This page left intentionally blank.
Sherman County
Multi-jurisdictional Natural Hazards Mitigation Plan

Report for:
Sherman County
City of Grass Valley
City of Moro
City of Rufus
City of Wasco
500 Court Street
Moro, Oregon 97039

Prepared by:
University of Oregon’s Community Service Center:
Resource Assistance to Rural Environments &
Oregon Partnership for Disaster Resilience
1209 University of Oregon
Eugene, Oregon 97403-1209

December 2013
Special Thanks & Acknowledgements

Sherman County developed this Natural Hazards Mitigation Plan through a regional partnership funded by the Federal Emergency Management Agency’s Pre-Disaster Mitigation Competitive Grant Program. FEMA awarded the Mid-Columbia Gorge Region grant to support the update of natural hazard mitigation plans for eight counties in the region. The region’s planning process utilized a four-phased planning process, plan templates and plan development support provided by Resource Assistance for Rural Environments (RARE) and the Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon’s Community Service Center. This project would not have been possible without technical and financial support provided by the Mid-Columbia Council of Governments.

Regional partners include:

- Mid-Columbia Council of Governments
- Oregon Emergency Management
- Oregon Public Health
- FEMA Region X
- Oregon Partnership for Disaster Resilience at the University of Oregon’s Community Service Center
- Resource Assistance to Rural Environments at the University of Oregon’s Community Service Center

Sherman County NHMP Steering Committee:

Neil Pattee, Mayor, City of Grass Valley
Larry Trieblehorm, Mayor, City of Moro
Cliff Jett, Mayor, City of Rufus
Greg Gosson, City Maintenance, City of Wasco
Thomas Macnab, Fire Chief, Moro Rural Fire Protection District
Terry Gardner, Oregon Department of Transportation
Rod Asher, Chief, Sherman County Fire Defense Board
Jerrilea Mayfield, Sherman County Emergency Medical Services
Shawn Payne, Director, Sherman County Emergency Services Department
Georgia Macnab, Planner, Sherman County Planning Department
Mark Coles, Road Master, Sherman County Road Department
City of Grass Valley NHMP Steering Committee:
The Grass Valley City Council served as the Grass Valley NHMP Steering Committee.

City of Moro NHMP Steering Committee:
Larry Triebelhorn, Mayor, City of Moro
Rene’ Moore, Administrator, City of Moro

City of Rufus NHMP Steering Committee:
The Rufus City Council served as the Rufus NHMP Steering Committee.

City of Wasco NHMP Steering Committee:
The Wasco City Council served as the Wasco NHMP Steering Committee.

Project Managers:
Garrett Jensen, Resource Assistance for Rural Environments
Shawn Payne, Director, Sherman County Emergency Services Department

Community Service Center Staff:
Megan Smith, Director, Resource Assistance for Rural Environments; Co-Director, Community Service Center
Josh Bruce, Interim Director, Partnership for Disaster Resilience
Michael Howard, Program Specialist, Partnership for Disaster Resilience
Titus Tomlinson, Program Assistant, Resource Assistance for Rural Environments
Julie Foster, Grants Administrator, Community Service Center
Linda White, Office Coordinator, 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 (DOGAMI)
Federal Emergency Management Agency (FEMA)
U.S. Geological Survey (USGS), Quaternary Fault and Fold Database
Garrett Jensen, Resource Assistance for Rural Environments (RARE)
About the Community Service Center

The Community Service Center (CSC), a research center affiliated with the Department 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 CSC 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 Community Service Center 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 Community Service Center. 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 Hazard Mitigation Plan is based in part on a plan template developed by the Oregon Partnership for Disaster Resilience. 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. As part of this regional planning initiative, OPDR provided copies of the plan templates to communities for use in developing or updating their natural hazard mitigation plans. OPDR hereby authorizes the use of all content and language provided to Sherman County in the plan template.
# Sherman County

## Multi-jurisdictional Natural Hazards Mitigation Plan

### Table of Contents

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

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

**Volume II: Mitigation Resources**

- Appendix A: Action Item Forms ......................................................................................... A-1
- Appendix B: Planning and Public Process ............................................................................ B-1
- Appendix C: Community Profile .......................................................................................... C-1
- Appendix D: Economic Analysis of Natural Hazards Mitigation Projects ..................... D-1
- Appendix E: Regional Hazard Mitigation Public Opinion Survey .................................... E-1
- Appendix F: Grant Programs ............................................................................................... F-1
April 1, 2014

Honorable Gary Thompson
County Judge, Sherman County Commissioners
P.O. Box 365
500 Court Street
Moro, Oregon 97039

Dear Judge Thompson:

On February 13, 2014, the U.S. Department of Homeland Security’s Federal Emergency Management Agency (FEMA) approved the Sherman County Natural Hazards Mitigation Plan as a multi-jurisdictional local plan as outlined in 44 CFR Part 201. With approval of this plan, the following entities are now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act’s hazard mitigation project grants through February 12, 2019:

Sherman County

City of Wasco

City of Grass Valley

City of Moro

City of Rufus

The list of approved jurisdictions has been updated to include the cities of Wasco, Grass Valley, Moro, and Rufus, which have recently adopted their respective addendums to the Sherman County Natural Hazards Mitigation Plan. To continue eligibility the plan must be reviewed, revised as appropriate, and resubmitted within five years of the original approval date.

If you have questions regarding your plan’s approval or FEMA’s mitigation grant programs, please contact our State counterpart, Oregon Office of Emergency Management, which coordinates and administers these efforts for local entities.

Sincerely,

Mark Carey, Director
Mitigation Division

cc: Dennis Sigrist, Oregon Office of Emergency Management

BH:bb
Resolution # 02-02-2014

Adopting Updates to the Sherman County
Multi-Jurisdictional Natural Hazards Mitigation Plan

Whereas, Sherman County recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

Whereas, an adopted Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, Sherman County fully participated in the FEMA prescribed mitigation planning process to prepare this Natural Hazards Mitigation Plan; and

Whereas, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the Sherman County Multi-Jurisdictional Natural Hazard Mitigation Plan and pre-approved it (dated, January 22, 2014) contingent upon this official adoption of the participating governments and entities;

Now, therefore, be it resolved, that Sherman County adopts the Sherman County Multi-Jurisdictional Natural Hazards Mitigation Plan as an official plan; and

Be it further resolved, that Sherman County will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the Sherman County Multi-Jurisdictional Natural Hazards Mitigation Plan.

Adopted this ___ day of __February, 2014__

Certifying Official

FILED: 8:05am
February 6, 2014
JENINE MCDERMID
SHERMAN COUNTY CLERK
BY: JENINE MCDERMID
Commissioner's Journal Book E
File: 192 Page: 818 Item: 22
Resolution # 14-02-18

A Resolution Adopting the City of Wasco Representation in the Updates to the Sherman County Multi-Jurisdictional Natural Hazards Mitigation Plan

Whereas, the City of Wasco recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

Whereas, an adopted Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of Wasco has fully participated in the FEMA prescribed mitigation planning process to prepare the Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

Whereas, the City of Wasco has identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of the City of Wasco to the impacts of future disasters within the Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan; and

Whereas, these proposed projects and programs have been incorporated into the Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan that has been prepared and promulgated for consideration and implementation by the cities of Sherman County; and

Whereas, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan and pre-approved it (dated, January 22, 2014) contingent upon this official adoption of the participating governments and entities;

Now, therefore, be it resolved, that the City of Wasco adopts the Sherman County Multi-Jurisdictional Natural Hazards Mitigation Plan as an official plan; and

Be it further resolved, that the City of Wasco will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the Sherman County Multi-Jurisdictional Natural Hazards Mitigation Plan.

Adopted this 18th day of February, 2014

[Signature]
Certifying Official
A Resolution Adopting the City of Moro Representation in the Updates to the 
Sherman County 
Multi-Jurisdictional Natural Hazards Mitigation Plan

Whereas, the City of Moro recognizes the threat that natural hazards pose to people, 
property and infrastructure within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to 
people, property and infrastructure from future hazard occurrences; and

Whereas, an adopted Natural Hazards Mitigation Plan is required as a condition of future 
funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation 
grant programs; and

Whereas, the City of Moro has fully participated in the FEMA prescribed mitigation 
planning process to prepare the Sherman County, Multi-Jurisdictional Natural Hazard 
Mitigation Plan, which has established a comprehensive, coordinated planning process to 
eliminate or minimize these vulnerabilities; and

Whereas, the City of Moro has identified natural hazard risks and prioritized a number of 
proposed actions and programs needed to mitigate the vulnerabilities of the City of Moro 
to the impacts of future disasters within the Sherman County, Multi-Jurisdictional 
Natural Hazard Mitigation Plan; and

Whereas, these proposed projects and programs have been incorporated into the 
Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan that has been 
prepared and promulgated for consideration and implementation by the cities of Sherman 
County; and

Whereas, the Oregon Office of Emergency Management and Federal Emergency 
Management Agency, Region X officials have reviewed the Sherman County, Multi-
Jurisdictional Natural Hazard Mitigation Plan and pre-approved it (dated, January 22, 
2014) contingent upon this official adoption of the participating governments and 
entities;

Now, therefore, be it resolved, that the City of Moro adopts the Sherman County Multi-
Jurisdictional Natural Hazards Mitigation Plan as an official plan; and

Be it further resolved, that the City of Moro will submit this Adoption Resolution to the 
Oregon Office of Emergency Management and Federal Emergency Management Agency, 
Region X officials to enable final approval of the Sherman County Multi-Jurisdictional 
Natural Hazards Mitigation Plan.

Adopted this 4th day of March, 2014

Certifying Official
A Resolution Adopting the City of Grass Valley Representation in the Updates to the Sherman County Multi-Jurisdictional Natural Hazards Mitigation Plan

Whereas, the City of Grass Valley recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

Whereas, an adopted Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of Grass Valley has fully participated in the FEMA prescribed mitigation planning process to prepare the Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

Whereas, the City of Grass Valley has identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of the City of Grass Valley to the impacts of future disasters within the Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan; and

Whereas, these proposed projects and programs have been incorporated into the Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan that has been prepared and promulgated for consideration and implementation by the cities of Sherman County; and

Whereas, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan and pre-approved it (dated, January 22, 2014) contingent upon this official adoption of the participating governments and entities;

Now, therefore, be it resolved, that the City of Grass Valley adopts the Sherman County Multi-Jurisdictional Natural Hazards Mitigation Plan as an official plan; and

Be it further resolved, that the City of Grass Valley will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the Sherman County Multi-Jurisdictional Natural Hazards Mitigation Plan.

Adopted this ___ day of March, 2014

Certifying Official
A Resolution Adopting the City of Rufus Representation in the Updates to the Sherman County Multi-Jurisdictional Natural Hazards Mitigation Plan

Whereas, the City of Rufus recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

Whereas, an adopted Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of Rufus has fully participated in the FEMA prescribed mitigation planning process to prepare the Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

Whereas, the City of Rufus has identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of the City of Rufus to the impacts of future disasters within the Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan; and

Whereas, these proposed projects and programs have been incorporated into the Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan that has been prepared and promulgated for consideration and implementation by the cities of Sherman County; and

Whereas, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the Sherman County, Multi-Jurisdictional Natural Hazard Mitigation Plan and pre-approved it (dated, January 22, 2014) contingent upon this official adoption of the participating governments and entities;

Now, therefore, be it resolved, that the City of Rufus adopts the Sherman County Multi-Jurisdictional Natural Hazards Mitigation Plan as an official plan; and

Be it further resolved, that the City of Rufus will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the Sherman County Multi-Jurisdictional Natural Hazards Mitigation Plan.

Adopted this 19th day of February 2014

[Signature]
Certifying Official
Volume I:
Basic Plan
This page left intentionally blank.
Executive Summary

Sherman 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: Sherman County, the City of Grass Valley, the City of Moro, the City of Rufus, and the City of Wasco. 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 permanently 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” - individuals, private businesses and industries, state and local governments, and the federal government.

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 project grants.

Who Participated in Developing the Plan?

Sherman 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 Grass Valley
- City of Moro
- City of Rufus
- City of Wasco
- Moro Rural Fire Protection District
- Oregon Department of Transportation
- Sherman County Emergency Medical Services
- Sherman County Emergency Services Department
- Sherman County Fire Defense Board
- Sherman County Planning Department
- Sherman County Road Department

Sherman 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.

Public outreach began early on and in the fall of 2011; the Oregon Partnership for Disaster Resilience (OPDR) distributed a mailed survey to 7,500 random households throughout the eight counties updating plans in the Columbia Gorge Region, 400 of which were sent to Sherman County households.

**How Does this Mitigation Plan Reduce Risk?**

This natural hazard mitigation plan is intended to assist Sherman County, the City of Grass Valley, the City of Moro, the City of Rufus, and the City of Wasco 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 Sherman 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?

Sherman County, the City of Grass Valley, the City of Moro, the City of Rufus, and the City of Wasco each conducted a risk assessment to evaluate the probability of each hazard as well as the vulnerability of the community to that hazard. 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 there is a lot of similarity between the cities and the county across all hazards. The greatest variation in hazard probability comes with the hazards of Drought (all the cities rank their probability risk lower than the county), Flood (all the cities rank their probability risk lower than the county), Landslide/Debris Flow (all the cities rank their probability risk lower than the county), Volcanic Event (the cities of Grass Valley and Wasco rate their probability risk higher than the county), Wildfire (the city of Moro ranks its probability risk lower than the county) and Windstorm (the city of Moro ranks its probability risk lower than the county).
Table ES.1: Risk Assessment - Probability

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Sherman County</th>
<th>Grass Valley</th>
<th>Moro</th>
<th>Rufus</th>
<th>Wasco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Flood</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Wildfire</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Windstorm</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: Sherman County NHMP Steering Committee, Updated February 15, 2012; Steering Committees for the cities of Grass Valley (April 2, 2012), Moro (May 16, 2012), Rufus (April 11, 2012) and Wasco (May 15, 2012)

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 a lot of variability between the county ratings and those of the cities. The greatest variation in hazard vulnerability comes with the hazards of Drought (all the cities rank their vulnerability risk lower than the county), Earthquake (Grass Valley, Moro and Rufus rate their vulnerability risk higher than the county), Flood (Grass Valley and Rufus rate their vulnerability risks higher than the county), Volcanic Event (all the cities rate their vulnerability risk higher than the county), Wildfire (Grass Valley, Moro and Wasco rate their vulnerability risk higher than the county), Windstorm (Moro rates their vulnerability risk lower than the county) and Winter Storm (all the cities rank their vulnerability risk higher than the county).

Table ES.2: Risk Assessment - Vulnerability

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Sherman County</th>
<th>Grass Valley</th>
<th>Moro</th>
<th>Rufus</th>
<th>Wasco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Flood</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Wildfire</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Windstorm</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: Sherman County NHMP Steering Committee, Updated February 15, 2012; Steering Committees for the cities of Grass Valley (April 2, 2012), Moro (May 16, 2012), Rufus (April 11, 2012) and Wasco (May 15, 2012)

What are the Plan Goals?

The plan goals describe the overall direction that the participating jurisdiction’s agencies,

44 CFR 201.6(c)(3)(i) – A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
organizations, and citizens can take toward mitigating risk from natural hazards.

1. Enhance the ability to respond effectively and swiftly
2. Protect life, reduce injuries, and minimize damage to property
3. Increased cooperation and collaboration between groups and agencies
4. 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 and within Section 3: Mitigation Strategy), which lists all the multi-hazard and hazard-specific action items included in the mitigation plan. The four incorporated cities – Grass Valley, Moro, Rufus and Wasco – have limited resources and rely on the county for certain services and public facilities. Because the cities rely upon the county to provide services most of the action items benefit both the county and the participating cities. Data collection, research and the public participation process resulted in the development of the action items. The Action Item Matrix 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.

How will the plan be implemented?

The plan maintenance section of this plan details the formal process that will ensure that the Sherman 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 annual 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 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 Sherman 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. This review will address the federal criteria outlined in FEMA Interim Final Rule 44 CFR Part 201.6. Once the plan is pre-approved by FEMA, the county formally adopts the plan via resolution. The individual jurisdiction’s conveners will be responsible for ensuring local adoption of the Sherman County multi-jurisdictional Natural Hazards Mitigation Plan and providing the support necessary to ensure plan implementation. Once the resolution is executed at the local level and documentation is provided to FEMA, the plan is formally acknowledged by FEMA and the county gains (or maintains) eligibility for the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds, and the Flood Mitigation Assistance program funds.

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 outlined 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 Plan 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.

Sherman County adopted the plan on **February 5, 2014**.

The City of Grass Valley adopted the plan on **March 3, 2014**.

The City of Moro adopted the plan on **March 4, 2014**.

The City of Rufus adopted the plan on **February 19, 2014**.

The City of Wasco adopted the plan on **February 18, 2014**.

FEMA Region X approved the Sherman County Multi-jurisdictional NHMP on **February 12, 2014**. 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 **February 12, 2019**.
### Table ES.3: 2012 Action Items: Sherman County, Cities of Grass Valley, Moro, Rufus and Wasco

<table>
<thead>
<tr>
<th>2012 Action Item</th>
<th>2012 Action Item Title</th>
<th>Coordinating Organization</th>
<th>Partner Organizations (Internal and External)</th>
<th>Timeline</th>
<th>Alignment with Goals</th>
<th>Applicable Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MH #1</strong></td>
<td>Seek funding for the implementation of priority projects that reduce the vulnerability of critical public facilities in Sherman County.</td>
<td>Sherman County Emergency Management</td>
<td>Sherman County; Sherman County NHMP Steering Committee; Cities of Grass Valley, Moro, Rufus, and Wasco; OEM; DOGAMI; FEMA</td>
<td>Long Term</td>
<td>X X X X X X X X X X</td>
<td>Sherman County; Grass Valley; Moro; Rufus; Wasco</td>
</tr>
<tr>
<td><strong>MH #2</strong></td>
<td>Work with utilities operating in Sherman County to establish tree-pruning programs around transmission lines and trunk distribution lines.</td>
<td>Sherman County Emergency Management</td>
<td>Sherman County; Cities of Grass Valley, Moro, Rufus, and Wasco; Pacific Power and Light; Wasco Rural Electric; BPA</td>
<td>Ongoing</td>
<td>X X X X X X X X X</td>
<td>Sherman County; Grass Valley; Moro; Rufus; Wasco</td>
</tr>
<tr>
<td><strong>MH #3</strong></td>
<td>Reduce the effects of winter storms on existing utility lines</td>
<td>Pacific Power and Light; Wasco Electric Cooperative</td>
<td>Sherman County; Cities of Grass Valley, Moro, Rufus, and Wasco; BPA</td>
<td>Ongoing</td>
<td>X X X X X X X X X</td>
<td>Sherman County; Grass Valley; Moro; Rufus; Wasco</td>
</tr>
<tr>
<td><strong>MH #4</strong></td>
<td>Develop and maintain a comprehensive impact database on severe natural hazard events in Sherman County.</td>
<td>Sherman County Emergency Management</td>
<td>County Planning; GIS; Cities of Grass Valley, Moro, Rufus, and Wasco; Utilities; ODOT; Oregon Climate Service; National Weather Service; National Oceanic and Atmospheric Administration (NOAA)</td>
<td>Ongoing</td>
<td>X X X X X X X X X</td>
<td>Sherman County; Grass Valley; Moro; Rufus; Wasco; Gilliam County, Wheeler County, ODOT</td>
</tr>
<tr>
<td><strong>MH #5</strong></td>
<td>Identify opportunities to reduce existing barriers to interagency cooperation and work together to reduce risk and loss from natural hazards.</td>
<td>Sherman County</td>
<td>County Emergency Management; County Road Department; Fire Districts; Cities of Grass Valley, Moro, Rufus, and Wasco; Gilliam County, Wheeler County, ODOT</td>
<td>Ongoing</td>
<td>X X X X X X X X X</td>
<td>Sherman County; Grass Valley; Moro; Rufus; Wasco; Gilliam County, Wheeler County, ODOT</td>
</tr>
<tr>
<td><strong>DR #1</strong></td>
<td>Include information regarding droughts in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Sherman County Emergency Management</td>
<td>County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; SWCD; Media; Railroad; Utilities; OSU Extension; Oregon Department of Agriculture; ODOT; OEM, American Red Cross; FEMA; FSA; NRCS</td>
<td>Ongoing</td>
<td>X X X X X X X X X</td>
<td>County Court; County Planning; County Road Department; Sherman County Emergency Management; City of Grass Valley; School District; Oregon Emergency Management; Federal Emergency Management Agency; American Red Cross; Army Corps of Engineers; FEMA; FSA</td>
</tr>
<tr>
<td><strong>EQ #1</strong></td>
<td>Include information regarding earthquakes in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Sherman County Emergency Management</td>
<td>County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; Media; Medical Clinic; North Central Public Health District; Railroad; School Districts; Utilities; ODOT; OEM; DOGAMI; American Red Cross; Army Corps of Engineers; FEMA; FSA</td>
<td>Long Term</td>
<td>X X X X X X X X X</td>
<td>County Court; Sherman County Emergency Management; City of Grass Valley; School District; Oregon Emergency Management; Federal Emergency Management Agency</td>
</tr>
<tr>
<td><strong>EQ #2</strong></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 a high collapse potential rate by the Department of Geology and Mineral Industries (DOGAMI).</td>
<td>Sherman County Planning Department</td>
<td>County Court; Sherman County Emergency Management; City of Grass Valley; School District; Oregon Emergency Management; Federal Emergency Management Agency</td>
<td>Long Term</td>
<td>X X X X X X X X X</td>
<td>County Court; Sherman County Emergency Management; City of Grass Valley; School District; Oregon Emergency Management; Federal Emergency Management Agency</td>
</tr>
<tr>
<td>2012 Action Item</td>
<td>2012 Action Item Title</td>
<td>Coordinating Organization</td>
<td>Partner Organizations (Internal and External)</td>
<td>Timeline</td>
<td>Alignment with Goals</td>
<td>Applicable Jurisdiction</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------</td>
<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>Sherman County Emergency Management</td>
<td>County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; Medical Clinic; Railroad; Utilities; ODOT; OEM; Senior and Disabled Services; American Red Cross; Army Corps of Engineers; FEMA; FSA</td>
<td>Ongoing</td>
<td>X X X X X X X</td>
<td>Sherman County, Grass Valley, Moro, Rufus, and Wasco</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>Sherman County Planning Department</td>
<td>County Emergency Management; Cities of Grass Valley, Moro, Rufus, and Wasco; DLC; OEM; FEMA</td>
<td>Ongoing</td>
<td>X X X X X X</td>
<td>Sherman County, Grass Valley, Moro, Rufus, and Wasco</td>
</tr>
<tr>
<td>FL #3</td>
<td>Develop a database of repetitive flood loss properties not covered by the National Flood Insurance Program.</td>
<td>Sherman County Emergency Management</td>
<td>Sherman County, Cities of Grass Valley, Moro, Rufus, and Wasco; DLC; OEM, FEMA</td>
<td>Long Term</td>
<td>X X X X X X</td>
<td>Sherman County, Grass Valley, Moro, Rufus, and Wasco</td>
</tr>
<tr>
<td>FL #4</td>
<td>Coordinate with the State Floodplain Coordinator and the Department of Land Conservation and Development (DLC) to update the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for Sherman County and the incorporated cities participating in the National Flood Insurance Program (NFIP).</td>
<td>Sherman County Planning Department</td>
<td>County Emergency Management; Cities of Grass Valley, Rufus, and Wasco; Department of Land Conservation and Development; Oregon Emergency Management; Federal Emergency Management Agency</td>
<td>Long Term</td>
<td>X X X X X X</td>
<td>Sherman County, Grass Valley, Moro, Rufus, and Wasco</td>
</tr>
<tr>
<td>LS #1</td>
<td>Include information regarding landslides/debris flows in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Sherman County Emergency Management</td>
<td>County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; Media; Railroads; Utilities; ODOT; OEM; Oregon Department of Fish &amp; Wildlife; American Red Cross; FSA</td>
<td>Ongoing</td>
<td>X X X X X X</td>
<td>Sherman County, Grass Valley, Moro, Rufus, and Wasco</td>
</tr>
<tr>
<td>SW/ WS #1</td>
<td>Educate farmers about ways to protect livestock from the effects of winter storms.</td>
<td>Sherman County Emergency Management</td>
<td>OSU extension; Oregon Department of Agriculture</td>
<td>Ongoing</td>
<td>X X X X X X</td>
<td>Sherman County, Grass Valley, Moro, Rufus, and Wasco</td>
</tr>
<tr>
<td>SW/ WS #2</td>
<td>Include information regarding severe weather/severe weather/winter storms in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Sherman County Emergency Management</td>
<td>County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; Media; Medical Clinic; Utilities; ODOT; OEM; American Red Cross</td>
<td>Ongoing</td>
<td>X X X X X X</td>
<td>Sherman County, Grass Valley, Moro, Rufus, and Wasco</td>
</tr>
</tbody>
</table>
Table ES.3: 2012 Action Items: Sherman County, Cities of Grass Valley, Moro, Rufus and Wasco (continued)

<table>
<thead>
<tr>
<th>2012 Action Item</th>
<th>2012 Action Item Title</th>
<th>Coordinating Organization</th>
<th>Partner Organizations (Internal and External)</th>
<th>Timeline</th>
<th>Alignment with Goals</th>
<th>Applicable Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Volcanic Event</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VE #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>Sherman County Emergency Management</td>
<td>County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; North Central Public Health District; Media; Medical Clinic; School District; ODOT; OEM; Senior and Disabled Services; American Red Cross; Railroads; Utilities; USGS; DEQ</td>
<td>Long Term</td>
<td>X X X X X</td>
<td>Sherman County, Grass Valley, Moro, Rufus, Wasco</td>
</tr>
<tr>
<td><strong>Wildfire</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WF #1</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>Sherman County Emergency Management</td>
<td>County Court; County Planning; County Road Department; Sheriff; Fire Districts; Cities of Grass Valley, Moro, Rufus, and Wasco; Media; Medical Clinic; Mutual Aid Partners; Railroads; Utilities; ODF; ODOT; OEM; Oregon Department of Fish &amp; Wildlife; OSP; State Fire Marshall; American Red Cross; BLM</td>
<td>Ongoing</td>
<td>X X X X X X X</td>
<td>Sherman County, Grass Valley, Moro, Rufus, Wasco</td>
</tr>
<tr>
<td><strong>Windstorm</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WDS #1</td>
<td>Include information regarding windstorms in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Sherman County Emergency Management</td>
<td>County Court; County Road Department; Sheriff; Fire Districts; Cities of Grass Valley, Moro, Rufus, and Wasco; Media; Medical Clinic; Railroads; Utilities; ODOT; OEM; Senior and Disabled Services; American Red Cross</td>
<td>Ongoing</td>
<td>X X X X X X X</td>
<td>Sherman County, Grass Valley, Moro, Rufus, Wasco</td>
</tr>
</tbody>
</table>
Section I: Introduction

This section provides a general introduction to natural hazards mitigation planning in Sherman County. In addition, Section I: Introduction 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 permanently 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” - individuals, private businesses and industries, state and local governments, and the federal government.

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?

Sherman 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: Sherman County, the City of Grass Valley, the City of Moro, the City of Rufus, and the City of Wasco. 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 project grants.
What Federal Requirements Does This Plan Address?

The Disaster Mitigation Act of 2000 (DMA 2000) is the latest federal legislation addressing 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 land use 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 the jurisdiction’s Comprehensive Plan, and helps each jurisdiction meet the requirements of statewide land use 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
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 (DLC).  

**How was the Plan Developed?**

The first Sherman County Natural Hazards Mitigation Plan was developed and approved in 2008. The 2011 plan update process marks the first update and second version of the county’s NHMP. This updated NHMP will consolidate and replace prior version of the plan.

**2011/2012 Plan Update Process**

The plan was developed following a pre-formulated schedule provided by the Oregon Partnership for Disaster Resilience and described by the statement of work in the county’s update and review process. The following schedule was developed to provide a timeline for completion of the plan update sections, though altered accordingly throughout the year 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>November</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 2 Work Session</td>
<td>Risk Assessment</td>
<td>February</td>
</tr>
<tr>
<td>Stage 3 Work Session</td>
<td>Goals &amp; 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 Work Session</td>
<td>Final Plan Preparation</td>
<td>June-August</td>
</tr>
<tr>
<td>Stage 6 Work Session</td>
<td>Plan Implementation</td>
<td></td>
</tr>
</tbody>
</table>

Source: Oregon Partnership for Disaster Resilience, 2012

Sherman County funded the 2011/2012 update of the Natural Hazards Mitigation Plan through a 2011 Pre-Disaster Mitigation (PDM) Planning Grant from FEMA. The Oregon Partnership for Disaster Resilience (OPDR) and Oregon Emergency Management utilized the PDM planning grant to update eight counties’ natural hazards mitigation plans in the Columbia Gorge region.

The Sherman County Emergency Management Department served as the convener for Sherman County Natural Hazards Mitigation Plan update process. The Sherman County Emergency Management Coordinator developed a new plan steering committee to review and update the mitigation plan 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 November 2011 and June 2012, the steering committee convened for three update meetings. Also during the update process, each city in Sherman 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 and sign-in sheets for each of the plan update meetings.

**SHERMAN COUNTY PLAN UPDATE INTRODUCTORY MEETING (NOVEMBER 2011)**

On November 9, 2011, the Sherman County Natural Hazards Mitigation Steering Committee (NHMSC) reconvened for an introductory meeting with OPDR and the RARE participant to provide an overview of the plan update process. The purpose of the meeting 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 OPDR 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.

**SHERMAN COUNTY RISK ASSESSMENT MEETING (FEBRUARY 2012)**

On February 15, 2012, 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) gather and update hazard history and probability and vulnerability estimates for each of the hazards identified in the county, (2) update the hazard analysis matrix for the windstorm hazard, (3) identify community vulnerabilities for each hazard addressed in the plan, and (4) 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 relative risk 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.

**CITY OF GRASS VALLEY RISK ASSESSMENT MEETING (APRIL 2012)**

On April 2, 2012, the RARE participant attended the Grass Valley City Council meeting 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 Sherman County NHMSC.

**CITY OF RUFUS RISK ASSESSMENT MEETING (APRIL 2012)**

On April 11, 2012, the RARE participant attended the Rufus City Council meeting 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 Sherman County NHMSC.
**City of Wasco Risk Assessment Meeting (May 2012)**

On May 15, 2012, the RARE participant attended the Wasco City Council meeting 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 Sherman County NHMSC.

**City of Moro Risk Assessment Meeting (May 2012)**

On May 16, 2012, the RARE participant and representatives from the City of Moro 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 Sherman County NHMSC.

**Sherman County Mitigation Strategy and Plan Implementation and Maintenance Meeting (May 2012)**

On June 5, 2012, NHMSC met once again to review and update the mitigation strategy and plan implementation and maintenance schedule. The purpose of the first half of the work session was to (1) review and update the mitigation plan’s mission statement and goals, (2) determine the status and progress of action items in the 2008 mitigation plan, and (3) discuss new action items for the 2012 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.

**Regional Survey and Public Outreach**

Public outreach began early on and in the fall of 2011; the Oregon Partnership for Disaster Resilience (OPDR) distributed a mailed survey to 7,500 random households throughout the eight counties updating plans in the Columbia Gorge Region, 400 of which were sent to Sherman County households. OPDR developed and distributed the survey in partnership with the University of Oregon’s Resource Assistance for Rural Environments (RARE) Program. The voluntary survey consisted of 24 questions divided into four sections: natural hazard information; community vulnerabilities and hazard mitigation strategies; mitigation and preparedness activities in your household; and general household information. OPDR and RARE designed the survey to determine public perceptions and opinions regarding natural hazards. Questions also focused on the methods and techniques survey respondents prefer to use in reducing the risks and losses associated with natural hazards. Volume III: Appendix E: Regional Household Preparedness Survey includes the survey instrument and results from the regional household preparedness survey.

During early stages of the planning process, pre-existing plans, studies, reports and other technical information from Sherman 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 mitigation plan 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 Hazard 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 Sherman County. The section includes a community profile, discussion of the government structure, listing of existing plans, policies, and programs, listing of community organizations, summary of existing mitigation actions, and an overview of the hazards addressed in the plan. 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 Hazard Annexes.

SECTION 4: PLAN IMPLEMENTATION AND MAINTENANCE
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.

Volume II: Mitigation Resources
The mitigation resources are designed to provide the users of the Sherman 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 Sherman County. The community profile is comprised of six different sections that describe Sherman 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 developed.

**APPENDIX D: ECONOMIC ANALYSIS OF NATURAL HAZARDS MITIGATION PROJECTS**
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 The Partnership. 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: REGIONAL HAZARD MITIGATION PUBLIC OPINION SURVEY**
This appendix includes the survey instrument and results from the regional household preparedness survey implemented by OPDR. The survey aims to gauge household knowledge of mitigation tools and techniques to assist in reducing the risk and loss from natural hazards, as well as assessing household disaster preparedness.

**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.
Section 2: All-Hazard Risk Assessment

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. Assessing natural hazard risk begins with the identification of hazards that can impact the jurisdiction. Included in the hazard assessment is an evaluation of potential hazard impacts – type, location, extent, etc. The second step in the risk assessment process is the identification of important community assets and system vulnerabilities. Example vulnerabilities include people, businesses, homes, roads, historic places, and drinking water sources. The last step is to evaluate the extent to which the identified hazards overlap with, or have an impact on, the important assets identified by the community.

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.

**Figure 2.1: Understanding Risk**

![Understanding Risk Diagram](https://www.oregonshowcase.org)

Source: Oregon Partnership for Disaster Resilience
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, as well as county staff and emergency managers to be prepared as much as possible. Sherman County identifies eight natural hazards that could potentially have an impact on the county. These hazards include: drought, earthquake, flood, landslide/debris flow, volcanic event, wildfire, windstorm, and winter storm. Table 2.1 categorizes the hazards identified by the county and compares it to the regional hazards identified in the State of Oregon NHMP for the Mid-Columbia Region, which includes Sherman County.

Table 2.1: Sherman County Hazard Identification

<table>
<thead>
<tr>
<th>Sherman 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>Landslide/Debris Flow</td>
<td>Landslide/Debris Flow</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>Volcano-Related Hazards</td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>Fires in Urban/Wildland Interface</td>
</tr>
<tr>
<td>Windstorm</td>
<td>Windstorm</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>Winter Storm</td>
</tr>
</tbody>
</table>

Source*: Sherman County NHMP Steering Committee, Updated February 15, 2012
Source*: State of Oregon Natural Hazards Mitigation Plan, Region 5: Mid-Columbia

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. Where trends emerge, disaster declarations 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 declared disasters have been approved within every state as a result of natural hazard related events. As of March 2012, FEMA has approved a total of 28 federal disaster declarations, two emergency declarations, and 49 fire management assistance declarations in Oregon. 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. When governors ask for presidential declarations of major disaster or emergency, they stipulate


which counties in their state they want included in the declaration. Table 2.2 summarizes the four major disasters declared for Sherman County by FEMA since 1953. The table shows that all of the major disaster declarations in Sherman County have been weather related.

### Table 2.2: FEMA Major Disaster Declarations - Sherman County

<table>
<thead>
<tr>
<th>Declaration Number</th>
<th>Date</th>
<th>Incident(s):</th>
<th>Incident 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-1099</td>
<td>9-Feb-1996</td>
<td>Severe Storms, Flooding</td>
<td>4-Feb-1996 to 21-Feb-1996</td>
<td>None</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

### 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. Table 2.3 lists the only federal emergency declaration for the county. In April 1977, a drought was declared for much of Oregon including Sherman County.

### Table 2.3: FEMA Emergency Declarations - Sherman County

<table>
<thead>
<tr>
<th>Declaration Number</th>
<th>Date</th>
<th>Incident(s):</th>
<th>Incident 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>-</td>
<td>None</td>
<td>A, B</td>
</tr>
</tbody>
</table>

Source: FEMA, Oregon Disaster History, Emergency Declarations

The following subsections summarize the characteristics and extent of each hazard. For additional information on each hazard, refer to Section 3: Hazard Chapters in the 2012 State of Oregon Natural Hazards Mitigation Plan.

---

Drought

**Characteristics**

Droughts are not uncommon in Oregon, nor are they just an “east of the mountains” phenomenon. They occur in all parts of the state in both summer and winter months. Droughts appear to be recurring and they can have a profound effect on the economy, particularly the hydro-power and agricultural sectors. 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. They include insect infestations in forests and the lack of water to support endangered fish species. 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.

The Oregon State University Extension Service published a report in June 1979 following the 1977 drought. Highlights of the survey findings indicate that the 1977 drought affected ranches in Eastern Oregon in the following ways:

- 80-percent of ranchers affected
- Three million AUM’s* forage lost
- 210,000 tons feed purchased
- 862,000 AUM’s forage leased
- 69,000 tons reduced hay sales
- 89,000 AUM’s salvaged from grain crops
- 115,000 animals sold
- 41 million gallons of water hauled

Other affects and adjustments include reduced rate of gain of cattle, delayed breeding, herd health problems, damaged grain crops and water development and equipment investments.

*AUM – Animal Unit Months: is the amount of forage needed to sustain one cow and her calf, one horse or five sheep or goats for a month.

**Location/Extent**

All of Sherman County is subject to a drought hazard.

**Significant Droughts**

Table 2.4 below identifies significant drought that have impacted Sherman County.

---


### Earthquake

**CHARACTERISTICS**

The geographical position of this region makes it susceptible to earthquakes from three sources: subduction zone, intraplate, and crustal events. However, given its location Sherman County is most susceptible to crustal earthquakes, with less potential for impacts from subduction or intraplate events. This suggests Sherman County can most likely expect shorter duration events with low levels of ground shaking and limited liquefaction (Region 5 Profile; DOGAMI). Figure 2.2 shows identified faults located in Sherman County and the surrounding area. Table 2.5 describes the faults located within the 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 Sherman County due to drought conditions.</td>
</tr>
<tr>
<td>2003</td>
<td>Governor Theodore Kulongoski issued a state of drought emergency in Sherman County on August 15, 2003. Executive Order No. 03-09 was issued due to conditions caused by drought and low water conditions.</td>
</tr>
<tr>
<td>2005</td>
<td>Governor Theodore Kulongoski issued a state of drought emergency for six counties in Oregon including Sherman 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 Sherman County on September 24, 2008. Executive Order No. 08-22 was issued due to conditions caused by drought and severe weather.</td>
</tr>
</tbody>
</table>

Areas within Sherman 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 Deschutes River valley, John Day River valley as well as in northern portions of the county near the Columbia River. There have been no previous occurrences of earthquakes documented in Sherman 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.
Flood

**Characteristics**

The most common type of flooding is associated with unseasonably warm, rainy weather during the winter months that can quickly melt snow. This condition 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. Flash floods and waterspouts are a substantial summer phenomenon and are associated with intense local thunderstorms. 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 lower Deschutes River or 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 lower Deschutes River and John Day River (Columbia River tributaries) are confined to fairly deep canyons with small floodplains. Consequently, they do not present the flood problems associated with smaller rivers.

**Location/Extent**

A majority (80 to 100-percent) of Sherman County is subject to a variety of flood conditions. Areas particularly susceptible to flooding include Gerkin Canyon, Grass Valley Canyon, Hay Canyon, Helm Spring, Barnum Creek, Biglow Road, China Hollow Lane, Dehler Lane, Kaseberg Lane, McDermid Estate Lane, McDonald Ferry Lane, McNab Lane, Welk Road and Medler.

The 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).

**Significant Floods**

*January 1923* – Widespread flooding in the Mid-Columbia Region. The weather was unseasonable warm with intense rain. Heavy rain melted snow rapidly and caused flooding throughout the region.

*January 1933* – Widespread flooding again in the Mid-Columbia Region. Heavy rain melted snow rapidly and caused flooding throughout the region.

*December 1955* - Widespread flooding again in the Mid-Columbia Region. Heavy rain melted snow rapidly and caused flooding throughout the region.

*December 1964* – Record breaking floods throughout the Mid-Columbia Region. Intense rain melted heavy snow packs that caused terrible flood damage.
February 1986 - The weather was unseasonable warm with intense rain. Heavy rain melted snow rapidly and caused flooding throughout the region.

Winter 1996/1997 – Flooding caused damage to many highways in Sherman County.

August 2003 – Flash floods in Rufus. City Hall, emergency services, and three residential basements flooded. Road damage was also reported.

Table 2.6: Historical Flood Records Deschutes River at Moody, 1898-2009
Above Major Flood Stage (12 ft)

<table>
<thead>
<tr>
<th>Date Crest</th>
<th>Gage Height (ft)</th>
<th>Streamflow (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-Feb-1996</td>
<td>12.08</td>
<td>70,300</td>
</tr>
<tr>
<td>22-Dec-1964</td>
<td>11.80</td>
<td>67,300</td>
</tr>
<tr>
<td>7-Jan-1923</td>
<td>10.20</td>
<td>43,600</td>
</tr>
</tbody>
</table>


Landslide/Debris Flow

**Characteristics**

The general term landslide refers to a range of geologic failures including slides, flows, falls, topples and spreads. Most slope failures in Sherman 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.

**Location/Extent**

Seismic activity could increase landslide danger, particularly at Maddy’s Hump, which is located one-mile east of Biggs and could potentially impact Interstate Highway 84. Other locations susceptible include Biggs Canyon, Cottonwood Canyon, Fulton Canyon, Scotts Canyon, Shearers Grade, Locus Grove, Mud Hollow, U.S. Highway 30, Oregon Route 206 and Oregon Route 216.

**Significant Landslides/Debris Flows**

February 1996 – A severe storm caused landslides in Sherman County. FEMA declared a Federal Disaster in 27 counties in Oregon including Sherman County.

March 2006 - A severe storm caused landslides in Sherman County. FEMA declared a Federal Disaster for counties in Oregon including Sherman County.
Volcanic Event

**CHARACTERISTICS**

Sherman County is situated east of the Cascade Mountain Range, which derived from volcanic activity. Within this range of mountains are several active and potentially active volcanoes. Mount Saint Helens, an active volcano in this chain, erupted violently in 1980 and began erupting steam and ash again during fall 2004 and spring 2005. Mt Hood, Mt. Jefferson and Mt. 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.

Geoscientists have provided some estimates of future activity in the vicinity of Crater Rock, a well-known feature on Mt. 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 Sherman County is 1 in 1,000.

**LOCATION/EXTENT**

Fallout from an eruption in the Cascade Mountain Range can affect the entire county.

Wildfire (WUI)

**CHARACTERISTICS AND BRIEF HISTORY**

Sherman County contains a diverse set of wildfire hazard and risk situations. Conditions throughout the county are conducive to large and fast moving wildfires. 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 found in portions of the county which contribute to the wildfire threat and potential for catastrophic losses:

- The John Day River Canyon and the Deschutes River Canyon with numerous side canyons, all with very steep slopes.

---


7 Ibid

8 Ibid

9 Ibid
• 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 add to the risk. Most wildfires in the county are human caused.

• All volunteer fire districts have limited number of volunteers and resources.

**LOCATION/EXTENT**

Countywide, in particular there are areas of most concern include breaks of the John Day River, breaks of the Deschutes River, wheat fields, natural vegetation areas, homesteads adjacent to Bureau of Land Management (BLM) land and along various canyons throughout the county (i.e. John Day River Canyon, Deschutes River Canyon). Many fires also occur along the railroad lines along the north part of the county.

**SIGNIFICANT WILDFIRES**

1983 – The Moro Fire

**Windstorm**

**CHARACTERISTICS**

Sherman County, particularly the northern section of the county, experiences extreme wind event along with most other counties located along the Columbia River. The most persistent high winds occur along the Columbia River Gorge, so much so that these areas have special building code standards. All manufactured homes in Region 5 (which includes Sherman County) that are within 30 miles of the Columbia River must meet special anchoring (i.e., tie-down) standards (Section 307: Wind Resistance). High winds in this area of Oregon are legendary. 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. Once set in motion, the winds can
attain speeds of 80 mph, halt truck traffic, and damage a variety of structures and facilities. In Moro, the average wind speed is highest, 9.9-mph, in April.\textsuperscript{10}

**LOCATION/EXTENT**

Countwide, in particular windstorms affect the northern part of the county along the Columbia River.

**SIGNIFICANT WINDSTORMS**

*April 1957* – A tornado caused minor damage to rangeland.

*November 1951* – Widespread damage from winds up to 60 mph with gusts of up to 80 mph. Winds caused damage to transmission and utility lines.

*December 1955* - Widespread damage from winds up to 65 mph. Winds caused damage to buildings and utility lines.

*November 1958* - Widespread damage from winds up to 50 mph with gusts of up to 71 mph. Winds caused road closures due to fallen tress.

*October 1962* – Columbus Day Storm – The most destructive windstorm in Oregon’s history.

**Winter Storm**

**CHARACTERISTICS**

Communities in Sherman County are known for cold winter conditions. This is advantageous in at least one respect: 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. Along U.S. Highway 97, south drifting snow (at mile post 22) and blizzard conditions have caused traffic to be completely halted. Also, 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. If motels become overwhelmed, Sherman County is prepared to house travelers in schools, local fire departments and churches.\textsuperscript{11} Furthermore, during the 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**

Freezing canyons and highways (i.e. Hay Canyon, John Day Canyon), U.S. Highway 97 south of mile post 22 experiences icy conditions and low visibility. In addition, Sherman County is plagued by icy roads, fog, low visibility and snow plague Sherman County, particularly on their main highways (206E, 97 and I-84). Drifting snow is a major problem along with freezing canyon and highway roads.


\textsuperscript{11} Sherman County Emergency Operations Plan. 2.1.2.8 Severe Weather-Winter Storm. Page 2-5.
**Significant Winter Storms**

*December 1861* – Storm produced between one and three feet of snow.

*January 1916* – Very heavy snowfall, especially in the mountains from two separate storms.

*January and February 1937* – Deep snow drifts.

*January 1950* – Record snow falls with considerable property damage.

*March 1960* – Winter storms caused many automobile accidents.

*January 1969* – Heavy snow falls.

*January 1980* – Series of storms which resulted in many injuries and power outages.

*February 1985* – Heavy snow in mountains; downed power lines.

*February 1986* – Central and Eastern Oregon received heavy snows resulting in broken power lines and traffic accidents.

*March 1988* – Strong winds with heavy snows.

*February 1990* – Heavy snows.


*December 26, 2003 through January 14, 2004* – FEMA declared a Federal Disaster for several Oregon counties including Sherman County on February 13, 2004.

**Hazard Probability**

Probability is the likelihood of future occurrence within a specified period of time. Sherman 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 2.7 presents the probability scores for each of the natural hazards present in Sherman County. As shown in the table, drought, flood, wildfire, windstorm and winter storm all have high probabilities. Landslide/debris flow has a medium probability and earthquake and volcanic event are both categorizes with low probabilities.
### Table 2.7: Natural Hazard Probability Assessment Summary – Sherman 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>Drought</td>
<td>10</td>
<td>7</td>
<td>70</td>
<td>High</td>
</tr>
<tr>
<td>Earthquake</td>
<td>2</td>
<td>7</td>
<td>14</td>
<td>Low</td>
</tr>
<tr>
<td>Flood - Riverine</td>
<td>10</td>
<td>7</td>
<td>70</td>
<td>High</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>5</td>
<td>7</td>
<td>35</td>
<td>Medium</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>1</td>
<td>7</td>
<td>7</td>
<td>Low</td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>10</td>
<td>7</td>
<td>70</td>
<td>High</td>
</tr>
<tr>
<td>Windstorm*</td>
<td>8</td>
<td>7</td>
<td>56</td>
<td>High</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>8</td>
<td>7</td>
<td>56</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: Shawn Payne, Sherman County Emergency Management, OEM Hazard Analysis, Updated October 29, 2009

*Source: Sherman County NHMP Steering Committee, Updated February 15, 2012
Community Vulnerability

Natural disasters occur as a predictable interaction among three broad systems: natural environment (e.g., climate, rivers systems, geology, forest ecosystems, etc.), the built environment (e.g., cities, buildings, roads, utilities, etc.) and societal systems (e.g., cultural institutions, community organization, business climate, service provision, etc.). A natural disaster occurs when a hazard impacts the built environment or societal systems and creates adverse conditions within a community.

It is not always possible to predict exactly when natural disasters will occur or the extent to which they may impact the community. However, communities can minimize losses from disaster events through deliberate planning and mitigation, as well as by identifying distinct vulnerabilities. Several factors that are commonly considered variables in a community’s collective vulnerability to disaster are listed below.

Populations

VULNERABLE POPULATIONS

A characteristic of disasters is that they 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. 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 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. Table 2.8 outlines specific vulnerable populations and general county-wide concerns along with the hazards that are most likely to impact them.

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.

12 State of Oregon Emergency Management, Natural Hazard Mitigation Plan, NHMP Region 5: Mid-Columbia, February 2012
ELDERLY
According to figures from the U.S. Census Bureau, in 2010 persons 65 and older made up 21.8-percent of the population in Sherman County. Furthermore, out of the 777 household located in the county, 103 (13.5-percent) 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.

Assisted Living Facility:
Sagewind Manor
Moro, Oregon

YOUTH
Special Education Students: students with Individualized Education Programs (IEPs) established under the guidelines of the federal Individuals with Disabilities Education Act (IDEA). During the 2005-06 academic year, 41 special education students were enrolled in Sherman County School District. During that year, special education students made up 15.2-percent of the student population in the county.13

Tourist/Travelers
Travelers along Interstate Highway 84 and U.S. Highway 97 along the Journey Through Time Scenic Byway are particularly vulnerable (historically) to numerous hazards. Tourists are particularly vulnerable to disasters. This is because tourists 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 Sherman County may have difficulty using 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.

DISABLED
According to 2000 Census figures from the U.S. Census Bureau, 315 (17.2-percent) persons five years of age or older in Sherman County have some form of a disability (either mental, physical or sensory). Disabled population data from the 2010 Census are currently not available for Sherman County.

Mental disability: According to 2000 census figures from the U.S. Census Bureau, 72 (3.9-percent) 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.14

Physical disability: According to 2000 census figures from the U.S. Census Bureau, 153 (8.3-percent) 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 2000 census figures from the U.S. Census Bureau, 90 (4.9-percent) 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 a 2010 estimate from the U.S. Census Bureau’s Small Area Estimates Branch, 13.7-percent of the total population in Sherman County has income below the national poverty level. 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 tend to have the greatest difficulty recovering from a disaster.

Table 2.8: Vulnerable Populations in Sherman County

<table>
<thead>
<tr>
<th>Natural Hazard Mitigation Plan Issue: Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County Asset Identification</td>
</tr>
<tr>
<td>Drought</td>
</tr>
<tr>
<td>Earthquake</td>
</tr>
<tr>
<td>Flood</td>
</tr>
<tr>
<td>Landslide</td>
</tr>
<tr>
<td>Volcanic Event</td>
</tr>
<tr>
<td>Wildfire</td>
</tr>
<tr>
<td>Windstorm</td>
</tr>
<tr>
<td>Water storm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sagewind Manor (Elderly/Assisted Living) in Moro</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
<tr>
<td>X</td>
</tr>
<tr>
<td>X</td>
</tr>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

Economy

Sherman 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 2.9 below, Sherman County NHMP Steering Committee identified specific economic issues along with the hazards that most likely impact them.

---


Table 2.9: Vulnerable Economies in Sherman County

<table>
<thead>
<tr>
<th>Sherman County Asset Identification</th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide Event</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
<th>Winter Storm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid Columbia Producers, Inc.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wind farms</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oregon Raceway</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azure Standards</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</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. States law requires that cities and the county jointly manage Urban Growth Areas, delineated by a city’s Urban Growth Boundary (UGB) that identifies lands needed to meet population and economic demands for growth within a 20-year period.

Table 2.10 highlights future land use and development scheduled to occur in the county along with the hazards that are most likely to impact them.

---

17 Source: State of Oregon Emergency Management Plan, Region 5: Mid-Columbia Regional Profile, February 2012
Table 2.10: Vulnerable Land Use & Development in Sherman County

<table>
<thead>
<tr>
<th>Sherman County Asset Identification</th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
<th>Winter storm</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGE Cascade Crossing Transmission Project (Mikkalo Substation): Sherman County</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential Development in Moro (north part of town)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environment

Natural capital is essential in sustaining all forms of life and plays an often under represented role in natural hazard community resiliency planning. With four distinct yet mild seasons, a diverse terrain and close proximity to national forests, Sherman 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, Sherman County can focus on key areas to better prepare, mitigate, and increase the resiliency of local communities. Table 2.11 below lists specific and general county-wide and city environmental concerns along with the hazards that are most likely to impact them.

Table 2.11: Vulnerable Environments in Sherman County

<table>
<thead>
<tr>
<th>Sherman County Asset Identification</th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
<th>Winter storm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campgrounds (Buck Hollow, Beavertail, Jones Canyon, Macks Canyon, Rattlesnake Pass, Twin Springs)</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City parks (Gile French Park: Rufus, Grass Valley City Park: Grass Valley, Moro City Park: Moro, Wasco City Park: Wasco)</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deschutes River</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deschutes River State Recreation Area</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>John Day River</td>
<td>X</td>
<td>X</td>
<td></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>
<td></td>
</tr>
<tr>
<td>LePage Park</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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. Table 2.12 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.

Table 2.12: Vulnerable Critical Infrastructure & Services in Sherman County

<table>
<thead>
<tr>
<th>Sherman County Asset Identification</th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
<th>Winter storm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County Courthouse</td>
<td></td>
<td>X</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sherman Elementary School</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sherman Junior/High School</td>
<td>x</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power System</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x X X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biggs Bridge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x X X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>John Day Dam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City Water Supply</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City Wastewater Treatment Facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire Dist./Dept. Facilities</td>
<td></td>
<td></td>
<td>X</td>
<td>x X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City Halls</td>
<td></td>
<td></td>
<td>X</td>
<td>x X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio Repeater Sites</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X X X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Seismic vulnerability assessments have highlighted the need for seismic retrofit of critical facilities. In 2006 the Oregon Department of Geology and Mineral Industries conducted a statewide seismic needs assessment survey using rapid visual screening. Table 2.13 identifies the results on critical facilities located in Sherman County. FEMA recommends
that all buildings with a score of 2.0 or less should be considered to have inadequate performance during the anticipated maximum seismic event. Three facilities in Sherman County have collapse potential scores of 2.0 or less. Two facilities, the South Sherman Elementary School in Grass Valley and the Sherman County Courthouse in Moro, have high collapse potential (greater than 10-percent). One facility, the Sherman Junior/Senior High School in Moro, has a moderate collapse potential (greater than 1-percent).

*Collapse Potential – A RVS score of 2.0 represents that there is a 1 in 100 chance (1-percent probability), that the building will collapse due to ground motion caused by the maximum considered earthquake. A score of 0.0 implies a 1 in 1 chance (100-percent probability). FEMA recommends that all buildings with a score of 2.0 or less should be considered to have inadequate performance during the anticipated maximum seismic event. DOGAMI has refined the relative rank of the RVS score into four categories: Very High (RVS less than or equal to zero, 100-percent probability of collapse), High (RVS from 0.1 to 1.0, greater than a 10-percent probability of collapse), Moderate (RVS from 1.1 to 2.0, greater than a 1-percent probability of collapse) and Low (RVS greater than or equal to 2.1, probability of collapse less than 1-percent). New construction is deemed to have low collapse potential. Sites that have been or are planned to have seismic rehabilitation are deemed to have moderate collapse potential. Sites that were missed during the field screening are deemed to have high collapse potential.

---

Table 2.13: Statewide Seismic Needs Assessment Using Rapid Visual Screening (RVS)

<table>
<thead>
<tr>
<th>City</th>
<th>Facility Name</th>
<th>Inspection Date</th>
<th>Final Score</th>
<th>FEMA-154 Collapse Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass Valley</td>
<td>South Sherman Elementary School</td>
<td>28-Jun-06</td>
<td>0.3</td>
<td>High (&gt;10%)</td>
</tr>
<tr>
<td>Grass Valley</td>
<td>South Sherman Rural Fire Protection District</td>
<td>28-Jun-06</td>
<td>3.3</td>
<td>Low (&lt;1%)</td>
</tr>
<tr>
<td>Moro</td>
<td>Sherman Junior/Senior High School</td>
<td>28-Jun-06</td>
<td>1.1</td>
<td>Moderate (&gt;1%)</td>
</tr>
<tr>
<td>Moro</td>
<td>Moro Rural Fire Protection District</td>
<td>28-Jun-06</td>
<td>3.2</td>
<td>Low (&lt;1%)</td>
</tr>
<tr>
<td>Moro</td>
<td>Sherman County Courthouse</td>
<td>28-Jun-06</td>
<td>0.6</td>
<td>High (&gt;10%)</td>
</tr>
<tr>
<td>Rufus</td>
<td>Rufus Volunteer Fire Department</td>
<td>28-Jun-06</td>
<td>2.6</td>
<td>Low (&lt;1%)</td>
</tr>
<tr>
<td>Wasco</td>
<td>North Sherman Elementary School</td>
<td>28-Jun-06</td>
<td>2.7</td>
<td>Low (&lt;1%)</td>
</tr>
<tr>
<td>Wasco</td>
<td>North Sherman County Rural Fire Protection District/Wasco Volunteer Fire Department</td>
<td>28-Jun-06</td>
<td>2.3</td>
<td>Low (&lt;1%)</td>
</tr>
</tbody>
</table>

Source: Oregon Department of Geology and Mineral Industries, Statewide Seismic Needs Assessment, 2006

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 section.

Vulnerability is the percentage of population and property likely to be affected under an “average” occurrence of the hazard. Sherman 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 2.14 presents the vulnerability scores for each of the natural hazards present in Sherman County. As shown in the table, a high vulnerability is not scored with any of the identified hazards within the county. Instead, Sherman County identifies medium vulnerability scores for the following hazards: drought, flood, landslide/debris flow, wildfire, windstorm and winter storm. In addition, Sherman County has low vulnerability scores for both earthquake and volcanic event.
Table 2.14: Community Vulnerability Assessment Summary – Sherman 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>Drought</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>Medium</td>
</tr>
<tr>
<td>Earthquake</td>
<td>2</td>
<td>5</td>
<td>10</td>
<td>Low</td>
</tr>
<tr>
<td>Flood - Riverine</td>
<td>6</td>
<td>5</td>
<td>30</td>
<td>Medium</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>6</td>
<td>5</td>
<td>30</td>
<td>Medium</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>3</td>
<td>5</td>
<td>15</td>
<td>Low</td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>7</td>
<td>5</td>
<td>35</td>
<td>Medium</td>
</tr>
<tr>
<td>Windstorm*</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>Medium</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Source: Shawn Payne, Sherman County Emergency Management, OEM Hazard Analysis, Updated October 29, 2009
*Source: Sherman County NHMP Steering Committee, Updated February 15, 2012

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.”

Sherman County, the City of Grass Valley, the City of Rufus and the City of Wasco participate in the National Flood Insurance Program (NFIP). Flood Insurance Rate Maps (FIRMs) for Sherman County, the City of Grass Valley and the City of Rufus are current as of September 1984; FIRMs for the City of Wasco are current as of September 1989 and FIRMs for the City of Moro are current of January 1950. Table 2.15 shows that as of November 2, 2012, there were 4 National Flood Insurance Program (NFIP) policies in force with a total value of over $870,2-thousand. Between 1978 and November 2, 2012, there were zero NFIP claims.

Table 2.15: 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>Total Premium</th>
<th># NFIP Claims</th>
<th>Total Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County</td>
<td>Sep-84</td>
<td>P</td>
<td>0</td>
<td>$0.00</td>
<td>$0.00</td>
<td>0</td>
<td>$0.00</td>
</tr>
<tr>
<td>Grass Valley</td>
<td>Sep-84</td>
<td>P</td>
<td>1</td>
<td>$210,000.00</td>
<td>$313.00</td>
<td>0</td>
<td>$0.00</td>
</tr>
<tr>
<td>Moro</td>
<td>Jan-50</td>
<td>NP</td>
<td>0</td>
<td>$0.00</td>
<td>$0.00</td>
<td>0</td>
<td>$0.00</td>
</tr>
<tr>
<td>Rufus</td>
<td>Sep-84</td>
<td>P</td>
<td>2</td>
<td>$390,000.00</td>
<td>$1,320.00</td>
<td>0</td>
<td>$0.00</td>
</tr>
<tr>
<td>Wasco</td>
<td>Sep-89</td>
<td>P</td>
<td>1</td>
<td>$270,200.00</td>
<td>$459.00</td>
<td>0</td>
<td>$0.00</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td>4</td>
<td>$870,200.00</td>
<td>$2,072.00</td>
<td>0</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

Source: State NFIP Coordinator; ^ P = Participating, NP = Not Participating

Table 2.16 illustrates that as of November 2, 2012, Sherman County and the cities of Grass Valley, Moro, Rufus and Wasco have zero repetitive flood loss properties. Sherman County’s last Community Assistance Visit was April 1985. The City of Rufus’s last Community Assistance Visit was April 1985. Neither Sherman County nor the cities of Grass Valley, Moro, Rufus, or Wasco are members of the Community Rating System (CRS).
Table 2.16: NFIP Repetitive Loss and Severe Repetitive Loss Summary

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th># SRL Properties-Validated</th>
<th># SRL Properties-Pending</th>
<th># RL Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Grass Valley</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Moro</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Rufus</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wasco</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Totals</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: State NFIP Coordinator

Risk Assessment

Shawn Payne, Director of Emergency Services in Sherman County, updated the county hazard analysis matrix on October 9, 2009. The Sherman County NHMP Steering Committee updated the windstorm hazard category at a steering committee meeting held on February 15, 2012. Table 2.17 presents the entire updated hazard analysis matrix for Sherman 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 priorities, but does not predict the occurrence of a particular hazard.¹⁹

With considerations for past historical events, the probability or likelihood of a particular hazard event occurring, the vulnerability to the community, and the maximum threat or worst case scenario, both wildfire and drought rank as the top hazards to the. Winter storm, flood, and windstorm make-up the next three highest ranked hazards, while landslide/debris flow, earthquake, and volcanic event make up the lowest ranked hazards in the matrix.

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 vulnerability or threat to the community, the score will remain relatively low. For example, the data indicates that windstorms occur more frequently in the county compared to flood events. However, since Sherman County is potentially more vulnerable to flood events, especially in a worst case scenario event, the overall threat score for flood is greater than that of windstorm. The hazard scores are influenced by not one or two of the categories, but all four combined.

---

The Sherman County NHMP Steering Committee also developed severity impact scores through a relative risk exercise at the steering committee meeting on February 15, 2012. The exercise takes 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. Table 2.18 presents the overall risk assessment for Sherman County including both the county’s hazard analysis and relative risk. The hazards are listed in rank order from high to low. Taking into account relative probability and severity impact scores, the data identifies flood and winter storm as the highest ranked threat hazards to Sherman County. Wildfire, windstorm and drought make-up the next three highest ranked hazards, while landslide/debris flow, earthquake, and volcanic event make-up the three lowest ranked hazards in terms of overall relative risk.

### Table 2.17: Hazard Analysis Matrix – Sherman County

<table>
<thead>
<tr>
<th>Hazard</th>
<th>History</th>
<th>Probability</th>
<th>Vulnerability</th>
<th>Maximum Threat</th>
<th>Total Threat Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Severity Weight Factor Subtotal</td>
<td>Severity Weight Factor Subtotal</td>
<td>Severity Weight Factor Subtotal</td>
<td>Severity Weight Factor Subtotal</td>
<td></td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>10 2 20</td>
<td>10 7 70</td>
<td>7 5 35</td>
<td>10 10 100</td>
<td>225</td>
</tr>
<tr>
<td>Drought</td>
<td>10 2 20</td>
<td>10 7 70</td>
<td>5 5 25</td>
<td>8 10 80</td>
<td>195</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>7 2 14</td>
<td>8 7 56</td>
<td>5 5 25</td>
<td>10 10 100</td>
<td>195</td>
</tr>
<tr>
<td>Flood - Riverine</td>
<td>6 2 12</td>
<td>10 7 70</td>
<td>6 5 30</td>
<td>7 10 70</td>
<td>182</td>
</tr>
<tr>
<td>Windstorm*</td>
<td>10 2 20</td>
<td>8 7 56</td>
<td>5 5 25</td>
<td>8 10 80</td>
<td>181</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>4 2 8</td>
<td>5 7 35</td>
<td>6 5 30</td>
<td>8 10 80</td>
<td>153</td>
</tr>
</tbody>
</table>

Source: Shawn Payne, Sherman County Emergency Management, OEM Hazard Analysis, Updated October 29, 2009
*Source: Sherman County NHMP Steering Committee, Updated February 15, 2012

### Table 2.18: Risk Assessment Summary – Sherman County

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Probability Total</th>
<th>Vulnerability Total</th>
<th>Total Threat Score</th>
<th>Severity Impact Score</th>
<th>Relative Probability</th>
<th>Relative Risk</th>
<th>Hazard Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood - Riverine</td>
<td>70 30</td>
<td>182</td>
<td>3.5 5</td>
<td>17.5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter Storm</td>
<td>56 25</td>
<td>195</td>
<td>3.2 4</td>
<td>12.8</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>70 35</td>
<td>225</td>
<td>2.1 5</td>
<td>10.5</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windstorm</td>
<td>56 25</td>
<td>181</td>
<td>2.5 4</td>
<td>10</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drought</td>
<td>70 25</td>
<td>195</td>
<td>1.5 5</td>
<td>7.5</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>35 30</td>
<td>153</td>
<td>1.9 2.5</td>
<td>4.75</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earthquake</td>
<td>14 10</td>
<td>96</td>
<td>3.2 1</td>
<td>3.2</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>7 15</td>
<td>44</td>
<td>1.8 0.5</td>
<td>0.9</td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Sherman County NHMP Steering Committee, Updated February 15, 2012
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 four incorporated cities in Sherman County; Grass Valley, Moro, Rufus and Wasco each held local steering committee meetings and completed a hazard analysis to compare to the assessment completed by the Sherman County NHMP Steering Committee. The following highlights the risk assessments completed by each city.

City of Grass Valley
Risk Assessment

JURISDICTION: City of Grass Valley
COMMITTEE: Grass Valley City Council
DATE: Monday, April 2, 2012

On April 2, 2012, Grass Valley City Council completed 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 Sherman County NHMSC. Table 2.19 identifies differences between probability and vulnerability between the City of Grass Valley and Sherman County.

Table 2.19: Probability and Vulnerability Comparison - Grass Valley and Sherman Co.

<table>
<thead>
<tr>
<th>Hazard</th>
<th>City of Grass Valley*</th>
<th>Sherman County^</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probability</td>
<td>Vulnerability</td>
</tr>
<tr>
<td>Drought</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Flood - Riverine</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Windstorm</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: *City of Grass Valley, Updated April 2, 2012
^ Sherman County NHMP Steering Committee, Updated February 15, 2012
**Hazard Probability:**

Compared to Sherman County, the hazard analysis for the City of Grass Valley identified a volcanic event hazards with *higher* probability.

The City of Grass Valley and Sherman County identified *equal* probability for future occurrences to four hazards that include:

- Earthquake
- Wildfire
- Windstorm
- Winter Storm

The hazard analysis for the City of Grass Valley identified *lower* probability to the remaining hazards compared to Sherman County:

- Drought
- Flood
- Landslide

**Community Vulnerability:**

Compared to Sherman County, the hazard analysis for the City of Grass Valley identified *higher* vulnerability to the following hazards:

- Drought
- Earthquake
- Flood
- Volcanic Event
- Wildfire
- Windstorm

The City of Grass Valley and Sherman County identified *equal* vulnerability to the windstorm hazard.

The hazard analysis for the City of Grass Valley identified *lower* vulnerability to landslide/debris flow compared to Sherman County.

Figure 2.3 presents a summary of the hazard analysis for the City of Grass Valley and compares the results to the assessment completed by the Sherman County NHMP Steering Committee.
Figure 2.3: Overall Hazard Analysis Comparison - Grass Valley and Sherman County

Source: City of Grass Valley, Updated April 2, 2012
Sherman County NHMP Steering Committee, Updated February 15, 2012
City of Moro
Risk Assessment

JURISDICTION: City of Moro
COMMITTEE: Moro NHMP Steering Committee
DATE: Wednesday, May 16, 2012

On May 16, 2012, Representatives from the City of Moro 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 Sherman County NHMSC. Table 2.20 identifies differences between probability and vulnerability between the City of Moro and Sherman County.

Table 2.20: Probability and Vulnerability Comparison - Moro and Sherman County

<table>
<thead>
<tr>
<th>Hazard</th>
<th>City of Moro*</th>
<th>Sherman County^</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probability</td>
<td>Vulnerability</td>
</tr>
<tr>
<td>Drought</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Flood - Riverine</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Windstorm</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: *City of Moro, Updated May 16, 2012
^ Sherman County NHMP Steering Committee, Updated February 15, 2012

Hazard Probability:

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

The City of Moro and Sherman County identified *equal* probability for future occurrences to three hazards that include:

- Earthquake
- Volcanic Event
- Winter Storm

The hazard analysis for the City of Moro identified *lower* probability to the remaining five hazards compared to Sherman County:
• Drought
• Flood
• Landslide/Debris Flow
• Wildfire
• Windstorm

Community Vulnerability:
Compared to Sherman County, the hazard analysis for the City of Moro identified higher vulnerability to five hazards:

• Drought
• Earthquake
• Volcanic Event
• Wildfire
• Winter Storm

The City of Moro and Sherman County both identified equal vulnerability to a flood hazard.

The hazard analysis for the City of Moro identified lower vulnerability to two hazards compared to Sherman County:

• Landslide/Debris Flow
• Windstorm

Figure 2.4 presents a summary of the hazard analysis for the City of Moro and compares the results to the assessment completed by the Sherman County NHMP Steering Committee.
Figure 2.4: Overall Hazard Analysis Comparison - Moro and Sherman County

Source: City of Moro, Updated May 16, 2012
Sherman County NHMP Steering Committee, Updated February 15, 2012
On April 11, 2012, Rufus City Council completed 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 Sherman County NHMSC. Table 2.21 identifies differences between probability and vulnerability between the City of Rufus and Sherman County.

### Table 2.21: Probability and Vulnerability Comparison - Rufus and Sherman County

<table>
<thead>
<tr>
<th>Hazard</th>
<th>City of Rufus</th>
<th>Sherman County</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probability</td>
<td>Vulnerability</td>
</tr>
<tr>
<td>Drought</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Flood - Riverine</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Windstorm</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: *City of Rufus, Updated April 11, 2012
^ Sherman County NHMP Steering Committee, Updated February 15, 2012

### Hazard Probability:

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

The City of Rufus and Sherman County identified equal probability for future occurrences to four hazards that include:

- Volcanic Event
- Wildfire
- Windstorm
- Winter Storm

The hazard analysis for the City of Rufus identified lower probability to the remaining three hazards compared to Sherman County:
Community Vulnerability:

Compared to Sherman County, the hazard analysis for the City of Rufus identified higher vulnerability to three hazards that include:

- Drought
- Earthquake
- Flood
- Volcanic Event
- Winter Storm

The City of Rufus and Sherman County both identified equal vulnerability to two hazards:

- Wildfire
- Windstorm

The hazard analysis for the City of Rufus identified lower vulnerability to a landslide/debris flow hazard compared to Sherman County.

Representatives from the City of Rufus expressed concern about two hazards in particular; severe weather/winter storm and flood. 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, the Biggs/Rufus Highway, and Scott Canyon Road can all 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 flooding within the city. In the past, the ditch that runs through the center of the city near the downtown district has nearly overflowed its banks. Many times debris has clogged up the ditch and prevented the water from flowing freely into the Columbia River, worsening the threat of a flood. The city also expressed concern about the age and accuracy of the city’s flood plain maps.

Figure 2.4 presents a summary of the hazard analysis for the City of Rufus and compares the results to the assessment completed by the Sherman County NHMP Steering Committee.
Figure 2.5: Overall Hazard Analysis Comparison - Rufus and Sherman County

Source: City of Rufus, Updated April 11, 2012
Sherman County NHMP Steering Committee, Updated February 15, 2012
On May 15, 2012, Wasco City Council completed 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 Sherman County NHMSC. Table 2.22 identifies differences between probability and vulnerability between the City of Rufus and Sherman County.

Table 2.22: Probability and Vulnerability Comparison - Wasco and Sherman County

<table>
<thead>
<tr>
<th>Hazard</th>
<th>City of Wasco*</th>
<th>Sherman County^</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probability</td>
<td>Vulnerability</td>
</tr>
<tr>
<td>Drought</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Flood - Riverine</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Volcanic Event</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Windstorm</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: *City of Wasco, Updated May 15, 2012
^ Sherman County NHMP Steering Committee, Updated February 15, 2012

Hazard Probability:

Compared to Sherman County, the hazard analysis for the City of Wasco identified the volcanic event hazard with higher probability.

The City of Wasco and Sherman County identified equal probability for future occurrences to following hazards:

- Earthquake
- Wildfire
- Windstorm
- Winter Storm

The hazard analysis for the City of Wasco identified lower probability to the remaining hazards compared to Sherman County:
• Drought
• Flood
• Landslide/Debris Flow

**Community Vulnerability:**

Compared to Sherman County, the hazard analysis for the City of Wasco identified higher vulnerability to the following hazards:

• Drought
• Volcanic Event
• Wildfire
• Winter Storm

The City of Wasco and Sherman County both identified *equal* vulnerability to the following hazards:

• Earthquake
• Flood
• Windstorm

The hazard analysis for the City of Moro identified *lower* vulnerability the landslide/debris flow hazard compared to Sherman County.

Figure 2.6 presents a summary of the hazard analysis for the City of Wasco and compares the results to the assessment completed by the Sherman County NHMP Steering Committee.
Figure 2.6: Overall Hazard Analysis Comparison - Wasco and Sherman County

Source: City of Wasco, Updated May 15, 2012
Sherman County NHMP Steering Committee, Updated February 15, 2012
Section 3: Mitigation Strategy

This section outlines Sherman 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 Hazard Mitigation Plan steering committee reviewed and updated the goals and action items documented in this plan. Additional planning process documentation is in Appendix B.

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 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 action items. 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.

- **Goals**— 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 goals are guiding principles for the specific recommendations that are outlined in the action items.

- **Action Items**— The action items are detailed recommendations for activities that local departments, citizens and others could engage in to reduce risk.

**Methods**

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

**Mitigation Plan Goals**

The Sherman County Natural Hazards Mitigation Steering Committee, as well as stakeholders, established Sherman County’s mitigation goals and action items. The goals are based on the goals established by the State of Oregon Natural Hazards Mitigation Plan as well as the regional goals shared by Sherman County, Gilliam County, and Wheeler County. However, specific emphasis and language is specific to Sherman County.
Goal 1: Enhance the ability to respond effectively and swiftly

Goal 2: Protect life, reduce injuries, and minimize damage to property

Goal 3: Increased cooperation and collaboration between groups and agencies

Goal 4: 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. For a comprehensive list of existing mitigation activities see Section 2, Risk Assessment and Appendix C, Community Profile

Listed below are a number of mitigation items that relate to action items identified in the previous version of the Sherman County NHMP. The actions listed below are either completed or partially completed. Additional information and future activities are identified in Appendix A, Action Item Forms and within Table B-2 of Appendix B. The action items were first vetted at the county steering committee meeting and then provided to the city steering committees (city councils) to update based on jurisdiction specific circumstances. Where applicable city specific information is included herein and within Table B-2 of Appendix B. The incorporated cities in Sherman County – Grass Valley, Moro, Rufus and Wasco – have limited resources and rely on the county for certain services and public facilities; as such unless indicated the status and timeline for the cities is the same as for the county. See Appendix B, Planning and Public Process for more information.

2008 Multi-Hazard Action Item #1 – Complete an inventory of public buildings that may be particularly vulnerable to natural hazards in Sherman County.

- The Oregon Department of Energy completed an inventory of public facilities in Sherman County that may be vulnerable to natural hazards in 2009.
- The Sherman County Emergency Services Department currently holds the inventory completed by the Department of Energy.
- The Department of Geology and Mineral Industries completed a Seismic Needs Assessment of public facilities in June 2006 to identify the collapse potential for facilities in the event of an earthquake.

2008 Multi-Hazard Action Item #3 - Work with utilities operating in Sherman County to establish tree-pruning programs around transmission lines and trunk distribution lines.

- Wasco Electric Cooperative and Pacific Power & Light annually perform tree-pruning and trimming of trees around power lines.
- Primary (distribution) and Secondary (individual service connections) areas are maintained and cleared.
- Oregon Public Utility Commission and Oregon Real Estate Agency require such activities to reduce outages and insure continuity of electrical services.
• These activities can help mitigate the effects from windstorm and severe weather/winter storm hazard events.

2008 Multi-Hazard Action Item #6 - Seek funding for generators and satellite telephones for critical facilities.

• Sherman County received a State Homeland Security Grant to purchase and install new generators at the Sherman County Courthouse and Moro Fire Hall.
• A new generator installed at the Sherman County Courthouse in 2011.
• A new generator installed at the Moro Fire Hall in 2012.
• Sherman County purchased new generators for the Gordon Ridge Repeater Site and Erskine Repeater Site using County funds.
• A new generator installed at the Gordon Ridge Repeater Site in 2010.
• A new generator installed at the Erskine Repeater Site in 2012.
• In 2011 the county moved the old generator from the Gordon Ridge Repeater Site to the the Moro Medical Clinic.

2008 Drought Action item #1 - Include information regarding droughts in a brochure of natural hazards and mail/make available to county residents and the public.

2008 Flood Action item #1 - Include information regarding flooding in a brochure of natural hazards and mail/make available to county residents and the public.

2008 Landslide Action item #1 - Include information regarding landslides/debris flows in a brochure of natural hazards and mail/make available to county residents and the public.

2008 Wildfire Action item #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.

2008 Windstorm Action item #1 - Include information regarding wind storms in a brochure of natural hazards and mail/make available to county residents and the public.

2008 Winter Storm Action item #2 - Include information regarding winter storms in a brochure of natural hazards and mail/make available to county residents and the public.

• The Sherman County Emergency Services Coordinator continually provides awareness and education about natural hazards in the Citizen Reporter, which is the Sherman County Government Publication.
• The county provides drought, flood, landslide, wildfire, windstorms, and winter storm mitigation activities and awareness information in the Citizen Reporter.

2008 Flood Action item #2 - Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.

• Physical Characteristics - Section XI of the Sherman County Comprehensive Plan conforms to meet with Statewide Planning Goal 7, Areas Subject to Natural Hazards.
• Section XI, Policy III – Proposals for development on lands designated as flood prone areas shall be subject to provisions of the National Flood Insurance Program.
and subsequent revisions thereof. Structures specifically designed to control soil erosion or store water shall be exempt from this policy.

2008 Wildfire Action item #1 - Develop and implement a countywide Community Wildfire Protection Plan (CWPP) for Sherman County to reduce the risk of fire in the Wildland-Urban Interface (WUI).

- Sherman County Court initiated the Sherman County Community Wildfire Protection Plan (CWPP) development process in the summer of 2008.
- The Sherman County Court adopted the plan on March 18, 2009.
- The plan is a result of a countywide effort intended to identify and prioritize wildfire hazards and to develop a strategy to reduce those hazards.

Government Structure

Beyond Emergency Management, most departments within the county and city governance structures have some degree of responsibility in building overall community resilience. Each plays a role in ensuring that jurisdiction functions and normal operations resume after an incident, and the needs of the population are met. For further explanation regarding how these departments influence hazard resilience, reference Appendix C: Community Profile.

Existing Plan & Policies

Communities often have existing plans and policies that guide and influence land use, land development, and population growth. Linking existing plans and policies to the Natural Hazards Mitigation Plan helps identify what resources already exist that can be used to implement the action items identified in the Plan. Plans and policies already in existence have support from local residents, businesses and policy makers. A list documenting plans and policies already in place in the county and participating cities can be found in Appendix C: Community Profile.

Community Organizations and Programs

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. The county and cities 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. Appendix C, Community Profile, provides a comprehensive list of community organizations and programs, and offers a more thorough explanation of how existing community organizations and programs can be utilized for hazard mitigation.

Current Mitigation Plan Action Items

Short and long-term action items identified through the planning process are an important part of the mitigation plan. 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 is provided below.

**Figure 3.1: Action Item Sources**

![Diagram of action item sources](image)

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 and the Hazard Annexes.
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 Sherman County multi-jurisdictional Natural Hazard 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. Sherman 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, Sherman County will work to incorporate the recommended mitigation action items into existing programs and procedures.

Many of the Sherman 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, Sherman County will implement the multi-jurisdictional Natural Hazard Mitigation Plan’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, and can adapt easily to changing conditions and needs. Implementing the Natural Hazard Mitigation Plan’s action items through such plans and policies increases their likelihood of being supported and implemented.

\(^2\) ibid
**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. *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 one to five years to implement.
Table 3.1: 2012 Action Items – Sherman County, Cities of Grass Valley, Moro, Rufus and Wasco

<table>
<thead>
<tr>
<th>2012 Action Item</th>
<th>2012 Action Item Title</th>
<th>Coordinating Organization</th>
<th>Partner Organizations (Internal and External)</th>
<th>Timeline</th>
<th>Alignment with Goals</th>
<th>Applicable Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MH #1</strong></td>
<td>Seek funding for the implementation of priority projects that reduce the vulnerability of critical public facilities in Sherman County.</td>
<td>Sherman County Emergency Management</td>
<td>Sherman County, Sherman County NHMP Steering Committee; Cities of Grass Valley, Moro, Rufus, and Wasco; OEM; DOGAMI; FEMA</td>
<td>Long Term</td>
<td>X X X X X X X X X X X X X X X X X X</td>
<td>Sherman County; Grass Valley; Moro; Rufus; Wasco</td>
</tr>
<tr>
<td><strong>MH #2</strong></td>
<td>Work with utilities operating in Sherman County to establish tree-pruning programs around transmission lines and trunk distribution lines.</td>
<td>Sherman County Emergency Management</td>
<td>Sherman County; Cities of Grass Valley, Moro, Rufus, and Wasco; Pacific Power and Light; Wasco Rural Electric; BPA</td>
<td>Ongoing</td>
<td>X X X X X X X X X X X</td>
<td>Sherman County; Grass Valley; Moro; Rufus; Wasco</td>
</tr>
<tr>
<td><strong>MH #3</strong></td>
<td>Reduce the effects of winter storms on existing utility lines</td>
<td>Pacific Power and Light; Wasco Electric Cooperative</td>
<td>Sherman County; Cities of Grass Valley, Moro, Rufus, and Wasco; BPA</td>
<td>Ongoing</td>
<td>X X X X X X X X X X</td>
<td>Sherman County; Grass Valley; Moro; Rufus; Wasco</td>
</tr>
<tr>
<td><strong>MH #4</strong></td>
<td>Develop and maintain a comprehensive impact database on severe natural hazard events in Sherman County.</td>
<td>Sherman County Emergency Management</td>
<td>County Planning; GIS; Cities of Grass Valley, Moro, Rufus, and Wasco; Utilities; ODOT; Oregon Climate Service; National Weather Service; National Oceanic and Atmospheric Administration (NOAA)</td>
<td>Ongoing</td>
<td>X X X X X X X X X X X</td>
<td>Sherman County; Grass Valley; Moro; Rufus; Wasco; Gilliam County, Wheeler County, ODOT</td>
</tr>
<tr>
<td><strong>MH #5</strong></td>
<td>Identify opportunities to reduce existing barriers to interagency cooperation and work together to reduce risk and loss from natural hazards.</td>
<td>Sherman County</td>
<td>County Emergency Management; County Road Department; Fire Districts; Cities of Grass Valley, Moro, Rufus, and Wasco; Gilliam County, Wheeler County, ODOT</td>
<td>Ongoing</td>
<td>X X X X X X X X X X</td>
<td>Sherman County; Grass Valley; Moro; Rufus; Wasco</td>
</tr>
</tbody>
</table>

**Drought**

| **DR #1**        | Include information regarding droughts in a brochure of natural hazards and mail/make available to county residents and the public. | Sherman County Emergency Management | County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; SWCD; Media; Railroad; Utilities; OSU Extension; Oregon Department of Agriculture; ODOT; OEM; American Red Cross; FEMA; FSA; NRCS | Ongoing | X X X X X X X X X X X X X X X X X X | Sherman County; Grass Valley; Moro; Rufus; Wasco |

**Earthquake**

| **EQ #1**        | Include information regarding earthquakes in a brochure of natural hazards and mail/make available to county residents and the public. | Sherman County Emergency Management | County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; Media; Medical Clinic; North Central Public Health District; Railroad; School Districts; Utilities; ODOT; OEM; DOGAMI; American Red Cross; Army Corps of Engineers; FEMA; FSA | Long Term | X X X X X X X X X X X X X X X X | Sherman County; Grass Valley; School District; Oregon Emergency Management; Federal Emergency Management Agency |
| **EQ #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 a high collapse potential rate by the Department of Geology and Mineral Industries (DOGAMI). | Sherman County Planning Department | County Court; Sherman County Emergency Management; City of Grass Valley; School District; Oregon Emergency Management; Federal Emergency Management Agency | Long Term | X X X X X X X X X X | Sherman County; Grass Valley; School District; Oregon Emergency Management; Federal Emergency Management Agency |
Table 3.1: 2012 Action Items – Sherman County, Cities of Grass Valley, Moro, Rufus and Wasco (continued)

<table>
<thead>
<tr>
<th>2012 Action Item</th>
<th>2012 Action Item Title</th>
<th>Coordinating Organization</th>
<th>Partner Organizations (Internal and External)</th>
<th>Timeline</th>
<th>Alignment with Goals</th>
<th>Applicable Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flood</strong></td>
<td></td>
<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>Sherman County Emergency Management</td>
<td>County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; Medical Clinic; Railroad; Utilities; ODOT; OEM; Senior and Disabled Services; American Red Cross; Army Corps of Engineers; FEMA; FSA</td>
<td>Ongoing</td>
<td>X X X X X X X X X</td>
<td></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>Sherman County Planning Department</td>
<td>County Emergency Management; Cities of Grass Valley, Moro, Rufus, and Wasco; DLCD; OEM; FEMA</td>
<td>Ongoing</td>
<td>X X X X X X X</td>
<td></td>
</tr>
<tr>
<td>FL #3</td>
<td>Develop a database of repetitive flood loss properties not covered by the National Flood Insurance Program.</td>
<td>Sherman County Emergency Management</td>
<td>Sherman County, Cities of Grass Valley, Moro, Rufus, and Wasco, DLCD, FEMA</td>
<td>Long Term</td>
<td>X X X X X X X X</td>
<td></td>
</tr>
<tr>
<td>FL #4</td>
<td>Coordinate with the State Floodplain Coordinator and the Department of Land Conservation and Development (DLCD) to update the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for Sherman County and the incorporated cities participating in the Nation Flood Insurance Program (NFIP).</td>
<td>Sherman County Planning Department</td>
<td>County Emergency Management; Cities of Grass Valley, Moro, Rufus, and Wasco; Department of Land Conservation and Development; Oregon Emergency Management; Federal Emergency Management Agency</td>
<td>Long Term</td>
<td>X X X X X X X</td>
<td></td>
</tr>
<tr>
<td><strong>Landslide/Debris Flow</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LS #1</td>
<td>Include information regarding landslides/debris flows in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Sherman County Emergency Management</td>
<td>County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; Medical; Railroads; Utilities; ODOT; OEM; Oregon Department of Fish &amp; Wildlife; American Red Cross; FSA</td>
<td>Ongoing</td>
<td>X X X X X X X</td>
<td></td>
</tr>
<tr>
<td><strong>Severe Weather/ Winter Storm</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SW/ WS #1</td>
<td>Educate farmers about ways to protect livestock from the effects of winter storms.</td>
<td>Sherman County Emergency Management</td>
<td>OSU Extension; Oregon Department of Agriculture</td>
<td>Ongoing</td>
<td>X X X X X X X X X</td>
<td></td>
</tr>
<tr>
<td>SW/ WS #2</td>
<td>Include information regarding severe weather/severe weather/winter storms in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Sherman County Emergency Management</td>
<td>County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; Media; Medical Clinic; Utilities; ODOT; OEM; American Red Cross</td>
<td>Ongoing</td>
<td>X X X X X X X X X</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.1: 2012 Action Items – Sherman County, Cities of Grass Valley, Moro, Rufus and Wasco (continued)

<table>
<thead>
<tr>
<th>2012 Action Item</th>
<th>2012 Action Item Title</th>
<th>Coordinating Organization</th>
<th>Partner Organizations (Internal and External)</th>
<th>Timeline</th>
<th>Alignment with Goals</th>
<th>Applicable Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; North Central Public Health District; Media; Medical Clinic; School District; ODOT; OEM; Senior and Disabled Services; American Red Cross; Railroads; Utilities; USGS; DEQ</td>
<td>Long Term</td>
<td></td>
<td>Sherman County, Grass Valley, Moro, Rufus, Wasco</td>
</tr>
<tr>
<td>VE #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>Sherman County Emergency Management</td>
<td></td>
<td></td>
<td>X X X X X</td>
<td></td>
</tr>
<tr>
<td>WF #1</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>Sherman County Emergency Management</td>
<td>County Court; County Planning; County Road Department; Sheriff; Fire Districts; Cities of Grass Valley, Moro, Rufus, and Wasco; Media; Medical Clinic; Mutual Aid Partners; Railroads; Utilities; ODF; ODOT; OEM; Oregon Department of Fish &amp; Wildlife; OSP; State Fire Marshall; American Red Cross; BLM</td>
<td>Ongoing</td>
<td>X X X X X X X X</td>
<td></td>
</tr>
<tr>
<td>WDS #1</td>
<td>Include information regarding windstorms in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Sherman County Emergency Management</td>
<td>County Court; County Road Department; Sheriff; Fire Districts; Cities of Grass Valley, Moro, Rufus, and Wasco; Media; Medical Clinic; Railroads; Utilities; ODOT; OEM; Senior and Disabled Services; American Red Cross</td>
<td>Ongoing</td>
<td>X X X X X X X X</td>
<td></td>
</tr>
</tbody>
</table>
Section 4: Plan Implementation and Maintenance

This section details the formal process that will ensure that the Sherman 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 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 and deemed complete, the Sherman County Director of Emergency Services 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 plan via resolution.

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, Gilliam County and Wheeler County. The Mayor shall be the convener for the City of Moro, while the city council chairs are the designated conveners for the cities of Grass Valley, Rufus and Wasco. All three county Natural Hazards Mitigation Plans (Gilliam, Sherman and Wheeler) and their associated city addenda were developed in a regional concept format.

- Coordinate 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;

• Incorporate, maintain, and update the County’s natural hazard risk GIS data elements; and

• Utilize the Risk Assessment as a tool for prioritizing proposed natural hazard risk reduction projects.

**Coordinating Body**

• The County Steering Committee will serve as the coordinating body for the mitigation plan, while the city councils for Grass Valley, Rufus and Wasco and the city administration for Moro shall act as the coordinating bodies for the respective city addenda, 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 Sherman County multi-jurisdictional Natural Hazards Mitigation Plan:

• City of Grass Valley

• City of Moro

• City of Rufus

• City of Wasco

• Moro Rural Fire Protection District

• Oregon Department of Transportation

• Sherman County Fire Defense Board

• Sherman County Emergency Medical Services

• Sherman County Emergency Services Department
• Sherman County Planning Department
• Sherman County Road Department

To make the coordination and review of Sherman County multi-jurisdictional Natural Hazard 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 Appendix A.

**Plan Maintenance**

Plan maintenance is a critical component of the natural hazard mitigation plan. Proper maintenance of the plan ensures that this plan will maximize the County’s and city/special district’s efforts to reduce the risks posed by natural hazards. This section was developed by the University of Oregon’s Partnership for Disaster Resilience and includes a process to ensure that a regular review and update of the plan occurs. The Steering Committee and local staff are responsible for implementing this process, in addition to maintaining and updating the plan through a series of meetings outlined in the maintenance schedule below.

**Annual Meetings**

The Committee will meet on an annual basis to complete the following tasks. During the 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.
- Review existing and new risk assessment data;
- Discuss methods for continued public involvement; and
- Document successes and lessons learned during the year.

The convener will be responsible for documenting the outcome of the annual meetings in Appendix B. The process the 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 natural hazards mitigation plan 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 actions. Potential mitigation activities often come from a variety of sources; therefore the project prioritization process needs to be flexible. Projects may be identified by committee members, local government staff, other planning documents, or the risk assessment. Figure 4.1 illustrates the project development and prioritization process.
Figure 4.1: Action Item and Project Prioritization Process

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 competitive grant program (PDM), 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. 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.
Figure 4.2: Benefit Cost Decision Criteria

![Decision Criteria Diagram]

Source: Community Service Center’s Partnership for Disaster Resilience at the University of Oregon, 2010.

If the activity requires federal funding for a structural project, the 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 committee will use 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.

Continued Public Involvement & Participation

The participating jurisdictions are dedicated to involving the public directly in the continual reshaping and updating of the Sherman County multi-jurisdictional Natural Hazard 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. There were small numbers from the public in attendance, but their input was appreciated and valued. Other forms of public involvement during the update process include:
• Post plan on the Sherman County Emergency Services Department Website for comment

• Post notices that invite public to participate in one of the Steering Committee meetings

• Implement various other outreach activities documented in this plan (See Section 4: Goals and Action Items)

In addition to the involvement activities listed above, the county’s multi-jurisdictional Natural Hazard Mitigation Plan has been archived and posted on the Partnership website via the University of Oregon Libraries’ Scholar’s Bank Digital Archive.

**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. The Wheeler County Natural Hazards Mitigation Plan is due to be updated in 2018. 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></td>
<td></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>
</tr>
<tr>
<td>Do you have a public involvement strategy for the plan update process?</td>
<td></td>
<td></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>
</tr>
<tr>
<td>Have public involvement activities taken place since the plan was adopted?</td>
<td></td>
<td></td>
<td>Document activities in the “planning process” section of the plan update.</td>
</tr>
<tr>
<td>Are there new hazards that should be addressed?</td>
<td></td>
<td></td>
<td>Add new hazards to the risk assessment section.</td>
</tr>
<tr>
<td>Have there been hazard events in the community since the plan was adopted?</td>
<td></td>
<td></td>
<td>Document hazard history in the risk assessment section.</td>
</tr>
<tr>
<td>Have new studies or previous events identified changes in any hazard’s location or extent?</td>
<td></td>
<td></td>
<td>Document changes in location and extent in the risk assessment section.</td>
</tr>
<tr>
<td>Has vulnerability to any hazard changed?</td>
<td></td>
<td></td>
<td>Document changes in vulnerability in the risk assessment section.</td>
</tr>
<tr>
<td>Have development patterns changed? Is there more development in hazard prone areas?</td>
<td></td>
<td></td>
<td>Document changes in vulnerability in the risk assessment section.</td>
</tr>
<tr>
<td>Do future annexations include hazard prone areas?</td>
<td></td>
<td></td>
<td>Document changes in vulnerability in the risk assessment section.</td>
</tr>
<tr>
<td>Are there new high risk populations?</td>
<td></td>
<td></td>
<td>Document changes in vulnerability in the risk assessment section.</td>
</tr>
<tr>
<td>Are there completed mitigation actions that have decreased overall vulnerability?</td>
<td></td>
<td></td>
<td>Document changes in vulnerability in the risk assessment section.</td>
</tr>
<tr>
<td>Did the plan document and/or address National Flood Insurance Program repetitive flood loss properties?</td>
<td></td>
<td></td>
<td>Document any changes to flood loss property status.</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></td>
<td></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>
</tr>
<tr>
<td>Did the plan identify data limitations?</td>
<td></td>
<td></td>
<td>If yes, the plan update must address them: either state how deficiencies were overcome or why they couldn’t be addressed</td>
</tr>
<tr>
<td>Did the plan identify potential dollar losses for vulnerable structures?</td>
<td></td>
<td></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>
</tr>
<tr>
<td>Are the plan goals still relevant?</td>
<td></td>
<td></td>
<td>Document any updates in the plan goal section.</td>
</tr>
<tr>
<td>What is the status of each mitigation action?</td>
<td></td>
<td></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>
</tr>
<tr>
<td>Are there new actions that should be added?</td>
<td></td>
<td></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>
</tr>
<tr>
<td>Is there an action dealing with continued compliance with the National Flood Insurance Program?</td>
<td></td>
<td></td>
<td>If not, add this action to meet minimum NFIP planning requirements.</td>
</tr>
<tr>
<td>Are changes to the action item prioritization, implementation, and/or administration processes needed?</td>
<td></td>
<td></td>
<td>Document these changes in the plan implementation and maintenance section.</td>
</tr>
<tr>
<td>Do you need to make any changes to the plan maintenance schedule?</td>
<td></td>
<td></td>
<td>Document these changes in the plan implementation and maintenance section.</td>
</tr>
<tr>
<td>Is mitigation being implemented through existing planning mechanisms (such as comprehensive plans, or capital improvement plans)?</td>
<td></td>
<td></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>
</tr>
</tbody>
</table>

Source: Oregon Partnership for Disaster Resilience (2010).
Volume II:
Mitigation Resources
This page left intentionally blank.
Appendix A:
Action Item Forms
Multi-Hazard

1) Seek funding for the implementation of priority projects that reduce the vulnerability of critical public facilities in Sherman County.

*Status: Deferred and Modified from 2008 NHMP*

2) Work with utilities operating in Sherman County to establish tree-pruning programs around transmission lines and trunk distribution lines.

*Status: Completed, Deferred, and Modified from 2008 NHMP*

3) Reduce the effects of natural hazards on existing utility lines

*Status: Deferred and Modified from 2008 NHMP*

4) Develop and maintain a comprehensive impact database on severe natural hazard events in Sherman County.

*Status: Deferred and Modified from 2008 NHMP*

5) Identify opportunities to reduce existing barriers to interagency cooperation and work together to reduce risk and loss from natural hazards.

*Status: Completed and Deferred from 2008 NHMP*
Multi-Hazard #1

<table>
<thead>
<tr>
<th>Proposed Action Item: MH#1</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 Sherman County. | **Goal 2:** Protect life, reduce injuries, and minimize damage to property  
**Goal 3:** Increased cooperation and collaboration between groups and agencies |

**Rationale for Proposed Action Item:**

- Sherman County is vulnerable to a number of natural hazards that can affect public facilities. In a self-completed hazard analysis, the county rated vulnerability to drought, flood, landslide/debris flow, wildfire, windstorm and severe weather/winter storm hazards as medium. The county rated the probability that drought, flood, wildfire, windstorm, and severe weather/winter storm will each occur as high. Each natural hazard can pose significant risks to 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 vulnerability to natural hazards, and recommends identifying the types and numbers of buildings and infrastructure that could be affected by hazards [201.6(c)(2)(iii)(A)]. 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 also 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)(iii)]. This inventory of public facilities that are vulnerable to natural hazards will allow the County to meet this requirement.
- The four incorporated cities in Sherman County—Grass Valley, Moro, and Rufus—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. Create list of important public facilities.
- Identify important historic and cultural resources, especially buildings or structures on the national register, vulnerable to natural hazards that should be preserved.
- Utilize outcomes of DOGAMI’s efforts on Senate Bill 2 seismic hazard inventory and risk assessment: http://www.oregongeology.com/sub/projects/rvs/default.htm
- Results of initial Senate Bill 2 inventory for Sherman County include: South Sherman Fire District, South Sherman Elementary, Sherman County Emergency Services, Moro Rural Fire Protection District, Sherman County Sheriff, Sherman High, Rufus Volunteer Fire Department, North Sherman County Rural Fire Protection District, and North Sherman Elementary.
- Identify specific vulnerabilities to public facilities for each natural hazard, especially those constructed of un-reinforced masonry that are vulnerable to earthquakes.
- Prioritize facilities based on vulnerability.
- Identify actions communities can take to reduce a facility’s vulnerability to a natural hazard.
- Incorporated communities should coordinate with the county to identify vulnerable facilities to mitigate their risk to natural hazards.

<table>
<thead>
<tr>
<th>Coordinating Organization:</th>
<th>Sherman County Emergency Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal Partners:</strong></td>
<td><strong>External Partners:</strong></td>
</tr>
<tr>
<td>Sherman County; Sherman County NHMP Steering Committee; Cities of Grass Valley, Moro, Rufus, and Wasco</td>
<td>OEM; DOGAMI; FEMA</td>
</tr>
<tr>
<td><strong>Potential Funding Sources:</strong></td>
<td><strong>Estimated cost:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Form Submitted by:</strong></td>
<td>Sherman County</td>
</tr>
<tr>
<td><strong>Action Item Status:</strong></td>
<td>Deferred and Modified from 2008 NHMP</td>
</tr>
</tbody>
</table>
Multi-Hazard #2

<table>
<thead>
<tr>
<th>Proposed Action Item: MH#2</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Work with utilities operating in Sherman County to establish tree-pruning programs around transmission lines and trunk distribution lines. | **Goal 2:** Protect life, reduce injuries, and minimize damage to property  
**Goal 3:** Increased cooperation and collaboration between groups and agencies |

**Rationale for Proposed Action Item:**

- Natural hazards including; windstorms and severe weather/winter storms, can severely affect electric utilities. Sherman County rated the probability to severe weather/winter storm and windstorms as high and the vulnerability to each hazard as medium. Falling trees can potential damage buildings and infrastructure, block roadways, and cause power outages from down overhead power lines. Tree pruning helps reduce the vulnerability to natural hazards and mitigating the potential damage they could cause to buildings and infrastructure. Implementing tree-pruning programs help to maximize time, money, and resources.
- The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Tree pruning will help reduce trees’ vulnerability to natural hazards by reducing the risk that trees will be downed in a severe weather/winter storm, damaging buildings and utilities. To effectively coordinate tree-pruning efforts, community members and utilities should establish agreed upon tree-pruning programs that will help reduce the risk that trees will damage buildings and utilities.
- The four incorporated cities in Sherman County –Grass Valley, Moro, Rufus and Wasco- 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. A coordinated effort will reduce the overall the risk to natural hazards and damage to utilities for both the county and the incorporated communities.

**Ideas for Implementation:**

- The communities should coordinate with the county and the utilities to establish tree-pruning programs.
- Identify tree-pruning programs other communities have successfully implemented.
- Meet with utilities to discuss tree pruning programs and implementation measures.
- Conduct public outreach on this effort through appropriate channels such as utility bill inserts or other methods.

**Potential Funding Sources:**

**Estimated cost:**

**Timeline:** Ongoing

**Coordinating Organization:** Sherman County Emergency Management

**Internal Partners:** Sherman County; Cities of Grass Valley, Moro, Rufus, and Wasco

**External Partners:** Pacific Power and Light; Wasco Rural Electric; BPA

**Form Submitted by:** Sherman County

**Action Item Status:** Completed, Deferred, and Modified from 2008 NHMP
Multi-Hazard #3

<table>
<thead>
<tr>
<th>Proposed Action Item: MH#3</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Reduce the effects of natural hazards on existing utility lines. | **Goal 2:** Protect life, reduce injuries, and minimize damage to property  
**Goal 3:** Increased cooperation and collaboration between groups and agencies |

**Rationale for Proposed Action Item:**

- Sherman County is vulnerable to a number of natural hazards that can affect public facilities. In a self-completed hazard analysis, the county rated vulnerability to drought, flood, landslide/debris flow, wildfire, windstorm and severe weather/winter storm hazards as medium. The county rated the probability that drought, flood, wildfire, windstorm, and severe weather/winter storm will each occur as high. Each natural hazard can pose significant risks to utilities.
- During severe weather/winter storms, ice can weight down power lines so that those lines droop to the ground in places where power poles are spaced too far apart. Older power poles were placed at longer distances than new poles that are put up today. These older lines are more vulnerable to line breakage because of the span distance between poles.
- The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on existing buildings and infrastructure [201.6(c)(3)(ii)].
- The three incorporated cities in Sherman County – Grass Valley, Moro, Rufus, and Wasco - 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:**

- Seek funding to intersperse new power poles between existing poles where extra long spans have created service provision issues in the past.
- In the pre-disaster mode, seek FEMAs Pre-Disaster Mitigation grant funds. Following a Presidential declaration of disaster, the Co-op may seek funds through FEMA’s Hazard Mitigation Grant Program.

**Coordinating Organization:** Pacific Power and Light; Wasco Electric Cooperative

**Internal Partners:** Sherman County; Cities of Grass Valley, Moro, Rufus, and Wasco

**External Partners:** BPA

**Potential Funding Sources:**

**Estimated cost:**

**Timeline:** Ongoing

**Form Submitted by:** Sherman County

**Action Item Status:** Deferred and Modified from 2008 NHMP
Multi-Hazard #4

**Proposed Action Item: MH#4**

Develop and maintain a comprehensive impact database on severe natural hazard events in Sherman County.

**Alignment with Plan Goals:**

| Goal 2: Protect life, reduce injuries, and minimize damage to property |
| Goal 3: Increased cooperation and collaboration between groups and agencies |

**Rationale for Proposed Action Item:**

- Sherman County is vulnerable to a number of natural hazards that can affect public facilities. In a self-completed hazard analysis, the county rated vulnerability to drought flood, landslide/debris flow, wildfire, windstorm and severe weather/winter storm hazards as medium. The county rated the probability that drought, flood, wildfire, windstorm, and severe weather/winter storm will each occur as high. Each natural hazard can pose significant risks to public facilities. 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 Sherman 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.
- The four incorporated cities in Sherman County – Grass Valley, Moro, Rufus, and Wasco– 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. 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:**

- The communities and the county should coordinate efforts to develop and maintain an impact database.
- Identify a responsible agency to collect natural hazards information to help establish and maintain baseline and historic records of hazard events;
- Document future events including impacts and losses;
- Identify public infrastructure and facilities subject to closures due to snowfall and ice hazards during severe weather/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:** Sherman County Emergency Management

<table>
<thead>
<tr>
<th>Internal Partners:</th>
<th>External Partners:</th>
</tr>
</thead>
<tbody>
<tr>
<td>County Planning; GIS; Cities of Grass Valley, Moro, Rufus, and Wasco; Utilities</td>
<td>ODOT; Oregon Climate Service; National Weather Service; National Oceanic and Atmospheric Administration (NOAA)</td>
</tr>
</tbody>
</table>

**Potential Funding Sources:**

<table>
<thead>
<tr>
<th>Estimated cost:</th>
<th>Timeline:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

**Form Submitted by:** Sherman County

**Action Item Status:** Deferred and Modified from 2008 NHMP
**Multi-Hazard #5**

<table>
<thead>
<tr>
<th>Proposed Action Item: MH#5</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify opportunities to reduce existing barriers to interagency cooperation and work together to reduce risk and loss from natural hazards.</td>
<td><strong>Goal 3:</strong> Increased cooperation and collaboration between groups and agencies</td>
</tr>
</tbody>
</table>

**Rationale for Proposed Action Item:**

- The Steering Committee identified the need to create interagency agreements to help reduce barriers to collaboration.
- Sherman, Gilliam, and Wheeler Counties often work together various projects already and have identified similar mitigation actions.
- The four incorporated cities in Sherman County—Grass Valley, Moro, Rufus, and Wasco—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:**

- Develop interagency agreements to better coordinate risk reduction activities within the County and within the three county area.
- Identify opportunities to work together to leverage limited resources on commonly identified projects.

<table>
<thead>
<tr>
<th>Coordinating Organization:</th>
<th>Sherman County</th>
</tr>
</thead>
</table>

**Internal Partners:**

- County Emergency Management;
- County Road Department;
- Fire Districts;
- Cities of Grass Valley, Moro, Rufus, and Wasco

**External Partners:**

- Gilliam County,
- Wheeler County,
- ODOT

**Potential Funding Sources:**

**Estimated cost:**

**Timeline:**

- Ongoing

**Form Submitted by:**

- Sherman County

**Action Item Status:**

- Completed and Deferred from 2008 NHMP
Drought

1) Include information regarding droughts in a brochure of natural hazards and mail/make available to county residents and the public.

   Status: Completed, Deferred, and Modified from 2008 NHMP
**Drought #1**

<table>
<thead>
<tr>
<th>Proposed Action Item: DR#1</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Include information regarding droughts in a brochure of natural hazards and mail/make available to county residents and the public. | **Goal 1:** Enhance the ability to respond effectively and swiftly.  
**Goal 2:** Protect life, reduce injuries, and minimize damage to property  
**Goal 3:** Increased cooperation and collaboration between groups and agencies  
**Goal 4:** 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:**

- Drought situations increase the risk of fire hazards.
- Drought situations cause visibility hazards.
- Drought situations cause critical water shortages for humans, animals and vegetation.
- The four incorporated cities in Sherman County—Grass Valley, Moro, Rufus, and Wasco—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 water conservation.
- Educate the public on Erosion control.
- Educate the public regarding drought resistant plants.

**Coordinating Organization:** Sherman County Emergency Management

**Internal Partners:** County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; SWCD; Media; Railroad; Utilities

**External Partners:** OSU Extension; Oregon Department of Agriculture; ODOT; OEM, American Red Cross; FEMA; FSA; NRCS

**Potential Funding Sources:**  
**Estimated cost:**  
**Timeline:** Ongoing

**Form Submitted by:** Sherman County

**Action Item Status:** Completed, Deferred, and Modified from 2008 NHMP
Earthquake

1) Include information regarding earthquakes in a brochure of natural hazards and mail/make available to county residents and the public.

   **Status:** Deferred and Modified from 2008 NHMP

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 a high collapse potential rate by the Department of Geology and Mineral Industries (DOGAMI).

   **Status:** New Action Item
### Earthquake #1

<table>
<thead>
<tr>
<th>Proposed Action Item: EQ#1</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Include information regarding earthquakes in a brochure of natural hazards and mail/make available to county residents and the public. | **Goal 1:** Enhance the ability to respond effectively and swiftly.  
**Goal 2:** Protect life, reduce injuries, and minimize damage to property  
**Goal 3:** Increased cooperation and collaboration between groups and agencies  
**Goal 4:** 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:
- People need to know what to expect.
- People need to know what they should do and have to prepare for an earthquake.
- People need to know what to do and where to go.
- Planning for a hazard helps to reduce the risk of injuries and loss of life.
- The four incorporated cities in Sherman County—Grass Valley, Moro, Rufus, and Wasco—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 regarding earthquakes.
- Make sure citizens know which buildings are deemed shelters.

<table>
<thead>
<tr>
<th>Coordinating Organization:</th>
<th>Sherman County Emergency Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal Partners:</strong></td>
<td>County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; Media; Medical Clinic</td>
</tr>
<tr>
<td><strong>External Partners:</strong></td>
<td>North Central Public Health District; Railroad; School Districts; Utilities; ODOT; OEM; DOGAMI; American Red Cross; Army Corps of Engineers; FEMA; FSA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potential Funding Sources:</th>
<th>Estimated cost:</th>
<th>Timeline:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Long Term</td>
</tr>
</tbody>
</table>

**Form Submitted by:** Sherman County  
**Action Item Status:** Deferred and Modified from 2008 NHMP
## Earthquake #2

**Proposed Action Item: EQ#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 a high collapse potential rate by the Department of Geology and Mineral Industries (DOGAMI).

**Alignment with Plan Goals:**

| Goal 2: Protect life, reduce injuries, and minimize damage to property |
| Goal 3: Increased cooperation and collaboration between groups and agencies |

### Rationale for Proposed Action Item:

- Oregon Senate Bill 2 (2005) directs DOGAMI, in consultation with project partners, to develop a statewide seismic needs assessment that includes seismic safety surveys of K-12 public school buildings and community college buildings that have a capacity of 250 or more persons, hospital buildings with acute inpatient care facilities, fire stations, police stations, sheriffs' offices and other law enforcement agency buildings.
- DOGAMI completed the seismic needs assessment in June 2006 for Sherman County. Two critical facilities were rated with High (greater than 10-percent) collapse potentials including the South Sherman Elementary School in Grass Valley and the Sherman County Courthouse in Moro.

### Ideas for Implementation:

- Seek funding through various grant programs to seismically retrofit the critical facilities rated with high collapse potential ratings.

### Coordinating Organization:

Sherman County Planning Department

### Internal Partners:

- County Court; Sherman County Emergency Management; City of Grass Valley; School District

### External Partners:

- Oregon Emergency Management; Federal Emergency Management Agency

### Potential Funding Sources:

<table>
<thead>
<tr>
<th>Seismic Rehabilitation Grant Program (OEM)</th>
</tr>
</thead>
</table>

### Estimated cost:

- Long Term

### Form Submitted by:

Sherman County

### Action Item Status:

New Action Item
1) Include information regarding flooding in a brochure of natural hazards and mail/make available to county residents and the public.

*Status: Completed, Deferred, and Modified from 2008 NHMP*

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

*Status: Completed and Deferred from 2008 NHMP*

3) Develop a database of repetitive flood loss properties not covered by the National Flood Insurance Program

*Status: Deferred from 2008 NHMP*

4) Coordinate with the State Floodplain Coordinator and the Department of Land Conservation and Development (DLCD) to update the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for Sherman County and the incorporated cities participating in the Nation Flood Insurance Program (NFIP).

*Status: New Action Item*
## Flood #1

<table>
<thead>
<tr>
<th>Proposed Action Item: FL#1</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Include information regarding flooding in a brochure of natural hazards and mail/make available to county residents and the public. | **Goal 1:** Enhance the ability to respond effectively and swiftly.  
**Goal 2:** Protect life, reduce injuries, and minimize damage to property  
**Goal 3:** Increased cooperation and collaboration between groups and agencies  
**Goal 4:** 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:

- Flooding can increase the risk of mud and debris on the roads.
- Flooding can increase the risk of driving on the roads.
- Flooding can increase the risk of personal and vehicle accidents and injuries.
- Flooding can increase the risk of trees falling on to roads or homes.
- Flooding can increase the risk of down communication and power lines.
- The three incorporated cities in Sherman County – Grass Valley, Moro, and Rufus- 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:

- Education regarding good Erosion control.
- Educate the public on what to do in a flood.
- Educate the public regarding not driving through flooded roads.

### Coordinating Organization:
Sherman County Emergency Management

### Internal Partners:
- County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco; Medical Clinic; Railroad; Utilities

### External Partners:
- ODOT; OEM; Senior and Disabled Services; American Red Cross; Army Corps of Engineers; FEMA; FSA;

### Potential Funding Sources:

### Estimated cost:  

### Timeline:  
Ongoing

### Form Submitted by:  
Sherman County

### Action Item Status:  
Completed, Deferred, and Modified from 2008 NHMP
### Flood #2

**Proposed Action Item: FL#2**

| Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances. |

**Alignment with Plan Goals:**

| Goal 2: Protect life, reduce injuries, and minimize damage to property |

**Rationale for Proposed Action Item:**

- The National Flood Insurance Program provides communities federally backed flood insurance to homeowners, renters, and business owners, provided that communities develop and enforce adequate floodplain management ordinances. The benefits of adopting NFIP standards for communities are a reduced level of flood damage in the community and stronger buildings that can withstand floods. According to the NFIP, buildings constructed in compliance with NFIP building standards suffer approximately 80 percent less damage annually than those not built in compliance.

- The Disaster Mitigation Act of 2000 requires communities to identify mitigation actions that address new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Continued participation in the NFIP will help reduce the level of flood damage to new and existing buildings in communities while providing homeowners, renters, and business owners additional flood insurance protection.

- The CAV is a scheduled visit to a community participating in the NFIP for the purpose of: 1) Conducting a comprehensive assessment of the community’s floodplain management program; 2) assisting the community and its staff in understanding the NFIP and its requirements; and 3) assisting the community in implementing effective flood loss reduction measures when program deficiencies or violations are discovered.

- The three incorporated cities in Sherman County—Grass Valley, Moro, and Rufus—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:**

- Actively participate with DLCD and FEMA during Community Assistance Visits.

- Conduct an assessment of the floodplain ordinances to ensure they reflect current flood hazards and situations, and meet NFIP requirements.

- The cities should coordinate with the county to ensure that floodplain ordinances and NFIP regulations are maintained and enforced.

**Coordinating Organization:** Sherman County Planning Department

**Internal Partners:** County Emergency Management; Cities of Grass Valley, Moro, Rufus, and Wasco

**External Partners:** DLCD; OEM; FEMA

**Potential Funding Sources:**

<table>
<thead>
<tr>
<th>Estimated cost:</th>
<th>Timeline:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing</td>
<td></td>
</tr>
</tbody>
</table>

**Form Submitted by:** Sherman County

**Action Item Status:** Completed and Deferred from 2008 NHMP
Flood #3

<table>
<thead>
<tr>
<th>Proposed Action Item: FL#3</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop a database of repetitive flood loss properties not covered by the National Flood Insurance Program</td>
<td>Goal 2: Safety of life and property</td>
</tr>
</tbody>
</table>

**Rationale for Proposed Action Item:**

- Often times, communities have repetitive flood loss properties that are not covered by the NFIP. Working with homeowners and business owners to identify mitigation actions, such as building elevation or property acquisition, can reduce the impact and damage from of floods on repetitive loss properties.
- The Disaster Mitigation Act of 2000 requires communities to identify mitigation actions that address existing buildings and infrastructure [201.6(c)(3)(ii)]. Developing mitigation actions for repetitive flood loss properties can significantly diminish the impact and damage from flooding on these properties.
- The four incorporated cities in Sherman County –Grass Valley, Moro, Rufus, and Wasco- 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:**

- Develop a database of repetitive flood loss properties not covered by the NFIP to track flood damage and to use when identifying mitigation actions.
- Sherman County Public Works and the cities should coordinate to identify properties not covered by the NFIP and teach homeowners and businesses about mitigation actions they can implement.
- Work with homeowners to identify potential mitigation measures to be funded through either Pre-Disaster Mitigation or Flood Mitigation Assistance.
- Develop countywide stormwater management strategies to address repetitive loss properties.

<table>
<thead>
<tr>
<th>Coordinating Organization:</th>
<th>Sherman County Emergency Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Partners:</td>
<td>External Partners:</td>
</tr>
<tr>
<td>Sherman County, Cities of Grass Valley, Moro, Rufus, and Wasco</td>
<td>DLCD, FEMA, OEM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potential Funding Sources:</th>
<th>Estimated cost:</th>
<th>Timeline:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Long Term</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Form Submitted by:</th>
<th>Sherman County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action Item Status:</td>
<td>Deferred from 2008 NHMP</td>
</tr>
</tbody>
</table>
**Flood #4**

<table>
<thead>
<tr>
<th>Proposed Action Item: FL#4</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinate with the State Floodplain Coordinator and the Department of Land Conservation and Development (DLCD) to update the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for Sherman County and the incorporated cities participating in the Nation Flood Insurance Program (NFIP).</td>
<td><strong>Goal 2:</strong> Protect life, reduce injuries, and minimize damage to property.</td>
</tr>
</tbody>
</table>

**Rationale for Proposed Action Item:**
- The current FEMA Flood Insurance Rate Maps (FIRMs) are out of date. The current effective map date is September 24, 1984, which means that the maps in Sherman County are the third oldest out of the 36 counties in the State of Oregon.
- Sherman County is one of four counties in the State of Oregon in which no elevation is determined in the FIRMs.
- New upland diversion dams have been built throughout the county and surrounding area since the current FIRMs became effective. This may potentially impact accuracy of the current maps.
- In order to properly and profitably fulfill Flood Action Item #2, the county needs more accurate, up to date Flood Insurance Rate Maps.

**Ideas for Implementation:**
- Contact the State Floodplain Coordinator and the Department of Land Conservation and Development

**Coordinating Organization:** Sherman County Planning Department

<table>
<thead>
<tr>
<th>Internal Partners:</th>
<th>External Partners:</th>
</tr>
</thead>
<tbody>
<tr>
<td>County Emergency Management; Cities of Grass Valley, Rufus, and Wasco;</td>
<td>Department of Land Conservation and Development; Oregon Emergency Management; Federal Emergency Management Agency</td>
</tr>
</tbody>
</table>

**Potential Funding Sources:** DLCD grants, FEMA funding

**Estimated cost:** Long Term

**Timeline:**

**Form Submitted by:** Sherman County

**Action Item Status:** New Action Item
Landslide/Debris Flow

1) Include information regarding landslides/debris flows in a brochure of natural hazards and mail/make available to county residents and the public.

Status: Completed, Deferred, and Modified from 2008 NHMP
### Landslide/Debris Flow #1

<table>
<thead>
<tr>
<th>Proposed Action Item: LS#1</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Include information regarding landslides/debris flows in a brochure of natural hazards and mail/make available to county residents and the public. | **Goal 1:** Enhance the ability to respond effectively and swiftly.  
**Goal 2:** Protect life, reduce injuries, and minimize damage to property  
**Goal 3:** Increased cooperation and collaboration between groups and agencies  
**Goal 4:** 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:

- Landslides/debris flows can happen without any or little warning.
- People need to know what to expect.
- People need to know what they should do and not do in the event of a landslide/debris flow.
- Need to plan for the reduction in potential economic losses.
- The three incorporated cities in Sherman County – Grass Valley, Moro, Rufus, and Wasco – 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 in regards to what to do if they come across a landslide or debris flow.
- Develop interagency agreements to cut through the red tape and develop a uniform set of rules.
- Educate the public on better ways to provide drainage and structural improvements to reduce economic losses.
- Educate the public to pay attention to weather broadcasts and potential hazard warnings.

#### Coordinating Organization:
Sherman County Emergency Management

#### Internal Partners:
- County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco

#### External Partners:
- Media; Railroads; Utilities; ODOT; OEM; Oregon Department of Fish & Wildlife; American Red Cross; FSA

#### Potential Funding Sources:

<table>
<thead>
<tr>
<th>Estimated cost:</th>
<th>Timeline:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing</td>
<td></td>
</tr>
</tbody>
</table>

#### Form Submitted by:
Sherman County

#### Action Item Status:
Completed, Deferred and, Modified from 2008 NHMP
Severe Weather/Winter Storm

1) Educate farmers about ways to protect livestock from the effects of winter storms.

   **Status:** Deferred and Modified from 2008 NHMP

2) Include information regarding severe weather/severe weather/winter storms in a brochure of natural hazards and mail/make available to county residents and the public.

   **Status:** Completed, Deferred, and Modified from 2008 NHMP
Severe Weather/Winter Storm #1

**Proposed Action Item: SW/WS#1**

Educate farmers about ways to protect livestock from the effects of winter storms.

**Alignment with Plan Goals:**

- **Goal 2:** Protect life, reduce injuries, and minimize damage to property
- **Goal 4:** 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:**

- Sherman County vulnerability rating for winter storms is medium. In addition, Sherman County has a high probability to winter storms. By encouraging farmers to better protect their livestock from winter storms, impacts to the local economy can be minimized.
- According to the Sherman County Community Profile, Agriculture is the industry with the largest workforce in the County.
- The Disaster Mitigation Act of 2000 requires communities to identify a comprehensive range of specific mitigation actions and projects for each hazard [201.6(c)(3)(ii)]. Protecting important community assets from winter storms is important.
- The four incorporated cities in Sherman County – Grass Valley, Moro, Rufus, and Wasco - have limited resources and rely on the county for certain services and public facilities. The cities should coordinate with the county to encourage farmers to protect livestock, establishing a unified countywide effort to reduce the impacts on the agricultural based economy.

**Ideas for Implementation:**

- Sherman County should partner with Oregon State University Extension Service and the Oregon Department of Agriculture for this effort.
- Installation of snow fences to reduce drifting snow on roads and paths, which could block access to barns, feed and water.
- Horses and livestock should have a shelter where they can be protected from wind, snow, ice and rain.
- Grazing animals should have access to a protected supply of food and non-frozen water.

**Coordinating Organization:** Sherman County Emergency Management

**Internal Partners:**

**External Partners:**

OSU Extension; Oregon Department of Agriculture

**Potential Funding Sources:**

**Estimated cost:**

**Timeline:**

Ongoing

**Form Submitted by:** Sherman County

**Action Item Status:** Deferred and Modified from 2008 NHMP
Severe Weather/Winter Storm #2

<table>
<thead>
<tr>
<th>Proposed Action Item: SW/WS#2</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| Include information regarding severe weather/severe weather/winter storms in a brochure of natural hazards and mail/make available to county residents and the public. | **Goal 1:** Enhance the ability to respond effectively and swiftly.  
**Goal 2:** Protect life, reduce injuries, and minimize damage to property  
**Goal 3:** Increased cooperation and collaboration between groups and agencies  
**Goal 4:** 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:**

- Severe weather and severe weather/winter storms increase the risk of down communication and power lines.
- Severe weather and severe weather/winter storms can increase the risk of driving on roads.
- Severe weather and severe weather/winter storms can increase the risk of low visibility on roads.
- Severe weather and severe weather/winter storms can increase the risk of trees and tree limbs on homes.
- Severe weather and severe weather/winter storms can increase the risk of running out of household supplies.
- Severe weather and severe weather/winter storms can increase the risk of personal and vehicle accidents and injuries.
- The three incorporated cities in Sherman County –Grass Valley, Moro, and Rufus- 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 prior to and during severe weather and severe weather/winter storm events.

**Coordinating Organization:** Sherman County Emergency Management

<table>
<thead>
<tr>
<th>Internal Partners: County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco</th>
<th>External Partners: Media; Medical Clinic; Utilities; ODOT; OEM; American Red Cross</th>
</tr>
</thead>
</table>

**Potential Funding Sources:**

<table>
<thead>
<tr>
<th>Estimated cost:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeline: Ongoing</td>
</tr>
</tbody>
</table>

**Form Submitted by:** Sherman County

**Action Item Status:** Completed, Deferred, and Modified from 2008 NHMP
Volcanic Event

1) Include information regarding volcanoes in a brochure of natural hazards and mail/make available to county residents and the public.

Status: Deferred and Modified from 2008 NHMP
### Volcanic Event

**Proposed Action Item: VE#1**
Include information regarding volcanoes in a brochure of natural hazards and mail/make available to county residents and the public.

**Alignment with Plan Goals:**
- **Goal 1:** Enhance the ability to respond effectively and swiftly.
- **Goal 2:** Protect life, reduce injuries, and minimize damage to property.
- **Goal 3:** Increased cooperation and collaboration between groups and agencies.
- **Goal 4:** 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:**
- The main concern in this county from an erupting volcano will be the ash fallout.
- 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.
- The four incorporated cities in Sherman County – Grass Valley, Moro, Rufus, and Wasco - 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 regarding staying indoors.
- Discuss what to expect and do if a volcano erupts, with children in school.
- Have information regarding volcanoes readily available to residents of the county and general public.

**Coordinating Organization:** Sherman County Emergency Management

**Internal Partners:**
- County Court; County Planning; County Road Department; Sheriff; Cities of Grass Valley, Moro, Rufus, and Wasco;

**External Partners:**
- North Central Public Health District; Media; Medical Clinic; School District; ODOT; OEM; Senior and Disabled Services; American Red Cross; Railroads; Utilities; USGS; DEQ

**Potential Funding Sources:**

<table>
<thead>
<tr>
<th>Estimated cost:</th>
<th>Timeline:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Long Term</td>
</tr>
</tbody>
</table>

**Form Submitted by:** Sherman County

**Action Item Status:** Deferred and Modified from 2008 NHMP
**Wildfire**

1) 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, Deferred, and Modified from 2008 NHMP*
## Wildfire #1

<table>
<thead>
<tr>
<th>Proposed Action Item: WF#1</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
</table>
| 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. | **Goal 1:** Enhance the ability to respond effectively and swiftly.  
**Goal 2:** Protect life, reduce injuries, and minimize damage to property  
**Goal 3:** Increased cooperation and collaboration between groups and agencies  
**Goal 4:** 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, Sherman County reported a high probability to future wildfire events and a medium vulnerability to the hazard. Implementing the CWPP can assist Sherman County in identifying mitigation partnerships, methods, and activities specifically for reducing its wildfire risk.
- Implementing the CWPP can also assist Sherman County in identifying mitigation partnerships, methods, and activities specifically for reducing its WUI fire risk.
- A community’s response capabilities can have a significant impact on the impact wildfire has on a community. Sherman County’s Road Department currently lacks adequate training and equipment.
- The four incorporated cities in Sherman County – Grass Valley, Moro, Rufus, and Wasco – 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:
- If appropriate and available follow County Wildfire Protection Plan.
- Educate the public on what to do in a wildfire.
- Educate public on 30-foot fuel reduction and debris removal around homes.
- Educate public on fire resistant roof, shelter and shrubs.

### Coordinating Organization:
Sherman County Emergency Management

### Internal Partners:
- County Court; County Planning; County Road Department; Sheriff; Fire Districts; Cities of Grass Valley, Moro, Rufus, and Wasco

### External Partners:
- Media; Medical Clinic; Mutual Aid Partners; Railroads; Utilities; ODF; ODOT; OEM; Oregon Department of Fish & Wildlife; OSP; State Fire Marshall; American Red Cross; BLM

### Potential Funding Sources:

<table>
<thead>
<tr>
<th>Estimated cost</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

### Form Submitted by:
Sherman County

### Action Item Status:
Completed, Deferred, and Modified from 2008 NHMP
Windstorm

1) Include information regarding windstorms in a brochure of natural hazards and mail/make available to county residents and the public.

*Status: Completed, Deferred, and Modified from 2008 NHMP*
Windstorm #1

<table>
<thead>
<tr>
<th>Proposed Action Item:</th>
<th>Alignment with Plan Goals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>WDS#1</td>
<td>Goal 1: Enhance the ability to respond effectively and swiftly.</td>
</tr>
<tr>
<td></td>
<td>Goal 2: Protect life, reduce injuries, and minimize damage to property</td>
</tr>
<tr>
<td></td>
<td>Goal 3: Increased cooperation and collaboration between groups and agencies</td>
</tr>
<tr>
<td></td>
<td>Goal 4: Motivate the public, private sector, and government agencies to mitigate against the effects of natural hazards through information and education</td>
</tr>
</tbody>
</table>

Rationale for Proposed Action Item:

- Windstorms increase the risk of down communication and power lines.
- Windstorms can increase the risk of debris on roads.
- Windstorms can cause poor visibility in areas where soil is loose.
- Windstorms can cause tree limbs to produce risks to homeowners/tenants.
- Windstorms are sometimes accompanied by heavy moisture.
- Windstorms can be a catalyst for traffic accidents.
- The four incorporated cities in Sherman County—Grass Valley, Moro, Rufus, and Wasco—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 windstorm.

Coordinating Organization: Sherman County Emergency Management

<table>
<thead>
<tr>
<th>Internal Partners:</th>
<th>External Partners:</th>
</tr>
</thead>
<tbody>
<tr>
<td>County Court; County Road Department; Sheriff; Fire Districts; Cities of Grass Valley, Moro, Rufus, and Wasco</td>
<td>Media; Medical Clinic; Railroads; Utilities; ODOT; OEM; Senior and Disabled Services; American Red Cross</td>
</tr>
</tbody>
</table>

Potential Funding Sources: |
Estimated cost: |
Timeline: Ongoing

Form Submitted by: Sherman County

Action Item Status: Completed, Deferred, and Modified from 2008 NHMP
## Appendix B:
### Planning and Public Process

### Table of Contents

#### 2012 Natural Hazards Mitigation Plan Update

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan Update Changes Memo</td>
<td>B-2</td>
</tr>
<tr>
<td>Phase I: Project Initiation Materials</td>
<td>B-13</td>
</tr>
<tr>
<td>Plan Update Invitations for the Cities of Grass Valley, Moro, Rufus, and Wasco</td>
<td>B-22</td>
</tr>
<tr>
<td>Phase II: Risk Assessment Materials</td>
<td>B-30</td>
</tr>
<tr>
<td>April 2, 2012 City of Grass Valley City Council Meeting Materials</td>
<td>B-38</td>
</tr>
<tr>
<td>April 11, 2012 City of Rufus City Council Meeting Materials</td>
<td>B-42</td>
</tr>
<tr>
<td>May 15, 2012 City of Wasco Plan City Council Meeting Materials</td>
<td>B-45</td>
</tr>
<tr>
<td>May 16, 2012 City of Moro Risk Assessment Meeting Materials</td>
<td>B-49</td>
</tr>
<tr>
<td>Phase III: Mitigation Strategy and Plan Implementation and Maintenance Materials</td>
<td>B-53</td>
</tr>
</tbody>
</table>

#### 2008 Natural Hazards Mitigation Plan Development

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008 NHMP Plan Development and Public Process</td>
<td>B-55</td>
</tr>
</tbody>
</table>
Memorandum

To: Federal Emergency Management Agency

From: Resource Assistance for Rural Environments, Oregon Partnership for Disaster Resilience

Date: January 7, 2013

Re: List of changes to the 2008 Sherman County NHMP to the 2012 Plan Update

Purpose

This memorandum describes the changes made to the 2008 Sherman County Natural Hazards Mitigation Plan (NHMP) during the 2011/2012 update process. Major changes are documented by plan section.

Project Background

In September 2011, Sherman County partnered with the Oregon Partnership for Disaster Resilience (OPDR) and Resources Assistance for Rural Environments (RARE) to update the 2008 Sherman County NHMP. The Disaster Mitigation Act of 2000 requires communities to update their mitigation plans every five years in order to remain eligible for Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), and Hazard Grant Mitigation Program (HMGP) funding. RARE and OPDR met with members of the Sherman County NHMP Steering Committee in November 2011, February 2012, and June 2012 to update the content within the county’s NHMP. The RARE participant also met with each city (Grass Valley, Moro, Rufus and Wasco) in April and May 2012 to update content and conduct a hazard analysis for each city’s jurisdiction. RARE, ODDR, and the Sherman County NHMP Steering Committee made several changes to the 2008 NHMP. Major changes are documented and summarized in this memorandum.

2012 Plan Update Changes

The sections below only discuss major changes and additions made to the 2008 Sherman County NHMP during the 2012 plan update process. Major changes include replacement or deletion of large portions of text, changes to the plan’s organization, and new additions to the plan. If a section is not addressed in this memorandum, then it can be assumed that no significant changes occurred.

The plan’s format and organization have been altered to fit with plan templates provided by OPDR. Table B1 below lists the 2008 plan section names and the corresponding 2012 section names as updated. This memorandum will use the 2012 plan update section names to reference any changes, additions, or deletions within the plan.
Table B.1: Changes to Plan Sections

<table>
<thead>
<tr>
<th>2008 Sherman County NHMP</th>
<th>2012 Sherman County NHMP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Volume I:</strong></td>
<td></td>
</tr>
<tr>
<td>Table of Contents</td>
<td>Table of Contents</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: Mitigation Strategy</td>
</tr>
<tr>
<td>Section 4: Mission, Goals, and Action Items</td>
<td>Section 4: Plan Implementation and Maintenance</td>
</tr>
<tr>
<td>Section 5: Plan Implementation and Maintenance</td>
<td></td>
</tr>
<tr>
<td><strong>Volume II:</strong></td>
<td></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><strong>Volume III:</strong></td>
<td></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: Economic 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>

Aside from substantial changes to plan section content, the most visible change to the plan’s organization from the update process is the removal of the Volume II from the 2008 Sherman County NHMP. Instead, the sections in Volume II of the 2008 NHMP are included in appropriate sections of the 2012 plan update.

**Front Pages**

1. The plan’s cover has been updated.

2. Acknowledgements have been updated to include the 2012 project partners and planning participants.

**Volume I**

Volume I provides the overall plan framework for the 2012 NHMP update. Volume I contains the following sections: 1) Introduction; 2) Risk Assessment 3) Goals and Action Items; and 4) Plan Implementation and Maintenance.

**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 2012 plan update process, and provides an overview of how the plan is organized. Major changes to Section 1 include the following:

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 Sherman County is eligible to apply (i.e., the Pre-Disaster Mitigation (PDM) Program, the Flood Mitigation Assistance (FMA) Program, and the Hazard Mitigation Grant Program (HMGP)).
2. Section 1 of the 2008 NHMP discussed the methodology for developing a plan and how the plan was organized. OPDR and the plan update coordinator replaced this 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.

SECTION 2: RISK ASSESSMENT

Section 2 describes Sherman County’s vulnerability to natural hazards in the region. This section highlights the hazards themselves in terms of probability and incidence, and identifies community assets. Major changes to Section 3 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.

- The Director of Emergency Services in Sherman County and the NHMP Steering Committee updated and made changes to the Hazard Analysis for the county using the Oregon Emergency Management Hazard Analysis Methodology. On October 29, 2009, the Director of Emergency Services updated the Hazard Analysis for seven out of the eight hazards. During the 2012 update, the NHMP Steering Committee completed the Hazard Analysis for the windstorm hazard, which was the only hazard not identified or scored in 2009. Changes to either probability or vulnerability in the hazard analysis from 2008 are defined below. All other hazard scores stayed the same.

  o Drought:
    - 2008 - Probability: High, Vulnerability: High
    - 2012 – Probability: High, Vulnerability: Medium

  o Flood
    - 2008 - Probability: High, Vulnerability: High
    - 2012 – Probability: High, Vulnerability: Medium
    - The Sherman County Comprehensive Plan ensures continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances, which was an identified action item in the 2008 NHMP. Section XI, Policy III – Proposals for development on lands designated as flood prone areas shall be subject to provisions of the National Flood Insurance Program and subsequent revisions thereof. Structures specifically designed to control soil erosion or store water shall be exempt from this policy.
    - The Steering Committee rated the vulnerability lower for flood for the following reasons.
      - The county complies with NFIP through local floodplain management ordinances and
• Zero properties in the NFIP program are repetitive or severe repetitive flood loss properties.

  o Wildfire (WUI)
    ▪ 2008 - Probability: High, Vulnerability: High
    ▪ 2012 – Probability: High, Vulnerability: Medium
    ▪ Sherman County Court adopted a Community Wildfire Protection Plan on March 18, 2009, which was previously an identified action item in the 2008 NHMP. The Steering Committee agreed that the plan potentially lowers the community’s vulnerability to a wildfire hazard.

• 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.

• The updates plan developed an overview of Sherman County hazards that summarizes information about the eight hazards identified by the NHMP Steering Committee. More detailed descriptions of each hazard can be found in Section 3: Hazard Chapters in the State of Oregon’s Natural Hazards Mitigation Plan.

• 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. The Sherman County Planner and the Director of Emergency Services both identified community vulnerabilities and the hazards that pose a threat to each for this section of the plan. The 2008 NHMP previously listed the community assets on a map in Volume II: Map of Community Assets, but did not assess what hazards the community assets are particularly vulnerable to.

• Additional tables address NFIP participation information and general risk assessment scoring.

• New to the Risk Assessment section for the 2012 update is individual Risk Assessments for the four incorporated cities in Sherman County that include: the City of Grass Valley, City of Moro, City of Rufus, and City of Wasco. Each city completed a Hazard Analysis for their jurisdiction to compare each identified hazard’s probability, vulnerability, and overall score to the county. The cities did not complete Hazard Analyses for the 2008 NHMP. The results of each city’s Hazard Analysis are found in this section of the 2012 update.

**SECTION 3: MITIGATION STRATEGY**

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

• The section title was changed from Mission, Goals, and Action Items in the 2008 NHMP to Mitigation Strategy in the 2012 update since the Sherman County NHMP Steering Committee did not establish an overall mission for the NHMP, nor was one established in
the 2008 plan. Instead, the NHMP Steering Committee chose to focus their resources and attention on updating the specific goals and actions items within the plan.

- The Sherman County NHMP Steering Committee reviewed the 2008 plan’s goals and modified them with the goals currently identified in Section 3. The county deferred all three goals from the previous plan and added a fourth goal in the update. Notably, the county reworded Goal 2. The cities reviewed and consented to the goals as identified by the county. Outlined below are the 2008 NHMP goals and their status for the 2012 update:

1) Goal 1: Ability to respond effectively and swiftly
   i. **Status:** Deferred

2) Goal 2: Safety of life and property
   i. **Status:** Deferred and Modified
   ii. New Goal 2: Protect life, reduce injuries, and minimize damage to property

3) Goal 3: Increased cooperation and collaboration between groups and agencies
   i. **Status:** Deferred

The NHMP Steering Committee established a new goal for the 2012 NHMP update with influence from the State of Oregon’s NHMP. The county 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 Sherman County NHMP.

4) New Goal 4: Motivate the public, private sector, and government agencies to mitigate against the effects of natural hazards through information and education
   i. **Status:** New Goal 4

- Several other tables and figures in the section were modified during the plan update. Several organizations were eliminated or modified (Table 4.2: Sherman County Social Service Providers). A flow chart that outlined the plan’s action item framework in terms of coordinating organizations was also created and reflects changes and updates to the plan’s action items (Figure 4.2: Action Item Framework, Sherman County Internal Partners). The updated plan also includes a Sherman County Action Item Matrix, a set of summary tables describing the county’s action items. The matrix reflects changes from the 2008 NHMP and was not included in the 2008 plan.

On June 5, 2012, the Sherman County NHMP Steering Committee met to review the 2008 NHMP action items. The committee reviewed and identified which of the 2008 NHMP’s 20 action items had been completed and whether they should be deleted or deferred. Action items were deleted for a number of reasons, including not meeting basic action item criteria such as being measurable, assignable, or achievable. Action items that were deferred had not yet been addressed or were only partially addressed over the previous five years, but the steering committee determined they were still worthy of being continued through the 2012 update. Most of the action items that were deferred were modified in some way to make them more achievable, accurate, or actionable. The cities of Grass Valley, Moro, Rufus and Wasco reviewed the changes made by the County and consented to the recommended changes and made additional comments as illustrated in the table.
below and within the Action Item Forms of Appendix A. The 20 action items from the 2008 NHMP and their statuses are discussed in Table B2 below.
### Table B.1: 2008 NHMP Action Items Status

<table>
<thead>
<tr>
<th>2008 Action Item</th>
<th>2012 Action Item Title</th>
<th>Status</th>
<th>Comment</th>
<th>2012 Action Item</th>
<th>Alignment with Goals</th>
<th>Applicable Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-Hazard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MH #1</td>
<td>Complete an inventory of public buildings that may be particularly vulnerable to natural hazards in Gilliam County.</td>
<td>Completed/Deleted</td>
<td>Department of Energy, Department of Geology and Mineral Industries both completed</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MH #2</td>
<td>Seek funding for the implementation of priority projects that reduce the vulnerability of critical public facilities in Sherman County.</td>
<td>Deferred/Modified</td>
<td>Lack of staff/funding</td>
<td>MH #1</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>MH #3</td>
<td>Work with utilities operating in Sherman County to establish tree-pruning programs around transmission lines and trunk distribution lines.</td>
<td>Completed/Deleted</td>
<td>Wasco Electric Cooperative and Pacific Power &amp; Light annually perform tree-pruning and trimming of trees around power lines.</td>
<td>MH #2</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>MH #4</td>
<td>Reduce the effects of winter storms on existing utility lines.</td>
<td>Deferred/Modified</td>
<td>Ongoing Action Item</td>
<td>MH #3</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>MH #5</td>
<td>Develop and maintain a comprehensive impact database on severe natural hazard events in Sherman County.</td>
<td>Deferred/Deleted</td>
<td>Lack of staff/funding</td>
<td>MH #4</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>MH #6</td>
<td>Seek funding for generators and satellite telephones for critical facilities</td>
<td>Completed/Deleted</td>
<td>Sherman County received a State Homeland Security Grant to purchase and install new generators at the Sherman County Courthouse and Moro Fire Hall</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MH #7</td>
<td>Identify opportunities to reduce existing barriers to interagency cooperation and work together to reduce risk and loss from natural hazards.</td>
<td>Completed/Deferred</td>
<td>Ongoing Action Item</td>
<td>MH #5</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Drought</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></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>Completed/Deferred</td>
<td>Completed in the Citizen Reporter. Ongoing Action Item</td>
<td>DR #1</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Sherman County NHMP**

Page B-8 December 2013
Table B.2: 2008 NHMP Action Items Status (continued)

<table>
<thead>
<tr>
<th>2008 Action Item</th>
<th>2012 Action Item Title</th>
<th>2012 Action Item</th>
<th>2012 Action Item</th>
<th>Comment</th>
<th>Alignment with Goals</th>
<th>Applicable Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Goal 1</td>
<td>Goal 2</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>Deferred/Modified</td>
<td>Lack of staff/funding</td>
<td>EQ #1</td>
<td>X</td>
<td>X</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 a high collapse potential rate by the Department of Geology and Mineral Industries (DOGAMI).</td>
<td>New Action Item</td>
<td>-</td>
<td>EQ #2</td>
<td>X</td>
<td>X</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>Completed/Deferred/Modified</td>
<td>Completed in the Citizen Reporter. Ongoing Action Item</td>
<td>FL #1</td>
<td>X</td>
<td>X</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>Completed / Deferred</td>
<td>Ongoing Action Item</td>
<td>FL #2</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>FL#3</td>
<td>Develop a database of repetitive flood loss properties not covered by the National Flood Insurance Program.</td>
<td>Deferred</td>
<td>Lack of staff/funding</td>
<td>FL #3</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>FL#4</td>
<td>Coordinate with the State Floodplain Coordinator and the Department of Land Conservation and Development (DLCD) to update the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for Sherman County and the incorporated cities participating in the Nation Flood Insurance Program (NFIP).</td>
<td>New Action Item</td>
<td>-</td>
<td>FL #4</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2008 Action Item</td>
<td>2008 Action Item Title</td>
<td>2012 Action Item Title</td>
<td>Status</td>
<td>Comment</td>
<td>Alignment with Goals</td>
<td>Applicable Jurisdiction</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------</td>
<td>------------------------</td>
<td>--------</td>
<td>---------</td>
<td>---------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>LS #1</td>
<td>Include information regarding landslides/debris flows in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Completed/Deferred/Modified</td>
<td>Completed in the Citizen Reporter. Ongoing Action Item</td>
<td>LS #1</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>VE #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>Deferred/Modified</td>
<td>Lack of staff/funding</td>
<td>VE #1</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>WF #1</td>
<td>Develop and implement a countywide Community Wildfire Protection Plan (CWPP) for Gilliam County to reduce the risk of fire in the Wildland-Urban Interface (WUI)</td>
<td>Completed/Deleted</td>
<td>The Sherman County Court adopted the CWPP on March 18, 2009</td>
<td>WF #1</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>WF #2</td>
<td>Provide Sherman County Road Department with fire fighting training and equipment</td>
<td>Deleted</td>
<td>Not applicable</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WF #3</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>Completed/Deferred/Modified</td>
<td>Completed in the Citizen Reporter. Ongoing Action Item</td>
<td>WF #1</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>WDS #1</td>
<td>Include information regarding windstorms in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Completed/Deferred/Modified</td>
<td>Completed in the Citizen Reporter. Ongoing Action Item</td>
<td>WDS #1</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>2008 Action Item</td>
<td>2012 Action Item Title</td>
<td>Status</td>
<td>Comment</td>
<td>2012 Action Item</td>
<td>Alignment with Goals</td>
<td>Applicable Jurisdiction</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------</td>
<td>--------</td>
<td>---------</td>
<td>------------------</td>
<td>----------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Goal 1</td>
<td>Goal 2</td>
</tr>
<tr>
<td>WTS#1</td>
<td>Educate farmers about ways to protect livestock from the effects of winter storms.</td>
<td>Deferred/Modified</td>
<td>Ongoing Action Item. Listed under new hazard category “Severe Weather/Winter Storm”</td>
<td>SW/ WS #1</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>WTS#2</td>
<td>Include information regarding severe weather/severe weather/winter storms in a brochure of natural hazards and mail/make available to county residents and the public.</td>
<td>Completed/Deferred/Modified</td>
<td>Completed in the Citizen Reporter. Ongoing Action Item. Listed under new hazard category “Severe Weather/Winter Storm”</td>
<td>SW/ WS #2</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
**SECTION 4: PLAN IMPLEMENTATION AND MAINTENANCE**

This section details the formal process that will ensure that the Sherman County NHMP remains an active and relevant document. 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 Sherman County Emergency Management Department is responsible for the NHMP duties listed in the section.
- The committee agreed that the Sherman County NHMP Steering Committee will remain the coordinating body and is responsible for appropriate tasks listed in the section.
- The committee agreed to update and change the current structure. The 2008 NHMP identified that the committee meet on a semi-annual basis. Because of lack of staff and time, the committee determined they would meet on an annually basis instead to address particular hazards that are more prominent throughout the year.
- Minor changes and revisions were made to the plan’s public involvement strategy.

**Volume II**

**APPENDIX A: ACTION ITEM FORMS**

Appendix A is new to the Sherman County NHMP and lists the plan’s action items and the current status. The 2008 NHMP listed the plan’s action item forms in Section 3: Mitigation Strategy. Action items are detailed recommendations for activities that local departments, citizens, and others could engage in to reduce risk. This appendix contains detailed action item forms for each of the mitigation strategies identified in this plan. The 2012 Appendix A action items include most of the 2008 action items, though some action items were deleted, completed, or modified, as well as new actions items that were created during the 2012 update process.

**APPENDIX B: PLANNING AND PUBLIC PROCESS**

Appendix B 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, and public involvement meetings or outreach strategies. The 2008 NHMP’s public process is also fully documented in Appendix B. The 2008 titled this section Appendix B: Steering Committee and Public Meetings.

**APPENDIX C: COMMUNITY PROFILE**

Appendix C consists of six subsections that describe the county in a variety of ways. These sections include: Natural Environment Capacity, Socio Demographic Capacity, Regional Economic Capacity, Built Capacity, Community Connectivity Capacity, and Political Capital. 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. Though the theme of the 2012 Appendix C: Community Profile is consistent with the Section 2: Community Profile from the 2008 NHMP, the entire section has been updated and modified in terms of scope and information, expanding from six pages to 44 pages. The 2008 version of the Sherman County NHMP included the Oregon NHMP’s Region 5: Regional Profile and Risk Assessment as Appendix D; the state information was utilized to inform the risk assessment of Section 2, however the appendix of that plan was not included as an appendix to
the Sherman County NHMP in the 2012 update. The Oregon NHMP’s Region 5: Regional Profile and Risk Assessment can be found here:

http://csc.uoregon.edu/opdr/hazard_mitigation/state_mitigation_plan/current

**APPENDIX D: ECONOMIC ANALYSIS OF NATURAL HAZARD MITIGATION PROJECTS**

Appendix D describes the Federal Emergency Management Agency’s (FEMA) requirements for benefit cost analyses in natural hazards mitigation, as well as various approaches for conducting economic analyses of proposed mitigation activities. This appendix replaces the 2007 NHMP’s information about benefit cost analyses.

**APPENDIX E: REGIONAL HAZARD MITIGATION PUBLIC OPINION SURVEY**

Appendix E provides a summary report of the survey administered to community stakeholders in the fall of 2011 during the early stages of the Sherman County NHMP Update. The Oregon Partnership for Disaster Resilience (OPDR) distributed a mailed survey to 7,500 random households throughout an eight county region in Northern Oregon. The counties surveyed included: Clackamas, Hood River, Gilliam, Morrow, Sherman, Umatilla, Wasco, and Wheeler. Four hundred surveys were sent to residents in Sherman County, 26 of which were returned. OPDR developed and distributed the survey in partnership with the University of Oregon’s Resource Assistance for Rural Environments (RARE) program. This appendix replaces the 2008 NHMP’s tables and summaries from the previous regional survey.

**APPENDIX F: GRANT PROGRAMS**

This appendix lists Post-Disaster Federal Programs; Pre-Disaster Federal Programs; Federal Mitigation Programs, Activities, & Initiatives; as well as State of Oregon Programs. The appendix also lists contact information and links to appropriate programs and support. The 2008 NHMP included this section in Volume III, Appendix A: Resource Directory.
Memorandum

To: Shawn Payne – Director of Emergency Services
From: Garrett Jensen, RARE-MCCOG/Josh Bruce, OPDR
Date: September 28, 2011
Re: Sherman County 2011-2012 Natural Hazard Mitigation Plan Update, Phase I – Getting Started

Purpose
This memorandum outlines the components of Phase I (Getting Started) of the 2011-2012 Sherman County Natural Hazard Mitigation Plan Update, including a preliminary schedule, initial data needs and next steps for the Oregon Partnership for Disaster Resilience (OPDR) and Sherman County.

Background
A Natural Hazard Mitigation Plan (NHMP) forms the foundation for a community’s long-term strategy to reduce disaster losses and break the cycle of disaster impacts, reconstruction and repeated damage. It creates a framework for risk-based decision making to reduce damages to lives, property and the economy from future disasters. Jurisdictions with Federal Emergency Management Agency (FEMA) approved mitigation plans are eligible for federal grant funding to implement those mitigation items identified in the plan. Jurisdictions are required to review, update and re-seek FEMA approval of their plans every five years in order to maintain grant eligibility. Sherman County adopted its current Natural Hazard Mitigation Plan in February 2008 making due for its 5-year update in February 2013.

The NHMPs of Clackamas, Hood River, Wasco, Sherman, Gilliam, Morrow, Wheeler and Umatilla Counties are also nearing expiration. In an effort to streamline the update process, OPDR will facilitate a regional planning approach with training sessions, technical assistance and plan updates for each county simultaneously. We anticipate holding up to four regional training sessions and appreciate your cooperation as we attempt to facilitate this process as efficiently as possible.

Preliminary Fall and Winter 2011-2012 Schedule
Between now and January 2012, OPDR will work with Sherman County Emergency Management to:

Develop a Work Plan (October 2011)
- Establish a viable work plan with the intention of submitting the Sherman County NHMP Update for FEMA approval in the summer of 2012
- Read and review the OPDR’s 2009-10 Natural Hazards Mitigation Plan Update Manual (available on Basecamp)

Conduct Project Initiation Meeting Between OPDR and County Project Leads (October 2011)
- Review scope of work and overall project schedule
- Review roles and responsibilities
- Coordinate plan update training schedule and locations

In order to maintain momentum and complete the plan update on schedule OPDR suggests that Sherman County complete the following during this same period:
Reconvene Mitigation Plan Steering Committee (October/November 2011)
Convene Sherman County NHMP Steering Committee*
Identify and invite new participants or jurisdictions
External Partners (e.g. Soil and Water Conservation Districts, Red Cross, Hospitals, School Districts, etc.)
Incorporated Jurisdictions (e.g. Biggs, Grass Valley, Kent, Moro, Rufus, Wasco)

Develop a Public Involvement Strategy (October/November 2011)
Review and update strategy identified in the 2007 Sherman County NHMP
Outreach strategies may include stakeholder surveys, public information workshops and press releases

Collect Data (November/December 2011)
Collect mitigation plan maintenance meeting agendas and minutes from the previous five years
Collect documentation related to any hazard occurrences or emergency declarations in Sherman County since 2007
Identify and document plan implementation activities, including completed projects and other “success stories”
Collect any local, state, or federal studies or reports completed since 2007
Local development ordinances, flood maps, HAZUS studies, DOGAMI studies, USGS reports, etc.

Identify necessary updates to the 2007 Sherman County NHMP (November/December 2011)
Mitigation Item Analysis (completed, pending, and un-initiated)
Previously identified data limitations

Next Steps for OPDR

Grant Administration
Finalize specific scope of work for Sherman County

Project Initiation
Schedule and hold kickoff meeting with regional project leads

Next Steps for Sherman County
Convene NHMP Steering Committee
Provide county assessment and taxation data
Brief county administration on project
Notify public. PSA – we can help write it and contact local news outlets
Identify potential stakeholder groups

Should you have any questions or concerns, please do not hesitate to contact either Garrett Jensen at (541) 298-4101 ext. 230 or via email at garrett.jensen@mccog.com, or Josh Bruce at (541) 346-7326 or via email at jdbruce@uoregon.edu.
*Previous 2007 steering committee members included:

- Gary Thompson - *Sherman County Judge*
- Neil Pattee - *Mayor, City of Grass Valley*
- Larry Triebelhorn - *Mayor, City of Moro*
- Karen Kellogg - *Mayor, City of Wasco*
- Cliff Jett - *Mayor, City of Rufus*
- Rod Asher - *Sherman County Fire Defense Board Chief*
- Georgia Macnab - *Sherman County Planning Director*
- Mark Coles - *Sherman County Road Master*
- Andy Anderson - *ODOT Supervisor*
- Brad Lohrey - *Sherman County Sheriff*
- Jerrilea Mayfield - *Sherman County EMS Designee*
- Shawn Payne - *Sherman County Emergency Services Director*
Dear Committee Partners,

You are receiving this e-mail because you either served on the County’s Steering Committee to develop the Sherman County Natural Hazards Mitigation Plan in 2006/2007 or have recently expressed interest to serve on the Steering Committee.

Per the Federal Emergency Management Agency (FEMA), Sherman County is currently in the process of updating its Natural Hazards Mitigation Plan. The County’s Emergency Management Department will be the county’s lead for the project, while the majority of the technical and facilitation support will be provided by Garrett Jensen, a RARE AmeriCorps participant, in conjunction with the Oregon Partnership for Disaster Resilience (housed through MCCOG).

As you are aware the Steering Committee forms a critical component of the Natural Hazard Mitigation Plan update process, as members serve as the primary source of information about local hazard events, community vulnerabilities and the status of mitigation action items.

It is envisioned FEMA’s requirement to update the County’s Natural Hazards Mitigation Plan will involve Steering Committee meetings throughout the year, starting with an initial kickoff meeting in early November (with the goal to adopt the update by June/July 2012). The kickoff meeting is scheduled during the following time:

Date: Wednesday, November 9, 2011
Time: 7:00pm to 9:30pm
Location: Moro Fire Station
309 Dewey St
Moro, Oregon 97039

Several topics will be addressed at the first Steering Committee meeting, but the presentation will focus on an overview of the upcoming year and outline expectations for Committee members.

I will contact you by next Monday with an agenda for the meeting. If you are no longer interested in serving on the Steering Committee, please let me know so we can insure a replacement or representation from your department/entity.

This is an important project and your participation on the Steering Committee is valued. If you need more information contact me at: ____________________________ or Garrett Jensen at 541.298.4101 ext. 230 / garrett.jensen@mccog.com

Best regards,
Issue Summary

A Natural Hazard Mitigation Plan (NHMP) forms the foundation for a community’s long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. It creates a framework for risk-based decision making to reduce damages to lives, property, and the economy from future disasters. Hazard mitigation is sustained action taken to reduce or eliminate long-term risk to people and their property from hazards.

The planning process is as important as the plan itself. Consensus built through the inclusion of cities and other agency stakeholders throughout Sherman County will improve the plan and the plan implementation process.

Sherman County Multi-Jurisdictional NHMP Update

The Federal Emergency Management Agency (FEMA) approved the Sherman County NHMP on February 1, 2008. In accordance with the five-year FEMA update and re-approval requirement, the Sherman County NHMP is due for update on February 1, 2013. Updating the mitigation plan is a requirement for maintaining eligibility for the Federal Emergency Management Agency’s Pre-Disaster Mitigation and Hazard Mitigation Grant Programs.

This project is being funded through FEMA’s Pre-Disaster Mitigation Grant Program; Planning Project for Gorge Plan Updates (Grant Number: EMS-2011-PC-0002). This project will include the following phases:

Phase 1 - Project Initiation
- Update and distribute planning resources and reference materials.
- Complete a thorough review of the current mitigation plan to identify specific update needs.
- Update the community profile for Sherman County.
- Convene the NHMP update steering committee and hold a kick-off meeting on November 9, 2011 which will cover the county responsibilities and describe opportunities for city involvement.
- Develop and implement a public outreach strategy.

Phase 2 - Risk Assessment
- Update information for the following natural hazards: wildfire, earthquake, flood, landslides, severe winter storm, severe winter storms, and earthquake.
- Review and update the causes, characteristics, location, extent, previous occurrences, probability, vulnerability, and community-related impacts (or potential impacts) for each hazard.
- Update information related to hazard history; describe any events that have occurred since 2007.
- Present and review hazard history, probability, and vulnerability the local steering committee at the second steering committee meeting (TBA).
Phase 3 - Action Plan

- Review all existing mitigation measures identified in the NHMP and document the current status of each of the mitigation measures identified in the plan.
- Update the list of NHMP action items in the plan to meet Sherman County’s current mitigation project needs.
- Meet with the Steering Committees to review and provide edits on the proposed action items.
- Review the mission, goals and action items to ensure they accurately reflect Sherman County’s current community mitigation needs.
- Review and update the plan implementation and maintenance process.

Phase 4 - Final Plan Review

- OPDR will prepare and present a draft Sherman County multi-jurisdictional NHMP to the steering committees and the public for review.
- OPDR will incorporate comments and edits and will present a final NHMP to Oregon Emergency Management and FEMA Region X for review and pre-approval.
- OPDR will assist Sherman County with the FEMA plan review and local adoption processes.

Steering Committee Involvement

OPDR will work with Sherman County to convene a fully representative steering committee including agency, participating city and other agencies involved with mitigation and/or the regulation of development in the county. Involvement will include telephone conversations, e-mail exchanges, and/or face-to-face meetings.

The Steering Committees will be tasked with ensuring that there is adequate stakeholder representation from the respective communities. OPDR is committed to moving the process along in as efficient a manner as possible and will look to combine tasks and limit the total number of steering committee meetings wherever possible.

Project Outcome

Our primary measure of success for this project will be the adoption of an updated Sherman County NHMP. Ultimately it will be the process communities go through in the planning effort and the eventual implementation of the plans, not the plans themselves, which will be the true indicators of success resulting from this project.
Meeting: Natural Hazards Mitigation Plan (NHMP) Update: Kickoff Meeting

Date: Wednesday, November 9, 2011

Time: 7:00 – 9:30 p.m.

Location: Moro Fire Station
309 Dewey St
Moro, Oregon 97039

MEETING AGENDA

I. Introductions and Background (15 minutes)
   • Welcome & Introductions
   • Who is Involved & Why

II. Natural Hazard Mitigation Overview/Update Process (75 minutes)
   • Natural Hazards Mitigation Planning Overview
   • Primary Goals/Anticipated Outcomes
   • Grant Opportunities
     Break (15 minutes)
   • Planning Requirements
   • Plan Update Process & Timeline
   • Steering Committees & Expectations
   • Public Involvement Strategies

III. Review Current NHMP’s Action Items (30 Minutes)

IV. Next Steps (15 Minutes)
   • Work to be Completed Before Next Meeting
   • Identify Date for Next Meeting

V. Questions/Comments/Other (15 minutes)

To access OPDR information and resources visit:
http://csc.uoregon.edu/OPDR
<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Representing</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Smith</td>
<td><a href="mailto:john.smith@email.com">john.smith@email.com</a></td>
<td>Planning and Public Process</td>
</tr>
<tr>
<td>Mary Johnson</td>
<td><a href="mailto:mary.johnson@email.com">mary.johnson@email.com</a></td>
<td>City of &lt;?=city_name?&gt;</td>
</tr>
<tr>
<td>Tom Williams</td>
<td><a href="mailto:tom.williams@email.com">tom.williams@email.com</a></td>
<td>City of &lt;?=city_name?&gt;</td>
</tr>
<tr>
<td>Lisa Garcia</td>
<td><a href="mailto:lisa.garcia@email.com">lisa.garcia@email.com</a></td>
<td>gosseime century Plunge</td>
</tr>
<tr>
<td>Bill Johnson</td>
<td><a href="mailto:bill.johnson@email.com">bill.johnson@email.com</a></td>
<td>City of Losco</td>
</tr>
<tr>
<td>Greg Gonzales</td>
<td><a href="mailto:greg.gonzales@email.com">greg.gonzales@email.com</a></td>
<td>&lt;city_name&gt; County Planning</td>
</tr>
<tr>
<td>George Wilson</td>
<td><a href="mailto:george.wilson@email.com">george.wilson@email.com</a></td>
<td>Sherman County Planning</td>
</tr>
<tr>
<td>Linda Martinez</td>
<td><a href="mailto:linda.martinez@email.com">linda.martinez@email.com</a></td>
<td>Sherman County Planning - Medical Emergency Room</td>
</tr>
<tr>
<td>Rob Adams</td>
<td><a href="mailto:rob.adams@email.com">rob.adams@email.com</a></td>
<td>Sherman County Planning - North Sherman Fire</td>
</tr>
</tbody>
</table>

*Kick-off Meeting, Wednesday, November 9, 2011*

*Meeting Site: In-Relative Room*
City of Grass Valley – Sherman County Natural Hazard Mitigation Plan Update

Issue Summary

In conjunction with the Oregon Partnership for Disaster Resilience (OPDR), Sherman County is currently in the process of updating its Natural Hazard Mitigation Plan (NHMP). This is a great opportunity for cities within the county to participate in the update process in order to maintain or acquire eligibility for federal funding to implement hazard mitigation projects locally. Consensus built through the inclusion of cities and other agency stakeholders throughout Sherman County will improve the plan implementation process as well as the final NHMP, and will ultimately aid the process of building more resilient communities.

Sherman County Multi-Jurisdictional NHMP Update

A Natural Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. It creates a framework for risk-based decision making to reduce damages to lives, property, and the economy from future disasters.

The Federal Emergency Management Agency (FEMA) approved the current Sherman County NHMP on February 1, 2008. In accordance with the five-year FEMA update and re-approval requirement, the plan will lapse on February 1, 2013.

In order for a jurisdiction within Sherman County to individually maintain eligibility for FEMA’s Pre-Disaster Mitigation and Hazard Mitigation Grant Programs, participation from the jurisdiction must be documented within the county’s plan. The code of federal regulations mandates the following:

Multi-jurisdictional Participation - §201.6(a) (3): Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process.

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.

Multi-jurisdictional Mitigation Strategy - §201.6(c) (3) (iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Multi-jurisdictional Plan Adoption - §201.6(c) (5): For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

This project is being funded through FEMA’s Pre-Disaster Mitigation Grant Program; Planning Project for Mid-Columbia Gorge County NHMP Updates (Grant Number: EMS-2011-PC-0002).
In order to document involvement from jurisdictions within Sherman County and complete the plan update on schedule, it is suggested that the City of Grass Valley complete the following over the next year.

**Establish a Mitigation Plan Steering Committee (Winter 2012)**
- Establish the City of Grass Valley Natural Hazards Mitigation Plan Steering Committee
- Identify and invite new participants and external partners (e.g. Red Cross, Hospitals, School Districts, etc.)

**Develop a Public Involvement Strategy (Spring 2012)**
- Establish strategies that encourage public involvement
- Outreach strategies may include public information workshops, city newsletters, and press releases

**Collect Data (Spring 2012)**
- Collect mitigation plan maintenance meeting agendas and minutes since 2007
- Collect documentation related to any hazard occurrences or emergency declarations in the City of Grass Valley since 2007
- Identify and document plan implementation activities, including completed projects and other “success stories”
- Collect any local, state, or federal studies or reports completed since 2007 if available

**Important Steps for the City of Grass Valley**
- Attend and participate in Sherman County’s NHMP Steering Committee meetings
- Brief city administration on project
- Establish and convene a City of Grass Valley NHMP Steering Committee at least once
- Notify public. PSA – we can help write it and contact local news outlets
- Identify potential stakeholder groups

**Steering Committee Involvement**

The Steering Committee will be tasked with ensuring that there is adequate stakeholder representation from the community. OPDR is committed to moving the process along in as efficient a manner as possible and will look to combine tasks and limit the total number of steering committee meetings wherever possible.

**Project Outcome**

Our primary measure of success for this project will be the adoption of an updated Sherman County NHMP. Ultimately it will be the process cities go through in the planning effort and the eventual implementation of the plans, not the plans themselves, which will be the true indicators of success resulting from this project.

Should you have any questions or concerns, please do not hesitate to contact either Garrett Jensen at 541.298.4101 ext. 230 or via email at garrett.jensen@mccog.com, or Josh Bruce at 541.346.7326 or via email at jdbruce@uoregon.edu.
City of Moro – Sherman County Natural Hazard Mitigation Plan Update

Issue Summary

In conjunction with the Oregon Partnership for Disaster Resilience (OPDR), Sherman County is currently in the process of updating its Natural Hazard Mitigation Plan (NHMP). This is a great opportunity for cities within the county to participate in the update process in order to maintain or acquire eligibility for federal funding to implement hazard mitigation projects locally. Consent built through the inclusion of cities and other agency stakeholders throughout Sherman County will improve the plan implementation process as well as the final NHMP, and will ultimately aid the process of building more resilient communities.

Sherman County Multi-Jurisdictional NHMP Update

A Natural Hazard Mitigation Plan forms the foundation for a community’s long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. It creates a framework for risk-based decision making to reduce damages to lives, property, and the economy from future disasters.

The Federal Emergency Management Agency (FEMA) approved the current Sherman County NHMP on February 1, 2008. In accordance with the five-year FEMA update and re-approval requirement, the plan will lapse on February 1, 2013.

In order for a jurisdiction within Sherman County to individually maintain eligibility for FEMA’s Pre-Disaster Mitigation and Hazard Mitigation Grant Programs, participation from the jurisdiction must be documented within the county’s plan. The code of federal regulations mandates the following:

Multi-jurisdictional Participation - §201.6(a) (3): Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process.

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.

Multi-jurisdictional Mitigation Strategy - §201.6(c) (3) (iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Multi-jurisdictional Plan Adoption - §201.6(c) (5): For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

This project is being funded through FEMA’s Pre-Disaster Mitigation Grant Program; Planning Project for Mid-Columbia Gorge County NHMP Updates (Grant Number: EMS-2011-PC-0002)
In order to document involvement from jurisdictions within Sherman County and complete the plan update on schedule, it is suggested that the City of Moro complete the following over the next year:

**Establish a Mitigation Plan Steering Committee (Winter 2012)**

Establish the City of Moro Natural Hazards Mitigation Plan Steering Committee
Identify and invite new participants and external partners (e.g. Red Cross, Hospitals, School Districts, etc.)

**Develop a Public Involvement Strategy (Spring 2012)**

Establish strategies that encourage public involvement
Outreach strategies may include public information workshops, city newsletters, and press releases

**Collect Data (Spring 2012)**

Collect mitigation plan maintenance meeting agendas and minutes since 2007
Collect documentation related to any hazard occurrences or emergency declarations in the City of Moro since 2007
Identify and document plan implementation activities, including completed projects and other “success stories”
Collect any local, state, or federal studies or reports completed since 2007 if available

**Important Steps for the City of Moro**

Attend and participate in Sherman County’s NHMP Steering Committee meetings
Brief city administration on project
Establish and convene a City of Moro NHMP Steering Committee at least once
Notify public. PSA – we can help write it and contact local news outlets
Identify potential stakeholder groups

**Steering Committee Involvement**

The Steering Committee will be tasked with ensuring that there is adequate stakeholder representation from the community. OPDR is committed to moving the process along in as efficient a manner as possible and will look to combine tasks and limit the total number of steering committee meetings wherever possible.

**Project Outcome**

Our primary measure of success for this project will be the adoption of an updated Sherman County NHMP. Ultimately it will be the process cities go through in the planning effort and the eventual implementation of the plans, not the plans themselves, which will be the true indicators of success resulting from this project.

Should you have any questions or concerns, please do not hesitate to contact either Garrett Jensen at 541.298.4101 ext. 230 or via email at garrett.jensen@mccog.com, or Josh Bruce at 541.346.7326 or via email at jdbruce@uoregon.edu.
City of Rufus – Sherman County Natural Hazard Mitigation Plan Update

**Issue Summary**

In conjunction with the Oregon Partnership for Disaster Resilience (OPDR), Sherman County is currently in the process of updating its Natural Hazard Mitigation Plan (NHMP). This is a great opportunity for cities within the county to participate in the update process in order to maintain or acquire eligibility for federal funding to implement hazard mitigation projects locally. Consensus built through the inclusion of cities and other agency stakeholders throughout Sherman County will improve the plan implementation process as well as the final NHMP, and will ultimately aid the process of building more resilient communities.

**Sherman County Multi-Jurisdictional NHMP Update**

A Natural Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. It creates a framework for risk-based decision making to reduce damages to lives, property, and the economy from future disasters.

The Federal Emergency Management Agency (FEMA) approved the current Sherman County NHMP on February 1, 2008. In accordance with the five-year FEMA update and re-approval requirement, the plan will lapse on February 1, 2013.

In order for a jurisdiction within Sherman County to individually maintain eligibility for FEMA’s Pre-Disaster Mitigation and Hazard Mitigation Grant Programs, participation from the jurisdiction must be documented within the county’s plan. The code of federal regulations mandates the following:

- **Multi-jurisdictional Participation** - §201.6(a) (3): Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process.
- **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.
- **Multi-jurisdictional Mitigation Strategy** - §201.6(c) (3) (iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.
- **Multi-jurisdictional Plan Adoption** - §201.6(c) (5): For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

This project is being funded through FEMA’s Pre-Disaster Mitigation Grant Program; Planning Project for Mid-Columbia Gorge County NHMP Updates (Grant Number: EMS-2011-PC-0002).
In order to document involvement from jurisdictions within Sherman County and complete the plan update on schedule, it is suggested that the City of Rufus complete the following over the next year:

_Establish a Mitigation Plan Steering Committee (Winter 2012)_

- Establish the City of Rufus Natural Hazards Mitigation Plan Steering Committee
- Identify and invite new participants and external partners (e.g. Red Cross, Hospitals, School Districts, etc.)

_Develop a Public Involvement Strategy (Spring 2012)_

- Establish strategies that encourage public involvement
  - Outreach strategies may include public information workshops, city newsletters, and press releases

_Collect Data (Spring 2012)_

- Collect mitigation plan maintenance meeting agendas and minutes since 2007
- Collect documentation related to any hazard occurrences or emergency declarations in the City of Rufus since 2007
- Identify and document plan implementation activities, including completed projects and other “success stories”
- Collect any local, state, or federal studies or reports completed since 2007 if available

**Important Steps for the City of Rufus**

- Attend and participate in Sherman County’s NHMP Steering Committee meetings
- Brief city administration on project
- Establish and convene a City of Rufus NHMP Steering Committee at least once
- Notify public. PSA – we can help write it and contact local news outlets
- Identify potential stakeholder groups

**Steering Committee Involvement**

The Steering Committee will be tasked with ensuring that there is adequate stakeholder representation from the community. OPDR is committed to moving the process along in as efficient a manner as possible and will look to combine tasks and limit the total number of steering committee meetings wherever possible.

**Project Outcome**

Our primary measure of success for this project will be the adoption of an updated Sherman County NHMP. Ultimately it will be the process cities go through in the planning effort and the eventual implementation of the plans, not the plans themselves, which will be the true indicators of success resulting from this project.

Should you have any questions or concerns, please do not hesitate to contact either Garrett Jensen at 541.298.4101 ext. 230 or via email at garrett.jensen@mccog.com, or Josh Bruce at 541.346.7326 or via email at jdbruce@uoregon.edu.
City of Wasco – Sherman County Natural Hazard Mitigation Plan Update

Issue Summary

In conjunction with the Oregon Partnership for Disaster Resilience (OPDR), Sherman County is currently in the process of updating its Natural Hazard Mitigation Plan (NHMP). This is a great opportunity for cities within the county to participate in the update process in order to maintain or acquire eligibility for federal funding to implement hazard mitigation projects locally. Consensus built through the inclusion of cities and other agency stakeholders throughout Sherman County will improve the plan implementation process as well as the final NHMP, and will ultimately aid the process of building more resilient communities.

Sherman County Multi-Jurisdictional NHMP Update

A Natural Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. It creates a framework for risk-based decision making to reduce damages to lives, property, and the economy from future disasters.

The Federal Emergency Management Agency (FEMA) approved the current Sherman County NHMP on February 1, 2008. In accordance with the five-year FEMA update and re-approval requirement, the plan will lapse on February 1, 2013.

In order for a jurisdiction within Sherman County to individually maintain eligibility for FEMA’s Pre-Disaster Mitigation and Hazard Mitigation Grant Programs, participation from the jurisdiction must be documented within the county’s plan. The code of federal regulations mandates the following:

Multi-jurisdictional Participation - §201.6(a) (3): Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process.

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.

Multi-jurisdictional Mitigation Strategy - §201.6(c) (3) (iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Multi-jurisdictional Plan Adoption - §201.6(c) (5): For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

This project is being funded through FEMA’s Pre-Disaster Mitigation Grant Program; Planning Project for Mid-Columbia Gorge County NHMP Updates (Grant Number: EMS-2011-PC-0002).
In order to document involvement from jurisdictions within Sherman County and complete the plan update on schedule, it is suggested that the City of Wasco complete the following over the next year:

**Establish a Mitigation Plan Steering Committee (Winter 2012)**
- Establish the City of Wasco Natural Hazards Mitigation Plan Steering Committee
- Identify and invite new participants and external partners (e.g. Red Cross, Hospitals, School Districts, etc.)

**Develop a Public Involvement Strategy (Spring 2012)**
- Establish strategies that encourage public involvement
- Outreach strategies may include public information workshops, city newsletters, and press releases

**Collect Data (Spring 2012)**
- Collect mitigation plan maintenance meeting agendas and minutes since 2007
- Collect documentation related to any hazard occurrences or emergency declarations in the City of Wasco since 2007
- Identify and document plan implementation activities, including completed projects and other “success stories”
- Collect any local, state, or federal studies or reports completed since 2007 if available

**Important Steps for the City of Wasco**
- Attend and participate in Sherman County’s NHMP Steering Committee meetings
- Brief city administration on project
- Establish and convene a City of Wasco NHMP Steering Committee at least once
- Notify public. PSA – we can help write it and contact local news outlets
- Identify potential stakeholder groups

**Steering Committee Involvement**

The Steering Committee will be tasked with ensuring that there is adequate stakeholder representation from the community. OPDR is committed to moving the process along in as efficient a manner as possible and will look to combine tasks and limit the total number of steering committee meetings wherever possible.

**Project Outcome**

Our primary measure of success for this project will be the adoption of an updated Sherman County NHMP. Ultimately it will be the process cities go through in the planning effort and the eventual implementation of the plans, not the plans themselves, which will be the true indicators of success resulting from this project.

Should you have any questions or concerns, please do not hesitate to contact either Garrett Jensen at 541.298.4101 ext. 230 or via email at garrett.jensen@mccog.com, or Josh Bruce at 541.346.7326 or via email at jdbruce@uoregon.edu.
Sherman County Emergency Management Services

Meeting: Natural Hazards Mitigation Plan (NHMP) Update: Meeting #2
Date: Wednesday, February 15, 2012
Time: 6:00 – 8:30 p.m.
Location: Moro Fire Station
309 Dewey St
Moro, Oregon 97039

Meeting Agenda

I. Welcome and Introductions (5 minutes)
II. Overview of Risk Assessment Process (10 minutes)
III. Review of Hazard Identification (15 minutes)
   a. Update Hazard Inventories
IV. Review Existing Vulnerability Information (20 Minutes)
   a. Review of Asset Worksheet
   b. Update the list of Community Critical/Essential Facilities and Infrastructure
V. Update Hazard Analysis Matrix (15 Minutes)
   a. Windstorms
VI. Relative Risk Overview (75 Minutes)
   a. Review of Relative Risk Questionnaire
   b. Outline potential severity/impact of identified hazards
VII. Next Steps (10 Minutes)
   a. Identify date for the next meeting

To access OPDR information and resources visit:
http://csc.uoregon.edu/OPDR
<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Representing</th>
<th>Reason for Request</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jim LeMayfield</td>
<td>lemayfield.wm.ca.gov</td>
<td>Sherman County EMS</td>
<td></td>
</tr>
<tr>
<td>Mike McQuillen</td>
<td>mcmquillen.cm.com</td>
<td>City of Granville</td>
<td></td>
</tr>
<tr>
<td>Dan O'Leary</td>
<td>o'leary.dcm.com</td>
<td>County of Granville</td>
<td></td>
</tr>
<tr>
<td>Larry Rice</td>
<td>rice.larry.cm.com</td>
<td>County of Granville</td>
<td></td>
</tr>
<tr>
<td>Frank Otey</td>
<td>otey.fcm.com</td>
<td>County of Granville</td>
<td></td>
</tr>
<tr>
<td>Val Rescigno</td>
<td>rescigno.vcm.com</td>
<td>County of Granville</td>
<td></td>
</tr>
<tr>
<td>Zad Asher</td>
<td>asher.zcm.com</td>
<td>County of Granville</td>
<td></td>
</tr>
</tbody>
</table>

Second Meeting - Sherman County NHMP Update

Meeting Sign-In

Second Meeting - Sherman County NHMP Update

Meeting Sign-In

Second Meeting - Sherman County NHMP Update

Meeting Sign-In

Second Meeting - Sherman County NHMP Update

Meeting Sign-In

Second Meeting - Sherman County NHMP Update

Meeting Sign-In

Second Meeting - Sherman County NHMP Update

Meeting Sign-In
Hazard Analysis Matrix Update Criteria

High = 8-10 points
Moderate = 4-7 points
Low = 1-3 point

Event History (x2) = based on the number of incidents equivalent to a Level 2 emergency (EOP).

- **High** = 4 or more events within the last 100 years
- **Moderate** = 2-3 events within the last 100 years
- **Low** = Less than 2 events within the last 100 years

Vulnerability (x5) = based on the percentage of population likely to be affected.

- **High** = More than 10% affected
- **Moderate** = 1-10% affected
- **Low** = Less than 1% affected

Maximum Threat (x10) = based on the percentage of population or property which could be affected in the worst case incident.

- **High** = More than 25% could be affected
- **Moderate** = 5-25% could be affected
- **Low** = Less than 5% could be affected

Probability (x7) = based on the likelihood of an occurrence within a specified period of time.

- **High** = One incident within a 10 year period
- **Moderate** = One incident within a 50 year period
- **Low** = One incident within a 100 year period
Relative Risk Exercise Questions

**INSTRUCTIONS:** Please use the table located at the end of each question and answer for each related hazard. Answer using the corresponding numbers (1-5) in each question to the best of your knowledge. For each question you will want to think about the relative risk associated with each particular hazard: earthquake, flood, landslide, volcanic event, wildfire, windstorm, and winter storm.

*Please answer each question in reference to Sherman County as a whole.*

**Question 1.** If this event has occurred in the past in your (region, county, city), what were the extent of injuries and deaths that occurred?

1. None, or this event has never occurred
2. Few minor injuries
3. Multiple minor injuries or a major injury
4. Multiple major injuries or a death
5. Multiple deaths and major injuries

<table>
<thead>
<tr>
<th></th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide/Debris Flow</th>
<th>Severe Weather/Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Question 2.** Consider the potential for injuries or deaths from past events or from similar events in other communities, and any changes or trends that would affect future injuries and deaths from this type of event. Estimate the number of injuries and deaths that could result from this event:

1. None
2. Few minor injuries
3. Multiple minor injuries or possible major injury
4. Multiple major injuries or possible death
5. Multiple deaths and major injuries

<table>
<thead>
<tr>
<th></th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide/Debris Flow</th>
<th>Severe Weather/Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Question 3.** Consider the vulnerability of your (region, county, city, facility) to this event. Estimate the extent of damage:

1. Little or no damage
2. Mild damage to several facilities
3. Moderate damage to multiple facilities
4. Severe damage to multiple facilities
5. Extensive damage to most facilities

<table>
<thead>
<tr>
<th></th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide/Debris Flow</th>
<th>Severe Weather/Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Question 4.** Considering the extent of damage, estimate the total cost to respond to the event and repair or replace all damaged facilities in your (region, county, city, facility):

1. Less than $1 million
2. Between $1 million and $10 million
3. Between $10 million and $100 million
4. Between $100 million and $1 billion
5. More than $1 billion

<table>
<thead>
<tr>
<th></th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide/Debris Flow</th>
<th>Severe Weather/Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Question 5.** If this event occurred in your (region, county, city, facility) estimate the duration of interruption to commercial business:

1. Hours
2. Days
3. Weeks
4. Months
5. Year or longer

<table>
<thead>
<tr>
<th></th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide/Debris Flow</th>
<th>Severe Weather/Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Question 6.** If this event occurred in your (region, county, city, facility) estimate the percentage of commercial business that would be interrupted:
1. Less than 10%
2. 10-30%
3. 30-50%
4. 50-75%
5. Greater than 75%

<table>
<thead>
<tr>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide/Debris Flow</th>
<th>Severe Weather/Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Question 7.** If this event occurred in your (region, county, city, facility) estimate the percentage of ecologic systems that will be impacted by this event?
1. Less than 10%
2. 10-25%
3. 25-50%
4. 50-75%
5. Greater than 75%

<table>
<thead>
<tr>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide/Debris Flow</th>
<th>Severe Weather/Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Question 8.** Consider the value your community places on ecosystem services* (clean water, clean air, open space, hunting, fishing, recreation, resource extraction, etc.). If this event occurred, what impact will it have on the community's ability to benefit from and/or access ecosystem services?
1. Little or no impact
2. Mild impact
3. Moderate impact
4. Severe impact
5. Extensive impact

*Ecosystem Services are the processes by which the environment produces resources that we often take for granted such as clean water, timber, habitat for wildlife and fisheries, and pollination of native and agricultural plants. Whether we find ourselves in the city or a rural area, the ecosystems in which humans live provide goods and services that can be impacted by natural hazard events. ~ Definition adapted from 2000 Ecological Society of America document.

<table>
<thead>
<tr>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide/Debris Flow</th>
<th>Severe Weather/Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Question 9.** If this event occurred in your (region, county, city, facility) estimate the percentage of the population that would be displaced by this event?

1. Less than 10%
2. 10-25%
3. 25-50%
4. 50-75%
5. Greater than 75%

<table>
<thead>
<tr>
<th></th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide/Debris Flow</th>
<th>Severe Weather/Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q9</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Question 10.** Consider the social networks in your community (cultural/sport events, education, religious activities, volunteer opportunities, civic engagement, etc.). If this event occurred, what impact would it have on the community's ability to engage in meaningful social interactions?

1. Little or no impact
2. Mild impact
3. Moderate impact
4. Severe impact
5. Extensive impact

<table>
<thead>
<tr>
<th></th>
<th>Drought</th>
<th>Earthquake</th>
<th>Flood</th>
<th>Landslide/Debris Flow</th>
<th>Severe Weather/Winter Storm</th>
<th>Volcanic Event</th>
<th>Wildfire</th>
<th>Windstorm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q10</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sherman County Natural Hazards Mitigation Plan (NHMP) Update

Issue Summary  March 14, 2012

In conjunction with the Oregon Partnership for Disaster Resilience (OPDR), Sherman County is currently in the process of updating its Natural Hazards Mitigation Plan (NHMP). This is a great opportunity for cities within the county to participate in the update process in order to maintain or acquire eligibility for federal funding to implement hazard mitigation projects locally. Involvement from each city is voluntary and is not required by FEMA in order to approve the plan. However, consensus built through the inclusion of cities and other agency stakeholders throughout Sherman County will improve the plan implementation process as well as the final NHMP, and will ultimately aid the process of building more resilient communities.

Sherman County Multi-Jurisdictional NHMP Update

A Natural Hazards Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction and repeated damage. It creates a framework for risk-based decision making to reduce damages to lives, property and the economy from future disasters.

The Federal Emergency Management Agency (FEMA) approved the current Sherman County NHMP on February 1, 2008. In accordance with the five-year FEMA update and re-approval requirement, the plan will lapse on February 1, 2013. The current Sherman County NHMP can be accessed online at the following web address:  http://csc.uoregon.edu/opdr/plans/sherman

City of Grass Valley Criteria for Involvement

In order for a jurisdiction within Sherman County to individually maintain eligibility for FEMA’s Pre-Disaster Mitigation and Hazard Mitigation Grant Programs, participation from the jurisdiction must be documented within the county plan. The Code of Federal Regulations (CFR) mandates the following:

Multi-jurisdictional Participation - §201.6(a)(3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process.

The City of Grass Valley is participating in plan update process through membership with and attendance at Sherman County’s NHMP Steering Committee meetings.

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 City Council is acting as the Steering Committee for the City of Grass Valley.

The City Council meeting on Monday, April 2, 2012, will address risk assessment through a Hazard Analysis similar to one complete by the county.

Multi-jurisdictional Mitigation Strategy - §201.6(c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Action items will be addressed at the next Sherman County NHMP Steering Committee meeting. A date has not been established yet for this meeting.
Multi-jurisdictional Plan Adoption - §201.6(c) (5): For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

The plan is tentatively scheduled for adoption sometime this summer.

---

Risk Assessment: Hazard Analysis

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 Sherman County NHMP Steering Committee identified eight natural hazards including drought, earthquake, flood, landslide/debris flow, volcanic event, wildfire, windstorm and winter storm. Shawn Payne, Director of Emergency Services for Sherman County, completed a Hazard Analysis in October 2009, where severity ratings (1-10) were applied to the four categories of history, vulnerability, maximum threat (worst-case scenario) and probability based as follows:

- **LOW** = choose the most appropriate number between 1 and 3 points
- **MEDIUM** = choose the most appropriate number between 4 and 7 points
- **HIGH** = choose the most appropriate number between 8 and 10 points

*Weight factors* also apply to each of the four categories as shown below.

**History** (weight factor for category = 2)

History is the record of previous occurrences. Events to include in assessing history of a hazard in your jurisdiction are events for which the following types of activities were required:

- The EOC or alternate EOC was activated
- Three or more EOP functions were implemented (e.g. alert & warning, evacuation, shelter, etc)
- An extraordinary multi-jurisdiction response was required
- A “Local Emergency” was declared

- **LOW** = score at 1 to 3 points based on 0 – 1 events in the past 100 years
- **MEDIUM** = score at 4 to 7 points based on 2 – 3 events in the past 100 years
- **HIGH** = score at 8 to 10 points based on 4+ events in the past 100 years

**Vulnerability** (weight factor for category = 5)

Vulnerability is the percentage of population and property likely to be affected under an “average” occurrence of the hazard.

- **LOW** = score at 1 to 3 points based on less than 1-percent affected
- **MEDIUM** = score at 4 to 7 points based on between 1 and 10-percent affected
- **HIGH** = score at 8 to 10 points based on more than 10-percent affected
**Maximum Threat** (weight factor for category = 10)

Maximum threat is the highest percentage of population and property that could be impacted under a worst-case scenario.

- **LOW** = score at 1 to 3 points based on less than 5-percent affected
- **MEDIUM** = score at 4 to 7 points based on between 5 and 25-percent affected
- **HIGH** = score at 8 to 10 points based on more than 25-percent affected

**Probability** (weight factor for category = 7)

Probability is the likelihood of future occurrence within a specified period of time.

- **LOW** = score at 1 to 3 points based on one incident likely within 75 - 100 years
- **MEDIUM** = score at 4 to 7 points based on one incident likely within 35 - 75 years
- **HIGH** = score at 8 to 10 points based on one incident likely within 10 - 35 years

By multiplying the **weight factors** associated with the categories by the **severity ratings**, we can arrive at subscores for history, vulnerability, maximum threat and probability for each hazard. Adding the subscores will produce a total score for each hazard. Scores completed for Sherman County are listed below. The risk assessment focuses on both vulnerability and probability scores.

<table>
<thead>
<tr>
<th>Sherman County Hazard Analysis</th>
<th>History</th>
<th>Vulnerability</th>
<th>Maximum Threat</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>Severity Weight Factor Subtotal Severity Weight Factor Subtotal Vulnerability* Severity Weight Factor Subtotal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earthquake</td>
<td>10 2 20 5 5 25 M</td>
<td>8 10 80</td>
<td>10 7 70</td>
<td>H 195 2</td>
</tr>
<tr>
<td>Flood - Riverine</td>
<td>6 2 12 5 6 30 M</td>
<td>7 10 70</td>
<td>2 7 14 L</td>
<td>96 7</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>4 2 8 6 5 30 M</td>
<td>8 10 80</td>
<td>5 7 35 M</td>
<td>153 6</td>
</tr>
<tr>
<td>Volcano</td>
<td>1 2 2 3 5 15 L</td>
<td>2 10 20</td>
<td>1 7 7 L</td>
<td>44 8</td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>10 2 20 7 5 35 M</td>
<td>10 10 100</td>
<td>10 7 70 H</td>
<td>225 1</td>
</tr>
<tr>
<td>Windstorm*</td>
<td>10 2 20 5 5 25 M</td>
<td>8 10 80</td>
<td>8 7 56 H</td>
<td>181 5</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>7 2 14 5 5 25 M</td>
<td>10 10 100</td>
<td>8 7 56 H</td>
<td>195 2</td>
</tr>
</tbody>
</table>

^Windstorm was evaluated by the Sherman County NHMP Steering Committee on February 15, 2012.

*Vulnerability, Probability Converted Scores: H = High, M = Medium, L = Low

**Project Outcome**

Our primary measure of success for this project will be the adoption of an updated Sherman County NHMP. Ultimately it will be the process cities go through in the planning effort and the eventual implementation of the plans, not the plans themselves, which will be the true indicators of success resulting from this project.

Should you have any questions or concerns, please do not hesitate to contact either Garrett Jensen at 541.298.4101 ext. 230 or via email at garrett.jensen@mccog.com, or Josh Bruce at 541.346.7326 or via email at jdbruce@uoregon.edu.
City of Grass Valley  
Regular Council Meeting  
April 2, 2012: 7 PM  
South Sherman Elementary  
Agenda  

1.0 Call to Order  
1.2 Approve Agenda  

PUBLIC HEARING FOR AMENDMENT TO ZONING ORDINANCE, ORDINANCE NO: 120 TO AMEND THE DEFINITION OF ACCESSORY USE OR STRUCTURE AND DECLARING AN EMERGENCY: Dan Meader  

2.0 Guests:  
Duane Boswell  
Shawn Payne  

3.0 Consent Agenda  
3.1 Minutes  
3.2 Financials  

4.0 Old Business:  
4.1 Amendment to Zoning Ordinance #120  
4.2 SDL Grant: park and pavilion project  
4.3 Funding committee for pavilion project: Rita Wilson/Joan Bird  
4.4 Easter Egg Hunt: Joann Duarte  

5.0 New Business  
5.1 Clean up day: tentative for May 5, 2012  
5.2 City Collaboration meeting regarding codes enforcement  
5.3 Rose Tucker Grant  

6.0 Adjourn  

* If necessary, an Executive Session may be held in accordance with: ORS 192.660(2)(e) Property; ORS 192.660(2)(h) Legal Rights; ORS 192.660(2)(i) Personnel
Sherman County Natural Hazards Mitigation Plan (NHMP) Update

Issue Summary
March 14, 2012

In conjunction with the Oregon Partnership for Disaster Resilience (OPDR), Sherman County is currently in the process of updating its Natural Hazards Mitigation Plan (NHMP). This is a great opportunity for cities within the county to participate in the update process in order to maintain or acquire eligibility for federal funding to implement hazard mitigation projects locally. Involvement from each city is voluntary and is not required by FEMA in order to approve the plan. However, consensus built through the inclusion of cities and other agency stakeholders throughout Sherman County will improve the plan implementation process as well as the final NHMP, and will ultimately aid the process of building more resilient communities.

Sherman County Multi-Jurisdictional NHMP Update

A Natural Hazards Mitigation Plan forms the foundation for a community’s long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction and repeated damage. It creates a framework for risk-based decision making to reduce damages to lives, property and the economy from future disasters.

The Federal Emergency Management Agency (FEMA) approved the current Sherman County NHMP on February 1, 2008. In accordance with the five-year FEMA update and re-approval requirement, the plan will lapse on February 1, 2013. The current Sherman County NHMP can be accessed online at the following web address: http://csc.uoregon.edu/opdr/plans/sherman

City of Rufus Criteria for Involvement

In order for a jurisdiction within Sherman County to individually maintain eligibility for FEMA’s Pre-Disaster Mitigation and Hazard Mitigation Grant Programs, participation from the jurisdiction must be documented within the county plan. The Code of Federal Regulations (CFR) mandates the following:

Multi-jurisdictional Participation - §201.6(a) (3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process.

The City of Rufus is participating in plan update process through membership with and attendance at Sherman County’s NHMP Steering Committee meetings.

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 City Council is acting as the Steering Committee for the City of Rufus.

The City Council meeting on Wednesday, April 11, 2012, will address risk assessment through a Hazard Analysis similar to one complete by the county.

Multi-jurisdictional Mitigation Strategy - §201.6(c) (3) (iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Action items will be addressed at the next Sherman County NHMP Steering Committee meeting. A date has not been established yet for this meeting.
Multi-jurisdictional Plan Adoption - \textit{§201.6(c) (5)}: For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

The plan is tentatively scheduled for adoption sometime this summer.

\begin{center}
\textbf{Risk Assessment: Hazard Analysis}
\end{center}

Multi-jurisdictional Risk Assessment - \textit{§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 Sherman County NHMP Steering Committee identified eight natural hazards including drought, earthquake, flood, landslide/debris flow, volcanic event, wildfire, windstorm and winter storm. Shawn Payne, Director of Emergency Services for Sherman County, completed a Hazard Analysis in October 2009, where severity ratings (1-10) were applied to the four categories of history, vulnerability, maximum threat (worst-case scenario) and probability based as follows:

\begin{itemize}
  \item \textit{LOW} = choose the most appropriate number between 1 and 3 points
  \item \textit{MEDIUM} = choose the most appropriate number between 4 and 7 points
  \item \textit{HIGH} = choose the most appropriate number between 8 and 10 points
\end{itemize}

\textit{Weight factors} also apply to each of the four categories as shown below.

\begin{center}
\textbf{History} (weight factor for category = 2)
\end{center}

History is the record of previous occurrences. Events to include in assessing history of a hazard in your jurisdiction are events for which the following types of activities were required:

\begin{itemize}
  \item The EOC or alternate EOC was activated
  \item Three or more EOP functions were implemented (e.g. alert & warning, evacuation, shelter, etc)
  \item An extraordinary multi-jurisdiction response was required
  \item A “Local Emergency” was declared
\end{itemize}

\begin{itemize}
  \item \textit{LOW} = score at 1 to 3 points based on 0 – 1 events in the past 100 years
  \item \textit{MEDIUM} = score at 4 to 7 points based on 2 – 3 events in the past 100 years
  \item \textit{HIGH} = score at 8 to 10 points based on 4+ events in the past 100 years
\end{itemize}

\begin{center}
\textbf{Vulnerability} (weight factor for category = 5)
\end{center}

Vulnerability is the percentage of population and property likely to be affected under an “average” occurrence of the hazard.

\begin{itemize}
  \item \textit{LOW} = score at 1 to 3 points based on less than 1-percent affected
  \item \textit{MEDIUM} = score at 4 to 7 points based on between 1 and 10-percent affected
  \item \textit{HIGH} = score at 8 to 10 points based on more than 10-percent affected
\end{itemize}
Maximum Threat (weight factor for category = 10)

Maximum threat is the highest percentage of population and property that could be impacted under a worst-case scenario.

LOW = score at 1 to 3 points based on less than 5-percent affected
MEDIUM = score at 4 to 7 points based on between 5 and 25-percent affected
HIGH = score at 8 to 10 points based on more than 25-percent affected

Probability (weight factor for category = 7)

Probability is the likelihood of future occurrence within a specified period of time.

LOW = score at 1 to 3 points based on one incident likely within 75 - 100 years
MEDIUM = score at 4 to 7 points based on one incident likely within 35 - 75 years
HIGH = score at 8 to 10 points based on one incident likely within 10 - 35 years

By multiplying the weight factors associated with the categories by the severity ratings, we can arrive at subscores for history, vulnerability, maximum threat and probability for each hazard. Adding the subscores will produce a total score for each hazard. Scores completed for Sherman County are listed below. The risk assessment focuses on both vulnerability and probability scores.

<table>
<thead>
<tr>
<th>Sherman County Hazard Analysis</th>
<th>History</th>
<th>Vulnerability</th>
<th>Maximum Threat</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Severity</td>
<td>Weight Factor</td>
<td>Subtotal</td>
<td></td>
</tr>
<tr>
<td>Drought</td>
<td>10</td>
<td>2</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>10</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>7</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>195</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Earthquake</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>5</td>
<td>10</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>10</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>7</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>10</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>96</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Flood - Riverine</td>
<td>6</td>
<td>2</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>5</td>
<td>30</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>10</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>7</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>landslide/Debris Flow</td>
<td>4</td>
<td>2</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>5</td>
<td>30</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>10</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>7</td>
<td>35</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volcano</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>5</td>
<td>15</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>7</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>10</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>10</td>
<td>2</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>5</td>
<td>35</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>10</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>7</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>225</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Windstorm^</td>
<td>10</td>
<td>2</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>10</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>7</td>
<td>56</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>181</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>7</td>
<td>2</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>10</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>7</td>
<td>56</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>195</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

^Windstorm was evaluated by the Sherman County NHMP Steering Committee on February 15, 2012.

*Vulnerability, Probability Converted Scores: H = High, M = Medium, L = Low

Project Outcome

Our primary measure of success for this project will be the adoption of an updated Sherman County NHMP. Ultimately it will be the process cities go through in the planning effort and the eventual implementation of the plans, not the plans themselves, which will be the true indicators of success resulting from this project.

Should you have any questions or concerns, please do not hesitate to contact either Garrett Jensen at 541.298.4101 ext. 230 or via email at garrett.jensen@mccog.com, or Josh Bruce at 541.346.7326 or via email at jdbruce@uoregon.edu.
In conjunction with the Oregon Partnership for Disaster Resilience (OPDR), Sherman County is currently in the process of updating its Natural Hazards Mitigation Plan (NHMP). This is a great opportunity for cities within the county to participate in the update process in order to maintain or acquire eligibility for federal funding to implement hazard mitigation projects locally. Involvement from each city is voluntary and is not required by FEMA in order to approve the plan. However, consensus built through the inclusion of cities and other agency stakeholders throughout Sherman County will improve the plan implementation process as well as the final NHMP, and will ultimately aid the process of building more resilient communities.

A Natural Hazards Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction and repeated damage. It creates a framework for risk-based decision making to reduce damages to lives, property and the economy from future disasters.

The Federal Emergency Management Agency (FEMA) approved the current Sherman County NHMP on February 1, 2008. In accordance with the five-year FEMA update and re-approval requirement, the plan will lapse on February 1, 2013. The current Sherman County NHMP can be accessed online at the following web address: http://csc.uoregon.edu/opdr/plans/sherman

In order for a jurisdiction within Sherman County to individually maintain eligibility for FEMA’s Pre-Disaster Mitigation and Hazard Mitigation Grant Programs, participation from the jurisdiction must be documented within the county plan. The Code of Federal Regulations (CFR) mandates the following:

Multi-jurisdictional Participation - §201.6(a) (3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process.

The City of Wasco is participating in plan update process through membership with and attendance at Sherman County's NHMP Steering Committee meetings.

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 City Council is acting as the Steering Committee for the City of Wasco.

The City Council meeting on Tuesday, May 15, 2012, will address risk assessment through a Hazard Analysis similar to one complete by the county.

Multi-jurisdictional Mitigation Strategy - §201.6(c) (3) (iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Action items will be addressed at the next Sherman County NHMP Steering Committee meeting. A date has not been established yet for this meeting.
Multi-jurisdictional Plan Adoption - **§201.6(c) (5):** For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

The plan is tentatively scheduled for adoption sometime this summer.

**Risk Assessment: Hazard Analysis**

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 Sherman County NHMP Steering Committee identified eight natural hazards including drought, earthquake, flood, landslide/debris flow, volcanic event, wildfire, windstorm and winter storm. Shawn Payne, Director of Emergency Services for Sherman County, completed a Hazard Analysis in October 2009, where severity ratings (1-10) were applied to the four categories of history, vulnerability, maximum threat (worst-case scenario) and probability based as follows:

- **LOW** = choose the most appropriate number between 1 and 3 points
- **MEDIUM** = choose the most appropriate number between 4 and 7 points
- **HIGH** = choose the most appropriate number between 8 and 10 points

*Weight factors* also apply to each of the four categories as shown below.

**History** (weight factor for category = 2)

History is the record of previous occurrences. Events to include in assessing history of a hazard in your jurisdiction are events for which the following types of activities were required:

- The EOC or alternate EOC was activated
- Three or more EOP functions were implemented (e.g. alert & warning, evacuation, shelter, etc)
- An extraordinary multi-jurisdiction response was required
- A “Local Emergency” was declared

- **LOW** = score at 1 to 3 points based on 0 – 1 events in the past 100 years
- **MEDIUM** = score at 4 to 7 points based on 2 – 3 events in the past 100 years
- **HIGH** = score at 8 to 10 points based on 4+ events in the past 100 years

**Vulnerability** (weight factor for category = 5)

Vulnerability is the percentage of population and property likely to be affected under an “average” occurrence of the hazard.

- **LOW** = score at 1 to 3 points based on less than 1-percent affected
- **MEDIUM** = score at 4 to 7 points based on between 1 and 10-percent affected
- **HIGH** = score at 8 to 10 points based on more than 10-percent affected
**Maximum Threat** (weight factor for category = 10)

Maximum threat is the highest percentage of population and property that could be impacted under a worst-case scenario.

- **LOW** = score at 1 to 3 points based on less than 5-percent affected
- **MEDIUM** = score at 4 to 7 points based on between 5 and 25-percent affected
- **HIGH** = score at 8 to 10 points based on more than 25-percent affected

**Probability** (weight factor for category = 7)

Probability is the likelihood of future occurrence within a specified period of time.

- **LOW** = score at 1 to 3 points based on one incident likely within 75 - 100 years
- **MEDIUM** = score at 4 to 7 points based on one incident likely within 35 - 75 years
- **HIGH** = score at 8 to 10 points based on one incident likely within 10 - 35 years

By multiplying the weight factors associated with the categories by the severity ratings, we can arrive at subscores for history, vulnerability, maximum threat and probability for each hazard. Adding the subscores will produce a total score for each hazard. Scores completed for Sherman County are listed below. The risk assessment focuses on both vulnerability and probability scores.

<table>
<thead>
<tr>
<th>Sherman County Hazard Analysis</th>
<th>History</th>
<th>Vulnerability</th>
<th>Maximum Threat</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard</td>
<td>Subtotal</td>
<td>Subtotal*</td>
<td>Subtotal</td>
<td>Subtotal*</td>
</tr>
<tr>
<td></td>
<td>Severity</td>
<td>Weight Factor</td>
<td></td>
<td>Severity</td>
</tr>
<tr>
<td>Drought</td>
<td>10</td>
<td>2 20</td>
<td>5 5</td>
<td>25</td>
</tr>
<tr>
<td>Earthquake</td>
<td>1</td>
<td>2 2</td>
<td>2 5</td>
<td>10</td>
</tr>
<tr>
<td>Flood - Riverine</td>
<td>6</td>
<td>2 12</td>
<td>6 5</td>
<td>30</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>4</td>
<td>2 8</td>
<td>6 5</td>
<td>30</td>
</tr>
<tr>
<td>Volcano</td>
<td>1</td>
<td>2 2</td>
<td>3 5</td>
<td>15</td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>10</td>
<td>2 20</td>
<td>7 5</td>
<td>35</td>
</tr>
<tr>
<td>Windstorm^</td>
<td>10</td>
<td>2 20</td>
<td>5 5</td>
<td>25</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>7</td>
<td>2 14</td>
<td>5 5</td>
<td>25</td>
</tr>
</tbody>
</table>

^Windstorm was evaluated by the Sherman County NHMP Steering Committee on February 15, 2012.

*Vulnerability, Probability Converted Scores: H = High, M = Medium, L = Low

**Project Outcome**

Our primary measure of success for this project will be the adoption of an updated Sherman County NHMP. Ultimately it will be the process cities go through in the planning effort and the eventual implementation of the plans, not the plans themselves, which will be the true indicators of success resulting from this project.

Should you have any questions or concerns, please do not hesitate to contact either Garrett Jensen at 541.298.4101 ext. 230 or via email at garrett.jensen@mccog.com, or Josh Bruce at 541.346.7326 or via email at jdbruce@uoregon.edu.
WASCO CITY COUNCIL MEETING
7:00 P.M. – WASCO CITY HALL – MAY 15, 2012

AGENDA

CALL TO ORDER
I Flag Salute
II Announce Additions/changes to Agenda
III Consent Calendar: Approve April 17, 2012 Minutes and Payment of May 2012 Bills
IV Recognition of Visitors: Those Who Wish to Comment about City Business Not on the Agenda will be Acknowledged at this Time and Included on the Agenda at the Discretion of the Mayor

BUSINESS & REPORTS
I Participate in Updating Process for Natural Hazard Mitigation Plan (Garrett Jensen)
II Review By-laws for Wasco Community Garden & Receive Planning Update (James)
III Review Intergovernmental Personnel Agreement & Consider Adoption
IV Conduct State Revenue Sharing Hearing to Consider Use of State Funds
V Discuss Annual Insurance Renewal with CIS and Re-assign an Agent of Record
VI Assume Sponsorship of Annual Wasco Memorial Day Celebration
VII Receive City Staff Reports
VIII Old Business
IX New Business (Additions Approved by Mayor at Beginning of Meeting)

ADJOURN

If necessary, Executive Session may be held in accordance with ORS 192.660.
As this is a regular meeting of the Wasco City Council, other matters that are not on the Agenda may be addressed as deemed appropriate by the Council. All meetings are open to the public.
In conjunction with the Oregon Partnership for Disaster Resilience (OPDR), Sherman County is currently in the process of updating its Natural Hazards Mitigation Plan (NHMP). This is a great opportunity for cities within the county to participate in the update process in order to maintain or acquire eligibility for federal funding to implement hazard mitigation projects locally. Involvement from each city is voluntary and is not required by FEMA in order to approve the plan. However, consensus built through the inclusion of cities and other agency stakeholders throughout Sherman County will improve the plan implementation process as well as the final NHMP, and will ultimately aid the process of building more resilient communities.

A Natural Hazards Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction and repeated damage. It creates a framework for risk-based decision making to reduce damages to lives, property and the economy from future disasters.

The Federal Emergency Management Agency (FEMA) approved the current Sherman County NHMP on February 1, 2008. In accordance with the five-year FEMA update and re-approval requirement, the plan will lapse on February 1, 2013. The current Sherman County NHMP can be accessed online at the following web address: http://csc.uoregon.edu/opdr/plans/sherman

In order for a jurisdiction within Sherman County to individually maintain eligibility for FEMA’s Pre-Disaster Mitigation and Hazard Mitigation Grant Programs, participation from the jurisdiction must be documented within the county plan. The Code of Federal Regulations (CFR) mandates the following:

Multi-jurisdictional Participation - §201.6(a) (3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process.

The City of Moro is participating in the plan update process through membership with and attendance at Sherman County’s NHMP Steering Committee meetings.

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 City Council is acting as the Steering Committee for the City of Moro.

A meeting with city representatives on Wednesday, May 16, 2012, will address risk assessment through a Hazard Analysis similar to one complete by the county.

Multi-jurisdictional Mitigation Strategy - §201.6(c) (3) (iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Action items will be addressed at the next Sherman County NHMP Steering Committee meeting. A date has not been established yet for this meeting.
Multi-jurisdictional Plan Adoption - **§201.6(c)** (5): For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

The plan is tentatively scheduled for adoption sometime this summer.

---

**Risk Assessment: Hazard Analysis**

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 Sherman County NHMP Steering Committee identified eight natural hazards including drought, earthquake, flood, landslide/debris flow, volcanic event, wildfire, windstorm and winter storm. Shawn Payne, Director of Emergency Services for Sherman County, completed a Hazard Analysis in October 2009, where severity ratings (1-10) were applied to the four categories of history, vulnerability, maximum threat (worst-case scenario) and probability based as follows:

- **LOW** = choose the most appropriate number between 1 and 3 points
- **MEDIUM** = choose the most appropriate number between 4 and 7 points
- **HIGH** = choose the most appropriate number between 8 and 10 points

*Weight factors* also apply to each of the four categories as shown below.

**History** (weight factor for category = 2)

History is the record of previous occurrences. Events to include in assessing history of a hazard in your jurisdiction are events for which the following types of activities were required:

- The EOC or alternate EOC was activated
- Three or more EOP functions were implemented (e.g. alert & warning, evacuation, shelter, etc)
- An extraordinary multi-jurisdiction response was required
- A “Local Emergency” was declared

*LOW* = score at 1 to 3 points based on 0 – 1 events in the past 100 years

*MEDIUM* = score at 4 to 7 points based on 2 – 3 events in the past 100 years

*HIGH* = score at 8 to 10 points based on 4+ events in the past 100 years

**Vulnerability** (weight factor for category = 5)

Vulnerability is the percentage of population and property likely to be affected under an “average” occurrence of the hazard.

*LOW* = score at 1 to 3 points based on less than 1-percent affected

*MEDIUM* = score at 4 to 7 points based on between 1 and 10-percent affected

*HIGH* = score at 8 to 10 points based on more than 10-percent affected
**Maximum Threat** (weight factor for category = 10)

Maximum threat is the highest percentage of population and property that could be impacted under a worst-case scenario.

\[ LOW = \text{score at 1 to 3 points based on less than 5-percent affected} \]

\[ MEDIUM = \text{score at 4 to 7 points based on between 5 and 25-percent affected} \]

\[ HIGH = \text{score at 8 to 10 points based on more than 25-percent affected} \]

**Probability** (weight factor for category = 7)

Probability is the likelihood of future occurrence within a specified period of time.

\[ LOW = \text{score at 1 to 3 points based on one incident likely within 75 - 100 years} \]

\[ MEDIUM = \text{score at 4 to 7 points based on one incident likely within 35 - 75 years} \]

\[ HIGH = \text{score at 8 to 10 points based on one incident likely within 10 - 35 years} \]

By multiplying the weight factors associated with the categories by the severity ratings, we can arrive at subscores for history, vulnerability, maximum threat and probability for each hazard. Adding the subscores will produce a total score for each hazard. Scores completed for Sherman County are listed below. The risk assessment focuses on both vulnerability and probability scores.

<table>
<thead>
<tr>
<th>Sherman County Hazard Analysis</th>
<th>History</th>
<th>Vulnerability</th>
<th>Maximum Threat</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Severity</td>
<td>Weight Factor</td>
<td>Subtotal</td>
<td>Severity</td>
</tr>
<tr>
<td>Drought</td>
<td>10</td>
<td>2</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Earthquake</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Flood - Riverine</td>
<td>6</td>
<td>2</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>4</td>
<td>2</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Volcano</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Wildfire (WUI)</td>
<td>10</td>
<td>2</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>Windstorm^</td>
<td>10</td>
<td>2</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>7</td>
<td>2</td>
<td>14</td>
<td>5</td>
</tr>
</tbody>
</table>

^Windstorm was evaluated by the Sherman County NHMP Steering Committee on February 15, 2012.

*Vulnerability, Probability Converted Scores: H = High, M = Medium, L = Low

**Project Outcome**

Our primary measure of success for this project will be the adoption of an updated Sherman County NHMP. Ultimately it will be the process cities go through in the planning effort and the eventual implementation of the plans, not the plans themselves, which will be the true indicators of success resulting from this project.

Should you have any questions or concerns, please do not hesitate to contact either Garrett Jensen at 541.298.4101 ext. 230 or via email at garrett.jensen@mccog.com, or Josh Bruce at 541.346.7326 or via email at jdbruce@uoregon.edu.
<table>
<thead>
<tr>
<th>Name</th>
<th>Representing</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rene' Moore</td>
<td>City of Mono, Mayor</td>
<td><a href="mailto:maro@comcast.com">maro@comcast.com</a></td>
</tr>
<tr>
<td>Larry Trebell</td>
<td>City of Mono, Mayor</td>
<td><a href="mailto:maro@comcast.com">maro@comcast.com</a></td>
</tr>
<tr>
<td>Correer Jensen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barez Kellor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Meeting: Natural Hazards Mitigation Plan (NHMP) Update: Meeting #3

   Phase III: Action Items
   Phase IV: Plan Implementation and Maintenance

Date: Tuesday, June 05, 2012
Time: 10:00 a.m. – 1:00 p.m.
Location: Moro Fire Station
309 Dewey St
Moro, Oregon 97039

Meeting Agenda

I. Welcome and Introductions (5 minutes)
II. Mitigation Strategy Overview (15 minutes)
III. Review Goals (15 minutes)
   • Review/Update Existing Goals
   • Goal Development
IV. Review Action Items (40 Minutes)
   • Review/Update Existing Action Items
V. Action Item Development (40 Minutes)
VI. Break (15 minutes)
VII. Plan Implementation and Maintenance (40 Minutes)
VIII. Community Involvement (5 Minutes)
IX. Next Steps (5 Minutes)
   • Finalizing the plan for approval

To access OPDR information and resources visit:
http://csc.uoregon.edu/OPDR
<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Representing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shawn Figures</td>
<td>shawnfigures1.com</td>
<td>Emvar Group, Inc.</td>
</tr>
<tr>
<td>Tom Martin</td>
<td><a href="mailto:Tom.Martin@moorefirm.com">Tom.Martin@moorefirm.com</a></td>
<td>McFarland &amp; Dept.</td>
</tr>
<tr>
<td>John Anderson</td>
<td><a href="mailto:john.angela@georgia.ca">john.angela@georgia.ca</a></td>
<td>City of Gainesville, GA</td>
</tr>
<tr>
<td>Ellis Armstrong</td>
<td><a href="mailto:ellie.armstrong@emvar.com">ellie.armstrong@emvar.com</a></td>
<td>Emvar Group, Inc.</td>
</tr>
<tr>
<td>Joseph Elliott</td>
<td><a href="mailto:joseph.elliott@moorefirm.com">joseph.elliott@moorefirm.com</a></td>
<td>City of Wasco</td>
</tr>
<tr>
<td>Georgia Harris</td>
<td><a href="mailto:georgia.harris@emvar.com">georgia.harris@emvar.com</a></td>
<td>Emvar Group, Inc.</td>
</tr>
</tbody>
</table>

Table continued below...
2008 Plan Development and Public 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, Hood River, Morrow, Sherman, Umatilla, Wasco, and Wheeler) counties to develop a Pre-Disaster Mitigation Planning Grant proposal. Each county joined the Partnership for Disaster Resistance and Resilience (The Partnership) by signing (through their County Commissions) a Memorandum of Understanding for this project. 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 Sherman 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;
- Sherman County Comprehensive Land Use Plan;
- Sherman County Zoning, Subdivision, Partitioning, and Land Development Ordinance;
- Sherman County: From Vision to Action: Strategic Plan for Economic Development;
- Sherman County Community Shelter Plan;
- North Central Oregon: Strategic Plan for Tourism; and
- Region 5 Household Preparedness Survey Report.

**STEERING COMMITTEE**

The Sherman 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.

Participants

In Sherman County the Emergency Services Coordinator met and discussed the need to develop the Pre-Hazard Mitigation Plan with the County Commissioners and the amount of work involved in putting it together. It was decided the best option was to contract with an outside consultant to prepare the plan. An outside contractor Susan Brewer of VISION Consulting & Grant Writing was hired to do all aspects of preparing the plan. It was the responsibility of the contractor hired to facilitate all the steering committee meetings and to contact and /or meet with the stakeholders. The Emergency Services Coordinator was responsible for notifying the steering committee members when, where and what time there would be a meeting.

The Contractor attended the fall training workshop in The Dalles, Oregon on October 12, 2005, and October 13, 2005.

A Steering Committee was developed to assist in developing the plan. The committee included:

- Sherman County Judge, Gary Thompson
- City of Grass Valley Mayor, Neil Pattee
- City of Moro Mayor, John Waldren
- City of Wasco Mayor, Karen Kellogg
- City of Rufus Mayor, Cliff Jett
- Sherman County Fire Defense Board Chief, Jim Payne
- Sherman County Planning Director, Georgia Macnab
- Sherman County Road Master, Mark Coles
- ODOT Supervisor, Andy Anderson
- Sherman County Sheriff, Brad Lohrey
- Sherman County EMS Designee, Jerrilea Mayfield
- Sherman County Emergency Services Director, Shawn Payne

The first meeting of the Sherman County Steering Committee was held on November 3, 2005 at the Sherman County Courthouse in Moro, Oregon. The committee reviewed the list of critical infrastructure for their county and made no changes to what was listed for Sherman County. The Steering Committee agreed to engage other interested stakeholders by inviting them to subsequent meetings. The following Steering Committee members were present:

- Sherman County Planning
- Sherman County Road Department
- Sherman County Sheriff’s Office
- Sherman County Judge
- City of Rufus
During the first meeting, the planning process and plan requirements were described to the Committee. In addition, the committee reviewed the list of critical infrastructure for their county and made several changes to what was listed for Sherman County. The Steering Committee agreed to engage other interested stakeholders by inviting them to subsequent Steering Committee meetings. The following is a list of the stakeholders that received invitations to the remaining meetings.

- The Sherman County Road Department
- Oregon Department of Transportation
- Sherman County EMS
- 911
- Sherman County Fire
- Sherman County School Superintendent
- Sherman County Health District (Moro Medical Clinic)
- Wasco/Sherman County Health Department
- Sherman County Sheriff’s Office
- Oregon State Police
- Wasco Rural Electric
- Pacific Power and Light
- Sprint Telephone Company
- Bureau of Land Management
- Oregon State Parks Department
- Moro, Grass Valley, Rufus and Wasco Public Works
- Mayors of Moro, Grass Valley, Rufus and Wasco
- Trans Canada Pipe Line
- Mid-Columbia Producers
- Bonneville Power Administration
- Red Cross

The second steering committee meeting was held on March 14, 2006 in Moro. The group reviewed what has been written to date in Sections #1, #2, and #3. It was evident to the committee that the state websites for the County need to be updated. Corrections noted will be made in the Pre-Mitigation Plan. Next the committee identified the community assets and functions and discussed what they wanted in the plan. They also briefly discussed some possible projects for action plans. The committee then plotted the assets, functions, and potential hazard sites on the County map. The following Steering Committee members and stakeholders attended:

**Steering Committee**

- City of Rufus
- City of Grass Valley
- Sherman County Planning
- City of Moro
- Sherman County Sheriff
- Sherman County Judge
Stakeholders

- Moro Fire Department

The third steering committee meeting was held in Moro on May 24, 2006. The definition of a stakeholder was explained by Consultant Susan Brewer. Bill Burns from DOGAMI was a guest at this meeting. Mr. Burns went over how to do a risk assessment. Following this the committee began identifying and mapping the past and present hazards on the Sherman County map. The following Steering Committee members and stakeholders attended:

Steering Committee

- City of Rufus
- City of Moro
- Sherman County Emergency Management

Stakeholders

- Department of Geology and Mineral Industries
- Oregon State Parks
- Wasco Electric Coop
- Sherman County Health Department
- Oregon State Police
- Sherman County Health District

The fourth steering and stakeholder meeting was held on June 21, 2006 in Moro. This meeting focused on developing a vision statement, and goals and action plans for each hazard. The following Steering Committee members and stakeholders attended:

Steering Committee

- City of Moro
- Sherman County Road Department
- Oregon Department of Transportation
- Sherman County Fire Defense Board
- Sherman County Emergency Management

Stakeholders

- Bureau of Land Management

The fifth meeting of the Sherman County Steering Committee and stakeholders was held on August 7, 2006 in Moro. The following Steering Committee members and stakeholders attended:

Steering Committee

- City of Moro Fire Department
- Sherman County Planning
- Sherman County Judge
- Sherman County Fire Defense Board
- Sherman County Emergency Management

Stakeholders
The County’s project webpage located on the Partners for Disaster Resistance & Resilience website will serve as an outreach tool to the community. The website was used to provide local contact information and updates on the planning process and also used to post draft sections of the plan. Posting draft plan sections provided the public an opportunity to review the draft plan prior to approval and adoption.

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 survey results improve public/private coordination of mitigation and preparedness for natural hazards by obtaining more accurate information on household understanding and needs. The results of the survey are documented in the plan’s Resource Appendix.

ONHW, with commitment from the Institute for Business and Home Safety (IBHS) provided individuals in the Region with access to, and use of, the IBHS interactive, web-based Open for Business property protection and disaster recovery planning tool. The purpose of the planning tool is to: (1) create understanding of the importance of disaster planning; (2) teach local businesses how to navigate the interactive, web-based Open for Business property protection and disaster recovery planning tool; (3) Assist small businesses develop their own plans during the training; and (4) teach businesses how to communicate the importance of developing and utilizing plans for property protection and recovery from business interruption.
Appendix C: Community Profile

The following section describes Sherman 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 which 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 information documented below, along with the hazard assessments located in Section 3: Hazard Assessment Updates, should be used as the local level rationale for the risk reduction action items identified in Appendix B. The identification of actions that reduce the Sherman County’s sensitivity and increase its resilience assist in reducing overall risk, or the area of overlap in Figure C.1 below.

Figure C.1 Understanding Risk

Source: Oregon Partnership for Disaster Resilience

Source: USGS-Oregon Partnership for Disaster Resilience Research Collaboration, 2006
Why Plan for Natural Hazards in Sherman County?

Natural hazards impact citizens, property, the environment and the economy of Sherman County. Droughts, earthquakes, flooding, landslides, volcanoes, wildfires, windstorms and winter storms have exposed Sherman County residents and businesses to the financial and emotional costs 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 natural hazards and activity within the county create 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 a Natural Hazards Mitigation Plan.

Natural Environment Capacity

Geography

Sherman County is located in north central Oregon and is the eighth smallest county by size in the state. The county claims approximately 831 square miles and ranges in elevation from 185 feet on the Columbia River to 3,600 feet on the plateau in the south.¹ Frequently referred to as the “Land Between the Rivers,” Sherman County is situated between the John Day River on the east and the Deschutes River on the west, each forming the boundaries with neighboring Gilliam and Wasco Counties.² The Columbia River forms the northern boundary with the State of Washington, and a majority of the southern boundary is defined by the canyons of Buck Hollow, a tributary of the Deschutes River.

Rolling hills and steep narrow canyons define the landscape of the county. The soil is mostly loess (wind-blown glacial silt) over residual soil from the underlying basalt with interspersed layers of volcanic ash.¹ Interestingly, Sherman County is the only county in Oregon without natural forestation.²

¹ Sherman County Website. “About Sherman County.” http://www.sherman-county.com/about_sherman_county.asp
Sherman County is 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. There are three ecoregions within the Columbia Plateau located in Sherman County; the Pleistocene Lake Basing, the Deschutes/John Day Canyons, and the Umatilla Plateau. Figure C.3 identifies the ecoregions within the county.

Pleistocene Lake Basins: The Pleistocene Lake Basins once contained vast temporary lakes that were formed 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.

---

Umatilla Plateau⁵: 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.

Deschutes/John Day Canyons⁵: 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.

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.⁶

The Columbia River Basin is the most hydroelectrically developed river system in the world.⁵ 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 ten major federal projects on the Columbia and Snake rivers. These federal projects are a major source of power in the region, and provide flood

---


control, navigation, recreation, fish and wildlife, municipal and industrial water supply, and irrigation benefits.\(^7\)

**JOHN DAY RIVER**

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.\(^8\) 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.\(^9\)

**John Day Scenic Waterway**\(^10\) 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).

---


**Deschutes River**

The Deschutes River flows approximately 245 miles through central Oregon and is a major tributary to the Columbia River. The Deschutes Basin encompasses roughly 10,700 square miles, making it the second largest river basin in the state. The Deschutes begins in Little Lava Lake in the Cascade Mountains, flows through two reservoirs and the City of Bend, then flows north through a deep gorge. Groundwater provides 90% of the streamflow to the lower Deschutes River, adjacent to Sherman County, and any changes in water resource use in the upper Deschutes Basin have the potential to affect stream flow in the lower Deschutes River. Oregon water law permits landowners and irrigators to own rights to more water than the rivers actually carry, causing parts of the Deschutes and many other rivers to nearly run dry during the summer months.

**Deschutes Scenic Waterway**: which includes the segments of the Deschutes River from Little Lava Lake downstream to Crane Prairie Reservoir, from the gaging station immediately below Wickiup Dam downstream to General Patch Bridge, from Harper Bridge downstream to the Central Oregon Irrigation District’s diversion structure (near river mile 171), from Robert Sawyer Park downstream to Tumalo State Park, from Deschutes Market Road Bridge downstream to Lake Billy Chinook Reservoir (excluding the Cline Falls hydroelectric facility near river mile 145), and from immediately below the existing Pelton reregulating dam downstream to the confluence of the Deschutes River with the Columbia River, excluding the City of Maupin (Wasco County) as its boundaries are constituted on October 4, 1977.

---


Climate

**TEMPERATURE, PRECIPITATION AND SNOWFALL**

Situated on the east side of the Cascade Mountains, Sherman County features a hybrid climate, part Mediterranean and part Intermountain Region, meaning four distinct seasons and low annual precipitation.\(^{15}\) The Columbia Gorge serves as a natural channel for normal eastward migration for air masses from the Pacific. These air masses tend to significantly modify extreme temperatures during both the summer and winter seasons. Rarely do abnormally hot or abnormally cool spells persist for more than a few days at a time. Table C.1 highlights the monthly averages and extremes for temperatures, precipitation and snowfall in the City of Moro. The average maximum temperature (°F) during the summer months tend to reach the low 80s, while the average minimum temperature during the winter months drops down below freezing into the mid 20s.

Strong marine influences also reflect the occurrence of precipitation, more than half of which falls from November through February.\(^{16}\) From 1981 to 2010, the average precipitation in Moro equaled 11.31 inches per year. Snowfall amounts averaged 17 inches per year with the highest amounts occurring in December and January.

<table>
<thead>
<tr>
<th>Month</th>
<th>Maximum Temperature (deg F)</th>
<th>Extreme Maximum (deg F)</th>
<th>Minimum Temperature (deg F)</th>
<th>Extreme Minimum (deg F)</th>
<th>Precipitation (inches)</th>
<th>Snowfall (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>39.4</td>
<td>63</td>
<td>26.3</td>
<td>-14</td>
<td>1.48</td>
<td>5.3</td>
</tr>
<tr>
<td>February</td>
<td>44.1</td>
<td>67</td>
<td>27.8</td>
<td>-15</td>
<td>1.12</td>
<td>3.3</td>
</tr>
<tr>
<td>March</td>
<td>52.1</td>
<td>73</td>
<td>32.3</td>
<td>3</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>April</td>
<td>58.4</td>
<td>83</td>
<td>36.2</td>
<td>20</td>
<td>0.91</td>
<td>0</td>
</tr>
<tr>
<td>May</td>
<td>66.3</td>
<td>100</td>
<td>42.6</td>
<td>26</td>
<td>0.97</td>
<td>0</td>
</tr>
<tr>
<td>June</td>
<td>73.7</td>
<td>102</td>
<td>48.2</td>
<td>32</td>
<td>0.64</td>
<td>0</td>
</tr>
<tr>
<td>July</td>
<td>82.7</td>
<td>106</td>
<td>54.1</td>
<td>36</td>
<td>0.24</td>
<td>0</td>
</tr>
<tr>
<td>August</td>
<td>82.4</td>
<td>106</td>
<td>53.4</td>
<td>34</td>
<td>0.25</td>
<td>0</td>
</tr>
<tr>
<td>September</td>
<td>74.7</td>
<td>100</td>
<td>46.2</td>
<td>24</td>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td>October</td>
<td>61.9</td>
<td>88</td>
<td>37.2</td>
<td>7</td>
<td>0.97</td>
<td>0.1</td>
</tr>
<tr>
<td>November</td>
<td>47.5</td>
<td>72</td>
<td>30.9</td>
<td>-15</td>
<td>1.59</td>
<td>1.9</td>
</tr>
<tr>
<td>December</td>
<td>37.7</td>
<td>63</td>
<td>24.9</td>
<td>-16</td>
<td>1.64</td>
<td>5.7</td>
</tr>
<tr>
<td><strong>Annual</strong></td>
<td><strong>60.1</strong></td>
<td><strong>106</strong></td>
<td><strong>38.3</strong></td>
<td><strong>-16</strong></td>
<td><strong>11.31</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

Source: National Weather Service Forecast Office, Pendleton, Oregon, NOAA Online Weather Data, Applied Climate Information System

**Land Cover**


Oregon, like most of the Western States, is largely owned by the federal government with a vast majority of federal lands administered by the Bureau of Land Management (BLM) and the U.S. Forest Service. However, in Sherman County 90-percent of the land is privately owned (roughly 475,000 acres) whereas only nine-percent of the land is owned by BLM (roughly 50,000 acres). Most of the land owned by BLM is adjacent to the Deschutes and John Day rivers. A majority of the private land in the county is either agricultural or pasture land as well as grasslands.

**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, Sherman County historically has dealt with windstorm and widespread heavy rain and thunderstorm events followed by flash flooding, as well as the occasional brushfire. By identifying these natural capitals such as key river systems, as well as temperature and precipitation patterns, Sherman County can recognize key hazard areas to better prepare, mitigate, and increase the resiliency of each community.

**Socio Demographic Capacity**

**Population**

According to the U.S. Census Bureau, the population of Sherman County in 2010 equaled 1,765 and averaged 2.1 persons per square mile. While the population in the State of Oregon increased by 12.0 percent from 2000 to 2010, Sherman County experienced an 8.7 percent decline in population during the same time period. The U.S. Census Bureau classifies rural as; “All territory outside of urban areas. This places the upper limit of rural at 2,500, since urban areas must have at least 2,500 people.” \(^{19}\) This definition is widely recognized as the “official” Federal definition of rural. Therefore, Sherman County is classified as rural and is the second least populated in the State of Oregon. It is slightly larger than neighboring Wheeler County, which also experienced a decline in population since 2000. Table C.2 describes the population changes in the region.

---

\(^{17}\) Allan, Stuart et al., *Atlas of Oregon*. Pg. 83.

\(^{18}\) Allan, Stuart et al., *Atlas of Oregon*. Pg. 84.

Table C.2: Population Changes, 2000 – 2010

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
<td>3,831,074</td>
<td>3,421,399</td>
<td>409,675</td>
<td>12.0%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Sherman County</td>
<td>1,765</td>
<td>1,934</td>
<td>-169</td>
<td>-8.7%</td>
<td>-0.9%</td>
</tr>
<tr>
<td>Gilliam County</td>
<td>1,871</td>
<td>1,915</td>
<td>-44</td>
<td>-2.3%</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Wasco County</td>
<td>25,213</td>
<td>23,791</td>
<td>1422</td>
<td>6.0%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Wheeler County</td>
<td>1,441</td>
<td>1,547</td>
<td>-106</td>
<td>-6.9%</td>
<td>-0.7%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2000 Census, 2010 Census

There are four incorporated cities in Sherman County: Grass Valley, Moro, Rufus and Wasco. Of the four cities, Wasco is the only to see an increase in population from 2000 to 2010. Moro, the county seat, Grass Valley and Rufus all saw decreases in population by more than three-percent each during the same time period. Overall, 65.0-percent of the county’s population resides in the four incorporated cities. In fact, a larger portion of the county now resides in the four cities compared to 2000 when only 59.8-percent of the county’s population resided in Grass Valley, Moro, Rufus and Wasco. Table C.3 describes population changes within the cities in Sherman County.

Table C.3: Population Changes, 2000 – 2010

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County</td>
<td>1,765</td>
<td>1,934</td>
<td>-169</td>
<td>-8.7%</td>
<td>-0.9%</td>
</tr>
<tr>
<td>Grass Valley</td>
<td>164</td>
<td>171</td>
<td>-7</td>
<td>-4.1%</td>
<td>-0.4%</td>
</tr>
<tr>
<td>Moro</td>
<td>324</td>
<td>337</td>
<td>-13</td>
<td>-3.9%</td>
<td>-0.4%</td>
</tr>
<tr>
<td>Rufus</td>
<td>249</td>
<td>268</td>
<td>-19</td>
<td>-7.1%</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Wasco</td>
<td>410</td>
<td>381</td>
<td>29</td>
<td>7.6%</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2000 Census, 2010 Census

Even though a larger portion of the county resides in these four cities, the City of Wasco is the only to see an increase in population since 2000. 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 and income can affect the integrity of a community. Therefore, these human capitals can impact community resilience to natural disasters and their ability to recover.

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. Currently, just under a third (29.7-percent) of the population in the county is over the age of 60, which is significantly higher compared to 20.1-percent of the population overall in the state. The Office of Economic Analysis projects that from 2010 to 2020 the
segment of population over the age of 60 will be the only age group to see an increase in population. Figure C.4 describes the current and projected population groups by age within the county. These numbers suggest that the county may want to consider focusing mitigation techniques that are feasible for elderly populations and provide support to this segment of the population to implement these techniques.

**Figure C.4: Sherman County Population by Age, 2010 and 2020**

Source: 2010 (Actual), U.S. Census Bureau, 2010 Census
Source: 2020 (Projected), Office of Economic Analysis, Department of Administrative Services, State of Oregon, Released April 2004

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 4 Southwest Oregon Regional Profile.
Two other important considerations for high risk populations are the number of households where persons 65 or older live alone along with single parent households. Table C.4 describes these two high risk populations within each jurisdiction. Approximately 35-percent of the households in the county are occupied by individuals who are 65 or older, 13.3-percent of which live alone. Additionally, 6.3-percent of the households in the county are occupied by single parents with children under the age of 18, the highest percent located in the City of Grass Valley. These populations will likely require additional support during a disaster and will inflict strain on the system if improperly managed.

Table C.4: High Risk Households in Sherman County

<table>
<thead>
<tr>
<th>Household Type</th>
<th>Sherman County</th>
<th>Grass Valley</th>
<th>Moro</th>
<th>Rufus</th>
<th>Wasco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households with individuals under 18</td>
<td>179</td>
<td>17</td>
<td>32</td>
<td>22</td>
<td>37</td>
</tr>
<tr>
<td>Single household with own children under 18</td>
<td>38</td>
<td>6</td>
<td>9</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Households with individuals 65 and over</td>
<td>274</td>
<td>35</td>
<td>58</td>
<td>48</td>
<td>69</td>
</tr>
<tr>
<td>Householder 65 years and over living alone</td>
<td>103</td>
<td>15</td>
<td>27</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>Total households</td>
<td>777</td>
<td>74</td>
<td>149</td>
<td>115</td>
<td>182</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2010 Census

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.5 describes the population in Sherman County by race and ethnicity.
Table C.5: Race and Ethnicity in Sherman County

<table>
<thead>
<tr>
<th>Race</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>1,765</td>
<td></td>
</tr>
<tr>
<td>One Race</td>
<td>1,733</td>
<td>98.2%</td>
</tr>
<tr>
<td>White</td>
<td>1,648</td>
<td>93.4%</td>
</tr>
<tr>
<td>Black or African American</td>
<td>4</td>
<td>0.2%</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>29</td>
<td>1.6%</td>
</tr>
<tr>
<td>Asian</td>
<td>3</td>
<td>0.2%</td>
</tr>
<tr>
<td>Native Hawaiian and other Pacific Islander</td>
<td>1</td>
<td>0.1%</td>
</tr>
<tr>
<td>Other race</td>
<td>48</td>
<td>2.7%</td>
</tr>
<tr>
<td>Two or more races</td>
<td>32</td>
<td>1.8%</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>1,765</td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino (of any race)</td>
<td>98</td>
<td>5.6%</td>
</tr>
<tr>
<td>Not Hispanic or Latino</td>
<td>1,667</td>
<td>94.4%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2010 Census

The U.S. Census reports that less than seven-percent of the Sherman County population identifies with a non-white race. Similarly, less than six-percent of the population is of Hispanic or Latino origin. It is important to identify specific ways to support all segments of the community through hazard preparedness and response. Culturally appropriate and effective outreach includes both methods and messaging targeted to this diverse audience. For example, 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. Compared to the state overall, Sherman County has a smaller percentage of residents who attain a Bachelor’s degree or higher, roughly 13.8-percent less. Table C.6 describes the level of education attained by residents in the county.
Table C.6: Educational Attainment

<table>
<thead>
<tr>
<th>Sherman County</th>
<th>Count</th>
<th>Percent</th>
<th>Margin of Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population 25 and over</td>
<td>1,284</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>High school graduate or higher</td>
<td>1,155</td>
<td>90.0%</td>
<td>+/-3.2%</td>
</tr>
<tr>
<td>Bachelor's degree or higher</td>
<td>198</td>
<td>15.0%</td>
<td>+/-3.0%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2006-2010 American Community Survey, 5-Year Estimate

<table>
<thead>
<tr>
<th>Oregon</th>
<th>Count</th>
<th>Percent</th>
<th>Margin of Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population 25 and over</td>
<td>2,614,886</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>High school graduate or higher</td>
<td>2,320,749</td>
<td>88.8%</td>
<td>+/-0.4%</td>
</tr>
<tr>
<td>Bachelor's degree or higher</td>
<td>751803</td>
<td>28.8%</td>
<td>+/-0.4%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2010 American Community

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 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.22 In 2010 the median household income across Sherman County equaled $49,295; this is significantly higher compared to both the region and the state. In fact, the county’s 27-percent growth in income between 2005 and 2010 is more than three times greater than the 8.1-percent growth indicated by the state over the same period of time. Figure C.4 illustrates median household income changes throughout the region.

---

22 State of Oregon Natural Hazards Mitigation Plan, Region 4 Southwest Oregon Regional Profile.
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 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. 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.7 identifies both the number and the percentage of individuals living below the poverty level. In 2010 the poverty guideline equaled income levels below $22,050 for a family of four.\textsuperscript{23} It is estimated that 13.7-percent of people and 20.2-percent of children live below the poverty level across the county. However, both of these levels have decreased since 2005, with the number of children living below the poverty level decreasing by 2.7-percent. In fact, the poverty level in the county is lower compared to both the state and national averages whereas in 2005 the rate in the county was higher. 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. However, the poverty estimates as a percentage are relatively lower in Sherman County compared to state and national averages.

Table C.7: Estimate on the Number of Residents Living in Poverty

<table>
<thead>
<tr>
<th></th>
<th>2005 Poverty All Ages (Estimate)</th>
<th>2010 Poverty All Ages (Estimate)</th>
<th>2005 Poverty Under 18 (Estimate)</th>
<th>2010 Poverty Under 18 (Estimate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County</td>
<td>283</td>
<td>242</td>
<td>84</td>
<td>71</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County</td>
<td>16.3%</td>
<td>13.7%</td>
<td>23.9%</td>
<td>20.2%</td>
</tr>
<tr>
<td>Oregon</td>
<td>14.1%</td>
<td>15.8%</td>
<td>18.8%</td>
<td>21.7%</td>
</tr>
<tr>
<td>United States</td>
<td>13.3%</td>
<td>15.3%</td>
<td>18.5%</td>
<td>21.6%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, Small Area Estimates Branch, 2005 Estimates, 2010 Estimates

The county has seen an increase since 2005 in the number of individuals enrolling in assistance programs. Figure C.5 illustrates the number of Sherman County residents receiving public assistance. As of July 2011, 299 people in the county were receiving Food Stamps; an increase of more than 24-percent from January 2008 when there were only 224. Furthermore, the number of school children eligible to receive free or reduced lunch has increased by 11.4-percent from 2005 to 2010. In fact, more than half of the students in the county now qualify for the lunch program. Table C.8 describes the status of Oregon’s children in terms of the number of children living in poverty and the percent of children eligible to receive free or reduced lunch. While the number of children living in poverty has decreased by 12.6-percent, the number of children eligible for the lunch program has increase by 11.4-percent.

Figure C.5: Public Assistance in Sherman County

Source: Oregon State University, Rural Studies Program, Oregon Agriculture and County Information System, 2008-2011
Table C.8: Public Assistance in Sherman County

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Childhood Poverty (ages 0-17)</td>
<td>87</td>
<td>80</td>
<td>83</td>
<td>84</td>
<td>69</td>
<td>76</td>
</tr>
<tr>
<td>Percent of children eligible to receive free/reduced lunch during the school year</td>
<td>43.0%</td>
<td>46.7%</td>
<td>50.0%</td>
<td>48.7%</td>
<td>50.4%</td>
<td>54.4%</td>
</tr>
</tbody>
</table>

Source: Children First for Oregon, Status of Oregon's Children, 2005-2010

Insurance Coverage

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.9 identifies health insurance coverage across Sherman County. The Census Bureau estimates in 2009 that the number of uninsured residents in Sherman County under the age of 65 equaled 298, roughly 22.8-percent. It is important to note that the uninsured rate for this population was higher in the county compared to the state (19.4-percent), and the rate of uninsured persons under 19 in the county (16.2-percent) was more than five-percent higher compared to the state (11.0-percent). However, both of these rates have declined considerably in the county since 2005.

Table C.9: Health Insurance Coverage in Sherman County

<table>
<thead>
<tr>
<th></th>
<th>Percent Uninsured - Under Age 65</th>
<th>Margin of Error</th>
<th>Percent Uninsured - Under Age 19</th>
<th>Margin of Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005 Sherman County</td>
<td>29.0%</td>
<td>+/-4.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oregon</td>
<td>18.70%</td>
<td>+/-0.9%</td>
<td></td>
</tr>
<tr>
<td>2006 Sherman County</td>
<td>29.0%</td>
<td>+/-3.9%</td>
<td>20.9%</td>
<td>+/-5.6%</td>
</tr>
<tr>
<td></td>
<td>Oregon</td>
<td>19.1%</td>
<td>+/-0.9%</td>
<td>12.9%</td>
</tr>
<tr>
<td>2007 Sherman County</td>
<td>25.3%</td>
<td>+/-3.5%</td>
<td>18.9%</td>
<td>+/-4.8%</td>
</tr>
<tr>
<td></td>
<td>Oregon</td>
<td>18.8%</td>
<td>+/-0.9%</td>
<td>12.8%</td>
</tr>
<tr>
<td>2008 Sherman County</td>
<td>24.9%</td>
<td>+/-2.1%</td>
<td>18.0%</td>
<td>+/-3.4%</td>
</tr>
<tr>
<td></td>
<td>Oregon</td>
<td>18.0%</td>
<td>+/-0.4%</td>
<td>12.3%</td>
</tr>
<tr>
<td>2009 Sherman County</td>
<td>22.8%</td>
<td>+/-1.8%</td>
<td>16.2%</td>
<td>+/-3.2%</td>
</tr>
<tr>
<td></td>
<td>Oregon</td>
<td>19.4%</td>
<td>+/-0.4%</td>
<td>11.0%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, Small Area Health Insurance Estimates, 2005-2009

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. 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.
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. median income, 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.

Median Income

Median income can be used as an indicator of the strength of a region’s economic stability. Table C.10 shows that between 2000 and 2010 the median household income in Sherman County has risen at a much faster rate than both the state and nation as a whole, though the County’s median income still remains below state and national averages.

<table>
<thead>
<tr>
<th></th>
<th>2000*</th>
<th>2010^</th>
<th>Change</th>
<th>Average Annual Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County</td>
<td>$35,142</td>
<td>$41,354</td>
<td>$6,212</td>
<td>1.64%</td>
</tr>
<tr>
<td>Oregon</td>
<td>$40,916</td>
<td>$46,560</td>
<td>$5,644</td>
<td>1.30%</td>
</tr>
<tr>
<td>United States</td>
<td>$41,994</td>
<td>$50,046</td>
<td>$8,052</td>
<td>1.77%</td>
</tr>
</tbody>
</table>

Source*: U.S. Census Bureau, Economic Characteristics, 2000
Source^: U.S. Census Bureau, Economic Characteristics, 2010 1-Year Estimates, 5-Year Estimates

Economic Diversity

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 Hachman Index, a formula that compares the composition of county and regional economies with those of states or the nation as a whole. Using the Hachman Index, a diversity ranking of 1 indicates the Oregon 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. Sherman County ranked lowest of the 36
counties in the state overall. Table C.11 describes the scores below for Sherman County and the surrounding region.

Table C.11: County Hachman Index Scores

<table>
<thead>
<tr>
<th>County</th>
<th>Hachman Index Score - 2009</th>
<th>Percent Change from 1999</th>
<th>State Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman</td>
<td>0.064</td>
<td>-15.8%</td>
<td>36</td>
</tr>
<tr>
<td>Gilliam</td>
<td>0.066</td>
<td>-52.2%</td>
<td>35</td>
</tr>
<tr>
<td>Wasco</td>
<td>0.357</td>
<td>-10.1%</td>
<td>17</td>
</tr>
<tr>
<td>Wheeler</td>
<td>0.148</td>
<td>-5.7%</td>
<td>29</td>
</tr>
<tr>
<td>Clackamas</td>
<td>0.855</td>
<td>6.6%</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Oregon Employment Department

While illustrative, economic diversity is not a guarantor of economic vitality or resilience. For example as of 2010, though Multnomah and Clackamas Counties are ranked number 1 and 2 in the state for economic diversity, they are both listed as “economically distressed” by the Oregon Business Development Commission. Meanwhile, neighboring Gilliam County, ranked 35 in terms of economic diversity, is not.24 The economic distress measure is based on indicators of decreasing new jobs, average wages and income, and is associated with an increase of unemployment.

Employment and Wages

Data provided by the U.S. Census Bureau in the 2010 American Community Survey indicate that Sherman County’s labor force (defined as the population of 16 and older which are in the labor force) increased from 627 to 723 between 2001 and 2010, a 15.3-percent increase.

There was a decline in unemployment in Sherman County from 2010 to 2011, reflecting national trends, and unemployment dropped as low as 7.7-percent in June 2011 according to the Oregon Employment Department.25 Many surrounding counties in the region have remained below the state average over the past three years, and Sherman County has remained below the national average during most of 2011. As of December 2011, total non-farm employment for the county was 780 individuals.26 Table C.12 and Figure C.6 both describe the recent trends in the unemployment throughout the county, region, state and nation.

24 Business Oregon – Oregon Economic Data “Distressed Communities List”
25 Ibid.
Table C.12: Regional Annual Unemployment (Seasonally Adjusted)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County</td>
<td>9.0%</td>
<td>10.0%</td>
<td>9.0%</td>
<td>5.8%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Gilliam County</td>
<td>6.5%</td>
<td>6.7%</td>
<td>6.8%</td>
<td>4.3%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Wasco County</td>
<td>8.4%</td>
<td>9.3%</td>
<td>9.0%</td>
<td>6.0%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Wheeler County</td>
<td>9.7%</td>
<td>10.8%</td>
<td>9.0%</td>
<td>5.8%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Oregon</td>
<td>9.5%</td>
<td>10.8%</td>
<td>11.1%</td>
<td>6.5%</td>
<td>5.2%</td>
</tr>
</tbody>
</table>

Source: Oregon Employment Department, Labor Force Data, Seasonally Adjusted Data 2007-2011

Employment data from the Oregon Employment Department demonstrate a cyclical employment pattern in Sherman County during the past five years, with the lowest levels of unemployment occurring in the spring and fall seasons (April, May, September and October).27 These levels typically respond most agricultural operations, and the slowing of the primary tourist season along the Columbia River.

Figure C.6: Unemployment Rate (Seasonally Adjusted)

Source: Oregon Employment Department, Labor Force Data, Seasonally Adjusted Data 2005-2011

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.13 displays the covered employment and payroll figures for Sherman County and neighboring counties in 2010.

---

Table C.13: Covered Employment and Payroll, 2010

<table>
<thead>
<tr>
<th>County</th>
<th>Number of Employees</th>
<th>Annual Payroll</th>
<th>Average Pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County</td>
<td>723</td>
<td>$26,039,961</td>
<td>$36,017</td>
</tr>
<tr>
<td>Gilliam County</td>
<td>896</td>
<td>$35,673,719</td>
<td>$39,814</td>
</tr>
<tr>
<td>Wasco County</td>
<td>10,674</td>
<td>$334,221,890</td>
<td>$31,312</td>
</tr>
<tr>
<td>Wheeler County</td>
<td>301</td>
<td>$7,239,023</td>
<td>$24,050</td>
</tr>
<tr>
<td>Oregon</td>
<td>1,598,642</td>
<td>$66,613,214,679</td>
<td>$41,669</td>
</tr>
</tbody>
</table>

Source: Oregon Employment Department, County Covered Employment and Wages, 2010

In 2009, there were 50 employment establishments operating in Sherman County, and 94-percent of those establishments had fewer than 20 employees. This is quite common for small businesses throughout the country. In fact, according to the U.S. Bureau of Labor Statistics, small businesses with fewer than 20 employees continue to be the largest set of employers. They make up 87-percent of all U.S. employer firms and employ about 18-percent of all persons employed. 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 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

---

28 U.S. Census Bureau - 2009 County Business Patterns, http://censtats.census.gov/cgi-bin/cbpnaic/cbpsect.pl
29 State of Oregon Natural Hazards Mitigation Plan, Region 4 Southwest Oregon Regional Profile
30 Ibid.
dependent on local sales for their business, such as retail trade, construction, and health and social assistance.31

**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.32 Thus, understanding and addressing the sensitivities of these industries is a strategic way to increase the resiliency of the entire regional economy. Sherman County’s economy is based upon agriculture (wheat farming, livestock ranching, barley, etc.), renewable energy production, transportation, and tourism. Sherman County has been a wheat-growing area since it was first settled, with miles of waving grain on rolling hills of wind-blown glacial silt. Self-employment, particularly in agricultural industries, is a major component of the job mix in Sherman County. An estimate of agricultural employment in 2010 boosts the county’s total employment by about 20-percent.33 Furthermore, volunteers provide many important services including rural and city fire protection, rescue and medical response units, local government, youth activities and educational support.

The county’s proximity to the Portland area, the Union Pacific railroad line and Interstate 84 provide good opportunities for the transportation of manufactured and agricultural goods. In addition, the region’s proximity to the high desert terrain, the Columbia River, the Deschutes River and the John Day River provide year-round sporting and tourism activities.

Table C.14 identifies covered employment in Sherman County by industry. As of 2010, the four industries with the most employees include; government (42.3-percent), leisure and hospitality (18.8-percent), retail (11.5-percent) and transportation, warehousing and utilities (10.6-percent). While Wasco County has considerable employment in some non-basic industries, such as health and social assistance as well as government, the County’s third largest industry (natural resources and mining) is of the basic nature and thus dependent to a large degree on sales outside of the local community. Basic industries encourage growth in non-basic industries and bring wealth into communities from outside markets. However, a high dependence on basic industries can lead to severe difficulties when recovering from a natural disaster if vital infrastructure or primary resource concentrations have been greatly damaged.

31 Ibid.
32 Ibid.
The Oregon Employment Department estimates net employment growth between 2001 and 2010. During this time period, transportation, warehousing and utilities, one of the county’s largest industries, experienced a growth of 50 employees (185.2-percent). Four industries experienced net losses during the time period: government (-6%), information (-26.7%) wholesale (-22.7%) and Manufacturing (-35.6%).34 This equated to the loss of 550 jobs, including 310 from manufacturing, 40 from information, 50 more from Wholesale, and 150 from government at all levels. Notably, government jobs still made up nearly 25 % of the County’s nonfarm employment, primarily at the local level.

---

34 Oregon Employment Department, Sherman County Covered Employment and Wages. 2011
Table C.15: Total Nonfarm Employment by Industry, 2001 and 2010

<table>
<thead>
<tr>
<th>Industry Detail</th>
<th>Employment 2001</th>
<th>Employment 2010</th>
<th>Number</th>
<th>Percent Change</th>
<th>AAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Private Coverage</td>
<td>373</td>
<td>418</td>
<td>45</td>
<td>12.1%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Construction</td>
<td>N/A</td>
<td>12</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Education &amp; Health Services</td>
<td>8</td>
<td>13</td>
<td>5</td>
<td>62.5%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Financial Activities</td>
<td>N/A</td>
<td>7</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Leisure &amp; Hospitality</td>
<td>106</td>
<td>136</td>
<td>30</td>
<td>28.3%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Natural Resources &amp; Mining</td>
<td>N/A</td>
<td>10</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Other Services</td>
<td>5</td>
<td>11</td>
<td>6</td>
<td>120.0%</td>
<td>9.2%</td>
</tr>
<tr>
<td>Trade, Transportation. &amp; Utilities</td>
<td>215</td>
<td>219</td>
<td>4</td>
<td>1.9%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Wholesale</td>
<td>43</td>
<td>60</td>
<td>17</td>
<td>39.5%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Retail</td>
<td>145</td>
<td>83</td>
<td>-62</td>
<td>-42.8%</td>
<td>-6.0%</td>
</tr>
<tr>
<td>Gasoline stations</td>
<td>70</td>
<td>47</td>
<td>-23</td>
<td>-32.9%</td>
<td>-4.3%</td>
</tr>
<tr>
<td>Transportation, Warehousing &amp; Utilities</td>
<td>27</td>
<td>77</td>
<td>50</td>
<td>185.2%</td>
<td>12.3%</td>
</tr>
<tr>
<td>Truck transportation</td>
<td>N/A</td>
<td>9</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Total All Government</td>
<td>254</td>
<td>306</td>
<td>52</td>
<td>20.5%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Total Annual Average Nonfarm Employment</td>
<td>627</td>
<td>724</td>
<td>97</td>
<td>15.5%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>


Labor and Commute Shed

Most 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 night 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 Sherman County reside. As shown in Table C.16, overall the workforce is somewhat mobile between Sherman, Wasco, Multnomah and Umatilla Counties. While the majority of Sherman County residents are employed within the county (42.9-percent), there are also a significant number of workers who commute to locations outside the county to work. Over 22.6-percent of workers who live in Sherman...
County commute to Wasco, Multnomah and Umatilla Counties for their job. 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.16: Work Destination Report, 2009 – Where Workers are Employed Who Live in Sherman County

<table>
<thead>
<tr>
<th>Location</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County</td>
<td>267</td>
<td>42.9%</td>
</tr>
<tr>
<td>Biggs Junction</td>
<td>8</td>
<td>1.3%</td>
</tr>
<tr>
<td>Moro</td>
<td>76</td>
<td>12.2%</td>
</tr>
<tr>
<td>Rufus</td>
<td>11</td>
<td>1.8%</td>
</tr>
<tr>
<td>Wasco</td>
<td>7</td>
<td>1.1%</td>
</tr>
<tr>
<td>Wasco County</td>
<td>74</td>
<td>11.9%</td>
</tr>
<tr>
<td>The Dalles</td>
<td>68</td>
<td>10.9%</td>
</tr>
<tr>
<td>Multnomah County</td>
<td>37</td>
<td>5.9%</td>
</tr>
<tr>
<td>Portland</td>
<td>28</td>
<td>4.5%</td>
</tr>
<tr>
<td>Umatilla County</td>
<td>30</td>
<td>4.8%</td>
</tr>
<tr>
<td>Hermiston</td>
<td>16</td>
<td>2.6%</td>
</tr>
<tr>
<td>Hood River County</td>
<td>22</td>
<td>3.5%</td>
</tr>
<tr>
<td>Hood River</td>
<td>18</td>
<td>2.9%</td>
</tr>
<tr>
<td>Gilliam County</td>
<td>19</td>
<td>3.1%</td>
</tr>
<tr>
<td>Condon</td>
<td>6</td>
<td>1.0%</td>
</tr>
<tr>
<td>Morrow County</td>
<td>19</td>
<td>3.1%</td>
</tr>
<tr>
<td>Washington County</td>
<td>19</td>
<td>3.1%</td>
</tr>
<tr>
<td>Yakima County, WA</td>
<td>16</td>
<td>2.6%</td>
</tr>
<tr>
<td>Yakima, WA</td>
<td>8</td>
<td>1.3%</td>
</tr>
<tr>
<td>Deschutes County</td>
<td>14</td>
<td>2.3%</td>
</tr>
<tr>
<td>All other locations</td>
<td>105</td>
<td>16.9%</td>
</tr>
<tr>
<td><strong>Total primary jobs</strong></td>
<td><strong>622</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, OnTheMap, Area Profile Analysis in 2009 by All Jobs

Table C.17 below tells the statistical story about where workers live who are employed in Sherman County. The majority of workers employed in the county are also residents (52.4-percent). The location outside of Sherman County where the highest numbers of workers come from is neighboring Wasco County (16.5-percent). However a substantial number of workers live east of Sherman County in Gilliam, Morrow and Umatilla Counties (8.4-percent), while many others live across the river in Klickitat and Yakima Counties in Washington (7.9-percent).
Table C.17: Home Destination Report, 2009 – Where Workers Live Who are Employed in Sherman County

<table>
<thead>
<tr>
<th>Location</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County</td>
<td>267</td>
<td>52.4%</td>
</tr>
<tr>
<td>Biggs Junction</td>
<td>6</td>
<td>1.2%</td>
</tr>
<tr>
<td>Grass Valley</td>
<td>17</td>
<td>3.3%</td>
</tr>
<tr>
<td>Moro</td>
<td>54</td>
<td>10.6%</td>
</tr>
<tr>
<td>Rufus</td>
<td>36</td>
<td>7.1%</td>
</tr>
<tr>
<td>Wasco</td>
<td>53</td>
<td>10.4%</td>
</tr>
<tr>
<td>Wasco County</td>
<td>84</td>
<td>16.5%</td>
</tr>
<tr>
<td>Chenoweth CDP</td>
<td>8</td>
<td>1.6%</td>
</tr>
<tr>
<td>Maupin</td>
<td>6</td>
<td>1.2%</td>
</tr>
<tr>
<td>The Dalles</td>
<td>37</td>
<td>7.3%</td>
</tr>
<tr>
<td>Klickitat County, WA</td>
<td>33</td>
<td>6.5%</td>
</tr>
<tr>
<td>Goldendale, WA</td>
<td>16</td>
<td>3.1%</td>
</tr>
<tr>
<td>Umatilla County</td>
<td>18</td>
<td>3.5%</td>
</tr>
<tr>
<td>Morrow County</td>
<td>16</td>
<td>3.1%</td>
</tr>
<tr>
<td>Hood River County</td>
<td>11</td>
<td>2.2%</td>
</tr>
<tr>
<td>Gillian County</td>
<td>9</td>
<td>1.8%</td>
</tr>
<tr>
<td>Condon</td>
<td>6</td>
<td>1.2%</td>
</tr>
<tr>
<td>Yakima County, WA</td>
<td>7</td>
<td>1.4%</td>
</tr>
<tr>
<td>Clackamas County</td>
<td>6</td>
<td>1.2%</td>
</tr>
<tr>
<td>Marion County</td>
<td>6</td>
<td>1.2%</td>
</tr>
<tr>
<td>All other locations</td>
<td>53</td>
<td>10.4%</td>
</tr>
<tr>
<td><strong>Total primary jobs</strong></td>
<td><strong>510</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, OnTheMap, Area Profile Analysis in 2009 by Primary Jobs

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 57.1-percent of Sherman County residents maintain employment outside of the county, nearly 48-percent of Sherman County workers reside elsewhere.

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 unemployment rate, and the moderate diversity of its economy (though dependent on several basic industries for revenue generation), Sherman County may experience a difficult time in recovering from a natural disaster than other communities with a more diverse economic base, and less unemployment.\textsuperscript{35} In addition, it is important to consider what might happen to the economy if the largest revenue generators and employers (leisure and hospitality, retail and transportation, warehousing and utilities), were heavily impacted by a disaster. To an extent, and to the benefit of Sherman 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 Sherman 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.

\textsuperscript{35} State of Oregon Natural Hazards Mitigation Plan, Region 4 Southwest Oregon Regional Profile.
Built Capacity

Housing Building Stock

Housing characteristics are an important factor in hazard mitigation planning, as some housing types tend to be less disaster resistant than others, and therefore warrant special attention. Table C.18 identifies the type of housing structures most common throughout Sherman County. Of particular interest are the number of mobile homes and other non-permanent housing structures, which account for 26.9-percent 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 multiunit structure will have an amplified impact on the population. However, only 4.1-percent of the housing units have two or more units.

Table C.18: Housing Type Summary

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 unit</td>
<td>667</td>
<td>69.0%</td>
</tr>
<tr>
<td>2 to 4 units</td>
<td>14</td>
<td>1.4%</td>
</tr>
<tr>
<td>5 to 9 units</td>
<td>18</td>
<td>1.9%</td>
</tr>
<tr>
<td>10 to 19 units</td>
<td>8</td>
<td>0.8%</td>
</tr>
<tr>
<td>Mobile home</td>
<td>253</td>
<td>26.2%</td>
</tr>
<tr>
<td>Boat, RV, van, etc.</td>
<td>7</td>
<td>0.7%</td>
</tr>
<tr>
<td>Total housing units</td>
<td>967</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2006-2010 American Community Survey, 5-Year Estimate

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 Oregon, many structures built after the late 1960’s began utilizing earthquake resistant designs and construction. Similarly, communities in the northwest began implementing flood elevation ordinances in the 1970’s. In 1990 Oregon again upgraded to stricter seismic standards that included earthquake loading in the building design. Table C.19 shows that less than 16-percent of the

36 State of Oregon Natural Hazards Mitigation Plan, Region 4 Southwest Oregon Regional Profile.
housing stock in Sherman County was built after 1990 when more stringent building codes were put in place, leaving more than 80-percent with questionable seismic stability, and more than 45-percent with very questionable seismic stability (percentage of homes built before 1960). Thus knowing the age of the structure is helpful in targeting outreach regarding retrofitting and insurance for owners of older structures.

Table C.19: Housing Units, Year Built

<table>
<thead>
<tr>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005 or later</td>
<td>24</td>
</tr>
<tr>
<td>2000 to 2004</td>
<td>25</td>
</tr>
<tr>
<td>1990 to 1999</td>
<td>98</td>
</tr>
<tr>
<td>1980 to 1989</td>
<td>75</td>
</tr>
<tr>
<td>1970 to 1979</td>
<td>192</td>
</tr>
<tr>
<td>1960 to 1969</td>
<td>95</td>
</tr>
<tr>
<td>1950 to 1959</td>
<td>110</td>
</tr>
<tr>
<td>1940 to 1949</td>
<td>59</td>
</tr>
<tr>
<td>1939 or earlier</td>
<td>289</td>
</tr>
</tbody>
</table>

Total housing units | 967 | 100.0%

Source: U.S. Census Bureau, 2006-2010 American Community Survey, 5-Year Estimate

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 27.6-percent of the housing units in Sherman County are renter-occupied.

Table C.20: Housing Occupancy Summary

<table>
<thead>
<tr>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupied housing units</td>
<td>777</td>
</tr>
<tr>
<td>Owner-occupied units</td>
<td>524</td>
</tr>
<tr>
<td>Renter-occupied units</td>
<td>253</td>
</tr>
<tr>
<td>Vacant housing units</td>
<td>141</td>
</tr>
<tr>
<td>Vacant units (for seasonal, recreational or occasional use)</td>
<td>57</td>
</tr>
</tbody>
</table>

39 State of Oregon Natural Hazards Mitigation Plan, Region 4 Southwest Oregon Regional Profile.
Total housing units | 918 | 100.0%
--- | --- | ---
Source: U.S. Census Bureau, 2010 Census

**Physical Infrastructure**

Physical infrastructure such as dams, roads, bridges, railways and airports support Sherman 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.  

**DAMS**

Dam failures can occur at any time and are quite common. Fortunately, most failures result in minor damage and pose little or no risk to life safety. However, the potential for severe damage still exists. The Oregon Water and Resources Department has inventoried all dams located in Oregon and Sherman County. The only dam in the county identified with a “high” hazard level is the John Day Dam located on the Columbia River east of Rufus. Construction of John Day Lock and Dam was completed in 1971. It is by far the largest dam in the county and was last inspected in 1991. Table C.21 identifies the threat potential for the 11 dams in Sherman County.

**Table C.21: Dam Threat Summary**

<table>
<thead>
<tr>
<th>Threat Potential Level</th>
<th>Number of Dams</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>1</td>
</tr>
<tr>
<td>Low</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: Oregon Water Resources Department, Dam Inventory Query

---

40 State of Oregon Natural Hazards Mitigation Plan, Region 4 Southwest Oregon Regional Profile.
41 Oregon Water Resources Department. Dam Inventory Query. Sherman County.
http://apps.wrd.state.or.us/apps/misc/dam_inventory/.
ROADS AND BRIDGES

Approximately 428 miles of road encompass Sherman County. The region’s major expressway is Interstate 84 (I-84). The interstate runs East/West through northern Sherman County and is the main passage for automobiles, buses and trucks traveling along the Columbia River. Other major highways that service the region include:

- U.S. Highway 97 runs north/south and connects Biggs at I-84 with Wasco, Grass Valley, Moro and Kent.
- Oregon Route 206 by and large runs east/west and connects Wasco to Condon in Gilliam County.
- Oregon Route 216 runs east-west connects Grass Valley to Tygh Valley in Wasco 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.22 represents the condition of the NBI, and highlights the number of distressed bridges in the region. The region encompasses all of Sherman, Wasco and Gilliam Counties. The NBI identifies four distressed bridges, and concludes that 20-percent of all the bridges in the region exhibit some form of structural or other deficiency. 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.

Table C.22: Bridge Deficiency Overview

<table>
<thead>
<tr>
<th>Structurally Deficient - Distressed Bridges</th>
<th>Other Deficiency - Distressed Bridges</th>
<th>Not Distressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>17</td>
<td>84</td>
</tr>
<tr>
<td>3.8%</td>
<td>16.2%</td>
<td>80.0%</td>
</tr>
</tbody>
</table>

Source: Oregon Department of Transportation, 2011 Bridge Condition Report

RAILWAYS

Railroads are major providers of regional and national cargo trade flows. A Union Pacific Railroad line runs through Sherman County and is limited to a stretch of

---

44 State of Oregon Natural Hazards Mitigation Plan, Region 4 Southwest Oregon Regional Profile.
tracks that follow I-84 and the Columbia River on the northern border of the County. 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**

Wasco State Airport serves Sherman County and is owned by Oregon Aeronautics Division. It is located one mile east of Wasco and has an asphalt paved runway that extends 3,450 feet. In 2010 the airport averaged 47 aircraft operations a week, mostly for transient general aviation purposes. Access to these airports faces the potential for closure from a number of natural hazards, including wind and winter storms common to the region.

**POWER PLANTS**

The sources of power production in the county are generated through wind energy and hydropower. The John Day Dam is the only hydroelectric dam in the county; it is located on the Columbia River east of Rufus. Construction of the dam was completed in 1971.

**John Day Dam:**

- **Powerhouse:** 1,975 ft long
- **Total Generating Capacity:** 16 generators, 2,200 megawatts
- **Spillway:** 20 gates, 1,228 ft long
- **Navigation Lock:** 650 ft long; 86 ft wide; 113 ft maximum lift

Sherman County has also experienced a significant growth in the number of wind farms since 2005. There are a total of 560 wind turbines now operating in the county with a total generating capacity of 1,057.3 megawatts of energy. Table C.23 identifies the inventory of wind farm projects in Sherman County. Seven of these projects began operating in 2007 or later, and three more have either been approved or are in the permitting process.

---

Table C.23: Wind Farm Inventory

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Turbines</th>
<th>Capacity</th>
<th>Developer(s)</th>
<th>Operating Status</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klondike I</td>
<td>16</td>
<td>24 MW</td>
<td>Northwestern Wind</td>
<td>Operating</td>
<td>2001</td>
</tr>
<tr>
<td>Klondike II</td>
<td>50</td>
<td>75 MW</td>
<td>Iberdrola</td>
<td>Operating</td>
<td>2005</td>
</tr>
<tr>
<td>Biglow Canyon - Phase 1</td>
<td>76</td>
<td>125.4 MW</td>
<td>PGE, Orion</td>
<td>Operating</td>
<td>2007</td>
</tr>
<tr>
<td>Klondike III</td>
<td>125</td>
<td>223.6 MW</td>
<td>Iberdrola</td>
<td>Operating</td>
<td>2007</td>
</tr>
<tr>
<td>Klondike IIIa</td>
<td>51</td>
<td>76.5 MW</td>
<td>Iberdrola</td>
<td>Operating</td>
<td>2008</td>
</tr>
<tr>
<td>Hay Canyon</td>
<td>48</td>
<td>100.8 MW</td>
<td>Iberdrola</td>
<td>Operating</td>
<td>2009</td>
</tr>
<tr>
<td>Biglow Canyon - Phase 2</td>
<td>65</td>
<td>149.5 MW</td>
<td>PGE</td>
<td>Operating</td>
<td>2009</td>
</tr>
<tr>
<td>Biglow Canyon - Phase 3</td>
<td>76</td>
<td>174.8 MW</td>
<td>PGE</td>
<td>Operating</td>
<td>2010</td>
</tr>
<tr>
<td>PāTu Wind</td>
<td>6</td>
<td>9 MW</td>
<td>Oregon Trail Wind Farm</td>
<td>Operating</td>
<td>2010</td>
</tr>
<tr>
<td>Star Point</td>
<td>47</td>
<td>98.7 MW</td>
<td>Iberdrola</td>
<td>Operating</td>
<td>2010</td>
</tr>
<tr>
<td>Golden Hills Wind - Phase 1</td>
<td>200</td>
<td>BP Alternative Energy</td>
<td>Approved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golden Hills Wind - Phase 2</td>
<td>200</td>
<td>BP Alternative Energy</td>
<td>Approved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brush Canyon Wind</td>
<td>500</td>
<td>E.ON Climate &amp; Renewables NA</td>
<td>In Permitting Process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td>560</td>
<td>1,057.3 MW</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Renewable Northwest Project, Renewable Energy Projects.  MW = Megawatts

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 Sherman 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 in the area.

---

**PACIFIC POWER (PacifiCorp)**

PacifiCorp serves 1,719,000 customers in Southern Washington, Oregon, Northern California, Eastern Idaho, Utah and Wyoming, including Sherman County and other communities in the Columbia Gorge. PacifiCorp has 62,800 miles of distribution line and approximately 16,200 miles of transmission lines.52 PacifiCorp consists of three business units, aggregating up to PacifiCorp:

**PacifiCorp Energy**, containing the electric generation, commercial and energy trading functions and the coal-mining operations of the company, is headquartered in Salt Lake City, Utah.

**Pacific Power**, which delivers electricity to customers in Oregon, Washington and California, is headquartered in Portland, Oregon. Pacific Power provides services to Oregon and the communities of Biggs, Grass Valley and Wasco in Sherman County.53

**Rocky Mountain Power**, which delivers electricity to customers in Utah, Wyoming and Idaho, is headquartered in Salt Lake City, Utah.54

- **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 Sherman, Wasco, Jefferson, Gilliam and Wheeler Counties.55

- **Bonneville Power Administrative56**
  
  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, including the John Day Dam, one nonfederal nuclear plant and several other small nonfederal power plants. About 30-percent 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 Sherman County.

---

NATURAL GAS TRANSMISSION

Gas Transmission Northwest Corporation (GTN), which is operated by TransCanada Corporation, transports natural gas to energy markets along 1,351 miles of pipe from the Canada-Idaho border to the Oregon-California border. A section of this pipeline runs through southeast Sherman County. Twelve compressor stations (#3 through #14) are located along the GTN pipeline system and provide the energy needed to move gas through the pipeline. Compressor Station #10 is located in Sherman County near Kent on Wilcox Road about 18 miles south of Grass Valley. The station has three turbine-driven compression units.

Sewage and Landfill

Each of the four incorporated cities in the county has their own water and waste facilities. Also, in a franchise agreement with Gilliam County, The Dalles Disposal / Waste Connections in Wasco County provides solid waste disposal, recycling opportunities and manages the transfer site on Welk Road.

Telecommunications

A number of telecommunication providers are available in Sherman County. According to Oregon Public Utility Commission, the following companies provide services to the county: AT&T Mobility LLC, CenturyLink, Gorge Networks, HughesNet, SawNet, Sprint, Verizon Wireless and WildBlue Communications, Inc.

Public-Safety Access Point

Tri-County Communications is the call center responsible for answering emergency calls for police, firefighting and ambulance services in Sherman, Gilliam and Wheeler Counties. The call center is stationed at 135 S. Main Street in Condon (Gilliam County).

---

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).\(^{60}\) The interruption or destruction of any of these facilities would have a debilitating effect on incident management. Critical facilities in Sherman County are identified in Table C.24 below.

**Table C.24: 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>1</td>
</tr>
<tr>
<td>Fire and Rescue Stations</td>
<td>4</td>
</tr>
<tr>
<td>Dams</td>
<td>11</td>
</tr>
<tr>
<td>Bridges</td>
<td>98</td>
</tr>
<tr>
<td>NBI Bridges</td>
<td>10</td>
</tr>
<tr>
<td>Non NBI Bridges/Box Culverts</td>
<td>88</td>
</tr>
<tr>
<td>School Districts</td>
<td>1</td>
</tr>
<tr>
<td>Airports (public)</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: State of Oregon Natural Hazards Mitigation Plan, Region 4 Southwest Oregon Regional Profile.

**HOSPITAL**

There are no hospitals located in Sherman County. The nearest hospitals are located in Goldendale, Washington, and The Dalles, Oregon.

- Klickitat Valley Hospital, Goldendale, Washington – critical access hospital
- Mid-Columbia Medical Center, The Dalles, Oregon – acute care hospital

*Critical access hospital* – a small facility that gives limited outpatient and inpatient hospital services to people in rural areas.

*Acute care hospital* – a hospital that provides short-term patient care.

**POLICE**

The Oregon State Police Department and the Sherman County Sherriff’s Office serve Sherman County.

**FIRE AND RESCUE**

Sherman County has three Rural Fire Protection Districts while the cities of Rufus and Moro each have their own Fire Departments. The districts and fire departments

---

\(^{60}\) State of Oregon Natural Hazards Mitigation Plan, Region 4 Southwest Oregon Regional Profile.
are all served by volunteers. The Moro Fire Department and the Moro Rural Fire District operate essentially as one department and share the same fire chief and fire fighters. The North Sherman County Rural Fire Protection District provides service to about 140,667 acres, Moro Rural Fire Protection District and City of Moro serves about 136,297 acres (Moro RFPD has 135,981 and Moro FD has 316), the City of Rufus provides services to about 869 acres and the South Sherman Fire Protection District serves 251,028 acres.

**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. The information within this community profile show that for all cities there has been a decline in population (except Wasco which has a minimal gain) and no new development within the cities; as such there have been no changes in development that impact the cities vulnerability (see Section 2 for more information).
Community Connectivity Capacity

Social Organizations

Social systems have the ability to easily reach vulnerable populations, which have a tendency to be more at-risk in the event of a disaster. Social systems can be community organizations and programs that provide social and community-based services for the public. It would be beneficial for the county to work with such programs to help distribute information that will help educate those who do not have the resources to learn about hazard mitigation.

Below are a few methods that social organizations located throughout Sherman County can use to become involved in hazard mitigation.

- 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.
### Table C.25: Sherman County Social Service Providers

<table>
<thead>
<tr>
<th>Name and Contact Information</th>
<th>Description</th>
<th>Service Area (Oregon)</th>
<th>Populations Served</th>
<th>Involvement with Natural Hazards Mitigation</th>
</tr>
</thead>
</table>
| **American Red Cross**       | The American Red Cross, a humanitarian organization led by volunteers and guided by its Congressional Charter and the Fundamental Principles of the International Red Cross and Red Crescent Movement, will provide relief to victims of disasters and help prevent, prepare for, and respond to emergencies. | Gilliam County, Hood River County, Sherman County, Wasco County | X X X X | 1.) Education and outreach  
2.) Information dissemination |
| Oregon Trail Chapter         | 507 West 9th Street  
The Dalles, Oregon 97058  
T: 503.280.1440 | | | |
| Columbia River District      | | | | |
| **Arc of the Mid-Columbia**  | The Arc of the Mid-Columbia provides child care, educational, financial, health, legal, and transportation resources and services for people with intellectual and developmental disabilities and their families. | Gilliam County, Hood River County, Sherman County, Wasco County, Wheeler County | X X X X | 1.) Education and outreach  
2.) Information dissemination |
| PO Box 521  
The Dalles, Oregon 97058 | | | | |
| **Boy Scouts of America**    | The Boy Scouts of America (BSA) is one of the nation’s largest and most prominent values-based youth development organizations. The BSA provides a program for young people that builds character, trains them in the responsibilities of participating citizenship, and develops personal fitness. | Hood River County, Sherman County, Wasco County | X | 1.) Education and outreach  
2.) Information dissemination |
| Cascade Pacific Council      | 2145 SW Natio Parkway  
Portland, Oregon 97201  
T: 503.226.3423 | | | |
| Mid-Columbia District        | | | | |
| **Child Care Partners**      | Child Care Partners is a network of people working to increase the quality of life for children and families by building on the strengths of families, providers, and programs to increase the quality, accessibility, and options for child care and other early childhood programs; by providing resources for these providers, programs and families; and by providing technical assistance, information and support. | Gilliam County, Hood River County, Sherman County, Wasco County, Wheeler County | X | 1.) Education and outreach  
2.) Information dissemination |
| 400 East Scenic Drive  
The Dalles, Oregon 97058  
T: 541.506.6131  
T: 1.800.755.1143 | | | | |
| **Camp Fire USA**            | Camp Fire USA Boys and Girls provides youth development programming for youth in kindergarten through 12th grade, as well as family activities. | Multiple | X | 1.) Education and outreach  
2.) Information dissemination |
| **Columbia**                 | 619 Southwest 11th Avenue,  
Suite 234  
Portland, Oregon 97205  
T: 503.224.7800 | | | |
| **Eastern Oregon Support**   | The Eastern Oregon Support Service Brokerage supports people with developmental disabilities in Eastern Oregon to achieve control over their lives and to participate in satisfying lifestyles based on the same aspirations as all citizens. Support Services are individually designed supports that assist a person to live in their own home or with family or friends and fully participate in community life, including work. | Baker County, Gilliam County, Grant County, Harney County, Hood River County, Malheur County, Morrow County, Sherman County, Umatilla County, Union County, Wallowa County, Wasco County, Wheeler County | X | 1.) Education and outreach  
2.) Information dissemination |
| **Services Brokerage**       | 1216 C Street  
Hood River, Oregon 97031  
T: 541.387.3600 | | | |
Table C.25: Sherman County Social Service Providers (continued)

<table>
<thead>
<tr>
<th>Name and Contact Information</th>
<th>Description</th>
<th>Service Area (Oregon)</th>
<th>Populations Served</th>
<th>Involvement with Natural Hazards Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gorge TransLink</td>
<td>Gorge TransLink, an alliance of rural providers offering public transportation services throughout the Mid-Columbia River Gorge area and to more distant destinations, such as the metropolitan cities of Portland, Oregon and Vancouver, Washington. The Gorge TransLink alliance members are committed to providing efficient, reliable and accessible transportation services to the residents of the five county region.</td>
<td>Hood River County, Sherman County, Wasco County</td>
<td>X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td>Healthy Start Program</td>
<td>Oregon Healthy Start provides parent education and home visitation for new parents. A trained professional will offer weekly home visits to families for a minimum of two years and up to five years. Parents learn to nurture their children and prepare them for school. The program connects families with parent education classes, social groups, and other community resources including medical professionals to ensure good primary health care. North Central Education Service District, through its Early Education program, delivers Healthy Start services to first births in Sherman County.</td>
<td>Gilliam County, Sherman County, Wheeler County</td>
<td>X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td>Legal Aid Services of Oregon Portland Regional Office</td>
<td>Legal Aid Services of Oregon is a non-profit organization that provides representation on civil cases to low-income clients throughout Oregon. The mission is to achieve justice for the low-income communities by providing a full range of the highest quality civil legal services.</td>
<td>Multnomah County, Clackamas County, Hood River County, Sherman County, Wasco County</td>
<td>X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td>Lifespan Respite Care Network</td>
<td>A lifespan respite care network connects families needing respite care with providers of respite care. The program provides training for caregivers, respite providers and families.</td>
<td>Sherman County, Wheeler County</td>
<td>X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td>Little Wheats Day Care</td>
<td>The mission of Little Wheats Day Care, a non-profit organization, is to provide clean, safe, comfortable care for children in Sherman County while offering the highest educational experiences available.</td>
<td>Sherman County</td>
<td>X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td>Mid-Columbia Center for Living</td>
<td>The Mid-Columbia Center for Living is a comprehensive outpatient behavioral health agency that offers a wide range of services to adults, children, and families. Our highly trained staff are here to help you or your family members with issues related to mental health, addictions or developmental disabilities.</td>
<td>Gilliam County, Hood River County, Sherman County, Wasco County</td>
<td>X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td>Name and Contact Information</td>
<td>Description</td>
<td>Service Area (Oregon)</td>
<td>Populations Served</td>
<td>Involvement with Natural Hazards Mitigation</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------</td>
<td>-----------------------</td>
<td>-------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td><strong>Mid-Columbia Community Action Program</strong>&lt;br&gt;312 East 4th Street&lt;br&gt;The Dalles, Oregon 97058&lt;br&gt;T: 541.2985131</td>
<td>Responsible for providing services geared toward the low income populations including: weatherization, food, energy, housing, water, daycare, respite care, and tax counseling.</td>
<td>Hood River County, Sherman County, Wasco County</td>
<td>X X X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td><strong>Mid-Columbia Council of Government</strong>&lt;br&gt;1113 Kelly Avenue&lt;br&gt;The Dalles, Oregon 97058&lt;br&gt;T: 541.294.6101</td>
<td>The Mid-Columbia Council of Governments achieves its mission by providing qualified staff, materials, and equipment support in the areas of workforce development; senior and disability services; transportation; grant writing; program administration; and selected other educational, social, technical and environmental/natural resource services.</td>
<td>Gilliam County, Hood River County, Sherman County, Wasco County, Wheeler County</td>
<td>X X X X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td><strong>Mid-Columbia Economic Development District</strong>&lt;br&gt;515 East Second Street&lt;br&gt;The Dalles, Oregon 97058&lt;br&gt;T: 541.296.2266</td>
<td>The Mid-Columbia Economic Development District promotes the creation of family-wage jobs, the diversification of the economic base, and the growth, development and retention of business and industry within the five-county district.</td>
<td>Hood River County, Sherman County, Wasco County</td>
<td>X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td><strong>Mid-Columbia Housing Authority and Columbia Gorge Housing Authority</strong>&lt;br&gt;312 Court Street, Suite 419&lt;br&gt;The Dalles, Oregon 97058&lt;br&gt;T: 1.888.356.8919</td>
<td>The Mid-Columbia Housing Authority and Columbia Gorge Housing Authority provide safe, decent, affordable housing to low-income families. Because housing is a basic human need and also vital to community and local economy, the Housing Authorities provide this assistance and so much more. Their programs help clients become self sufficient by offering training, counseling, help with goal setting and incentive to save money. The Housing Authorities meet the needs of a growing population of senior citizens, disabled persons on fixed incomes, unemployed and underemployed people to improve family self sufficiency and participation in community.</td>
<td>Hood River County, Sherman County, Wasco County</td>
<td>X X X X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td><strong>Moro Medical Clinic</strong>&lt;br&gt;110 Main Street&lt;br&gt;Moro, Oregon 97039&lt;br&gt;T: 541.565.3325</td>
<td>Moro Medical Clinic provides primary health and rural health care services.</td>
<td>Sherman County</td>
<td>X X X X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td><strong>North Central Education Service District</strong>&lt;br&gt;135 S Main Street&lt;br&gt;Condon, OR 97823&lt;br&gt;T: 541.384.2732</td>
<td>Services include, but are not limited to: Early Intervention/Early Childhood Special Education services for children with disabilities, birth to kindergarten, print and graphic services, technology planning and support services, special education support personnel, assistance in curriculum development, Frontier Learning Network and meeting Oregon’s School Reform Act requirements.</td>
<td>Gilliam County, Sherman County, Wheeler County</td>
<td>X X</td>
<td>1.) Education and outreach 2.) Information dissemination 3.) Plan/project implementation</td>
</tr>
<tr>
<td>Name and Contact Information</td>
<td>Description</td>
<td>Service Area (Oregon)</td>
<td>Populations Served</td>
<td>Mitigation</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------</td>
<td>----------------------</td>
<td>-------------------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>North Central Public Health District</strong></td>
<td>The North Central Public Health District is responsible for enforcement and administration of public and environmental health laws of federal, state, and county government. They conduct activities necessary for the preservation of health, prevention of disease, and protection of the public.</td>
<td>Gilliam County, Sherman County, Wasco County</td>
<td>X X X X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td>419 East 7th Street, The Dalles, Oregon 97058 T: 541.506.2600</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oregon Department of Human Services District 9</strong></td>
<td>The Department of Human Services provides self-sufficiency, medical, and mental health services as well as assistance for children, the elderly, and people with disabilities.</td>
<td>Gilliam County, Hood River County, Sherman County, Wasco County, Wheeler County</td>
<td>X X X X</td>
<td>1.) Education and outreach 2.) Information dissemination 3.) Plan/project implementation</td>
</tr>
<tr>
<td>Condon Office 103 South Main Street Condon, OR 978233 T: 541.384.2882</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sagewind Manor</strong></td>
<td>Sagewind Manor is a senior independent living facility in Moro owned and operated by Mid-Columbia Housing Authority/Cascade Housing Authority. The complex provides 12 one-bedroom apartments equipped with air-conditioning, laundry hookup, private patio and outside storage. Rent includes sewer, water and garbage services.</td>
<td>Sherman County</td>
<td>X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td>300 Dewey Street Moro, Oregon 97039 T: 541.442.5526 T: 541.296.3997</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sherman County Juvenile Department</strong></td>
<td>The Sherman County Juvenile Department provide sanctions and services to youth ages 12-17 that are referred for law violations by law enforcement agencies. The Juvenile Department provides opportunities for accountability and reformation in the community.</td>
<td>Sherman County</td>
<td>X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td>500 Court Street Moro, Oregon 97039 T: 541.565.3461</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sherman County Senior &amp; Community Center</strong></td>
<td>Sherman County Senior &amp; Community Center is a central place for services, activities and social events for the people of Sherman County. The primary purpose is to enhance the lives of older adults by offering the opportunity for social, recreational, health and wellness, educational, and nutritional services and programs. Additionally, the center is available for the public to rent for social events, meetings, classes, and other activities which benefit our county’s well being.</td>
<td>Sherman County</td>
<td>X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td>300 Dewey Street Moro, OR 97039 T: 541.565.3191</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sherman County Senior Meals Service</strong></td>
<td>Served at noon Monday through Friday $3.00 - Seniors / $6.00 - General Public A limited meals-on-wheels program is growing with delivery of frozen microwavable meals throughout the county once a week.</td>
<td>Sherman County</td>
<td>X</td>
<td>1.) Education and outreach 2.) Information dissemination</td>
</tr>
<tr>
<td>300 Dewey Street Moro, OR 97039 T: 541.565.3191</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table C.25: Sherman County Social Service Providers (continued)

<table>
<thead>
<tr>
<th>Name and Contact Information</th>
<th>Description</th>
<th>Service Area (Oregon)</th>
<th>Populations Served</th>
<th>Involvement with Natural Hazards Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Olympics Oregon</td>
<td>Special Olympics Oregon is efficiently expanding programs to get closer and closer to serving every individual with intellectual disabilities that qualifies to participate in Special Olympics. Special Olympics Oregon offers training and competition opportunities in 14 different Olympic-style sports. There are three sports seasons throughout the year, with statewide competitions and training in winter, summer and fall.</td>
<td>Sherman County, Wasco County</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Women, Infants, and Children Program (WIC)</td>
<td>WIC is the Special Supplemental Nutrition Program for Women, Infants and Children. This public health program is designed to improve health outcomes and influence lifetime nutrition and health behaviors in targeted, at-risk populations. Nutrition education is the cornerstone of the WIC Program.</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

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.26 outlines voter participation and turnout percentages from the 2008 Presidential General Election compared to the 2010 State Representative General Election. The 2008 Presidential General Election resulted in an 88-percent voter turnout in the county, while the 2010 State Representative General Election only resulted in a turnout of about 76.5-percent voter participation. These results are higher than the overall voter participation reported in Oregon.

---

Table C.26: Voter Turnout Percentages

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>2008 Presidential General Election</th>
<th>2010 State Representative General Election</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sherman County*</td>
<td>Oregon^</td>
</tr>
<tr>
<td>Total - Registerd Voters</td>
<td>1,213</td>
<td>2,153,914</td>
</tr>
<tr>
<td>Total - Ballots Cast</td>
<td>1,067</td>
<td>1,845,251</td>
</tr>
<tr>
<td>Voter Turnout Percentage</td>
<td>88.0%</td>
<td>85.7%</td>
</tr>
</tbody>
</table>

Source*: Sherman County Election Results ; ^: 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.27 summarizes the five National Historic Sites and their location throughout Sherman County.

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.27: List of National Register of Historic Places in Sherman County

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Columbia Southern Railroad Passenger Station and Freight Warehouse</td>
<td>Wasco</td>
</tr>
<tr>
<td>DeMoss Springs Park</td>
<td>Moro (vicinity)</td>
</tr>
<tr>
<td>Mack Canyon Archeological Site</td>
<td>Restricted</td>
</tr>
<tr>
<td>Moore, John and Helen, House</td>
<td>Moro (vicinity)</td>
</tr>
<tr>
<td>Sherman County Courthouse</td>
<td>Moro</td>
</tr>
</tbody>
</table>

Source: National Register of Historic Places, Sherman County, Oregon
**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.28 lists the libraries and museums located in Sherman County.

**Table C.28: List of Libraries and Museums in Sherman County**

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wasco City Library</td>
<td>Wasco</td>
</tr>
<tr>
<td>Sherman County Public/School Library</td>
<td>Moro</td>
</tr>
<tr>
<td>Sherman County Historical Museum</td>
<td>Moro</td>
</tr>
</tbody>
</table>

Source: Sherman County Website

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.29 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. Sherman County is estimated to have 91.9-percent of its residents live in the same house or moved within the county. The figures of community stability are relatively consistent across the region.

---

Table C.29: Regional Residential Stability

<table>
<thead>
<tr>
<th>County</th>
<th>Geographic Stability Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County</td>
<td>91.9%</td>
</tr>
<tr>
<td>Gilliam County</td>
<td>91.3%</td>
</tr>
<tr>
<td>Wasco County</td>
<td>91.8%</td>
</tr>
<tr>
<td>Wheeler County</td>
<td>90.9%</td>
</tr>
<tr>
<td>Oregon</td>
<td>92.5%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2006-2010 American Community Survey. Geographical Mobility in the Past Year 5-Year Estimates

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 something they can afford. 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.30 identifies owner occupied housing units across the region; the remaining households are either renter occupied or are vacant. Sherman County has the highest percentage of homeowners compared to all of its surrounding counties.

Table C.30: Regional Homeownership

<table>
<thead>
<tr>
<th>County</th>
<th>Homeownership Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman County</td>
<td>57.1%</td>
</tr>
<tr>
<td>Gilliam County</td>
<td>48.6%</td>
</tr>
<tr>
<td>Wasco County</td>
<td>56.0%</td>
</tr>
<tr>
<td>Wheeler County</td>
<td>48.4%</td>
</tr>
<tr>
<td>Oregon</td>
<td>56.4%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2010 Census, Owner occupied housing units

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. Sherman 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. From higher than average voter turnout percentage to high percentages of regional stability and regional homeownership, Sherman 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**

In Sherman County, the administrative office is the office of the County Court. Sherman 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 a 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 Sherman County in various forums. The County Court overserves 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.

Each of the participating cities is governed by a mayor and council form of government and are provided emergency services by a mix of county, private and volunteer services.

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 Sherman County government that have a role in 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 Services**: coordinates human and financial resources to provide the citizens of Sherman County and the public at large with the optimum level of emergency services. This department represents Sherman County Emergency Services at the regional, state and federal level when it is necessary to preserve or advance the County’s interests. The Director serves as the County Disaster Preparedness Officer, 911 Coordinator and Fire Departments’ Administrator, assists in recruitment and retention of volunteers in emergency services, writes grants for additional resources for emergency services, and oversees the
operations of Rescue One. The Emergency Services Advisory Committee provides guidance on policy and budget.64

- **Fair Ground Facilities:** The Fairgrounds are located about 1 mile from Highway 97 in Moro, and 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 Sherman, Gilliam 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.65

- **Planning:** performs all functions relating to the principles and practices of Oregon Land Use planning for Sherman County. The Planning Department encourages the most appropriate use of land; aids in the provision of county services; conserves and stabilizes the value of property; encourages the orderly growth of the County; and, in general to promotes the public health, safety, convenience and general welfare through the implementation of the County's Comprehensive Plan.66

- **Road Department:** responsible for planning, maintenance and construction of county roads. The Rural Road Advisory Committee establishes five-year plans directing the work of the Department.67 The Road Department will have important information about the resilience of the physical aspects of the community. This department can help prioritize projects for mitigation and will be a key partner in implementation as well.

- **Sherman County Community Transit:** provides public transportation for seniors, disabled persons and others as space allows. The populations that are served are potential high risk populations if a disaster were to occur.

- **Sheriff’s Office:** responsible for maintaining the peace within the county and is directly accountable to the people, running for election every

---

four years. Responsibilities are diverse and intensive. Operations run the gamut from law enforcement duties, to the delivery of civil papers, execution of court orders, incarceration of offenders, organizing search and rescue operations, marine patrol and preparing for and coordinating responses to man-made and natural disasters.68

- **Weed Department**: responsible for preventing the establishment and spread of noxious weeds in accordance with County, State and Federal weed laws, and to encourage and assist in organization of noxious weed control and education programs and cooperate with governmental and private agencies and individuals in developing weed control measures and projecting long-term effects on the economic well being of Sherman County.69 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 Plans & 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.70

The Sherman 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 action items identified in the Plan. Implementing the natural hazards mitigation plan’s action items through existing plans and policies increases their likelihood of being supported and getting updated, and maximizes the county’s resources.

The participating cities each have limited capacity and planning documents. As required by Oregon law each city has a comprehensive plan – Grass Valley (1978), Moro (2003), Rufus (1978) and Wasco (2003) - which provide for orderly development within the cities and account for a limited framework for each city to protect life and property from natural disasters and hazards.

The following are a list of plans and policies already in place in Sherman County:

• North Sherman County Watershed Council Action Plan, January 2006
• Sherman Coordinated Transportation Plan, April 15, 2009
• Sherman County Ambulance Service Area Plan, April 2011
• Sherman County Community Wildfire Protection Plan, March 18, 2009
• Sherman County Comprehensive Land Use Plan, June 2007
• Sherman County Emergency Operations Plan, August 2010
• Sherman County Zoning, Subdivision, Partitioning and Land Development Ordinance, July 2003

SHERMAN COUNTY COMMUNITY WILDFIRE PROTECTION PLAN

• Date of Last Revision: March 2009
• Author/Owner: Sherman 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 making them eligible and securing grants and/or other funding sources to treat hazardous fuel situations and to better prepare residents for wildfires that may occur. It includes a strategy with action projects which, when implemented, will decrease the potential for large wildfires in the county and reduce the potential loss of property values and threat to human life.
• Relationship to the Natural Hazards Mitigation Plan: the Community Wildfire Protection Plan (CWPP) is intended to be adopted for incorporation within the Sherman County Natural Hazards Mitigation Plan. The CWPP contains goals and actions that seek to minimize the risk of wildfire hazards to the county.

SHERMAN COUNTY COMPREHENSIVE PLAN

• Date of Last Revision: June 2007
• Author/Owner: Sherman County
• Description: The Sherman County Comprehensive Plan is intended to assure that: 1) changes in land use are carefully considered for their short and long term impacts; 2) rational decisions are made and based upon factual data; 3) the community guides the use of all land; 4) equal and adequate protection is given to the rights of all landowners and citizens; and 5) actions and policies of all levels of government are coordinated. It is a legal document upon with investments for the future, by government and private enterprise, may be base with confidence.
• Relationship to the Natural Hazards Mitigation Plan: Physical Characteristics - Section XI of the Sherman County Comprehensive Plan conforms to meet with Statewide Planning Goal 7, Areas Subject to Natural Hazards. Goals and policies within this section of the plan relate to goals and actions identified in the Natural Hazards Mitigation Plan for the county.

SHERMAN COUNTY EMERGENCY OPERATIONS PLAN

• Date of Last Revision: August 2010
• **Author/Owner:** Sherman County  
• **Description:** The Emergency Operations Plan (EOP) is an all-hazard plan that describes how Sherman County will organize and respond to emergencies and disasters in the community. It is recognized that response to emergency or disaster conditions in order to maximize the safety of the public and to minimize property damage is a primary responsibility of government. It is the goal of Sherman County that responses to such conditions are conducted in the most organized, efficient, and effective manner possible. To aid in accomplishing this goal, Sherman County has incorporated the principles of the National Incident Management System (NIMS) and Incident Command System (ICS) into emergency operations, plans, and ongoing activities.  
• **Relationship to the Natural Hazards Mitigation Plan:** By in large, the EOP attempts to be all-inclusive in combining the following four phases of emergency management:  
  o **Mitigation:** activities that eliminate or reduce the vulnerability to disasters;  
  o **Preparedness:** activities that governments, organizations, and individuals develop to save lives and minimize damage;  
  o **Response:** activities that prevent loss of lives and property and provide emergency assistance; and  
  o **Recovery:** short- and long-term activities that return all systems to normal or improved standards.

**Sherman County Transportation System Plan**

• **Date of Last Revision:** April 2009  
• **Author/Owner:** Mid-Columbia Economic Development District/Sherman County  
• **Description:** The Sherman County Transportation System Plan focuses on addressing the transportation needs of three target populations residing in Sherman County: low income individuals, individuals with disabilities, and individuals who are senior. The transportation plan looks at gaps in services and prioritizes needs to assist in: 1) improving transportation services for three target populations by identifying opportunities to coordinate existing resources; 2) providing a strategy to guide investment of financial resources; and 3) guiding the acquisition of future funds and grants.  
• **Relationship to the Natural Hazards Mitigation Plan:** Transportation systems are important is evacuating and responding to natural disasters. Mitigation actions that focus on strengthening transportation systems can be incorporated into the Sherman County Transportation System Plan.

**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.\textsuperscript{71}

Appendix D: Economic Analysis of Natural Hazard Mitigation Projects

This appendix was developed by the Oregon Partnership for Disaster Resilience at the University of Oregon’s Community Service Center. 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.

The appendix outlines three approaches for conducting economic analyses of natural hazard mitigation projects. 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 State Police – Office of Emergency Management, 2000), and Federal Emergency Management Agency 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 economic analysis can be used to evaluate mitigation projects.

Why Evaluate Mitigation Strategies?

Mitigation activities 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, police, 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.
What are some Economic Analysis Approaches for Evaluating Mitigation Strategies?

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 Office of Emergency Management (OEM), the Federal Emergency Management Agency, 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 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.

**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 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 county planning commission, 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
It is important to realize that various funding sources require different types of economic analyses. The following figure is to serve as a guideline for when to use the various approaches.

Figure D.1: Economic Analysis Flowchart

Source: Oregon Partnership for Disaster Resilience at the University of Oregon’s Community Service Center, 2005

Implementing the Approaches
Benefit/cost analysis, cost-effectiveness analysis, and the STAPLE/E are important tools in evaluating whether or not to implement a mitigation activity. A framework for evaluating mitigation activities is outlined below. This framework should be used in further analyzing the feasibility of prioritized mitigation activities.

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, and small business development, among others. Incorporating natural hazard mitigation with other community projects can increase the viability of project implementation.
Resources


Appendix E: Mid-Columbia Regional Natural Hazard Mitigation Public Opinion Survey

Survey Purpose and Use

The purpose of this survey was to gauge the overall perception of natural disasters, determine a baseline level of loss reduction activity for residents in the community, and assess citizen’s support for different types of individual and community risk reduction activities.

Data from this survey directly informs the natural hazard planning process. Counties in the Mid-Columbia region can use this survey data to enhance action item rationale and ideas for implementation. Other community organizations can also use survey results to inform their own outreach efforts. Data from the survey provides the counties with a better understanding of desired outreach strategies (sources and formats), a baseline understanding of what people have done to prepare for natural hazards, and desired individual and community strategies for risk reduction.

Background

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. Development of the Natural Hazards Mitigation Plan update process for eight counties in the Mid-Columbia Gorge and surrounding regions was pursued in compliance with subsections from 44 CFR 201.6 guidelines.

Citizen involvement is a key component in the natural hazard mitigation planning process. Citizens should have the opportunity to voice their ideas, interests and concerns about the impact of natural disasters on their communities. To that end, the DMA2K requires citizen involvement in the natural hazard mitigation planning process. It states: “An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

1. An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval
2. An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate
development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process.”

According to Bierle¹, the benefits of citizen involvement include the following: (1) educate and inform public; (2) incorporate public values into decision making; (3) substantially improve the quality of decisions; (4) increase trust in institutions; (5) reduce conflict; and (6) ensure cost effectiveness.

**Methodology**

In the fall of 2011, the Oregon Partnership for Disaster Resilience (OPDR) distributed a mailed survey to 7,500 random households throughout an eight county region in Northern Oregon. The counties surveyed included: Clackamas, Hood River, Gilliam, Morrow, Sherman, Umatilla, Wasco, and Wheeler. OPDR developed and distributed the survey in partnership with three members of the University of Oregon’s Resource Assistance for Rural Environments (RARE) program.

Given the geographic extent of the survey area and significant county population differences in the region, OPDR stratified the survey sample across three distinct sub-regions (see Table E-1 below). To ensure a minimum number of returns in each of the counties in sub-region three, OPDR leveled the sample at 400 surveys per county (excepting Umatilla). Once OPDR determined the sample size for each county, they contracted with the Oregon Secretary of State Elections Division (OED) to randomly select names and addresses from state voter rolls. Table E-1 shows the survey sample size by sub-region.

Table E-1: Survey Sample Size

<table>
<thead>
<tr>
<th>County</th>
<th>Population '09</th>
<th>Pop as percent of subregion</th>
<th>Survey sample size by county</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subregion 1 - West</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clackamas</td>
<td>379,845</td>
<td>100%</td>
<td>2,500</td>
</tr>
<tr>
<td><strong>Subregion 2 - Gorge</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hood River</td>
<td>21,725</td>
<td>47%</td>
<td>1,200</td>
</tr>
<tr>
<td>Wasco</td>
<td>24,230</td>
<td>53%</td>
<td>1,300</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>45,955</td>
<td>100%</td>
<td>2,500</td>
</tr>
<tr>
<td><strong>Subregion 3 - East</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sherman*</td>
<td>1,830</td>
<td>2%</td>
<td>400</td>
</tr>
<tr>
<td>Gilliam*</td>
<td>1,885</td>
<td>2%</td>
<td>400</td>
</tr>
<tr>
<td>Wheeler*</td>
<td>1,585</td>
<td>2%</td>
<td>400</td>
</tr>
<tr>
<td>Morrow</td>
<td>12,540</td>
<td>14%</td>
<td>400</td>
</tr>
<tr>
<td>Morrow</td>
<td>72,430</td>
<td>80%</td>
<td>900</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>90,270</td>
<td>100%</td>
<td>2,500</td>
</tr>
<tr>
<td><strong>Combined Total</strong></td>
<td>516,070</td>
<td></td>
<td>7,500</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey
*Indicates that OPDR modified the sample size in these counties in an attempt to ensure a minimum number of survey returns.

Each mailed survey packet contained: (1) a cover letter that explained the purpose of the survey and described the survey incentives; (2) a copy of the survey; (3) a survey participation card; and (4) a postage-paid envelope in which to return the completed survey and participation card.

The survey consisted of 24 questions divided into four sections: natural hazard information; community vulnerabilities and hazard mitigation strategies; mitigation and preparedness activities in your household; and general household information. OPDR and RARE designed the survey to determine public perceptions and opinions regarding natural hazards. Questions also focused on the methods and techniques survey respondents prefer to use in reducing the risks and losses associated with natural hazards.

The survey participation card asked survey recipients to enter the amount of time it took them to complete the survey. It also functioned as a voluntary entry form into a drawing for an assortment of household preparedness items. The drawing provided participants an incentive for completing the survey and expressed that it was not required, but rather encouraged, that they complete it. One winner from each of the eight participating counties was chosen at random by the OPDR office.

Ten days before the survey deadline, OPDR sent a reminder postcard to each household urging them to complete the survey and return it as soon as possible. Of the 7,500 surveys sent, 733 were returned undeliverable for a final sample size of 6,767. OPDR received 951 completed surveys for a 14-percent overall survey response rate.
A key concern of organizations that conduct surveys is statistical validity. If one were to assume that the sample was perfectly random and that there was no response bias, then the survey would have a margin of error of ±5-percent at the 95-percent confidence level. In simple terms, this means that if a survey were conducted 100 times, the results would end up within ±5-percent of those presented in this report.

One limitation of the study’s methodology is potential non-response bias from the mailed survey. The survey results represent only those households where residents are registered to vote. There could also be a bias of answers based on which residents are renters compared to owners. Despite these areas of potential response bias, the intent of this survey was not to be statistically valid but instead to gain the perspective and opinions of resident’s regarding natural hazards in the region. Our assessment is that the results reflect a range attitudes and opinions of residents throughout the eight surveyed counties.

Survey Results

This section presents the compiled data and analysis for the 2011 Mid-Columbia Region Natural Hazard Mitigation Public Opinion Survey. We provide a copy of the survey instrument as Attachment A of this report; raw data is provided in Attachment B.

Natural Hazard Information

This section reports the experiences of survey respondents involving natural hazards, and their exposure to preparedness information.

The survey results indicate that about 28-percent of the respondents or someone in their household has personally experienced natural disasters in the past five years, or since they have lived in the community in which they currently reside (see Table E-2 below).

### Table E-2: Direct Experience with Natural Disasters in Respondent County

<table>
<thead>
<tr>
<th>Answer</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>28%</td>
<td>249</td>
</tr>
<tr>
<td>No</td>
<td>72%</td>
<td>656</td>
</tr>
<tr>
<td>Q-1 total</td>
<td>100%</td>
<td>905</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

Of those respondents who have experienced a natural disaster in the last five years, 51-percent experienced windstorms, 49-percent experienced wildfire, 38-percent experienced severe winter storms, and 19-percent experienced flood. Table E-3 illustrates the disasters experienced in the past five years in the Mid-Columbia region.
Table E-3: Type of Natural Disaster Experienced in Past Five Years

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windstorm</td>
<td>51%</td>
<td>126</td>
</tr>
<tr>
<td>Wildfire</td>
<td>49%</td>
<td>121</td>
</tr>
<tr>
<td>Severe Winter Storm</td>
<td>38%</td>
<td>94</td>
</tr>
<tr>
<td>Flood</td>
<td>19%</td>
<td>48</td>
</tr>
<tr>
<td>Drought</td>
<td>11%</td>
<td>27</td>
</tr>
<tr>
<td>Dust Storm</td>
<td>7%</td>
<td>17</td>
</tr>
<tr>
<td>Landslide/Debris Flow</td>
<td>7%</td>
<td>17</td>
</tr>
<tr>
<td>Earthquake</td>
<td>5%</td>
<td>13</td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
<td>10</td>
</tr>
<tr>
<td>Volcanic Eruption</td>
<td>1%</td>
<td>3</td>
</tr>
<tr>
<td>Q-1 &quot;yes&quot; answers</td>
<td>100%</td>
<td>249</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

The survey also asked respondents to rank their personal level of concern for specific natural disasters affecting their community. Figure E-4 shows that more than 70-percent of respondents indicated that they are concerned or very concerned about windstorms and winter storms with nearly 60-percent indicating a high level of concern related to wildfires. A majority of respondents also demonstrated concern over earthquake and flood hazards with 55-percent and 49-percent of respondents marking “concerned” or “very concerned” for those two hazards respectively. Of lesser concern were the landslide, drought and volcano hazards with 47-, 46- and 43-percent of respondents marking “not very concerned” or “not concerned” for those hazards respectively. Dust storm is the hazard respondents are least concerned about with roughly 65-percent of respondents marking the “not very concerned” or “not concerned” choices. Figure E-1 summarizes respondent answers by hazard.
Figure E-1: Level of Concern About Natural Disasters Affecting Respondent County

Next, the survey asked if survey recipients had received information about how to increase the safety of their households and homes from natural hazards. Table E-4 shows that over half (53-percent) of respondents indicated that they have received information regarding home and family safety from natural disasters at some time in the past.

Table E-4: Respondents Who Have Received Information Concerning Natural Disaster Home Safety

<table>
<thead>
<tr>
<th>Answer</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>53%</td>
<td>489</td>
</tr>
<tr>
<td>No</td>
<td>47%</td>
<td>438</td>
</tr>
<tr>
<td>Q-3 total</td>
<td>100%</td>
<td>927</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

Of respondents who had received information, 27-percent received the information within the last six months and 20-percent received information six months to one year ago (see Table E-5). This suggests that, while outreach is occurring, it is reaching fewer than half of
the households in the Mid-Columbia region and surrounding areas, and that many of the households have not received any information in over a year.

Table E-5: Most Recent Date of Contact for Information Concerning Natural Disaster Home Safety

<table>
<thead>
<tr>
<th>Answer</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within last 6 months</td>
<td>27%</td>
<td>131</td>
</tr>
<tr>
<td>Between 6-12 months</td>
<td>20%</td>
<td>99</td>
</tr>
<tr>
<td>Between 1-2 years</td>
<td>22%</td>
<td>107</td>
</tr>
<tr>
<td>Between 2-5 years</td>
<td>15%</td>
<td>75</td>
</tr>
<tr>
<td>5 years or more</td>
<td>11%</td>
<td>55</td>
</tr>
<tr>
<td>Q-3 &quot;yes&quot; answers</td>
<td>100%</td>
<td>489</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

Of the respondents who received information on natural hazard preparedness, the news media (36-percent) and government agencies (18-percent) were cited most often as being the source of the information. Table E-6 shows the sources most respondents last received information from. Note that while the question directed respondents to check only one answer, a number of respondents selected more than one choice. Therefore, readers should use some caution when interpreting these results.

Table E-6: Most Recent Provider of Natural Disaster Home Safety Information

<table>
<thead>
<tr>
<th>Answer</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>News Media</td>
<td>36%</td>
<td>174</td>
</tr>
<tr>
<td>Government Agency</td>
<td>18%</td>
<td>86</td>
</tr>
<tr>
<td>Other</td>
<td>15%</td>
<td>74</td>
</tr>
<tr>
<td>Not Sure</td>
<td>14%</td>
<td>68</td>
</tr>
<tr>
<td>Utility Company</td>
<td>8%</td>
<td>38</td>
</tr>
<tr>
<td>American Red Cross</td>
<td>6%</td>
<td>29</td>
</tr>
<tr>
<td>Neighbor/friend/family</td>
<td>5%</td>
<td>25</td>
</tr>
<tr>
<td>Insurance Agent/Company</td>
<td>5%</td>
<td>24</td>
</tr>
<tr>
<td>Other non-profit org.</td>
<td>4%</td>
<td>17</td>
</tr>
<tr>
<td>Social media (e.g. Facebook)</td>
<td>1%</td>
<td>4</td>
</tr>
<tr>
<td>Univ./research facility</td>
<td>0%</td>
<td>2</td>
</tr>
<tr>
<td>Elected official</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Q-4 total</td>
<td>111%</td>
<td>489</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey
Note: Total percentage exceeds 100% because some respondents chose more than one category.

Survey respondents provided an interesting contrast between the sources that they had recently received information from, and those that they perceived to be the most trustworthy. While only six-percent of respondents said they last received information from the American Red Cross, more respondents chose the American Red Cross as the most trusted source of information than any other option. The second and third most trusted
sources cited by respondents were “utility company” and “government agency”. “Elected Official” and “Social Media” received the lowest number of responses. Table E-7 shows the sources respondents trust the most for providing this information.

**Table E-7: Most Trusted Providers of Information for Natural Disaster Home Safety**

<table>
<thead>
<tr>
<th>Answer</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Red Cross</td>
<td>359</td>
</tr>
<tr>
<td>Utility Company</td>
<td>313</td>
</tr>
<tr>
<td>Government Agency</td>
<td>312</td>
</tr>
<tr>
<td>Univ./research facility</td>
<td>242</td>
</tr>
<tr>
<td>News Media</td>
<td>221</td>
</tr>
<tr>
<td>Insurance Agent/Company</td>
<td>186</td>
</tr>
<tr>
<td>Neighbor/friend/family</td>
<td>166</td>
</tr>
<tr>
<td>Not Sure</td>
<td>97</td>
</tr>
<tr>
<td>Other non-profit org.</td>
<td>93</td>
</tr>
<tr>
<td>Other</td>
<td>78</td>
</tr>
<tr>
<td>Elected official</td>
<td>14</td>
</tr>
<tr>
<td>Social media (e.g. Facebook)</td>
<td>9</td>
</tr>
<tr>
<td>Q-5 total</td>
<td>2,090</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey  
Note: Respondents could check up to three information providers

When asked what the most effective way was to receive information, respondents indicated that television news (440 responses), newspaper stories (331 responses), and mail (315 responses) were the most effective. Interestingly, various types of advertisement (televisions, radio, billboards, newspaper) all received relatively low responses. Table E-8 shows the effectiveness rating of information dissemination methods expressed by survey respondents.
Table E-8: Most Effective Method for Respondents to Receive Information Concerning Natural Disaster-Related Home Safety

<table>
<thead>
<tr>
<th>Answer</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Television news</td>
<td>440</td>
</tr>
<tr>
<td>Newspaper stories</td>
<td>331</td>
</tr>
<tr>
<td>Mail</td>
<td>315</td>
</tr>
<tr>
<td>Fire Department/Rescue</td>
<td>245</td>
</tr>
<tr>
<td>Radio news</td>
<td>227</td>
</tr>
<tr>
<td>Fact sheet/brochure</td>
<td>224</td>
</tr>
<tr>
<td>Email newsletters</td>
<td>220</td>
</tr>
<tr>
<td>Online news outlets</td>
<td>126</td>
</tr>
<tr>
<td>Public workshops/meetings</td>
<td>121</td>
</tr>
<tr>
<td>University or research institution</td>
<td>87</td>
</tr>
<tr>
<td>Schools</td>
<td>72</td>
</tr>
<tr>
<td>Television ads</td>
<td>56</td>
</tr>
<tr>
<td>Books</td>
<td>50</td>
</tr>
<tr>
<td>Social media (e.g. Facebook)</td>
<td>38</td>
</tr>
<tr>
<td>Magazine</td>
<td>34</td>
</tr>
<tr>
<td>Radio ads</td>
<td>33</td>
</tr>
<tr>
<td>Other</td>
<td>33</td>
</tr>
<tr>
<td>Outdoor ads (e.g. billboards, etc.)</td>
<td>32</td>
</tr>
<tr>
<td>Newspaper ads</td>
<td>26</td>
</tr>
<tr>
<td>Chamber of Commerce</td>
<td>21</td>
</tr>
<tr>
<td>Q-6 total</td>
<td>2,731</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

An overwhelming majority of survey respondents (87-percent of those who answered Question 7) indicated that they were not aware of their county’s natural hazards mitigation plan prior to receiving the survey. This suggests the need for increases in or changes to local NHMP education and outreach programs.

Table E-7: Respondent Knowledge/Awareness of County Natural Hazards Mitigation Plan

<table>
<thead>
<tr>
<th>Answer</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>13%</td>
<td>124</td>
</tr>
<tr>
<td>No</td>
<td>87%</td>
<td>814</td>
</tr>
<tr>
<td>Q-7 total</td>
<td>100%</td>
<td>938</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

Consistent with the responses displayed in Table E-7, only 12-percent of respondents claimed to be aware, prior to the survey, that FEMA requires their county to update the NHMP every five years in order to be eligible for federal pre- and post-disaster hazard mitigation funds.
Table E-8: Respondent Awareness of FEMA Requirements for Five Year NHMP Update to Receive Hazard Mitigation Funding

<table>
<thead>
<tr>
<th>Answer</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>12%</td>
<td>110</td>
</tr>
<tr>
<td>No</td>
<td>88%</td>
<td>827</td>
</tr>
<tr>
<td>Q-8 total</td>
<td>100%</td>
<td>938</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

Community Vulnerabilities and Hazard Mitigation Strategies

This section outlines the assets that survey respondents felt would be vulnerable to natural hazards in the region. The section also describes citizens’ priorities for planning for natural hazards and the community-wide strategies respondents support.

The survey asked respondents to rank categories of community assets in terms of their vulnerability. These questions were intended to help the Mid-Columbia region and surrounding communities determine citizen priorities when planning for natural hazards, by comparing the level of importance that they attach to specific community assets and risk reduction activities. Figure E-2 illustrates that respondents found human related assets to be by far the most vulnerable (50-percent), followed distantly by infrastructure (22-percent). Survey respondents found environmental assets to be the third most vulnerable (17-percent), followed closely by economic assets (13-percent), however economic assets made up a noticeably higher proportion than environmental assets in rankings 2-4. Cultural/historic assets (three-percent) received the lowest consistent ranking in terms of vulnerability, preceded somewhat closely by governance (eight-percent).
Next, the survey asked respondents to indicate the importance that they attach to particular types of public and private community assets. As shown in Figure E-3, over 90-percent of respondents indicated that hospitals, major bridges and fire/police stations are very important or somewhat important to them. In addition, over 80-percent indicated that schools (K-12) and small businesses are very important or somewhat important to them. Parks were the least important to survey respondents, followed closely by museums/historical buildings, college/university, and city hall/courthouse.
A number of activities can reduce your community’s risk from natural hazards. These activities can be both regulatory and non-regulatory. Please check the box that best represents your opinion of the following strategies to reduce the risk and loss associated with natural disasters.

To gauge attitudes toward different types of mitigation strategies, the survey asked respondents to indicate their level of support for various risk reduction activities. Figure E-4 shows that while there is general support among survey respondents about protecting assets such as schools, homes, businesses and historic or cultural assets, respondents were somewhat mixed in their agreement about how to accomplish those protections.
With respect to specific asset types, 87-percent of the respondents strongly agree or agree that they support improving the disaster preparedness of local schools, over 80-percent of respondents strongly agree or agree that they support steps to safeguard the local economy, and over 77-percent strongly agree or agree that they would be willing to make their homes more disaster-resistant. In addition, 87-percent strongly agree or agree that they support disclosure of natural hazard risks during real estate transactions.

With respect to risk reduction strategies, respondents generally appear to support a mix of regulatory, non-regulatory and tax-dollar based approaches. For example, over 50-percent of respondents support the use of tax dollars to reduce risk and losses from natural hazards and over 60-percent indicate support for a mix of regulatory and non-regulatory approaches to reducing risk. That said, respondents overwhelmingly support the use policy strategies over the use of tax supported compensation strategies when specifically used to limit development in hazard areas. As Figure E-4 shows, fewer than 25-percent of respondents indicated support when specifically asked about the use of tax dollars to compensate property owners for not developing in hazard areas (with close to 50-percent disagreeing or strongly disagreeing with a compensations approach) while 70-percent of respondents indicated general or strong support for policies that prohibit development in areas subject to natural hazards (with only 13-percent in disagreement).
Figure E-4: Respondent Preferences for Community Risk Reduction Activities

The survey then asked respondents to indicate the level of importance they would place on a number of policies and priorities within their communities. The protection of critical facilities (e.g. transportation networks, hospitals, fire stations) received the strongest level of support with close to 100-percent of respondents finding it to be important or very important. Similarly, over 90-percent of survey respondents found protecting and reducing damage to utilities to be important or very important, with just under 90-percent who found strengthening emergency services (e.g. police, fire, ambulance) to be worthy of the same designation.

Roughly 50-percent of survey respondents felt that protecting private property and disclosing natural hazard risks during real estate transactions was important, as was promoting cooperation among public agencies, citizens, non-profit organizations, and businesses. Protecting historical and cultural landmarks was the lowest priority for survey respondents, followed by enhancing the function of natural features (e.g. streams, wetlands), and preventing development in hazard areas. Figure E-5 summarizes the results for priorities regarding planning for natural hazards in the region.

Source: 2011 NHMP Public Opinion Survey
Mitigation and Preparedness Activities in your Household

This section provides an overview of household level natural hazard mitigation and preparedness activities in the Mid-Columbia region.

Over 56-percent percent of respondents claimed to have talked with members of their households about what to do in the case of a natural disaster or emergency. In addition, 43-percent had prepared a “Disaster Supply Kit” which entails storing extra food, water, and other emergency supplies, while 41-percent were trained in first aid or CPR during the past year. Nearly 95-percent of respondents had placed smoke detectors on every level of the home while more than a third of respondents claimed to have attended meetings or received information on natural disasters or emergency preparedness, developed a “Household/Family Emergency Plan,” and/or discussed/created a utility shutoff procedure in the event of a natural disaster. Figure E-5 summarizes all of the activities that respondents indicated they have done, plan to do, have not done, or were unable to do to prepare for natural disasters.

Source: 2011 NHMP Public Opinion Survey
Figure E-5: Activities that Respondents Have Done, Plan to Do, Have Not Done, or are Unable to Do

- **Prepared your home by having smoke detectors on each level of the house?**
  - Have Done: 94%
  - Plan To Do: 2%
  - Done: 0%

- **Talked with members in your household about what to do in case of a natural disaster or emergency?**
  - Have Done: 57%
  - Plan To Do: 16%
  - Not Done: 26%

- **Prepared a "Disaster Supply Kit" (stored extra food, water, batteries, or other emergency supplies)?**
  - Have Done: 43%
  - Plan To Do: 26%
  - Not Done: 30%

- **In the last year, has anyone in your household been trained in First Aid or Cardio-Pulmonary Resuscitation (CPR)?**
  - Have Done: 41%
  - Plan To Do: 5%
  - Not Done: 52%

- **Attended meetings or received written information on natural disasters or emergency preparedness?**
  - Have Done: 38%
  - Plan To Do: 7%
  - Not Done: 53%

- **Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?**
  - Have Done: 33%
  - Plan To Do: 30%
  - Not Done: 37%

- **Discussed or created a utility shutoff procedure in the event of a natural disaster?**
  - Have Done: 33%
  - Plan To Do: 21%
  - Not Done: 45%

Source: 2011 NHMP Public Opinion Survey

**General Household Information**

Demographic questions provide a statistical overview of the characteristics of the respondents. This section asked respondents about their age and gender, level of education, median income, race, ethnicity, and length of residence in the state of Oregon.
AGE AND GENDER

Table E-9 shows the age range of survey respondents. The median age of survey respondents was 55-64 years old.

Table E-9: Age of Survey Respondents

<table>
<thead>
<tr>
<th>Age</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;19</td>
<td>1%</td>
<td>5</td>
</tr>
<tr>
<td>20-24</td>
<td>2%</td>
<td>18</td>
</tr>
<tr>
<td>25-29</td>
<td>2%</td>
<td>19</td>
</tr>
<tr>
<td>30-34</td>
<td>3%</td>
<td>23</td>
</tr>
<tr>
<td>35-39</td>
<td>5%</td>
<td>43</td>
</tr>
<tr>
<td>40-44</td>
<td>6%</td>
<td>56</td>
</tr>
<tr>
<td>45-49</td>
<td>7%</td>
<td>65</td>
</tr>
<tr>
<td>50-54</td>
<td>12%</td>
<td>111</td>
</tr>
<tr>
<td>55-59</td>
<td>14%</td>
<td>127</td>
</tr>
<tr>
<td>60-64</td>
<td>15%</td>
<td>141</td>
</tr>
<tr>
<td>65-69</td>
<td>13%</td>
<td>121</td>
</tr>
<tr>
<td>70-74</td>
<td>8%</td>
<td>69</td>
</tr>
<tr>
<td>75-79</td>
<td>5%</td>
<td>47</td>
</tr>
<tr>
<td>80+</td>
<td>8%</td>
<td>73</td>
</tr>
<tr>
<td>Q-14 total</td>
<td>100%</td>
<td>918</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

Table E-10 displays the gender of survey respondents, where women accounted for 54-percent of the sample.

Table E-10: Gender of Survey Respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>46%</td>
<td>428</td>
</tr>
<tr>
<td>Male</td>
<td>54%</td>
<td>502</td>
</tr>
<tr>
<td>Q-15 total</td>
<td>100%</td>
<td>930</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

LEVEL OF EDUCATION

In general, survey respondents were evenly distributed in terms of levels of education. About 16-percent of survey respondents specified they held a GED or were high school graduates, compared to over 31-percent who specified having attended some college or trade school. Just fewer than 35-percent of respondents had completed a college degree, while just over 16-percent of respondents had acquired a postgraduate degree.
### Table E-11: Level of Education

<table>
<thead>
<tr>
<th>Answer</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School Grad/GED</td>
<td>147</td>
<td>16%</td>
</tr>
<tr>
<td>Some College/Trade School</td>
<td>291</td>
<td>31%</td>
</tr>
<tr>
<td>College degree</td>
<td>323</td>
<td>35%</td>
</tr>
<tr>
<td>Postgraduate degree</td>
<td>149</td>
<td>16%</td>
</tr>
<tr>
<td>Other</td>
<td>16</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Q-16 total</strong></td>
<td>926</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

### Household Income

Just under 22-percent of respondents had household incomes of $30,000 or less, over 32-percent had incomes from $30,000-$60,000, roughly 25-percent had incomes between $60,000-$99,999, while just over 21-percent had incomes of $100,000 or more.

### Table E-12: Household Income

<table>
<thead>
<tr>
<th>Household Income</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $10,000</td>
<td>4%</td>
<td>33</td>
</tr>
<tr>
<td>$10,000-$19,999</td>
<td>9%</td>
<td>70</td>
</tr>
<tr>
<td>$20,000-$29,999</td>
<td>9%</td>
<td>74</td>
</tr>
<tr>
<td>$30,000-$39,999</td>
<td>10%</td>
<td>86</td>
</tr>
<tr>
<td>$40,000-$49,999</td>
<td>10%</td>
<td>86</td>
</tr>
<tr>
<td>$50,000-$59,999</td>
<td>11%</td>
<td>89</td>
</tr>
<tr>
<td>$60,000-$69,999</td>
<td>9%</td>
<td>71</td>
</tr>
<tr>
<td>$70,000-$79,999</td>
<td>7%</td>
<td>59</td>
</tr>
<tr>
<td>$80,000-$89,999</td>
<td>6%</td>
<td>46</td>
</tr>
<tr>
<td>$90,000-$99,999</td>
<td>4%</td>
<td>33</td>
</tr>
<tr>
<td>$100,000-$149,999</td>
<td>14%</td>
<td>119</td>
</tr>
<tr>
<td>More than $150,000</td>
<td>7%</td>
<td>56</td>
</tr>
<tr>
<td><strong>Q-17 total</strong></td>
<td>100%</td>
<td>822</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

### Regional Residency

Table E-13 lists the zip codes reported by survey respondents.
Table E-13: Respondent Zip Code

<table>
<thead>
<tr>
<th>Answer</th>
<th>Percent</th>
<th>Number</th>
<th>Answer</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>96086</td>
<td>0%</td>
<td>1</td>
<td>97063</td>
<td>3%</td>
<td>12</td>
</tr>
<tr>
<td>97001</td>
<td>0%</td>
<td>2</td>
<td>97065</td>
<td>3%</td>
<td>12</td>
</tr>
<tr>
<td>97002</td>
<td>0%</td>
<td>2</td>
<td>97067</td>
<td>1%</td>
<td>4</td>
</tr>
<tr>
<td>97004</td>
<td>0%</td>
<td>2</td>
<td>97068</td>
<td>6%</td>
<td>26</td>
</tr>
<tr>
<td>97009</td>
<td>2%</td>
<td>9</td>
<td>97070</td>
<td>2%</td>
<td>8</td>
</tr>
<tr>
<td>97013</td>
<td>3%</td>
<td>12</td>
<td>97071</td>
<td>0%</td>
<td>2</td>
</tr>
<tr>
<td>97014</td>
<td>2%</td>
<td>8</td>
<td>97081</td>
<td>0%</td>
<td>1</td>
</tr>
<tr>
<td>97015</td>
<td>2%</td>
<td>7</td>
<td>97086</td>
<td>1%</td>
<td>4</td>
</tr>
<tr>
<td>97017</td>
<td>0%</td>
<td>1</td>
<td>97089</td>
<td>2%</td>
<td>7</td>
</tr>
<tr>
<td>97021</td>
<td>3%</td>
<td>12</td>
<td>97140</td>
<td>0%</td>
<td>1</td>
</tr>
<tr>
<td>97022</td>
<td>1%</td>
<td>3</td>
<td>97206</td>
<td>1%</td>
<td>3</td>
</tr>
<tr>
<td>97023</td>
<td>2%</td>
<td>8</td>
<td>97219</td>
<td>0%</td>
<td>2</td>
</tr>
<tr>
<td>97027</td>
<td>1%</td>
<td>5</td>
<td>97222</td>
<td>4%</td>
<td>20</td>
</tr>
<tr>
<td>97028</td>
<td>0%</td>
<td>1</td>
<td>97267</td>
<td>6%</td>
<td>28</td>
</tr>
<tr>
<td>97029</td>
<td>0%</td>
<td>1</td>
<td>97750</td>
<td>4%</td>
<td>16</td>
</tr>
<tr>
<td>97031</td>
<td>22%</td>
<td>99</td>
<td>97756</td>
<td>0%</td>
<td>1</td>
</tr>
<tr>
<td>97033</td>
<td>1%</td>
<td>3</td>
<td>97801</td>
<td>7%</td>
<td>32</td>
</tr>
<tr>
<td>97034</td>
<td>2%</td>
<td>11</td>
<td>97812</td>
<td>4%</td>
<td>18</td>
</tr>
<tr>
<td>97035</td>
<td>3%</td>
<td>13</td>
<td>97813</td>
<td>0%</td>
<td>1</td>
</tr>
<tr>
<td>97037</td>
<td>2%</td>
<td>7</td>
<td>97818</td>
<td>1%</td>
<td>5</td>
</tr>
<tr>
<td>97038</td>
<td>3%</td>
<td>13</td>
<td>97823</td>
<td>1%</td>
<td>4</td>
</tr>
<tr>
<td>97039</td>
<td>4%</td>
<td>18</td>
<td>97830</td>
<td>6%</td>
<td>29</td>
</tr>
<tr>
<td>97040</td>
<td>2%</td>
<td>8</td>
<td>97835</td>
<td>0%</td>
<td>1</td>
</tr>
<tr>
<td>97041</td>
<td>4%</td>
<td>18</td>
<td>97836</td>
<td>1%</td>
<td>6</td>
</tr>
<tr>
<td>97042</td>
<td>0%</td>
<td>1</td>
<td>97838</td>
<td>8%</td>
<td>35</td>
</tr>
<tr>
<td>97044</td>
<td>0%</td>
<td>2</td>
<td>97843</td>
<td>0%</td>
<td>1</td>
</tr>
<tr>
<td>97045</td>
<td>8%</td>
<td>36</td>
<td>97844</td>
<td>1%</td>
<td>5</td>
</tr>
<tr>
<td>97049</td>
<td>1%</td>
<td>3</td>
<td>97862</td>
<td>4%</td>
<td>18</td>
</tr>
<tr>
<td>97050</td>
<td>1%</td>
<td>6</td>
<td>97868</td>
<td>0%</td>
<td>2</td>
</tr>
<tr>
<td>97051</td>
<td>0%</td>
<td>1</td>
<td>97874</td>
<td>2%</td>
<td>8</td>
</tr>
<tr>
<td>97055</td>
<td>2%</td>
<td>11</td>
<td>97875</td>
<td>1%</td>
<td>3</td>
</tr>
<tr>
<td>97056</td>
<td>0%</td>
<td>1</td>
<td>97880</td>
<td>0%</td>
<td>1</td>
</tr>
<tr>
<td>97058</td>
<td>28%</td>
<td>129</td>
<td>97882</td>
<td>1%</td>
<td>4</td>
</tr>
<tr>
<td>97062</td>
<td>0%</td>
<td>2</td>
<td>97886</td>
<td>1%</td>
<td>4</td>
</tr>
</tbody>
</table>

Q-18 total 100% 456

Source: 2011 NHMP Public Opinion Survey

Of the seven counties the survey was mailed to, the most returned surveys came from residents of Clackamas County (31.8-percent). In Wasco County 201 surveys were returned, followed by 153 in Hood River County, and 122 in Umatilla County. Due to the survey distribution methodology, fewer surveys were distributed to Umatilla County than were to
Clackamas, Wasco or Hood River Counties, otherwise the return rate from the county may have more closely matched that of Clackamas County, which has a more comparable number of residents compared to the other counties in the region.

**Table E-14: Percent of Surveys Received Per County**

<table>
<thead>
<tr>
<th>County</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clackamas County</td>
<td>32%</td>
<td>297</td>
</tr>
<tr>
<td>Hood River County</td>
<td>16%</td>
<td>153</td>
</tr>
<tr>
<td>Gilliam County</td>
<td>3%</td>
<td>26</td>
</tr>
<tr>
<td>Morrow County</td>
<td>3%</td>
<td>25</td>
</tr>
<tr>
<td>Sherman County</td>
<td>5%</td>
<td>47</td>
</tr>
<tr>
<td>Umatilla County</td>
<td>13%</td>
<td>122</td>
</tr>
<tr>
<td>Wasco County</td>
<td>21%</td>
<td>201</td>
</tr>
<tr>
<td>Wheeler County</td>
<td>7%</td>
<td>64</td>
</tr>
<tr>
<td><strong>Q-19 total</strong></td>
<td><strong>100%</strong></td>
<td><strong>935</strong></td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

Over 80-percent of survey respondents have lived in Oregon for 20 years or more, roughly 10-percent have lived in Oregon for 10-19 years, and nearly 5-percent have for 5-9 years.

**Table E-15: Length of Oregon Residency**

<table>
<thead>
<tr>
<th>Answer</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 year</td>
<td>1%</td>
<td>5</td>
</tr>
<tr>
<td>1-5 years</td>
<td>4%</td>
<td>34</td>
</tr>
<tr>
<td>5-9 years</td>
<td>5%</td>
<td>44</td>
</tr>
<tr>
<td>10-19 years</td>
<td>10%</td>
<td>97</td>
</tr>
<tr>
<td>20 years or more</td>
<td>81%</td>
<td>754</td>
</tr>
<tr>
<td><strong>Q-22 total</strong></td>
<td><strong>100%</strong></td>
<td><strong>934</strong></td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

**HOUSING CHARACTERISTICS**

Homeownership is an important variable in education and outreach programs, and knowledge of the percentage of homeowners in a community can help target the programs. Additionally, homeowners might be more willing to invest time and money in making their homes more disaster resistant. Over 87-percent of survey respondents are homeowners.
Nearly 79-percent of survey respondents live in single family homes, 12-percent live in manufactured homes, and five-percent in apartments; the other four-percent live in duplexes, condo/townhouses, or some other form of housing.

### Table E-16: Home Ownership

<table>
<thead>
<tr>
<th>Answer</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>13%</td>
<td>119</td>
</tr>
<tr>
<td>Own</td>
<td>87%</td>
<td>808</td>
</tr>
<tr>
<td>Q-23 total</td>
<td>100%</td>
<td>927</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

### Table E-17: Housing Type

<table>
<thead>
<tr>
<th>Answer</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-family home</td>
<td>79%</td>
<td>710</td>
</tr>
<tr>
<td>Duplex</td>
<td>1%</td>
<td>5</td>
</tr>
<tr>
<td>Apartment (3-4 units)</td>
<td>1%</td>
<td>8</td>
</tr>
<tr>
<td>Apartment (5 or more units)</td>
<td>4%</td>
<td>35</td>
</tr>
<tr>
<td>Condo/townhouse</td>
<td>2%</td>
<td>16</td>
</tr>
<tr>
<td>Manufactured home</td>
<td>12%</td>
<td>112</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
<td>18</td>
</tr>
<tr>
<td>Q-24 total</td>
<td>100%</td>
<td>904</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

### RACE AND ETHNICITY

Just under 97-percent of survey respondents specified white as their race; of those that replied, only 28 (roughly three-percent) specified a race other than white. Table E-18 presents the results.

### Table E-18: Respondent Race

<table>
<thead>
<tr>
<th>Race</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian or Alaska Native</td>
<td>2%</td>
<td>16</td>
</tr>
<tr>
<td>Asian</td>
<td>1%</td>
<td>12</td>
</tr>
<tr>
<td>Black or African American</td>
<td>0%</td>
<td>3</td>
</tr>
<tr>
<td>Native Hawaiian or Other Pac Islander</td>
<td>0%</td>
<td>1</td>
</tr>
<tr>
<td>White</td>
<td>96%</td>
<td>879</td>
</tr>
<tr>
<td>Q-20 total</td>
<td>100%</td>
<td>911</td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

With respect to ethnicity, just under two-percent of survey respondents self identified as Hispanic or Latino, whereas US Census figures suggest that the number should be much higher for the region. For example, nearly 15-percent of the population in Wasco County is reported as Hispanic or Latino in origin, compared to nearly 24-percent in Umatilla County.
### Table E-19: Respondent Ethnicity

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic or Latino</td>
<td>2%</td>
<td>16</td>
</tr>
<tr>
<td>Not Hispanic or Latino</td>
<td>98%</td>
<td>826</td>
</tr>
<tr>
<td><strong>Q-21 Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>842</strong></td>
</tr>
</tbody>
</table>

Source: 2011 NHMP Public Opinion Survey

### Written Responses to Open-Ended Questions

This section includes the transcripts of respondent answers when checking the “other” option provided in some questions. In addition, we’ve included comments provided by respondents at the end of the survey.

**Question 1:** During the past five years in the county you currently reside in, have you or someone in your household directly experienced a natural disaster such as an earthquake, severe windstorm, flood, wildfire, or other type of natural disaster? Other:

- Electrical outage
- Excess air pollution related to coal-fired plant and/or coal transported through Wasco County
- Hurricane
- Large fallen trees
- Rainstorm – very heavy
- Solar flares (emergency pulse)
- Unseasonable freeze, crops killed
- Water spout
- Wild animal damage

**Question 2:** How concerned are you about the following natural disasters affecting your county? Other:

- Airborne pathogens
- Anarchy
- Animal/plant virus infection
- Asteroid annihilation
- Chemical spill
- Combinations of . . .
- Corona mass ejections
- Dam failure (3)
- Dangerous wild animals
- December 21, 2012
- Depression & hunger
- Electrical outage
- Fog
- Government exploding more
- Hail
- Human cause (fallout)
- Ice storm
- Incompetent government @ all levels
- Large fallen trees (2)
- Mt. Ranier erupting
- Nuclear meltdown/war
- One of dams break
- Radiation from Hanford
- Reservoir above us getting damaged & flooding downhill on top of us
- Severe rain storm
- The Dalles dam breaking
- Tornado (2)
- Tsunami
- Tsunami evacuation zone
Question 4: From whom did you last receive information about how to make members of your household and your home safer from natural disasters? Other:

- Books (2)
- Boy Scouts & school projects
- CERT Training through Fire Dept.
- Church (4)
- Coast to Coast - George Nory
- CSEP
- Discover Channel, OPB, History Channel
- Emergency department of some type
- Employer (15)
- Employer CERT team
- Family
- FEMA
- Fire Department (12)
- Fire department distributed “Fire Preparedness” brochure
- Forest service
- Internet (4)
- Internet blogs
- Local health fair, community events
- Magazine
- Myself, I’m a former combat sailor (Panama 89, Desert Shield, Desert Storm)
- Myself, I was in a flood in Ashland that ruined the water & sewage plant
- Never
- None
- Providence Health Fair (hospital)
- Reading
- Safety commission
- School (2)
- Self
- Self-Google search
- Senior center
- Talk radio conservative
- Training
- TV commercials
- TV Outdoor Channel
- Web
- Work on disaster control committee OHSU library

Question 5: Whom would you most trust to provide you with information about how to make your household and home safer from natural disasters? Other:

- Books (3)
- Churches (10)
- Coast to Coast – George Nory
- Common sense
- Community events
- Consumer Reports
- County sheriff
- Department of Forestry
- Depends on what kind of disaster
- Drinking water supply
- Fellow church members
- Fire department (4)
- Fire department/police (2)
- God
- Hospital
- Internet blogs
- Internet research
- Mortgage lender
- Multiple sources preferred
- Law offices
- Local government agencies
- Local police department
- None
- Not the government!
- Personal research/internet
- Police
- Self (3)
- Senior center
- Several sources – best
• Someone who has gone through disaster
• Talk radio conservative
• Utility services

Question 6: What is the most effective way for you to receive information about how to make your household and home safer from natural disasters? Other:

• Churches (9)
• Door-to-door “hangers”
• Fire department/police
• Government
• Internet blogs
• News podcasts
• Newspapers
• Online, institution info
• Online publications/websites
• Read book
• Sheriff’s office
• Website

10. Next we would like to know what specific types of community assets are most important to you. Other

<table>
<thead>
<tr>
<th>Rating</th>
<th>Community Asset</th>
<th>Rating</th>
<th>Community Asset</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Active senior center</td>
<td>1</td>
<td>Grain storage &amp; shipping facilities</td>
</tr>
<tr>
<td>1</td>
<td>Active volunteer opportunities</td>
<td>1</td>
<td>Hardware/lumber stores</td>
</tr>
<tr>
<td>1</td>
<td>Agriculture</td>
<td>1</td>
<td>Health Dept.</td>
</tr>
<tr>
<td>1</td>
<td>Airports (2)</td>
<td>1</td>
<td>Highway/street maint. (2)</td>
</tr>
<tr>
<td>1</td>
<td>Ambulance</td>
<td>1</td>
<td>Highways/streets (17)</td>
</tr>
<tr>
<td>1</td>
<td>Animal shelters</td>
<td>2</td>
<td>Highways/streets</td>
</tr>
<tr>
<td>1</td>
<td>Bridges</td>
<td>1</td>
<td>Homes (2)</td>
</tr>
<tr>
<td>1</td>
<td>Broadband</td>
<td>1</td>
<td>Humans</td>
</tr>
<tr>
<td>2</td>
<td>Children!</td>
<td>1</td>
<td>Individual property</td>
</tr>
<tr>
<td>1</td>
<td>Chamber of Commerce</td>
<td>1</td>
<td>Internet access (2)</td>
</tr>
<tr>
<td>1</td>
<td>Child abuse services/facility</td>
<td>1</td>
<td>Jobs</td>
</tr>
<tr>
<td>1</td>
<td>Churches (12)</td>
<td>1</td>
<td>Lake</td>
</tr>
<tr>
<td>1</td>
<td>City maintenance</td>
<td>1</td>
<td>Laundromat</td>
</tr>
<tr>
<td>1</td>
<td>City works</td>
<td>1</td>
<td>Livestock facilities</td>
</tr>
<tr>
<td>1</td>
<td>Clean air</td>
<td>2</td>
<td>Library (9)</td>
</tr>
<tr>
<td>1</td>
<td>Columbia River (2)</td>
<td>1</td>
<td>Local Catholic church</td>
</tr>
<tr>
<td>1</td>
<td>Communications (3)</td>
<td>1</td>
<td>Local general practice MDs</td>
</tr>
<tr>
<td>1</td>
<td>Community hall</td>
<td>1</td>
<td>Local medical clinic</td>
</tr>
<tr>
<td>1</td>
<td>Cultural arts</td>
<td>2</td>
<td>Local rural veterinarian</td>
</tr>
<tr>
<td>1</td>
<td>Dams (8)</td>
<td>2</td>
<td>Meals on Wheels</td>
</tr>
<tr>
<td>1</td>
<td>Disaster plan</td>
<td>1</td>
<td>Local shopping</td>
</tr>
<tr>
<td>1</td>
<td>Dog &amp; cat rescue</td>
<td>1</td>
<td>Medical clinic (7)</td>
</tr>
<tr>
<td>1</td>
<td>Ecological resources (2)</td>
<td>1</td>
<td>Mentally ill facilities</td>
</tr>
<tr>
<td>1</td>
<td>Education</td>
<td>1</td>
<td>Mountains/trees/streams (2)</td>
</tr>
<tr>
<td>1</td>
<td>Electrical substations</td>
<td>1</td>
<td>Movie theater</td>
</tr>
<tr>
<td>1</td>
<td>Electricity (6)</td>
<td>1</td>
<td>My apt.</td>
</tr>
<tr>
<td>1</td>
<td>EMS</td>
<td>1</td>
<td>National forest</td>
</tr>
<tr>
<td>1</td>
<td>Evacuation routes</td>
<td>1</td>
<td>NORCOR</td>
</tr>
<tr>
<td>1</td>
<td>Family</td>
<td>1</td>
<td>Ornaments</td>
</tr>
<tr>
<td>1</td>
<td>Family farms</td>
<td>1</td>
<td>OSU Extension/4-H</td>
</tr>
<tr>
<td>1</td>
<td>Farms (4)</td>
<td>1</td>
<td>People</td>
</tr>
<tr>
<td>1</td>
<td>Fire/ambulance</td>
<td>1</td>
<td>Pharmacies (2)</td>
</tr>
<tr>
<td>1</td>
<td>Food supplies/banks (19)</td>
<td>1</td>
<td>Police/sheriff</td>
</tr>
<tr>
<td>2</td>
<td>Forests</td>
<td>2</td>
<td>Pool</td>
</tr>
<tr>
<td>1</td>
<td>Foster care homes</td>
<td>1</td>
<td>Post Office (3)</td>
</tr>
<tr>
<td>1</td>
<td>Fuel availability (2)</td>
<td>1</td>
<td>Power infrastructure</td>
</tr>
<tr>
<td>1</td>
<td>Gas (3)</td>
<td>1</td>
<td>Prisons</td>
</tr>
<tr>
<td>1</td>
<td>Geological study</td>
<td>1</td>
<td>Public transportation (5)</td>
</tr>
<tr>
<td>Rating</td>
<td>Community Asset</td>
<td>Rating</td>
<td>Community Asset</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------</td>
<td>--------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Radio/CB</td>
<td>1</td>
<td>Social services</td>
</tr>
<tr>
<td>1</td>
<td>Range land</td>
<td>1</td>
<td>Telephone (4)</td>
</tr>
<tr>
<td>1</td>
<td>Recreation (3)</td>
<td>1</td>
<td>Utilities (11)</td>
</tr>
<tr>
<td>1</td>
<td>Red Cross (2)</td>
<td>1</td>
<td>Walking trails</td>
</tr>
<tr>
<td>1</td>
<td>River health</td>
<td>1</td>
<td>Water sources (12)</td>
</tr>
<tr>
<td>1</td>
<td>Scenic view</td>
<td>1</td>
<td>Water for farming</td>
</tr>
<tr>
<td>1</td>
<td>Security/safety (2)</td>
<td>2</td>
<td>Water supply</td>
</tr>
<tr>
<td>1</td>
<td>Sewer</td>
<td>1</td>
<td>Water treatment</td>
</tr>
<tr>
<td>2</td>
<td>Sewer</td>
<td>1</td>
<td>Wilderness areas (2)</td>
</tr>
<tr>
<td>1</td>
<td>Sheriff’s Dept. (2)</td>
<td>2</td>
<td>Wildlife/fish</td>
</tr>
<tr>
<td>1</td>
<td>Shopping areas</td>
<td>2</td>
<td>Wildlife</td>
</tr>
<tr>
<td>1</td>
<td>Sidewalks</td>
<td>2</td>
<td>Wineries</td>
</tr>
</tbody>
</table>

Question 16: Please indicate your level of education. Other:

- 11\textsuperscript{th} grade (2)
- Associates degree
- Automotive engineering, fire science degree, fire science instructor (retired)
- D.M.D., M.D., Ph.D.
- Dropped out of high school
- Extensive post-grad studies
- Half way through master’s program online
- I got to the 9\textsuperscript{th} grade, but did not finish
- JD, UO law school
- Masters in music
- Navy schools
- Nuclear medicine technology
- Post-master certification
- Quit high school to join the army
- Still in high school

Question 24: Do you own or rent your home? Other:

- 3 livable quarters, all separate
- 3,000 ft w/2 story garage
- Apartment (2)
- Apartment in single family home
- Retirement community
- Cracker box
- Farm (3)
- Farm w/outbuildings (2)
- Live with family
- Ranch (3)
- Ranch w/bunkhouses
- House
- Commercial property
- RV
- Travel trailer
Additional Comments

We received the following comments in response to the “Please feel free to provide any additional comments in the space provided” box at the end of the survey.

- You should be aware that I live in an apartment at Willamette View Retirement Community and preparedness is ever present in the general and overall planning in programs and printed word.
- Floods if all Columbia dams burst.
- Thanks for your interest in our community. U of O is positioned to use evidence-based science to evaluate/recommend/prioritize strategies to mitigate the disruptions of likely national disasters. Before acting, most citizens must be energized to prepare based upon credible & direct advice.
- Churches and schools are important for 1) comfort, 2) familiarity, 3) size for housing large groups, 4) willingness to be open for the public. I saw nothing suggesting the importance of churches.
- I thank God for your efforts to make us safe.
- 1) It would be very useful to discover locations of local community buildings that would provide emergency provisions. 2) Taking a quick seminar regarding emergency things-to-know.
- Income info should have NO effect on any questionnaire – there are stupid wealthy people and other very intelligent poor people, i.e. example – people running for elected offices – there sure are some “real sinners” out there!
- I feel there needs to be help for land owners to clear brush to prepare for wildfire in areas, also as land owners.
- The big earthquake is coming. Oregon must be ready.
- Building codes are too easy-going knowing that the sub-Cascadia fault line is waiting to happen. In other words, the prescriptive path for building is too lenient.
- My answers are based on the fact that I live in a disaster-free area, mostly.
- Due to my health and age I live in an assisted living facility.
- I neither trust nor rely on government for anything. I have ZERO confidence in the propaganda machine that is our current print and broadcast media. I trust only myself and my family. We will survive.
- I would not support any proposals for tax increases!
- Biggest threat is a major earthquake affecting the entire Pacific Northwest region. Public seems unaware of this threat from Cascadia Subduction Zone.
- I feel wildfire is by far the most problem in the Eastern Oregon area. Now that Ordnance is almost closed I would like to see “Oregon Emergency Management” set up to build fire guards now. It would put lots of people to work and we sure do need that and next summer is too late to start building them. We had lots of cleared areas many years ago. Now railroad and wheat farmers buy insurance and don’t have fire guards.
- As I and my family only moved to Oregon in January 2008 from the U.K. I am still not familiar with many of the situations referred to in this survey. I am sorry I cannot be more helpful.
- As a geologist in OR & WA, earthquakes are the biggest concern facing our area in the near future. Our infrastructure and non-reinforced structures will not withstand even a moderate subduction zone quake. Geologic history has shown repeated 9+
magnitude earthquakes, most recently in the 1600s. Government will cease to function without our bridges and roads. Serious effort needs to be dedicated to identifying vulnerable features and buildings.

- I applaud your efforts to improve and comply with disaster preparedness and its requirements.
- I own an adult foster home. I have emergency preparedness plan, maps, supplies, food, water, info on every single person in my home, and phone numbers of contacts in case of emergency. I and my staff are as prepared as anyone can be. A lot of survival depends on how quick you are at making decisions and right decisions under pressure. So have plans, practice procedures, and if it happens hopefully everyone reacts correctly based on practice.
- I lost faith in FEMA after Hurricane Katrina and in info given by top government officials (“duct tape”). But I think the government (Fed and local) should show leadership in these areas. Partnership with university may help with credibility. I also don’t trust the media to report it accurately enough. These days they often seem to oversimplify or over-sentimentalize.
- Don’t want to see implementation of disaster plans as reason to hire more government employees.
- Should ask type of social economic data for people 1) Do they work? 2) Do they work for a) emergency service, 2) critical infrastructure, 3) government, 4) disaster mitigation group, 5) school. 3) Do they have children? 4) Is there anyone in the household with disabilities? This will allow for more detailed trenching & more focus on community efforts.
- Due to cutbacks I’m not too confident Umatilla County can provide any realistic disaster plan or relief. Ensuring electrical utility service/restoration is most critical for disaster recovery in my area.
- Hope the time, effort, and expense of this survey results in information that will be used to plan for dealing with natural disasters. If not, this survey is a waste of time and expense.
- We have no school, hospital, or elder care facilities. Our daycare facilities are important. We have pre-school but no permanent site. Also, we did (5 to 6 years ago) have a county-wide power outage and I called everywhere to find fuel for stranded motorists – the only gas station in Sherman County that can still pump gas is the station (Texaco @ the time) at the east end of Rufus! Shaniko in Wasco County could not pump gas either. My husband is an EMT/firefighter and regional safety officer for ODOT. He will respond (either as ODOT or a volunteer) in the event of a natural disaster and I and extended family will do as he says if he’s able to communicate with me. More planning and preparedness would be good though so I know exactly what to do, how to do it, and when to do it! Thank you for your survey!
- It’s hard to relate to any natural disasters in our area as we’ve never had any real ones in my 80 years except strong winter storms. Our town is on a hill so is pretty immune to these.
- Thanks for doing this. My best to all in 2012.
- We would be interested in a disaster training – not via video or internet – from a line person.
• Several years ago I was involved in a severe dust storm traveling on I-84. In this dust storm a number of people were killed in highway accidents. It was really terrible. Since this time, not much, if anything, has been done to mitigate or regulate the high levels of agricultural tillage adjacent to the interstate highway. I would suspect that the agricultural operators along this highway receive significant federal subsidies. Why not regulate this?

• I never had understood why people develop in possible high risk areas such as on rivers or bluffs, and expect someone else to pay for loss. I am not for regulatory action or policies to prohibit owners from doing what they want, however, I do believe people should be responsible for their actions.

• FEMA is bungling and incompetent at best and looks like a criminal dirty tricks outfit. Not only did they fail @ New Orleans, they attacked people who did help. Recommend disbanding of FEMA, prosecute FEMA. They have much to answer for and have done no good. The kind of emergency they want is to attack people and put them in slave labor camps.

• I would like to recommend that at least once a year the counties should do a Practice run just in case there is a natural disaster. That way people won’t freak out and cause more problems if a disaster happens.

• Concern for seniors who retire in rural places. How will their residence be identified and cause more problems if a disaster happens.

• Education on preparedness is essential (widespread). Community preparedness is key – community involvement, truth about regional hazards would help people to prepare. Government cannot be relied on for truth. Media cannot be relied on for truth. Possibly very proactive community education workshops through fire, police, schools for the entire area. Some people’s emergency preparedness = a gun → they just take what they need by force instead of stocking up.

• We experience wildfires or a threat of one nearly every year. Our volunteer fire departments are a great comfort. They respond immediately and perform with unbelievable expertise.

• 1) We need more local first aid classes. 2) Posting notices in our Post Offices is a good way to communicate. 3) All of our local utilities need to be more involved in educating for disasters.

• Fuel (*e.g. dead wood) for wildfires in the forests is one of the main hazards in our area.

• We live in a remote area, in a canyon, crossing creeks, accessible from one direction only. We are extremely concerned about wildfire & flood due to our lack of accessibility. We have been instructed by a fire department visit how to make our area more fire safe.

• An earthquake near Spray would isolate (100-percent) the town from outside help or leaving for any reason. Surrounded by a lot of rock rims. One way in would be air!
• Good info, needs to be done. Good survey!
• Encouraging employers to train employees would be another outlet for learning. My employer, Mid Col Center for Living, has taken an upfront, prepared, and involved approach to emergency and/or disaster awareness. I think all employers should do the same. I have taken my training home & shared w/my family & friends it is comforting to know we are prepared.
• The time taken for a federal agency to act/react places much undue strain on those most affected. The recent Nehalam flooding and the FEMA antics were an embarrassment to the citizens of Vernonia & surrounding area.
• About 7-8 years ago I attended a Red Cross Preparedness meeting to deal with the possibility of a chemical depot leak and its effects on the populace. Fortunately, we never had to find out how the plan worked!
• Fish & wildlife don’t allow streams to be cleared to avoid flooding. Fish seem to be more important than people or property to them!! Not a good way to be.
• I live in a home for the elderly, about 100 people. I answered the questions about where I live.
• Some of the answers I gave are because I don’t trust the people who would ultimately make the decisions – especially environmentalists. I think some are not in the majority of our population to realize the basic needs. In other words, they go overboard and only have their opinion. Thank you.
• Organize acts, curb disobedience. Could result in serious consequences & would refute an organized response.
• Wildfire, wind, & ice storms are our biggest concern here. Maintaining the farming lifestyle is more important than preserving buildings. Saving farms leads to continued support of the community as farms continue to generate income.
• Education is much stronger than regulation because you can achieve voluntary action; nobody has resources to enforce regulations after they are written.
• I am very concerned about the long-term detrimental effects of extensive pesticide use in this area on the many orchards here and the cross-contamination with the drinking water, both municipal and even individual wells that are privately owned. I see what appears to be a statistically larger developmentally challenged population here and wonder if there is a connection to the extensive pesticide use and water runoff.
• Resources need to be developed, determined, and maintained by local neighborhoods and communities because in the event of a large disaster outside resources will more than likely be strapped or not available.
• I have worked in hospitals in nuclear medicine, s-ray, and radiation therapy for 38 years. Have been involved in nuclear medicine disaster preparedness in Arkansas and Oregon and gone through training for dirty bomb response. Worked at Mid-Columbia Medical Center in The Dalles, Oregon, for 22½ years.
• Thanks to those of you who are devoted to smart safety strategies. We do what we can, also.
• I feel that the emphasis should be on individual preparedness. Too many people feel that the government should & will be at their doorstep in an emergency. I feel that the information should be aimed at citizens.
• 1) Need community information as to where to assemble in a disaster. 2) Need education as to how to prepare as a public employee to help others. 3) Is a staging area in place for children and animals?

• Homeowners/buyers should be aware of potential risk, but government should not ensure again (e.g. flood) it.

• Our county/city has never held a meeting to inform the public of any disaster plan. I don’t even know where they have emergency shelter or supplies.

• Utilities, utilities, utilities.

• Thanks for the opportunity to participate in your survey.

• We do not have a hospital in our county. Roads and bridges are very important to reach a hospital if Air Link cannot fly. The John Day River floods often.

• We live in a secure community & have very few natural disasters and Mexicans help me out a lot!!

• With global climate change and natural disasters increasing in frequency and severity it is a good thing that you are undertaking this work! I became particularly frustrated while trying to honestly complete this survey, especially Questions 11 and 12 and almost threw it in the trash. Why? Lack of definitions, examples, explanations, implications of answers, etc. Some of the questions seemed to me could only be validly answered by someone fairly well versed in land use planning, disaster planning, and management. Please understand that I find almost all surveys of any type frustrating and I throw them away, however, I believe in what you are doing, so I am taking the time to offer my comments. The survey would probably have gotten a better feeling for citizen attitudes, ideas, and priorities and thus more accurate and meaningful results if there had been some type of introductory “white paper” document discussing the hazards and explaining the current principles of natural hazard mitigation and providing some of the information mentioned below.

Q1: Minimizes the import by framing it only in the personal context – “...have you or someone in your household directly experienced...” The questions should have started with “Which natural disasters have your county experienced in the last 4 years?” Q6: The “Other methods” seemed to actually be sources of the information, not ways of receiving information. Q11: “...regulatory approach to reducing risk, “...non-regulatory approaches.” Examples of regulations that might be used and examples of non-regulatory approaches would be helpful to know. “support policies to prohibit development in areas subject to natural hazards.” Private property? Public lands? Examples of such policies. Use of local tax dollars to reduce risks and losses from natural disasters – examples. Steps to safeguard the local economy following a disaster – examples. Q12: Protecting private property? By whom? How? Who pays? I cannot accurately answer this question without knowing the context. In a “white paper,” ODF’s wildfire impact/protection self-certification program for Forestland-Urban Interface Lots would be a great example. What does “enhancing the function of natural features” mean? Q11 and 12: Disclosure of natural hazard risks during real estate transactions – Who is to be the official body to make these risk determinations including the probabilities of such occurrences? Will insurance companies be able to use this information to “cherry pick” clients offering to insure some clients/properties, both public and private, and not others?

• We believe successful disaster management depends on people working together in specific local neighborhood groups rather than depending on community-wide
response by EMS. Help with organizing these groups on a community-wide scale is necessary.

• Thank you for bringing this to our attention. It lets us know what we need to be thinking about doing to prepare for a disaster.

• I received far more disaster info (i.e. hurricane) the few years I lived in Florida than I have ever received while living in Oregon.

• We have spent about $30,000 in the last two decades to flood-proof our residence. Our neighbors have paid/constructed similar amounts to control flood/debris flow problems!

• Because the questions were pretty general there was a need of more specific information (Q11). The survey was a good vehicle to have a discussion with our children and grandchildren. We did the survey at a family dinner.

• I do understand that government needs to be involved in mitigating/preventing natural disasters, but I also believe citizens and landowners have the same responsibility. I don’t believe tax dollars should be used to pay landowners when they buy property and it has potential disaster areas, i.e. building a house on an ocean beach.

• We live near the Columbia River and experience windstorms frequently throughout the year. More information about “severe windstorms” would be beneficial.

• There are several homes and properties not occupied or bank-owned in the area. This is a hazard as well since they’re not being maintained or kept up. These can be disasters waiting to happen. It’s frustrating when the bank won’t sell until prices are up.

• Wheeler County has a population of around 1200 – no radio, no newspaper! We have no way to communicate with residents in small communities that are 75 to 90 miles apart. Our officials are elderly and for the most part uneducated or unwilling to act on behalf of citizens. The best thing the U of O could do is provide us with a way to communicate. Cell towers, cable, radio stations, etc are all needed.

• I think people who live in cities are more likely to be unprepared. There is an assumption that the state, FEMA, or National Guard can take care of them. If the disaster is widespread this is not true. When a widespread disaster strikes, people have to rely upon themselves and assist others as possible. I’ve lived on a farm and in cities. Farm people know their neighbors. I believe community building and outreach are important aspects that are missing, especially in areas of population density. If a large disaster strikes Facebook & Twitter could go down – even if it doesn’t it does not substitute for knowing one’s immediate neighbors. We insulate ourselves – from neighbors and extreme possibilities.

• Both have had first aid training. One had CPR training, many hours of fire fighting. We have landscaped our property protecting in case of flooding.

• In the future you should define the “use of a regulatory approach.” I don’t think many “civilians” are familiar with the jargon. Jargon should be avoided when at all possible in public surveys.

• I feel people should be able to build where they want. However, if they choose to build in a natural disaster prone area and the natural disaster occurs, tax @ shouldn’t go to help them. They knew!
• Small towns such as Pendleton are home to many intelligent, flexible, and self-sufficient people who I am confident, once they learn to communicate better, will make the changes necessary to weather any storm.
• Would be very excited to attend informational meetings on this subject. We as a family are not prepared for a disaster. This makes you think about the issue.
• RE: #20 & 21. Hispanic is no more white than Indian. Why isn’t there a race for Hispanic? Just saying!
• In the event of a national disaster information on preparing for pets would also be appreciated.
• I want to thank all who are working with this organization. This survey has brought awareness to me and everyone around me that I have talked to about this matter. Thank you.
• As a small business owner I already filled out three sets of reports each year to BATF, Oregon Fire Marshall, and Fed DOT. Also pay $700-800 to file reports. Don’t need any more paperwork to fill out or fees to pay.
• The Sheriff’s Department employees do not understand or know local ordinances. Planning Commissions do not support environmental issues. All departments refuse to comply with ORS 192 preventing citizens from access to information.
• My husband and I took the time to fill out this questionnaire because we’ve been concerned about what would happen if we were to have a natural disaster occur in The Dalles-Hood River, Oregon area. To the best of our knowledge the two most devastating disasters that could occur in this area would be an earthquake and Mt. Hood could erupt. With the major fault line that we have in this area, along with the chance of Mt. Hood could erupt, we truly feel that the residents in this area have not been prepared properly for either of those disasters. If either of these were to occur, the entire area on both sides of the river would basically be shut off from the rest of the state on both sides of the Columbia River. We have been extremely fortunate for many years not to have incurred a disaster, but our day is coming. We truly feel that this area needs to be educated on what to do and where to go sometime in the near future, before it’s too late.
• Mostly I’m concerned with wildfire. We have two homes, paid for. One is in the urban interface in Washington State. I keep my property clear of brush and downed trees, but it is only a matter of time until the west burns given all the bug kill.
• Earthquake is my biggest fear of property damage and possible loss of live.
• Thanks for asking! Good luck with your results.
• No mention of housing & feeding of victims. Don’t wait for FEMA.
• See “Oregon At Risk” from OSSPAC.
• In future surveys, either allow “mixed” for race and ethnicity, or don’t ask. It makes a mixed-ethnicity person like me have to choose one parentage over another. As for race, in addition to inter-‘racial’ marriage, there is no biological/scientific basis for the term. Also, this should be literacy-adjusted. Many of the words would stump many people. This is a very high-literacy level survey. Is this being made available in Spanish?
• Oregon residents who are not accustomed to earthquakes really need to be educated. News media needs to stop acting like they want a serious natural disaster to occur in Oregon. Education needed for everyone if there is a big earthquake on the Cascadia Subduction Zone.
• This is a wonderful idea. I look forward to receiving info on how to plan for disasters.
• 1) Every household needs to know the current route of evacuation! Need to teach this in the schools. 2) Need fire extinguishers or garden hoses ready to go in case of indoor/outdoor fires (burn barrel ban!). 3) Our hazard in Maupin is the railroad & tanks that haul chemicals. The general public has not been informed of any siren system & evacuation route.
• I live in a three-story apartment building built in the late 60s. If there is an earthquake it will all come down and I am on the bottom level. Also, I lived through Hurricane Andrew in Florida so I know exactly what preparedness can do.
• I’m worried about unsafe trees falling on our house.
• 1) I believe we have two major threats – windstorms, resulting in downed trees, damaged buildings, etc. This can happen any year. It should be a foundation from which to build disaster preparedness. 2) The other threat is earthquake. When it finally does hit, it might be ugly – if we are practiced at one we will be better prepared for two.
• Police, fire, medical very important for us all. Thanks. Our gorge is most beautiful and loved by all. Recycling, peace, and harmony for all hopefully. Thanks.
• Sheriff’s offices were not listed. While similar, they perform a more demanding service in rural counties than police. In Wasco County they cover almost 3,000 miles as opposed to less than 10. They have responsibility for search and rescue, marine, forest, animal control functions, and jails in addition to law enforcement duties, all of which are critical in emergencies.
• I think people in rural areas are generally more prepared because they experience power outages (along with water loss) more often and have become more self-reliant. I don’t want a nanny state! We don’t need government doing more things for us. We need government doing less things to us.
• We do not trust FEMA for anything!
• For me, as a senior citizen, it would be helpful to get a brief written summary of what I should do in my area of town for listed emergencies. Evacuating is not an easily accomplished option for many of us as senior citizens. Would buses (school?) be a possibility? Pets?
• Have lived in earthquake-prone areas. Also high wind areas. Always have disaster kit at ready.
• I believe in less government regulation and I do not think there is tax money available to pay for some of the things implied here. Our county is almost broke and so is our state & federal government. People need to take more care of themselves and not depend on the government to do so.
• We are very concerned about wildfires in our area. We are surrounded by wooded acreage with a large electrical line and a natural gas line to the east of our property.
• This county couldn’t help anyone. They argue over everything. The government is in the way to progress. Red tape, no jobs, only stoppage from government. We had a diabetic visit who forgot their needles – no one had any available. Clinics or ambulance said it was not their job. In a disaster? Laughing out loud. You better look out for yourself if you visit here. Sheriff is 1 hour away. Better be packing a gun. Robbers get away with no consequences.
• I’m in a small town in Wheeler County. The need I see is how to care for these people in a natural disaster. In the rest of the state supplies of food would stop & they would come to this area. I think there should be stockpiles in each community.

• 1) Give homeowners more freedom to cut down very large trees near or around home, property, roads, infrastructures, etc. that they believe will cause major damage to these areas if trees should fall down from storms and/or natural or war acts. Permits and/or city requirements are to regulatory and leave dangerous trees in place. So please stop permits and regulations. We need to get these trees under control and away from private and public structures. 2) Every two to three days police, fire, and ambulance come down Hwy 43 in West Linn, Lake Oswego, etc. blaring their sirens. Could we have them train on highways outside city limits with sirens, and train in Hwy 43 with sirens off or maybe just once a month with them on. We don’t know if it is something serious that they are going to or just training. This is also causing major noise pollution and disturbance during sleep hours with animals barking and we won’t know when it is for real or not when something major happens such as disasters. Thank you so much.

• Might be a good idea to address special needs of rural landowners. These people have animals, livestock, and other features that may present unique circumstances in an emergency. Utilities are the primary asset I rely on, especially electricity which is important for heat, refrigeration, & well water. Earthquake or volcanic eruption is two major disasters I am concerned about that will have a major effect on Clackamas County. Special info, training, information, and survival kits would be valuable. Thanks for this opportunity!

• It is up to the owners of property to take care of themselves and their property, not the government. Neighbors and friends will take care of each other.

• As a survivor of an F-5 tornado in 1974 and then a blizzard in 1978 I strongly believe in disaster preparedness and possibly emergency exercises involving as many agencies as possible such as what Gary Brown did for Sioux City, Iowa, in 1989. They had an awesome response from police, fire, National Guard, volunteers, etc. resulting in lives saved after the crash of United 232. It would be great to have that kind of team ready to respond to any natural disaster!

• I don’t know where to find the information needed to do the things listed in the household preparedness section.

• Community meetings are always on Saturday and I work. Evenings would be better.

• Stop spending money on light rail and use it to fortify road and utility infrastructure.

• Newspapers could print stories/maps, etc. occasionally to help inform the public of regular procedures, possible problems, escape routes, and who would be first responders to different types of events. So at least the public would have a “rough” idea in place.

• One area of disaster mitigation could be the promotion of PVSolar to offer a backup plan for electrical power should our utility grid breakdown.

• There needs to be more workshops or disaster meetings.

• The Native American, disregarding spiritual beliefs & customs, has more common sense than any other race/ethnicity. The Native American has always respected, preserved, and taken care of the land. They (American/Native Indian) take only what they need and preserve/protect what they don’t need. The Native American is the best EPA ever. PUT THEM IN CHARGE OF ECOLOGY. They (Native Americans)
don’t rape the landscape. **ASK THEM!!!** Also, we need **less, not more**, federal government.

- We have very few instances of natural disasters. The worst have been freezing & destroying fruit trees and some destruction from high winds and dust.
- In Wasco County not enough information goes out to the public about preparedness programs. Can public access online a copy of programs?
- We had a large tree limb fall on cars and insurance wouldn’t pay for anything because they say it was a natural disaster. And there was a flood once because the dam was full and the man who opened the gates of the dam was gone. Do you consider this a natural disaster or negligence?
- We have chemical facilities here with ammonia and weed & bug killers (all poisons) – most in large tanks. A disaster could trigger a second disaster. These tanks are located on the edge of town at a higher elevation than 98-percent of the town. The natural drainage would be into the town proper.
- I am a Red Cross volunteer and trainer.
- Brochure mailings explaining utility shutoff, emergency kit contents, quantity of food (days) to have on hand, good places for family members to meet if separated & why, other issues regularly associated but not thought about during/concerning natural disasters. Have community information meetings made up of community citizens. If any of these exist make them more accessible/known about to community citizens. Thank you!
- In Wamic we are only concerned about flood because we are not allowed to clear the stream bed of three mile creek above and below town. We flood because the creek is forced to spread out because of overgrowth in the creek. The creek is dry for part of the year, yet we are not allowed to clean the creek. We flood only because of politics and nothing natural.
- Good idea – thank you for asking!
- I believe people should be advised on real estate documents if the home they are about to buy is built on an ancient landslide. As consumers we’d have no idea! I am shocked how few people carry earthquake insurance. To me, this is like a ticking time bomb situation like those who didn’t insure in Louisiana before Katrina hit. Wish we’d help people understand the **real** quake danger here!
- This is a great thing to do. As a small community, a natural disaster would devastate our town.
- Thank you!!! Would be interested in the results. Number 9 was a little confusing … human life is most important to me but in our rural area it is not likely to impact people.
- My experience is that my local fire department & U.S. Forest Service office had little/limited info readily available about fire prevention in small acreage residential zones in upland forest ecosystem. This should change with staff and related kits/packets of info easily accessible/no fee.
- Like the concept of personal preparedness for natural disasters, etc. Personal responsibility and gathering of info, etc. Don’t totally agree with government agencies mandating policies or spending money on things that should be individual responsibility, etc., i.e. government really does things half as good for twice the cost.
• I’m very concerned that our county’s grotesquely incompetent “planning” department could be involved in any activities that could affect safety or emergency response.
• Would like to know if there is a community facility where people can go if their homes are damaged (i.e. school gym, etc.).
• We have a wood stove in case electricity goes out. We have also strapped water heaters to walls & reinforced beams to floor joists with gussets. We have thinned out many tree limbs near house but still have more. Attending a meeting and receiving written info on preparedness would be very helpful.
Appendix F:
Grant Programs

Hazard Mitigation Programs

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.
- Physical Disaster Loan Program
  - 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.

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.
- 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.

- http://www.fema.gov/government/grant/fma/index.shtm

Detailed program and application information for federal post-disaster and pre-disaster programs can be found in the FY10 Hazard Mitigation Assistance Unified Guidance, available at http://www.fema.gov/library/viewRecord.do?id=3649


OEM contact: Dennis Sigrist, dsigrist@oem.state.or.us

State Programs
- 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 Hazard 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.
  - http://www hud.gov/offices/cpd/communitydevelopment/programs/

- 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.
  - http://www.oweb.state.or.us/

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&org=SES

Hazard ID and Mapping

- 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/

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. http://coastalmanagement.noaa.gov/
- Community Development Block Grant Entitlement Communities Program, HUD. 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://www.hud.gov/offices/cpd/communitydevelopment/programs/entitlement/
- Assistance to Firefighters Grant Program, FEMA. 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.firegrantsupport.com/
- 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. http://www.nrcs.usda.gov/programs/EWP/

• **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. [http://www.fema.gov/government/grant/pa/index.shtm](http://www.fema.gov/government/grant/pa/index.shtm)

• **National Flood Insurance Program**, FEMA. Makes available flood insurance to residents of communities that adopt and enforce minimum floodplain management requirements. [http://www.fema.gov/business/nfip/](http://www.fema.gov/business/nfip/)


• **Emergency Management Performance Grants**, FEMA. Helps state and local governments to sustain and enhance their all-hazards emergency management programs. [http://www.fema.gov/government/grant/empg/index.shtm#0](http://www.fema.gov/government/grant/empg/index.shtm#0)


• **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/flip/flip_questions.html](http://www.nps.gov/ncrc/programs/flip/flip_questions.html)

• **Wetlands Reserve program**, USDA-NCRS. Financial and technical assistance to protect and restore wetlands through easements and restoration agreements. [http://www.nrcs.usda.gov/Programs/WRP/](http://www.nrcs.usda.gov/Programs/WRP/)

• **Secure Rural Schools and Community Self-Determination Act of 2000**, US Forest Service. Reauthorized for FY2008-2011, 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.fed.us/srs/](http://www.fs.fed.us/srs/)