mitigation actions. The table includes information on each organization or program’s service area, types of services offered, populations served, and how the organization or program could be involved in natural hazard mitigation. The three involvement methods are defined below.

- Education and Outreach – Organizations can partner with the community to educate the public or provide outreach assistance and materials on natural hazard preparedness and mitigation.
- Information Dissemination – Organizations can partner with the community to provide and distribute hazard-related information to target audiences.
- Plan/Project Implementation – Organizations may have plans and/or policies that may be used to implement mitigation activities or the organization can serve as the coordinating or partner organization to implement mitigation actions.

Civic Engagement

Civic engagement and involvement are important indicators of community connectivity. Whether it is engagement through outlets such as volunteerism or through local, state, and national politics, you can gauge the connection people have to their community by the more they are willing to help out.

Those who are more invested in their community may also have a higher tendency to vote in political elections. Below, Table C.24 outlines voter participation and turnout percentages from the 2014 State Representative Election compared to the 2016 Presidential General Election. The 2016 Presidential General Election resulted in an 86.4% voter turnout in Gilliam County, while the 2014 State Representative General Election only resulted in a turnout of just less than 80% voter participation. However, both of these elections saw a higher turnout than the overall voter participation reported in Oregon.

---

Table C.24: Voter Turnout Percentages

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>2014 State Representative Election</th>
<th>2016 Presidential General Election</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gilliam County*</td>
<td>Oregon^</td>
</tr>
<tr>
<td>Total - Registered Voters</td>
<td>1,181</td>
<td>1,275</td>
</tr>
<tr>
<td>Total - Ballots Cast</td>
<td>2,174,763</td>
<td>2,561,657</td>
</tr>
<tr>
<td>Voter Turnout Percentage</td>
<td>78.6%</td>
<td>86.4%</td>
</tr>
</tbody>
</table>

Source*: Gilliam County Election Results, Gilliam County Website
Source^: Oregon Blue Book Election Results

Cultural Resources

Cultural resources provide residents with a sense of belonging and provide a glimpse into the past to teach current residents about the histories and lives of past residents. Historic sites, museums, and libraries are just a few resources that give residents and visitors a sense of cultural connectivity to a place. These resources celebrate history and help define an area that people call home.

Historic Places

The National Register of Historic Places lists all types of facilities and infrastructure that help define a community. Whether it is first schoolhouse in town or even just the home of a resident who played a vital role in the success of the community, the Register lists all types of historic features that characterize the area. Table C.25 summarizes the three National Historic Sites or Districts throughout Gilliam County. All three are located in the City of Condon. Table C.32 identifies the 36 listed resources located in the Condon Commercial Historic District.

These places provide current residents, youth, and visitors with a sense of community. Because of the history behind these sites, and their role in defining a community, it is important to protect these historic sites from the impacts natural disasters might have on them.

Table C.25: List of National Register of Historic Places in Gilliam County

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condon Commercial Historic District</td>
<td>Condon</td>
</tr>
<tr>
<td>S.B. Baker Building</td>
<td>Condon</td>
</tr>
<tr>
<td>Silas A. Rice Log House</td>
<td>Condon</td>
</tr>
</tbody>
</table>

Source: National Register of Historic Places
Table C.26: Condon Commercial Historic District

<table>
<thead>
<tr>
<th>Building</th>
<th>Address in Condon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank Block</td>
<td>135 S Main St</td>
</tr>
<tr>
<td>Bank Saloon</td>
<td>319 S Main St</td>
</tr>
<tr>
<td>BPOE</td>
<td>117 S Main St</td>
</tr>
<tr>
<td>Buckhorn Saloon</td>
<td>306 S Main St</td>
</tr>
<tr>
<td>Burns Garage</td>
<td>222 S Main St</td>
</tr>
<tr>
<td>Campbell Building</td>
<td>114 S Main St</td>
</tr>
<tr>
<td>City Hall #1</td>
<td>306 S Main St</td>
</tr>
<tr>
<td>City Hall; Masonic Hall</td>
<td>128 S Main St</td>
</tr>
<tr>
<td>Condon Grain Growers Coop Association Office</td>
<td>105 S Main St</td>
</tr>
<tr>
<td>Condon Milling Company</td>
<td>109 N Main St</td>
</tr>
<tr>
<td>Dunn Brothers Annex</td>
<td>311 S Main St</td>
</tr>
<tr>
<td>Dunn Brothers Annex</td>
<td>307 S Main St</td>
</tr>
<tr>
<td>Farr Building</td>
<td>218 S Main St</td>
</tr>
<tr>
<td>Fatlands</td>
<td>110 S Main St</td>
</tr>
<tr>
<td>First National Bank</td>
<td>103 S Main St</td>
</tr>
<tr>
<td>First National Bank</td>
<td>311 S Main St</td>
</tr>
<tr>
<td>Gilliam County Bank</td>
<td>103 W Summit St</td>
</tr>
<tr>
<td>Hollen and Sons</td>
<td>134 S Main St</td>
</tr>
<tr>
<td>Home Telephone</td>
<td>119 W Gilliam St</td>
</tr>
<tr>
<td>Horner Law Office</td>
<td>217 S Main St</td>
</tr>
<tr>
<td>Horner, Moore &amp; Co</td>
<td>213 S Main St</td>
</tr>
<tr>
<td>Hotel Condon</td>
<td>202 S Main St</td>
</tr>
<tr>
<td>IOOF Hall</td>
<td>207-209 S Main St</td>
</tr>
<tr>
<td>John F. Reisacher Building</td>
<td>201-203 S Main St</td>
</tr>
<tr>
<td>Liberty Theater</td>
<td>212 S Main St</td>
</tr>
<tr>
<td>Parman and Harris Building</td>
<td>122 N Oregon St</td>
</tr>
<tr>
<td>Parman and Harris Lumber Company</td>
<td>101 N Main St</td>
</tr>
<tr>
<td>Pilter Building</td>
<td>225 S Main St</td>
</tr>
<tr>
<td>Potter's Grocery</td>
<td>208 S Main St</td>
</tr>
<tr>
<td>Round-Up Café</td>
<td>211 S Main St</td>
</tr>
<tr>
<td>S.B. Baker Building (listed individually as well)</td>
<td>333 S Main St</td>
</tr>
<tr>
<td>Shelley's Garage</td>
<td>102 N Main St</td>
</tr>
<tr>
<td>U.S. Post Office</td>
<td>129 S Main St</td>
</tr>
<tr>
<td>Union Oil Station</td>
<td>234 S Main St</td>
</tr>
<tr>
<td>Veterans Memorial Hall</td>
<td>120 S Main St</td>
</tr>
<tr>
<td>Weed Building</td>
<td>127 S Main St</td>
</tr>
</tbody>
</table>

Source: Oregon Historic Sites Database
Libraries and Museums

Libraries and Museums are other facilities which a community will use to stay connected. Because all but one city within the county operates a public library, these facilities should be considered a common place for the community to gather during a disaster, as well as and serve a critical function in maintaining a sense of community. Below, Table C.27 lists the two libraries and one museum located in Gilliam County.

Table C.27: List of Libraries and Museums in Sherman County

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arlington Public Library</td>
<td>Arlington</td>
</tr>
<tr>
<td>Gilliam County Library</td>
<td>Condon</td>
</tr>
<tr>
<td>Gilliam County Historical Society Depot Museum</td>
<td>Condon</td>
</tr>
</tbody>
</table>

Source: Oregon Museum Association, Oregon Public Libraries

Museums can also function in maintaining a sense of community as they provide residents and visitors with the opportunity to explore the past and develop cultural capacity. As a preservation of history, it is important to also consider museums in the mitigation process for community resilience, as these structures should be protected in critical times, especially disasters.

Community Stability

Residential Geographic Stability

Geographic stability is often a result of feeling connected to one’s community and a measure of one’s rootedness. A person’s place attachment refers to this sense of community and can often ones efforts to help revitalize a community. When looking at the percentage of regional residential stability one can determine that the higher the number of residents who have stayed in a geographic location, the more likely they are to have a place attachment. Regional residential stability is important to consider in the mitigation process as those who have been here awhile are more likely to have a vested interest in the area and should be more willing to help with hazard mitigation efforts. Table C.34 estimates residential stability across the region. It is calculated by the number of people who have lived in the same house and those who have moved within the same county area a year ago, compared to the percentage of people who have not. Gilliam County is estimated to have 91.3% of its residents live in the same house or moved within the County. The figures of community stability are relatively consistent across the region.

Homeownership

Another measure of community stability and place attachment is homeownership. One does not seek to be a homeowner in a place they don’t feel safe and secure. Residents who become homeowners search for a place in which they are happy, protected, and able to

---

afford a home. Homeownership is an indicator that residents will return to a community post-disaster, as these people are economically and socially invested in the community. Likewise, homeowners are more likely to take necessary precautions in protecting their property. Table C.28 identifies owner occupied housing units across the region; the remaining households are either renter occupied or are vacant. Table C.29 describes homeownership rates throughout the County. Most home mobility occurs in the City of Arlington, where seasonal employment is common.

### Table C.28: Regional Homeownership

<table>
<thead>
<tr>
<th>County</th>
<th>Homeownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
<td>61%</td>
</tr>
<tr>
<td>Gilliam County</td>
<td>64%</td>
</tr>
<tr>
<td>Morrow County</td>
<td>72%</td>
</tr>
<tr>
<td>Sherman County</td>
<td>61%</td>
</tr>
<tr>
<td>Wasco County</td>
<td>64%</td>
</tr>
<tr>
<td>Wheeler County</td>
<td>74%</td>
</tr>
</tbody>
</table>

Source: Social Explorer Tables: ACS 2016 (5-Year Estimates)(SE), ACS 2016 (5-Year Estimates), Social Explorer Table 94; U.S. Census Bureau

### Table C.29 Gilliam County Homeownership

<table>
<thead>
<tr>
<th>Place</th>
<th>Homeownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arlington</td>
<td>53%</td>
</tr>
<tr>
<td>Condon</td>
<td>72%</td>
</tr>
<tr>
<td>Lonerock</td>
<td>70%</td>
</tr>
<tr>
<td>Gilliam County</td>
<td>64%</td>
</tr>
</tbody>
</table>

Source: Social Explorer Tables: ACS 2016 (5-Year Estimates)(SE), ACS 2016 (5-Year Estimates), Social Explorer Table 94; U.S. Census Bureau

### Synthesis

Community connectivity capacity places a strong emphasis on social structure, trust and norms, as well as cultural resources within a community. In terms of community resilience, these emerging elements of social and cultural capital will be drawn upon to stabilize the recovery of the community. Social and cultural capitals are present in all communities; however, it is dramatically different from one town to the next as they reflect the specific needs and composition of the community residents. A community with low residential stability may hinder the full potential social and cultural resources, adversely affecting the community’s coping and response mechanisms.

Place attachment can be determined through a variety of outlets. Gilliam County has a wide range of resources that range from social organizations, civic engagement, and cultural capital that help support findings that suggest residents are well connected with a sense of community and regional stability. With a higher than average voter turnout percentage and an average percentages of regional stability, Gilliam County residents are involved. The county should consider investing time to inform and support its residents to build more resilient and better prepared communities, as they are more likely to return in the event of a disaster. Likewise, it is important to consider the roles such services and facilities can, and will, provide to residents during a disaster event.
Political Capital

Government Structure

Gilliam County’s Mission is to provide essential public services, both legally required and locally desired, that protect and enhance the quality of life in an efficient, effective and respectful manner.

In Gilliam County, the administrative office is the office of the County Court. Gilliam County is a general law county governed by a three member County Court, consisting of a County Judge and two Commissioners. The County Judge is an elected, nonpartisan, full time position serving a six year term. The Judge functions as the day to day administrator of the county as well as chairman of the board and as Juvenile and Probate Judge. The two Commissioners are partisan positions who serve part time for a four year term. The Commissioners and Judge acting as the County Court, set policy for and represent Gilliam County in various forums. The County Court oversees all non-elected departments of the County. Although the County Court shares the actual administration of County affairs with the elective department heads, it is, nevertheless, the focal point for decisions that must be made locally with respect to county affairs. The court is served by a full-time appointed court administrator.\textsuperscript{73}

All the departments within the governance structure have some degree of responsibility in building overall community resilience. Each plays a role in ensuring that the county functions and normal operations resume after an incident, and the needs of the population are met. Some divisions and departments of Gilliam County government that have a role in natural hazard mitigation include:

- **Commission for Children and Families**: takes the role of leaders and facilitators of meetings; provide stronger links between the community and formal systems. There is respectful inclusion of all community members, community awareness and commitment to action. The Commission for Children and Families plans, advocates, and engages the community around issues on behalf of families and children, often thought of as vulnerable populations due to increased sensitivity to the impacts of hazard incidents. Because this department is in frequent contact with a vulnerable population, it would be a natural partner in mitigation actions for outreach efforts and to build the County’s awareness of the needs of children and families.

- **Emergency Management**: the department is located in the Gilliam County Sheriff’s Office. The Sheriff is the director and Chris Fitzsimmons serves as the coordinator. Gilliam County is vulnerable to a variety of natural disasters including: droughts, earthquakes, floods, landslides, volcanic events, wildfires, windstorms, and winter storms.\textsuperscript{74}

\textsuperscript{73} Gilliam County Website. Departments. County Court. http://www.co.gilliam.or.us/departments/county_court/index.html
\textsuperscript{74} Gilliam County Website. Departments. Emergency Management. http://www.co.gilliam.or.us/departments/emergency/index.html
- **Fair Ground Facilities**: Serves as an entertainment venue but can be considered a staging site for response efforts. Mitigation could include specific actions to ensure the facilities could be used during response; such as extra power should it need to be used as a shelter.

- **Health and Human Services**: The North Central Public Health District serves citizens of Gilliam, Sherman and Wasco Counties, and is responsible for enforcement and administration of public and environmental health laws of federal, state, and county government. The North Central Public Health District conducts activities necessary for the preservation of health, prevention of disease, and protection of the public by following the three core public health functions: assessment, monitoring, and policy development. Furthermore, the Public Health Emergency Preparedness (PHEP) Program develops plans and procedures to better prepare the counties to respond, mitigate, and recover from all public health emergencies.\(^7^5\)

- **Planning**: is responsible for comprehensive land use planning for Gilliam County. The Gilliam County Zoning Ordinance provides the legal framework for the land use regulations in the County. The intent of the Comprehensive Plan is to establish a single, coordinated set of policies which will act to provide for orderly development of Gilliam County. These policies will give a direction to planning, establish priorities for action, serve as a basis for future decisions, provide a standard by which progress can be measured, and promote a sense of community for an improved quality of life. It will also help all levels of government and private enterprise to understand the wants and needs of all Gilliam County citizens.\(^7^6\)

- **Road Department**: The Gilliam County Road Department consists of a ten person crew and maintains 428 miles of road. Of those miles 310 are gravel road and 118 miles of pavement. Of the paved roads 25 miles are machine laid, and the remaining 93 miles are chip seal oil mats. The Road Department also maintains the 18 bridges located throughout the County.\(^7^7\) The Road Department will have important information about the resilience of the physical aspects of the community. This department can help to prioritize projects for mitigation and will be a key partner in implementation as well.

- **Sheriff Office**: The Sheriff’s Office currently employs five full time deputies, a civil deputy, a reserve deputy, a full time inmate work crew supervisor and a part time work crew supervisor. The Sheriff is entrusted with the protection of his constituents through the enforcement of laws, protecting the United States Constitution and its Amendments. The Sheriff manages a narcotics detection K-9 program and the inmate work crew program and is responsible for the 911 center, parole & probation, search and rescue, NORCOR jail facility, 911 funds,  

---

\(^7^5\) North Central Public Health District Website. http://www.wshd.org/wshd/default.htm  
\(^7^6\) Gilliam County Website. Departments. Planning.  
http://www.co.gilliam.or.us/departments/planning/index.html  
\(^7^7\) Gilliam County Website. Departments. Road.  
http://www.co.gilliam.or.us/departments/road_department/index.html
emergency management, and law enforcement services to the City of Arlington.78

- **Weed Department**: maintains the weeds on the roadsides, works to keep noxious weed at a minimum throughout the county and assist the area landowners with their needs. The Weed Department also does work for Oregon Department of Transportation, Bonneville Power Administration, Bureau of Land Management, Union Pacific Railroad, Corps of Engineers and Pacific Gas.79 The department can help to prioritize projects for mitigation and will be a key partner in implementation as well, especially projects related to wildfire prevention.

**Existing Plan & Policies**

Communities often have existing plans and policies that guide and influence land use, land development and population growth. Such existing plans and policies can include comprehensive plans, zoning ordinances and technical reports or studies. Plans and policies already in existence have support from local residents, businesses and policy makers. Many land-use, comprehensive and strategic plans get updated regularly, and can adapt easily to changing conditions and needs.80 The Gilliam County Natural Hazards Mitigation Plan includes a range of recommended action items that, when implemented, will reduce the County’s vulnerability to natural hazards. Many of these recommendations are consistent with the goals and objectives of the County’s existing plans and policies. Linking existing plans and policies to the Natural Hazards Mitigation Plan helps identify what resources already exist that can be used to implement the mitigation action items identified in the Plan. Implementing the NHMP’s action items through existing plans and policies increases their likelihood of being supported and getting updated, and maximizes the County’s resources.

The following are a list of plans and policies already in place in Gilliam County:

**Gilliam County Community Wildfire Protection Plan**

- **Date of Last Revision**: December 2007
- **Author/Owner**: Gilliam County
- **Description**: The plan is a result of a county-wide effort initiated to identify and prioritize wildfire hazards and to develop a strategy to reduce those hazards. The plans assists the county, the communities within the county, and the fire districts in securing National Fire Plan grants and other funding sources to threat hazardous fuel situations and to better prepare residents for wildfires that may occur. It includes a strategy with action project that, when implemented, will decrease the potential for large wildfires in the county and reduce the loss of property and threat to human life.

---

79 Gilliam County Website. Departments. Weed Department. http://www.co.gilliam.or.us/departments/weed_control_department/index.html
• **Relationship to the Natural Hazards Mitigation Plan:** the Community Wildfire Protection Plan (CWPP) incorporates mitigation strategies for wildfires; information from the CWPP supports and informs the NHMP.

**Gilliam County Comprehensive Plan**

- **Date of Last Revision:** October 2017
- **Author/Owner:** Gilliam County
- **Description:** The intent of the Gilliam County Comprehensive Plan is to establish a single, coordinated set of policies which will act to provide for orderly development of Gilliam County. These policies will give a direction to planning, establish priorities for action, serve as a basis for future decisions, provide a standard by which progress can be measured, and promote a sense of community for an improved quality of life. It will also help all levels of government and private enterprise to understand the wants and needs of all Gilliam County citizens.
- **Relationship to the Natural Hazards Mitigation Plan:** Goal 7 of the Gilliam County Comprehensive Plan provides the framework for the county to adopt inventories, policies, and implement measures to reduce risk to people and property from floods, landslides, earthquakes and related hazards, and wildfires. The following policies are in place to guide the identification of areas subject to natural hazards, regulation of development in those areas, and protection of citizens, property, and the environment from the effects of natural hazards:
  - The county will continue to comply with FEMA requirements in order to maintain eligibility for the National Flood Insurance Program.
  - In order to preserve the flood-carrying capacity of stream channels and prevent damaging increases in flood heights, development in the floodway should be prohibited or strictly regulated.
  - Development in the flood plain should be regulated to protect life and property and minimize private losses and public costs for rescue and repair of flood-damaged structures. Residences should be elevated at least one foot above the base flood elevation.
  - Consideration should be given to development of flood control projects.
  - New buildings should comply with building codes setbacks from both rim and tow of slopes.

**Gilliam County Emergency Operations Plan**

- **Date of Last Revision:** September 2010
- **Author/Owner:** Gilliam County
- **Description:** The Emergency Operations Plan (EOP) is an all-hazard plan that describes how Gilliam County will organize and respond to emergencies and disasters in the community. Specifically, the EOP describes the roles and responsibilities of departments and personnel within Gilliam County when an incident occurs, and it establishes high level guidance that supports implementation of the National Incident Management System (NIMS), including adherence to the concepts and principles of the Incident Command System (ICS).
- **Relationship to the Natural Hazards Mitigation Plan:** Support Annex D - Mitigation Plan, focuses on the ongoing effort to lessen the impact of disasters on people and
The purpose of the annex is to develop efforts that strive to help the most people and that make the most effective use of resources as the highest priorities. By in large, the EOP attempts to be all-inclusive in combining the following four phases of emergency management:

- **Mitigation:** activities that eliminate or reduce the vulnerability to disasters;
- **Preparedness:** activities that governments, organizations, and individuals develop to save lives and minimize damage;
- **Response:** activities that prevent loss of lives and property and provide emergency assistance; and
- **Recovery:** short- and long-term activities that return all systems to normal or improved standards.

**Gilliam County Strategic Action Plan for Economic Development**

- **Date of Last Revision:** May 2010
- **Author/Owner:** Gilliam County
- **Description:** The Strategic Action Plan for Economic Development in Gilliam County is designated to guide local economic development efforts toward cooperative, measurable success. Development of the plan focused on a “foundation up” approach that brought together representatives from municipal governments, organizations, and local interest groups to forge a vision of economic prosperity for the area and measurable goals to achieve that vision.
- **Relationship to the Natural Hazards Mitigation Plan:** Tier 1: Primary Focus of the Gilliam County Strategic Plan for Economic Development identifies business development, infrastructure, and housing as the three primary focus areas of the plan. In particular, the plan identifies improving infrastructure by expansion and enhancement of current infrastructure such as water and waste-water systems, roads, rails and barge facilities, and industrial land development. These same goals and actions can be linked and identified in the Natural Hazards Mitigation Plan for the county.

**Gilliam County Transportation System Plan**

- **Date of Last Revision:** April 2015
- **Author/Owner:** Gilliam County
- **Description:** The Gilliam County Transportation System Plan guides the management of existing transportation facilities and the design and implementation of future facilities for the next 20 years. The plan constitutes the transportation element of the county’s comprehensive plan and satisfies the requirements of the Oregon Transportation Planning Rule established by the Department of Land Conservation and Development (DLCD). It identifies and prioritizes transportation projects for inclusion of the Oregon Department of Transportation’s (ODOT) Statewide Transportation Improvement Program (STIP).
- **Relationship to the Natural Hazards Mitigation Plan:** Transportation systems are important in evacuating and responding to natural disasters. Mitigation actions that focus on strengthening transportation systems can be incorporated into the Gilliam County Transportation System Plan.
State of Oregon Building Codes

- **Date of Last Revision**: Current with State standards
- **Author/Owner**: City of The Dalles, State of Oregon
- **Description**: The Gilliam County Building Codes are adopted from the State of Oregon guidelines. They are regularly enforced; the Planning Department reports all known violations. The Building Codes identify standards for construction and development to mitigate damage and avoid unsound structures.
- **Relationship to Natural Hazards Mitigation Plan**: Building Codes enforce structural standards, including fire and storm resistant building materials, seismic stability, and defensible space. Mitigation actions focusing on resident resiliency can be incorporated into Building Codes.

Gilliam County Zoning Ordinances

- **Date of Last Revision**: 2015
- **Author/Owner**: Gilliam County
- **Description**: The Gilliam County Zoning Ordinances include Site Plan Review Requirements, Subdivision Ordinance, and acquisition of land for public use. Zoning Ordinances are regularly enforced.
- **Relationship to Natural Hazards Mitigation Plan**: Zoning Ordinances guide development and protection of natural resources. Mitigation actions can be implemented through the Zoning Ordinances.

Gilliam County Financial Resources

- Capital Improvements project funding, if budgeted/approved
- Levy taxes for specific purposes, if budgeted/approved
- Incur debt through general obligation or special tax bonds, if voter approved
- Fees for water, sewer, and utilities
- Federal funding programs
- State funding programs

**Synthesis**

Political capital is recognized as the government and planning structures established within the community. In terms of hazard resilience, it is essential for political capital to encompass diverse government and non-government entities in collaboration; as disaster losses stem from a predictable result of interactions between the physical environment, social and demographic characteristics and the built environment. While Gilliam County has adequate plans and policies in place, specific planning documents may be amended and update to reduce hazards risk when siting residences or supplementary structures.

---

This appendix was developed by the Oregon Partnership for Disaster Resilience at the University of Oregon’s Community Service Center – now called the Institute for Policy Research and Engagement (IPRE) and used in the 2006-2007 Hood River County NHMP. It has been reviewed and accepted by the Federal Emergency Management Agency (FEMA) as a means of documenting how the prioritization of actions shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

The appendix outlines three approaches for conducting economic analyses of natural hazard mitigation projects: Benefit/Cost Analysis, Cost-Effectiveness Analysis, and STAPLE/E approach. It describes the importance of implementing mitigation activities, different approaches to economic analysis of mitigation strategies, and methods to calculate costs and benefits associated with mitigation strategies.

Information in this section is derived in part from: The Interagency Hazards Mitigation Team, State Hazard Mitigation Plan, (Oregon Military Department – Office of Emergency Management, 2000), and FEMA Publication 331, Report on Costs and Benefits of Natural Hazard Mitigation. This section is not intended to provide a comprehensive description of benefit/cost analysis, nor is it intended to evaluate local projects. It is intended to (1) raise benefit/cost analysis as an important issue, and (2) provide some background on how an economic analysis can be used to evaluate mitigation projects.

A different approach was used to prioritize the mitigation actions in the Gilliam County 2018 NHMP update. See the Mitigation Strategy in Section 3 of Volume I for details.

Why Evaluate Mitigation Strategies?

Mitigation actions reduce the cost of disasters by minimizing property damage, injuries, and the potential for loss of life, and by reducing emergency response costs, which would otherwise be incurred. Evaluating possible natural hazard mitigation activities provides decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Evaluating mitigation projects is a complex and difficult undertaking, which is influenced by many variables. First, natural disasters affect all segments of the communities they strike, including individuals, businesses, and public services such as fire, law enforcement, utilities, and schools. Second, while some of the direct and indirect costs of disaster damages are measurable, some of the costs are non-financial and difficult to quantify in dollars. Third, many of the impacts of such events produce “ripple-effects” throughout the community, greatly increasing the disaster’s social and economic consequences.
While not easily accomplished, there is value from a public policy perspective, in assessing the positive and negative impacts from mitigation activities, and obtaining an instructive benefit/cost comparison. Otherwise, the decision to pursue or not pursue various mitigation options would not be based on an objective understanding of the net benefit or loss associated with these actions.

**Mitigation Strategy Economic Analyses Approaches**

The approaches used to identify the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into three general categories: benefit/cost analysis, cost-effectiveness analysis and the STAPLE/E approach. The distinction between the three methods is outlined below:

**Benefit/Cost Analysis**

Benefit/cost analysis is a key mechanism used by the state Oregon Military Department – Office of Emergency Management (OEM), the FEMA, and other state and federal agencies in evaluating hazard mitigation projects, and is required by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended.

Benefit/cost analysis is used in natural hazards mitigation to show if the benefits to life and property protected through mitigation efforts exceed the cost of the mitigation activity. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to reduce or avoid disaster-related damages later. Benefit/cost analysis is based on calculating the frequency and severity of a hazard, avoiding future damages, and risk. In benefit/cost analysis, all costs and benefits are evaluated in terms of dollars, and a net benefit/cost ratio is computed to determine whether a project should be implemented. A project must have a benefit/cost ratio greater than 1 (i.e., the net benefits will exceed the net costs) to be eligible for FEMA funding. Jurisdictions must use the FEMA BCA toolkit, latest version available, unless an alternate approach has been approved by FEMA. Jurisdictions must consult with the SHMO (State Hazard Mitigation Officer) if they intend on using an alternate approach. See [https://www.fema.gov/benefit-cost-analysis](https://www.fema.gov/benefit-cost-analysis) for more information.

**Cost-Effectiveness Analysis**

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. This type of analysis, however, does not necessarily measure costs and benefits in terms of dollars. Determining the economic feasibility of mitigating natural hazards can also be organized according to the perspective of those with an economic interest in the outcome. Hence, economic analysis approaches are covered for both public and private sectors as follows.

**Investing in Public Sector Mitigation Activities**

Evaluating mitigation strategies in the public sector is complicated because it involves estimating all of the economic benefits and costs regardless of who realizes them, and potentially to a large number of people and economic entities. Some benefits cannot be evaluated monetarily, but still affect the public in profound ways. Economists have developed methods to evaluate the
economic feasibility of public decisions which involve a diverse set of beneficiaries and non-market benefits.

Investing in Private Sector Mitigation Activities

Private sector mitigation projects may occur on the basis of one or two approaches: it may be mandated by a regulation or standard, or it may be economically justified on its own merits. A building or landowner, whether a private entity or a public agency, required to conform to a mandated standard may consider the following options:

1. Request cost sharing from public agencies;
2. Dispose of the building or land either by sale or demolition;
3. Change the designated use of the building or land and change the hazard mitigation compliance requirement; or
4. Evaluate the most feasible alternatives and initiate the most cost effective hazard mitigation alternative.

The sale of a building or land triggers another set of concerns. For example, real estate disclosure laws can be developed which require sellers of real property to disclose known defects and deficiencies in the property, including earthquake weaknesses and hazards to prospective purchases. Correcting deficiencies can be expensive and time consuming, but their existence can prevent the sale of the building. Conditions of a sale regarding the deficiencies and the price of the building can be negotiated between a buyer and seller.

STAPLE/E Approach

Considering detailed benefit/cost or cost-effectiveness analysis for every possible mitigation activity could be very time consuming and may not be practical. There are some alternate approaches for conducting a quick evaluation of the proposed mitigation activities which could be used to identify those mitigation activities that merit more detailed assessment. One of those methods is the STAPLE/E approach.

Using STAPLE/E criteria, mitigation activities can be evaluated quickly by steering committees in a synthetic fashion. This set of criteria requires the Steering Committee to assess the mitigation activities based on the Social, Technical, Administrative, Political, Legal, Economic and Environmental (STAPLE/E) constraints and opportunities of implementing the particular mitigation item in your community. The second chapter in FEMA’s How-To Guide “Developing the Mitigation Plan – Identifying Mitigation Actions and Implementation Strategies” as well as the “State of Oregon’s Local Natural Hazard Mitigation Plan: An Evaluation Process” outline some specific considerations in analyzing each aspect. The following are suggestions for how to examine each aspect of the STAPLE/E approach from the “State of Oregon’s Local Natural Hazard Mitigation Plan: An Evaluation Process.”

Social: Community development staff, local non-profit organizations, or a local planning board can help answer these questions.

- Is the proposed action socially acceptable to the community?
• Are there equity issues involved that would mean that one segment of the community is treated unfairly?

• Will the action cause social disruption?

**Technical:** The city or county public works staff, and building department staff can help answer these questions.

• Will the proposed action work?

• Will it create more problems than it solves?

• Does it solve a problem or only a symptom?

• Is it the most useful action in light of other community goals?

**Administrative:** Elected officials or the city or county administrator, can help answer these questions.

• Can the community implement the action?

• Is there someone to coordinate and lead the effort?

• Is there sufficient funding, staff, and technical support available?

• Are there ongoing administrative requirements that need to be met?

**Political:** Consult the mayor, city council or city board of commissioners, city or county administrator, and local planning commissions to help answer these questions.

• Is the action politically acceptable?

• Is there public support both to implement and to maintain the project?

**Legal:** Include legal counsel, land use planners, risk managers, and city council or county planning commission members, among others, in this discussion.

• Is the community authorized to implement the proposed action? Is there a clear legal basis or precedent for this activity?

• Are there legal side effects? Could the activity be construed as a taking?

• Is the proposed action allowed by the comprehensive plan, or must the comprehensive plan be amended to allow the proposed action?

• Will the community be liable for action or lack of action?

• Will the activity be challenged?

**Economic:** Community economic development staff, civil engineers, building department staff, and the assessor’s office can help answer these questions.

• What are the costs and benefits of this action?

• Do the benefits exceed the costs?
• Are initial, maintenance, and administrative costs taken into account?
• Has funding been secured for the proposed action? If not, what are the potential funding sources (public, non-profit, and private?)
• How will this action affect the fiscal capability of the community?
• What burden will this action place on the tax base or local economy?
• What are the budget and revenue effects of this activity?
• Does the action contribute to other community goals, such as capital improvements or economic development?
• What benefits will the action provide? (This can include dollar amount of damages prevented, number of homes protected, credit under the CRS, potential for funding under the HMGP or the FMA program, etc.)

**Environmental:** Watershed councils, environmental groups, land use planners and natural resource managers can help answer these questions.

• How will the action impact the environment?
• Will the action need environmental regulatory approvals?
• Will it meet local and state regulatory requirements?
• Are endangered or threatened species likely to be affected?

The STAPLE/E approach is helpful for doing a quick analysis of mitigation projects. Most projects that seek federal funding and others often require more detailed benefit/cost analyses.

**When to use the Various Approaches**

The following figure is to serve as a guideline for when to use the various economic analysis approaches.
Implementing the Approaches

Benefit/cost analysis, cost-effectiveness analysis, and the STAPLE/E are three important tools that can be used in evaluating whether or not to implement a mitigation activity. Since none of these approaches were used in the Gilliam County 2018 NHMP update, the 2012 NHMP text has been deleted.

1. Identify the Activities

Activities for reducing risk from natural hazards can include structural projects to enhance disaster resistance, education and outreach, and acquisition or demolition of exposed properties, among others. Different mitigation projects can assist in minimizing risk to natural hazards, but do so at varying economic costs.

2. Calculate the Costs and Benefits

Choosing economic criteria is essential to systematically calculating costs and benefits of mitigation projects and selecting the most appropriate activities. Potential economic criteria to evaluate alternatives include:

- **Determine the project cost.** This may include initial project development costs, and repair and operating costs of maintaining projects over time.

- **Estimate the benefits.** Projecting the benefits, or cash flow resulting from a project can be difficult. Expected future returns from the mitigation effort depend on the correct specification of the risk and the effectiveness of the project, which may not be well known. Expected future costs depend on the physical durability and potential economic obsolescence of the investment. This is difficult to project. These
considerations will also provide guidance in selecting an appropriate salvage value. Future tax structures and rates must be projected. Financing alternatives must be researched, and they may include retained earnings, bond and stock issues, and commercial loans.

- **Consider costs and benefits to society and the environment.** These are not easily measured, but can be assessed through a variety of economic tools including existence value or contingent value theories. These theories provide quantitative data on the value people attribute to physical or social environments. Even without hard data, however, impacts of structural projects to the physical environment or to society should be considered when implementing mitigation projects.

- **Determine the correct discount rate.** Determination of the discount rate can just be the risk-free cost of capital, but it may include the decision maker’s time preference and also a risk premium. Including inflation should also be considered.

3. Analyze and Rank the Activities

Once costs and benefits have been quantified, economic analysis tools can rank the possible mitigation activities. Two methods for determining the best activities given varying costs and benefits include net present value and internal rate of return.

**Net present value.** Net present value is the value of the expected future returns of an investment minus the value of the expected future cost expressed in today’s dollars. If the net present value is greater than the projected costs, the project may be determined feasible for implementation. Selecting the discount rate, and identifying the present and future costs and benefits of the project calculates the net present value of projects.

**Internal rate of return.** Using the internal rate of return method to evaluate mitigation projects provides the interest rate equivalent to the dollar returns expected from the project. Once the rate has been calculated, it can be compared to rates earned by investing in alternative projects. Projects may be feasible to implement when the internal rate of return is greater than the total costs of the project. Once the mitigation projects are ranked on the basis of economic criteria, decision-makers can consider other factors, such as risk, project effectiveness, and economic, environmental, and social returns in choosing the appropriate project for implementation.

**Economic Returns of Natural Hazard Mitigation**

The estimation of economic returns, which accrue to building or land owners as a result of natural hazard mitigation, is difficult. Owners evaluating the economic feasibility of mitigation should consider reductions in physical damages and financial losses. A partial list follows:

- Building damages avoided
- Content damages avoided
- Inventory damages avoided
- Rental income losses avoided
- Relocation and disruption expenses avoided
- Proprietor’s income losses avoided
These parameters can be estimated using observed prices, costs, and engineering data. The difficult part is to correctly determine the effectiveness of the hazard mitigation project and the resulting reduction in damages and losses. Equally as difficult is assessing the probability that an event will occur. The damages and losses should only include those that will be borne by the owner. The salvage value of the investment can be important in determining economic feasibility. Salvage value becomes more important as the time horizon of the owner declines. This is important because most businesses depreciate assets over a period of time.

**Additional Costs from Natural Hazards**

Property owners should also assess changes in a broader set of factors that can change as a result of a large natural disaster. These are usually termed “indirect” effects, but they can have a very direct effect on the economic value of the owner’s building or land. They can be positive or negative, and include changes in the following:

- Commodity and resource prices
- Availability of resource supplies
- Commodity and resource demand changes
- Building and land values
- Capital availability and interest rates
- Availability of labor
- Economic structure
- Infrastructure
- Regional exports and imports
- Local, state, and national regulations and policies
- Insurance availability and rates

Changes in the resources and industries listed above are more difficult to estimate and require models that are structured to estimate total economic impacts. Total economic impacts are the sum of direct and indirect economic impacts. Total economic impact models are usually not combined with economic feasibility models. Many models exist to estimate total economic impacts of changes in an economy. Decision makers should understand the total economic impacts of natural disasters in order to calculate the benefits of a mitigation activity. This suggests that understanding the local economy is an important first step in being able to understand the potential impacts of a disaster, and the benefits of mitigation activities.

**Additional Considerations**

Conducting an economic analysis for potential mitigation activities can assist decision-makers in choosing the most appropriate strategy for their community to reduce risk and prevent loss from natural hazards. Economic analysis can also save time and resources from being spent on inappropriate or unfeasible projects. Several resources and models are listed on the following page that can assist in conducting an economic analysis for natural hazard mitigation activities.

Benefit/cost analysis is complicated, and the numbers may divert attention from other important issues. It is important to consider the qualitative factors of a project associated with mitigation that cannot be evaluated economically. There are alternative approaches to implementing mitigation projects. With this in mind, opportunity rises to develop strategies that integrate natural hazard mitigation with projects related to watersheds, environmental
planning, community economic development, small business development, critical infrastructure upgrades, and transportation projects, among others. Incorporating natural hazard mitigation with other community projects can increase the viability and benefits of project implementation.

**Resources**


This page intentionally left blank.
Appendix E: Survey Results

Survey Purpose and Use

The public notices of the NHMP update, posted to the County and City websites as described in Appendix B, included a link to an online survey which was posted on the Gilliam Emergency Management website from April 2, 2018 through June 30, 2018, which twenty-six residents responded to. A physical copy of the survey was distributed at outreach events; six responses were collected from this process. Outreach events are described in Section B, Planning and Public Process. Survey responses were considered during the prioritization of hazards and selection of mitigation actions by the Gilliam County Steering Committee. The online survey also drew several comments on social media, which were considered by the Steering Committee as well. Furthermore, the survey served as a key component of public education and outreach for the NHMP. The online survey responses and in-person responses are detailed below.

Overall Survey Results

The online survey had three questions that were the same as those posed in the in-person survey. Those three questions: hazards of highest concern (question #2 online, #1 in-person), assets of highest vulnerability (question #3 online, #2 in-person), and priority mitigation activities (question #4 online, #3 in-person). Overall results of the 32 responses - online (26) plus in person (6) – are shown below in the three graphics. The two surveys, online and in-person, are shown in full below along with all responses and are referred to as the resident survey. An image of the in-person survey is included as well as Figure E.4.

The resident survey respondents reported highest concern about wildfire and winter storm, followed by drought and windstorm. The social media comments remarked that windstorms were common in the County, and may necessitate a higher hazard ranking. The Steering Committee determined that windstorms were a lower concern due to the infrequent need for emergency services or property damage associated with wind events, although windstorms are common in Gilliam County. Residents reported concerns that human (life/injury), governance, and infrastructure were most vulnerable to hazards. The Steering Committee determined that overall vulnerabilities for windstorm were low. The other hazards that residents identified as highest concern – wildfire, winter storm, and drought – were confirmed by the Steering Committee. Survey respondents reported their mitigation priorities as protecting critical infrastructure, strengthening emergency services, and reducing damage to utilities. These were prioritized by the Steering Committee in several mitigation actions. See Section 3 Mitigation Strategy for a list of Gilliam County’s mitigation actions.
Figure E.1 Significant Hazards

Hazards of Concern

Number of Survey Responses

- Drought
- Earthquake
- Flood
- Wildfire
- Volcanic Eruption
- Wind Storm
- Winter Storm

Source: Nicolia Mehrling, Gilliam County/DLCD

Figure E.2 Vulnerable Assets

Vulnerable County Assets

Number of Survey Responses

- Governance (ability to...)
- Infrastructure (bridges,...
- Human (lives, health, injuries)
- Economic (businesses,....
- Cultural/historic (libraries,....
- Environmental (forests,....

Source: Nicolia Mehrling, Gilliam County/DLCD
Figure E.3 Priority Mitigation Activities

Source: Nicolia Mehrling, Gilliam County/DLCD
Detailed Survey Results

NHMP Online Outreach Survey

Number of Survey respondents: Twenty-six

1. Have you heard of the Natural Hazard Mitigation Plan before this?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>8</td>
<td>18</td>
</tr>
</tbody>
</table>

2. How concerned are you about the following natural disasters affecting Gilliam County? Please assign a number to your concern, with "1" meaning "Not at all concerned," and "5" meaning "Very concerned."

<table>
<thead>
<tr>
<th>Natural Disaster</th>
<th>Very Concerned</th>
<th>Somewhat Concerned</th>
<th>Neutral</th>
<th>Not Very Concerned</th>
<th>Not Concerned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>12</td>
<td>5</td>
<td>7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Earthquake</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>Flood</td>
<td>0</td>
<td>1</td>
<td>9</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Wildfire</td>
<td>20</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Volcanic Eruption</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Wind Storm</td>
<td>5</td>
<td>11</td>
<td>8</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>12</td>
<td>10</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

3. Of the following Gilliam County assets, which do you think are the most important to protect from the impacts caused by a natural disaster? Please assign a number, with "1" meaning "not at all important" and "5" meaning "very important."

<table>
<thead>
<tr>
<th>County Asset</th>
<th>Very Important</th>
<th>Somewhat Important</th>
<th>Neutral</th>
<th>Not Very Important</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance (ability to maintain order, provide public services: sheriff’s operations, 911 services, public works, communications, etc)</td>
<td>19</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Infrastructure (bridges, utilities, schools, roads)</td>
<td>13</td>
<td>12</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Human (lives, health, injuries)</td>
<td>24</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Economic (businesses, farmland)</td>
<td>6</td>
<td>8</td>
<td>9</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Cultural/historic (libraries, historic buildings, fairgrounds, museums)</td>
<td>1</td>
<td>9</td>
<td>10</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Environmental (forests, waterways)</td>
<td>5</td>
<td>8</td>
<td>9</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
4. Planning for natural hazards can help communities survive with fewer negative impacts. Prioritizing mitigation actions can help keep a community functioning as close to normally as possible during and after a disaster.

Of the following listed goals for reducing the risk from hazards, please assign a number to its level of importance, with "1" meaning "Not at all important," and "5" meaning "Very important."

<table>
<thead>
<tr>
<th>Statements</th>
<th>Very Important</th>
<th>Somewhat Important</th>
<th>Neutral</th>
<th>Not Very Important</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protect Life and Property: Protecting critical infrastructure (fire stations, hospitals, roads)</td>
<td>21</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Protect Private Property</td>
<td>5</td>
<td>11</td>
<td>7</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Preventing Development in hazard areas</td>
<td>6</td>
<td>5</td>
<td>8</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Support economic resilience to disasters (protect primary industries through education and support)</td>
<td>4</td>
<td>8</td>
<td>9</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Education and Outreach: Increase awareness and actions among citizens, agencies, nonprofit organizations, and industry</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Promote cooperation and partnerships with public agencies, citizens, businesses and nonprofit organizations</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Protect cultural and historic landmarks</td>
<td>3</td>
<td>6</td>
<td>11</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Preserve and rehabilitate natural systems to serve hazard mitigation functions</td>
<td>0</td>
<td>2</td>
<td>10</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Strengthen Emergency Services (fire, police, ambulance)</td>
<td>17</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Protect and reduce damage to utilities</td>
<td>9</td>
<td>11</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

5. For each activity listed below, please select the choice that applies to ANY member of your household.

For example, for the first answer, if ANY member of your household "has attended meetings
or received written information on natural disasters or emergency preparedness," please select "Have done."

<table>
<thead>
<tr>
<th>In your household, have you or someone in your household:</th>
<th>Have Done</th>
<th>Not Done</th>
<th>Unable To Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attended meetings or received written information on natural disasters or emergency preparedness?</td>
<td>16</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Talked with members in your household about what to do in case of a natural disaster or emergency?</td>
<td>16</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Developed a “Household/Family Emergency Plan” in order to decide what everyone would do in the event of a disaster?</td>
<td>14</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Prepared a “Disaster Supply Kit” (stored extra food, water, batteries, or other emergency supplies)?</td>
<td>8</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>In the last year, has anyone in your household been trained in First Aid or Cardio-Pulmonary Resuscitation (CPR)?</td>
<td>21</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Prepared your home by having smoke detectors on each level of the house</td>
<td>24</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Discussed or created a utility shutoff procedure in the event of a natural disaster?</td>
<td>4</td>
<td>21</td>
<td>0</td>
</tr>
</tbody>
</table>

6. What area of Gilliam County do you live in?

<table>
<thead>
<tr>
<th>City of Arlington</th>
<th>City of Condon</th>
<th>City of Lonerock</th>
<th>Unincorporated County</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>13</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

7. What is the most effective way for you to receive information about how to make your household and home safer from natural disasters?

<table>
<thead>
<tr>
<th>Email</th>
<th>Mailed Publications</th>
<th>Video</th>
<th>News outlets</th>
<th>Websites</th>
<th>Social Media</th>
<th>Complimentary Classes/courses</th>
<th>Other methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>13</td>
<td>7</td>
<td>8</td>
<td>6</td>
<td>17</td>
<td>7</td>
<td>n/a</td>
</tr>
</tbody>
</table>
NHMP In-person Outreach Survey

Number of Survey respondents: Six

1. Which of the following hazards are you most concerned about? (Please mark top three)

<table>
<thead>
<tr>
<th>Hazard</th>
<th># Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>2</td>
</tr>
<tr>
<td>Earthquake</td>
<td>0</td>
</tr>
<tr>
<td>Flood</td>
<td>0</td>
</tr>
<tr>
<td>Wildfire</td>
<td>2</td>
</tr>
<tr>
<td>Winter storm</td>
<td>2</td>
</tr>
<tr>
<td>Windstorm</td>
<td>0</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>0</td>
</tr>
</tbody>
</table>

2. In your opinion, which of the following community assets are most susceptible to damage from natural hazards?

<table>
<thead>
<tr>
<th>Asset</th>
<th># Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human (loss of life/injuries)</td>
<td>2</td>
</tr>
<tr>
<td>Economic (business closure/job loss)</td>
<td>1</td>
</tr>
<tr>
<td>Infrastructure (damage/loss of bridges, utilities, schools)</td>
<td>2</td>
</tr>
<tr>
<td>Cultural historical (damage/loss of libraries, museums, fairgrounds)</td>
<td>2</td>
</tr>
<tr>
<td>Environmental (damage/loss of forests, waterways, etc)</td>
<td>1</td>
</tr>
<tr>
<td>Governance (ability to maintain order and/or provide public amenities and services)</td>
<td>0</td>
</tr>
</tbody>
</table>

3. The following statements will help determine citizen priorities regarding planning for natural hazards in Gilliam County. Please tell us how important each one is to you.

<table>
<thead>
<tr>
<th>Statements</th>
<th>Very Important</th>
<th>Somewhat Important</th>
<th>Neutral</th>
<th>Not Very Important</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protecting private property</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Protecting critical infrastructure (transportation networks, hospitals, fire stations)</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Preventing development in hazard areas</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Enhancing the function of natural features</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Protecting historical and cultural landmarks</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Protecting and reducing damage to utilities</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Strengthen emergency services</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Promote cooperation and partnerships with, public agencies, citizens, businesses and non profit organizations</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Figure E.4 Outreach Flyer and Survey

Natural Hazard Mitigation Planning 101

Natural hazards happen. Disasters occur when they impact people, property, and the environment.

Why engage in natural hazards mitigation planning?

- To avoid disasters by reducing or eliminating the long-term risk to human life, property, and the environment from natural hazards
- To maintain eligibility for federal pre- and post-disaster mitigation funding for planning and projects

For more information, to review the plan, or to provide input, contact Nicola Mehring at nicola.mehring@co.hood-river.or.us

What is in a Natural Hazards Mitigation Plan?

- **Community Profile**: Describe the community in terms of geography, land use, housing, economy, demographics, governance, infrastructure.
- **Hazard Profile**: Describe hazards’ causes and characteristics; historic impacts; and future probability of occurrence.
- **Risk Assessment**: Combine community profile and hazard profile findings to identify strengths and weaknesses. Analyze and prioritize risk.
- **Mitigation Strategy**: Assess capabilities and set hazard mitigation goals. Identify and prioritize feasible actions to reduce LONG TERM risk.
- **Plan Maintenance Process**: Establish a system and schedule for monitoring, evaluating, and updating the Plan.

Help us plan by filling out this survey!

1. Which of the following hazards are you most concerned about? (please mark top three)
   - [ ] Drought
   - [ ] Earthquake
   - [ ] Flood
   - [ ] Landslide
   - [ ] Wildfire
   - [ ] Winter Storm
   - [ ] Windstorm
   - [ ] Volcanic Event

2. In your opinion, which of the following community assets are most susceptible to damage from natural hazards?
   - [ ] Human (loss of life, injuries)
   - [ ] Economic (business closure, job loss)
   - [ ] Infrastructure (damage/loss of bridges, utilities, schools)
   - [ ] Cultural/historic (damage/loss of libraries, museums, fairgrounds)
   - [ ] Environmental (damage/loss of forests, waterways, etc.)
   - [ ] Governance (ability to maintain order and/or provide public amenities and services)

3. The following statements will help determine citizen priorities regarding planning for natural hazards in Gilliam County. Please tell us how important each one is to you.

<table>
<thead>
<tr>
<th>Actions</th>
<th>Very Important</th>
<th>Somewhat Important</th>
<th>Neutral</th>
<th>Not Very Important</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protecting private property</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protecting critical facilities (e.g., transportation, networks, hospitals, fire stations)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventing development in hazard areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhancing the function of natural features (e.g., streams, wetlands)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protecting historical and cultural landmarks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protecting and reducing damage to utilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strengthening emergency services (e.g., police, fire, ambulance)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promoting cooperation among public agencies, citizens, non-profit organizations, and businesses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX F: GRANT PROGRAMS

Introduction

There are numerous local, state and federal funding sources available to support natural hazard mitigation projects and planning. The following section includes an abbreviated list of the most common funding sources utilized by local jurisdictions in Oregon. Because grant programs often change, it is important to periodically review available funding sources for current guidelines and program descriptions.

Post-Disaster Federal Programs

Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The HMGP involves a paper application which is first offered to the counties with declared disasters, then statewide if funding is still available. [http://www.fema.gov/hazard-mitigation-grant-program](http://www.fema.gov/hazard-mitigation-grant-program)

Physical Disaster Loan Assistance

When physical disaster loans are made to homeowners and businesses following disaster declarations by the U.S. Small Business Administration (SBA), up to 20% of the loan amount can go towards specific measures taken to protect against recurring damage in similar future disasters. [http://www.sba.gov/category/navigation-structure/loans-grants/small-business-loans/disaster-loans](http://www.sba.gov/category/navigation-structure/loans-grants/small-business-loans/disaster-loans)

Pre-Disaster Federal Programs

Pre-Disaster Mitigation Grant Program

The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds. The PDM grant program is offered annually; applications are submitted online. Applicants need
Flood Mitigation Assistance Program

The overall goal of the Flood Mitigation Assistance (FMA) Program is to fund cost-effective measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other National Flood Insurance Program (NFIP) insurable structures. This specifically includes:

- Reducing the number of repetitively or substantially damaged structures and the associated flood insurance claims;
- Encouraging long-term, comprehensive hazard mitigation planning;
- Responding to the needs of communities participating in the NFIP to expand their mitigation activities beyond floodplain development activities; and
- Complementing other federal and state mitigation programs with similar, long-term mitigation goals.

Detailed program and application information for federal post-disaster and pre-disaster programs can be found in the FY15 Hazard Mitigation Assistance Unified Guidance, available at: https://www.fema.gov/media-library/assets/documents/103279. Note that guidance regularly changes. Verify that you have the most recent edition. Flood mitigation assistance is usually offered annually; applications are submitted online. Applicants need a user profile approved by the State Hazard Mitigation Officer, which should be garnered well before the application period opens.

For Oregon Military Department, Office of Emergency Management (OEM) grant guidance on Federal Hazard Mitigation Assistance, visit: https://www.oregon.gov/OEM/emresources/Grants/Pages/HMA.aspx

Contact: Angie Lane, angie.lane@state.or.us

State Programs

Seismic Rehabilitation Grant Program

The Seismic Rehabilitation Grant Program (SRGP) provides state funds to strengthen public schools and emergency services buildings so they will be less damaged during an earthquake. Reducing property damage, injuries, and casualties caused by earthquakes is the goal of the SRGP. http://www.orinfrastructure.org/Infrastructure-Programs/Seismic-Rehab/

Community Development Block Grant Program

The Community Development Block Grant Program promotes viable communities by providing: 1) decent housing; 2) quality living environments; and 3) economic opportunities, especially for low and moderate income persons. Eligible activities most relevant to natural hazards mitigation include: acquisition of property for public purposes; construction/reconstruction of
public infrastructure; community planning activities. Under special circumstances, CDBG funds also can be used to meet urgent community development needs arising in the last 18 months which pose immediate threats to health and welfare.  

**Oregon Watershed Enhancement Board**

While OWEB’s primary responsibilities are implementing projects addressing coastal salmon restoration and improving water quality statewide, these projects can sometimes also benefit efforts to reduce flood and landslide hazards. In addition, OWEB conducts watershed workshops for landowners, watershed councils, educators, and others, and conducts a biennial conference highlighting watershed efforts statewide. Funding for OWEB programs comes from the general fund, state lottery, timber tax revenues, license plate revenues, angling license fees, and other sources. OWEB awards approximately $20 million in funding annually. More information at: http://www.oregon.gov/OWEB/Pages/index.aspx

**Federal Mitigation Programs, Activities & Initiatives**

**Basic & Applied Research/Development**

National Earthquake Hazard Reduction Program (NEHRP), National Science Foundation.

Through broad based participation, the NEHRP attempts to mitigate the effects of earthquakes. Member agencies in NEHRP are the US Geological Survey (USGS), the National Science Foundation (NSF), the Federal Emergency Management Agency (FEMA), and the National Institute for Standards and Technology (NIST). The agencies focus on research and development in areas such as the science of earthquakes, earthquake performance of buildings and other structures, societal impacts, and emergency response and recovery. http://www.nehrp.gov/

Decision, Risk, and Management Science Program, National Science Foundation.

Supports scientific research directed at increasing the understanding and effectiveness of decision making by individuals, groups, organizations, and society. Disciplinary and interdisciplinary research, doctoral dissertation research, and workshops are funded in the areas of judgment and decision making; decision analysis and decision aids; risk analysis, perception, and communication; societal and public policy decision making; management science and organizational design. The program also supports small grants for exploratory research of a time-critical or high-risk, potentially transformative nature. http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5423

**Hazard ID and Mapping**

National Flood Insurance Program: Flood Mapping; FEMA

National Map: Orthoimagery, DOI – USGS

Develops topographic quadrangles for use in mapping of flood and other hazards.  
https://nationalmap.gov/ortho.html

Mapping Standards Support, DOI-USGS


Soil Survey, USDA-NRCS

Maintains soil surveys of counties or other areas to assist with farming, conservation, mitigation or related purposes.  http://soils.usda.gov/survey/printed_surveys/

**Project Support**

Coastal Zone Management Program, NOAA.

Provides grants for planning and implementation of non-structural coastal flood and hurricane hazard mitigation projects and coastal wetlands restoration.  https://coast.noaa.gov/ CZM/

Community Development Block Grant Entitlement Communities Program, US Department of Housing and Urban Development

Provides grants to entitled cities and urban counties to develop viable communities (e.g., decent housing, a suitable living environment, expanded economic opportunities), principally for low- and moderate-income persons.  http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/community DEVELOPMENT/PROGRAMS/ENTITLEMENT

National Fire Plan (DOI – USDA)

The NFP provides technical, financial, and resource guidance and support for wildland fire management across the United States. This plan addresses five key points: firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability.  http://www.forestsandrangelands.gov/

Assistance to Firefighters Grant Program, FEMA

FEMA AFGM grants are awarded to fire departments to enhance their ability to protect the public and fire service personnel from fire and related hazards.  Three types of grants are available: Assistance to Firefighters Grant (AFG), Fire Prevention and Safety (FP&S), and Staffing for Adequate Fire and Emergency Response (SAFER).  http://www.fema.gov/welcome-assistance-firefighters-grant-program

Emergency Watershed Protection Program, USDA-NRCS

Provides technical and financial assistance for relief from imminent hazards in small watersheds, and to reduce vulnerability of life and property in small watershed areas damaged by severe natural hazard events.  
Rural Development Assistance – Utilities, USDA

Direct and guaranteed rural economic loans and business enterprise grants to address utility issues and development needs.  
https://www.rd.usda.gov/about-rd/agencies/rural-utilities-service

Rural Development Assistance – Housing, USDA.

The RDA program provides grants, loans, and technical assistance in addressing rehabilitation, health and safety needs in primarily low-income rural areas. Declaration of major disaster necessary.  
https://www.rd.usda.gov/programs-services

Public Assistance Grant Program, FEMA.

The objective of the Federal Emergency Management Agency's (FEMA) Public Assistance (PA) Grant Program is to provide assistance to State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President.  

National Flood Insurance Program, FEMA

The NFIP makes available flood insurance to residents of communities that adopt and enforce minimum floodplain management requirements.  
http://www.fema.gov/national-flood-insurance-program

HOME Investments Partnerships Program, HUD

The HOME IPP provides grants to states, local government and consortia for permanent and transitional housing (including support for property acquisition and rehabilitation) for low-income persons.  
https://www.hud.gov/program_offices/comm_planning/affordablehousing/programs/home/

Disaster Recovery Initiative, HUD

The DRI provides grants to fund gaps in available recovery assistance after disasters (including mitigation).  

Emergency Management Performance Grants, FEMA

EMPG grants help state and local governments to sustain and enhance their all-hazards emergency management programs.  
https://www.fema.gov/emergency-management-performance-grant-program

Partners for Fish and Wildlife, DOI – FWS

The PFW program provides financial and technical assistance to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats.  
http://www.fws.gov/partners/
North American Wetland Conservation Fund, DOI-FWS

NAWC fund provides cost-share grants to stimulate public/private partnerships for the protection, restoration, and management of wetland habitats.

Federal Land Transfer / Federal Land to Parks Program, DOI-NPS

Identifies, assesses, and transfers available federal real property for acquisition for State and local parks and recreation, such as open space.
http://www.nps.gov/ncrc/programs/fip/index.htm

Wetlands Reserve program, USDA-NCRS

The WR program provides financial and technical assistance to protect and restore wetlands through easements and restoration agreements.


Reauthorized for FY2012, it was originally enacted in 2000 to provide five years of transitional assistance to rural counties affected by the decline in revenue from timber harvests on federal lands. Funds have been used for improvements to public schools, roads, and stewardship projects. Money is also available for maintaining infrastructure, improving the health of watersheds and ecosystems, protecting communities, and strengthening local economies.
http://www.fs.usda.gov/pts/
Appendix G: OCCRI Report

Place holder – report to be provided