



# Sherman County

## Multi-Jurisdictional Natural Hazards Mitigation Plan

Prepared for: Sherman County, Grass Valley, Moro, Rufus, and Wasco



# **Sherman County**

## Natural Hazards Mitigation Plan

### **Report for:**

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Department  
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# Special Thanks & Acknowledgements

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- 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

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- Shawn Payne, Sherman County Emergency Services Director

This Natural Hazard Mitigation Plan was developed through a regional partnership funded by the Federal Emergency Management Agency's Pre-Disaster Mitigation Competitive Grant Program. The Southeast Oregon Region grant was awarded to support the development of natural hazard mitigation plans for the region. The region's planning process utilized a four-phased planning process, plan templates and plan development support provided by the Oregon Natural Hazards Workgroup at the University of Oregon's Community Service Center.

Regional partners include:

- Federal Emergency Management Agency Region 10;
- Oregon Emergency Management;
- Oregon Department of Geology and Mineral Industries;
- Oregon Natural Hazards Workgroup at the University of Oregon's Community Service Center;
- Resource Assistance for Rural Environments at the University of Oregon's Community Service Center;

- Gilliam County;
- Hood River County;
- Morrow County,
- Umatilla County,
- Wasco County, and
- Wheeler County.

**Geographic Information Systems (GIS) Maps:**

All maps in this plan were developed by Oregon Department of Geology and Mineral Industries (DOGAMI) as part of the regional partnership.

**Sherman County  
Natural Hazards Mitigation Plan**

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# Executive Summary

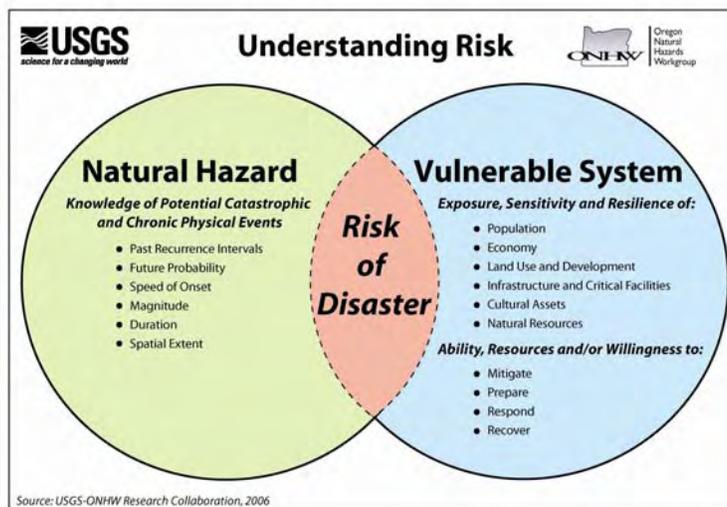
Sherman County developed this Natural Hazard Mitigation Plan in an effort to reduce future loss of life and property resulting from natural disasters. It is impossible to predict exactly when these disasters will occur, or the extent to which they will affect the community. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from natural disasters.

Natural hazard mitigation is defined as 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 individuals, private businesses and industries, state and local governments, and the federal government.

## Why Develop this Mitigation Plan?

This natural hazard mitigation plan is intended to assist Sherman County reduce the risk from natural hazards by identifying resources, information, and strategies for risk reduction. It will also help guide and coordinate mitigation activities throughout the community. The figure below is utilized throughout the plan to illustrate the concept of risk reduction.

**Figure i.1 Understanding Risk**



Source: Oregon Natural Hazards Workgroup, 2006

A natural hazard mitigation plan can assist the community to understand what puts the community at risk. When a community can identify and understand the relationship between the natural hazards it faces, its vulnerable systems, and its existing capacity, it becomes better equipped to identify and implement actions aimed at reducing the community's overall risk to natural hazards.

## Who Participated in Developing the Plan?

In Fall 2005, the Oregon Natural Hazards Workgroup (ONHW) 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 four counties in the region. ONHW, DOGAMI and the communities were awarded the grant in the Fall of 2005 and local planning efforts began quickly thereafter.

Sherman County Natural Hazard Mitigation Plan is the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector and regional organizations. A project steering committee guided the process of developing the plan. The steering committee was comprised of representatives from the following organizations.

- Wheeler County Judge
- City of Fossil Fire Chief
- County Commissioner
- City of Mitchell
- City of Spray Fire Department
- Twickenham Volunteer Fire
- Wheeler County Road Master
- ODOT Supervisor
- Wheeler County Sheriff, & Emergency Management
- Wheeler County Emergency Services

The Sherman County Court and Emergency Management Department were designated as the plan's co-convenor 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. The County's project webpage, located on the Partners for Disaster Resistance & Resilience website, will serve as an outreach tool to the

community. As part of the regional PDM grant, ONHW implemented a region wide household preparedness survey.

## What are the Plan Goals?

The plan goals describe the overall direction that Sherman County agencies, organizations, and citizens can take toward mitigating risk from natural hazards.

- Ability to respond effectively and swiftly
- Safety of life and property
- Increased cooperation and collaboration between groups and agencies

## How are the Action Items Organized?

The action items are organized within an action matrix (located at the end of this Summary), which lists all the multi-hazard and hazard-specific action items included in the mitigation plan. Data collection and research and the public participation process resulted in the development of these action items. The Action Item Matrix portrays the overall plan framework and identifies linkages between the plan goals, and actions. The matrix documents a description of the action, the coordinating organization, timeline, and the plan goals addressed.

- **Coordinating Organization:** The coordinating organization is the public agency with 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 Partners:** Internal partner organizations are departments within the community that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.
- **External Partners:** External Partner organizations can assist the community 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.

The internal and external partner organizations listed in the mitigation plan are potential partners recommended by the project steering committee, but who were not necessarily contacted during the development of the plan. Partner organizations should be contacted by the coordinating organization to establish commitment of time and or resources to action items.

- **Timeline:** Action items include both short-term and long-term activities. Each action item includes an estimate of the timeline for implementation. *Short-term action items (ST)* are activities which city agencies are capable of implementing with existing

resources and authorities within one to two years. *Long-term action items (LT)* may require new or additional resources or authorities, and may take between one and five years to implement.

- **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 the implementation.

## How will the plan be implemented?

The plan maintenance section of this document details the formal process that will ensure that the Sherman County Natural Hazards Mitigation Plan remains an active and relevant document. 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 community will integrate public participation throughout the plan maintenance process. Finally, this section intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms such as the Comprehensive Plan, Capital Improvement Plans, and Building Codes outlined in the Development Code.

### Plan Adoption

After the Plan is locally reviewed and deemed complete, Sherman County Emergency Management Services will be responsible for submitting it to the State Hazard Mitigation Officer at Oregon Emergency Management. Oregon Emergency Management will then submit the Plan 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. 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 and the Hazard Mitigation Grant Program.

The accomplishment of the Natural Hazards Mitigation Plan goals and actions depends upon the maintenance of a competent Steering Committee and adequate support from the county 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.<sup>i</sup>

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<sup>i</sup> Based on the City of Beaverton's Promulgation Statement for plan adoption.

# Section 1

## Introduction

### Why Develop a Mitigation Plan?

Sherman County developed this Natural Hazards Mitigation Plan in an effort to reduce future loss of life and property resulting from natural disasters. This plan includes Sherman County as well as the cities of Grass Valley, Moro, Rufus, and Wasco. The four incorporated cities in Sherman County 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, the actions identified in this plan are considered multi-jurisdictional actions because they benefit both the County and all the participating cities.

It is impossible to predict exactly when these disasters will occur, or the extent to which they will affect the County. 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 disasters.

A natural disaster occurs when a natural hazard impacts people or property and creates adverse conditions within a community. This plan focuses on the primary natural hazards that could affect Sherman County, Oregon, which include drought, seismic, wildfires, floods, landslides, volcano activity, windstorms, and winter storms. The dramatic increase of the costs associated with natural disasters over the past decades has fostered interest in identifying and implementing effective means of reducing vulnerability. This Natural Hazards Mitigation Plan is intended to assist Sherman County in reducing its risk from natural hazards by identifying resources, information, and strategies for risk reduction.

The plan is non-regulatory in nature, meaning that it does not set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public in the County; (2) identification and prioritization of future mitigation activities; and (3) assistance in meeting federal planning requirements and qualifying for assistance programs. The mitigation plan works in conjunction with other County plans and programs including the Emergency Operations and Response Plan, Transportation Plan, Comprehensive Land Use Plan, County Road Improvement Plan, Lower John Day Partnership Plan, County Plan, U.S. Department of Agriculture Plan, City Hazard Assessment and Response Plans, and Water Shed Council Plans, as well as the State of Oregon Natural Hazards Mitigation Plan.

The plan provides a set of actions to prepare for and reduce the risks posed by natural hazards through education and outreach programs; the development of partnerships; implementation of preventative

activities such as land use or watershed management programs; the removal, reduction, or containment of risk factors; and better preparation for a quick response to disasters should they occur in the county. The actions described in the plan are intended to be implemented through existing plans and programs within the County whenever possible when funding is not a factor. If funding is a factor in the implementation of the actions described, then funding will need to be explored and acquired.

## **What is Natural Hazard Mitigation?**

Natural hazard mitigation is defined as permanently reducing or alleviating the loss of life, property, and injuries resulting from natural hazards through long and short-term strategies. Example strategies include planning, policy changes, programs, projects, and other activities. Mitigation is the responsibility of individuals, private businesses and industries, state and local governments, and the federal government.<sup>i</sup>

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 term communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

## **Policy Framework for Natural Hazards 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 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 County's Comprehensive Plan, and helps the County 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 federal levels. Some of the key agencies in this area include Oregon Emergency Management (OEM), Oregon Building Codes Division (BCD), Oregon Department of Forestry

(ODF), Oregon Department of Geology and Mineral Industries (DOGAMI), and the Department of Land Conservation and Development (DLCD).

The Disaster Mitigation Act of 2000 (DMA 2000) is the latest federal legislation addressing mitigation planning. The legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. As such, this Act established a pre-disaster hazard mitigation 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. States and local communities 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.

## How was the Plan Developed?

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.<sup>ii</sup> 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.

The following is a summary of major activities included in the planning process.

### **Step 1: Organizing to Prepare the Plan**

In Sherman County the Emergency Management Director 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 Management Director was responsible for notifying the steering committee members when, where, and what time meetings would be held.

The Emergency Management Director, along with the contractor, attended the fall training workshop in The Dalles on October 12<sup>th</sup> and 13<sup>th</sup> 2005.

A Steering Committee was formed to assist in developing the plan. The committee includes:

- 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 Management Director, Shawn Payne

## Step 2: Involving the Community

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
- Sherman County Health District
- Sherman County Emergency Management

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**

- Sherman County Health District

The sixth meeting of the Sherman County Steering Committee and stakeholders was held on November 27, 2007 in Moro. The following Steering Committee members and stakeholders attended:

### **Steering Committee**

- Sherman County Road Department
- City of Grass Valley
- City of Rufus
- Sherman County Planning
- Sherman County Judge
- Sherman County Emergency Management
- Sherman County EMS

## Stakeholders

- Bureau of Land Management
- Oregon Department of Transportation

The County's project webpage, located on the Partners for Disaster Resistance & Resilience website, will serve as an outreach tool to the community. The webpage will be used to provide local contact information and updates on the planning process and will also be used to post draft sections of the plan. Posting draft plan sections will provide the public with 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 in developing 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.

## Step 3: Describing the Community

The County developed a community profile in an effort to gain a better understanding of the community assets that might be at risk from natural hazards.

The Sherman County community profile was created by utilizing data from the Regional Profile, State Plan, and appropriately through onset visits and discussions with the Sherman County Steering Committee and stakeholders within and outside the county. There was some data updating from what was in the Regional Plan of two areas involving future hazards risk probability ratings which they feel strongly need to be rated at a higher level.

## Step 4: Identifying and Characterizing the Hazards Impacting the Community

The top and most likely hazards for Sherman County are droughts, landslides/debris flows, floods, wildfire, windstorms, and winter storms.

Large earthquakes or volcanic events are possible threats to Sherman County, but are not a sizeable threat.

Identification of the hazards was done through the use of the State Technical Resource guide and NHMP Risk Assessment, local data from the Steering Committee and Stakeholders, DOGAMI, The Oregon Weather Book, The National Climatic Data Center, the OEM State Natural Hazard Mitigation Plan of 2003 and FEMA Gov. News.

Once the data was gathered it was then plotted on a county map by the steering committee and stakeholders in two separate meetings.

During the second steering committee meeting, each member identified the community assets and functions and those were also added to the county map.

Once all the information is compiled and place on the map it then will be transferred to a permanent map for planning purposes and for use during any natural hazard event.

### **Step 5: Developing Plan Goals**

Because the three smallest Counties in the State have the same needs and limited resources, both financial and human, they developed their plans around a regional concept. They carried this throughout their plans, including the development of goals. As you read through their plans you will see the similarities.

The Action plan goals were developed in Sherman County by the Steering Committee and Stakeholders. The steering committee met a total of 6 times with the consultant to develop the plan. The stakeholders had a formal meeting and then as they could attend the steering committee meetings.

### **Step 6: Developing Solutions**

The Action Plans for each of the hazards were developed by the Stakeholders and Steering Committee. Again, a Regional approach of the three counties (Gilliam, Sherman, and Wheeler) was used to focus on solutions or action items for each hazard. After the goals were established for the plan, objectives were identified, strategies were established, and priority actions identified.

### **Step 7: Setting the Plan in Motion:**

The County Court and Sherman County Emergency Management shall serve as conveners of this plan. The NHMP Steering Committee, which guided the development of this plan, shall also serve as the coordinating body to ensure implementation of the mitigation plan.

## **How is the Plan Organized?**

Each section of the mitigation plan provides specific information and resources to assist readers in understanding the hazard-specific issues facing Sherman County citizens, businesses, and the environment. Combined, the sections work together to create a mitigation plan that

further the community's mission to produce a mitigation plan which is useable both in size and content, and coordinates as well as compliments other plans within the county to reduce risks and prevent loss from future natural hazard events. This plan structure enables stakeholders to use the section(s) of interest to them.

### **Section 1: Introduction**

The Introduction briefly describes the County's mitigation planning efforts and the methodology used to develop the plan. It also includes information about the steering committee's role, and how stakeholders provided input.

### **Section 2: Community Profile**

The Community Profile briefly describes the County in terms of demographic, economic, and development trends as well as geography, environment, housing, and transportation. The Community Profile also documents existing plans, policies, and programs as well as completed mitigation activities.

### **Section 3: Risk Assessment Summary**

This section describes the risk assessment process and summarizes the best available local hazard data. It is organized according to the federal requirements for a risk assessment: hazard identification, profiling hazard events, and vulnerability assessment/inventorying assets.

### **Section 4: Mitigation Plan Goals and Action Items**

This describes the plan components that guide implementation of the identified mitigation strategies. This section also documents the plan vision, mission, goals, objectives, and actions.

### **Section 5: Plan Maintenance**

This section provides information on the implementation and maintenance of the plan. It describes the process for prioritizing projects, and includes a suggested list of tasks for updating the plan to be completed at the annual and 5-Year review meetings.

## **Plan Annexes**

The plan includes several annexes, including:

- Annex I – Identifying & Assessment of Communities at Risk in Oregon
- Annex II – Map of County Assets, Facilities, Infrastructure and Public Buildings Identified as Critical Facilities
- Annex III - Resolutions

## **Resources Appendices**

The resources appendices are designed to provide users of the Sherman County 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.

## **A - Resource Directory**

This appendix describes the various local, regional, state and federal resources available for each of the hazards addressed in the plan.

## **B - Steering Committee and Public Meetings**

This appendix describes the various agendas, minutes and sign-in sheets from the Steering Committee meetings held during the planning process.

## **C - Regional Household Preparedness Survey**

This appendix includes the survey instrument and results from the household preparedness survey implemented by ONHW throughout the region. 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.

## **D – Regional Profile**

This report was developed by the Community Service Center's Oregon Natural Hazards Workgroup at the University of Oregon. This report serves as the nexus between the State Natural Hazard Mitigation Plan and local plans. A component of the State Plan, the report is utilized by local communities to identify specific issues locally and to develop potential action items. Communities review and update the data in the report based on their best available local data. The updates are then incorporated into the State Plan, creating a state level plan that is built upon information and data from the local level. Using the best available data, the regional profile includes a Demographic Profile that discusses the population in the region, an Infrastructure Profile that addresses the region's critical facilities and systems of transportation and power transmission, and an Economic Profile that discusses the scale and scope of the regional economy with a focus on the key industries. In addition to describing characteristics and trends, each profile section identifies the traits that indicate sensitivity to natural hazards.

This report also includes the regional risk assessment that describes historical impacts, general location, extent, and severity of past natural hazard events as well as the probability of future events. This information is aggregated at the regional level and provides counties with a baseline understanding of past and potential natural hazards.

These assessments were based on best available data from various state agencies related to historical events, repetitive losses, county hazard analysis rankings, and general development trends. The risk assessment was written in 2003 by the Community Service Center's Oregon Natural Hazards Workgroup at the University of Oregon as part of the State Natural Hazards Mitigation Plan.

## **E - Economic Analysis of Natural Hazard 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.

#### **F – Existing Plans and Policies and Organizations**

This appendix identifies the existing plans and policies the County and cities have in place to assist in implementing the mitigation strategies identified in the plan. It also identifies existing community organizations that might serve as partners to implement mitigation actions.

#### **G – Open For Business**

This appendix documents the Institute for Business & Home Safety's Open for Business trainings that were held in conjunction with the regional planning effort.

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<sup>i</sup> Massachusetts Department of Environmental Management. 1999. "Hazard Mitigation: Managing Risks, Lowering Costs.

<http://www.state.ma.us/dem/programs/mitigate/whatis.htm> Accessed 8/2/02

<sup>ii</sup> More information on the Oregon Natural Hazards Workgroup can be found at <http://darkwing.uoregon.edu/~onhw>

# Section 2

## Community Profile

This section provides information on the characteristics of Sherman County in terms of demographic, economic, and development trends as well as geography and environment, and housing and transportation. Many of these community characteristics can affect how natural hazards impact communities, and can affect how communities choose to plan for natural hazard mitigation. Considering these characteristics during the planning process can assist in identifying appropriate measures for natural hazard mitigation.

### Geography and Climate

Major rivers in Sherman County include the Columbia River, the John Day River, and the Deschutes River. The Columbia River in Sherman County runs along Interstate 84 in the Columbia Gorge. The John Day River divides Sherman and Gilliam Counties. The Deschutes River divides Sherman and Wasco Counties.

Sherman County is located in the Mid-Columbia Region and has a land mass of 831 square miles.

All of Sherman County is located in what is known as Climate Division 6 (North Central Oregon) which was established by the National Climatic Data Center. The Division 6 Climate Zone is characterized by being relative dry in the portions east of the Cascade Mountains. The region extends from the Columbia River southward over hill country of the forested mountain areas, which border climate zone. The Columbia River is used for irrigation, transportation, and hydroelectric power and dominates the area.

Most of the precipitation received in Sherman County is during the winter months. The months of November through February generally see the most precipitation from winter storms. The precipitation is in the form of rain in the lower elevations and snow in the higher ridges and peaks. Heavy showers can be found in the summer months from thunderstorms. At one end of the county Moro receives an annual rainfall of 11.43 inches, while Kent at the south end receives nearly 13 inches.<sup>i</sup>

Biggs and Rufus sit in the Columbia Gorge and therefore are susceptible to high winds which are quite common. The majority of summer winds come from the west, while winter winds can come from either the west or east and can be strong enough to cause damage. Extremely cold conditions can be felt throughout Sherman County during the winter months when a large easterly flow of air brings in cold continental air.<sup>ii</sup>

The hottest months are generally July and August with the average temperature ranging between 81 and 82 degrees. The extreme can be 106 degrees. The coldest months are generally January and December. The average winter temperature ranges 24 to 25 degrees. The average snowfall annually is 19.0 to 19.8 inches.<sup>iii</sup>

All of the soils in Sherman County are what is known as Mollisols.

The Mollisols are characterized as soils formed mainly in association with grassland vegetation and have relatively thick dark surface horizons rich in organic matter. Under the organic matter there are subsoils which are either weakly developed or enriched in clay or carbonates.<sup>iv</sup>

## Population and Demographics

The impact in terms of loss and the ability to recover vary among population groups following a disaster. Historically, 80% of the disaster burden falls on the public. Of this number, a disproportionate burden is placed upon special needs groups, particularly minorities and the poor.

The population of Sherman County is 1,827 and it has an average of 2 people per square mile. While the state of Oregon as a whole has grown 4% from 2000 to 2006, this area has declined by 6.6% for the same time period. There are 4 incorporated communities, Rufus, Wasco, Moro, and Grass Valley, and 2 unincorporated, Biggs and Kent.<sup>v</sup>

The ethnic background of Sherman County is:

Two or more races and Asian – 1.6%

Other – 2.8%

Hispanic – 4.9%

Caucasian – 93.6%<sup>vi</sup>

Over 49% of the population is female and 26% of the population is under 18. The unemployment rate is averaging 11% and 15% of families below the federal poverty level guidelines. In a typical month 19% of all children receive assistance through food stamps. In Sherman County 28% of the children do not have health insurance coverage. Sherman County is one of three counties in the State of Oregon which have the largest population of uninsured children. The other two counties are Gilliam and Wheeler. Babies born to mothers with a high school education averages 20%. Children who live in households with at least one parent working is 94% in Sherman County.<sup>vii</sup>

There is a lack of comprehensive medical care in Sherman County. There is no hospital. The nearest hospital is located in The Dalles. There is a part-time medical clinic in Moro. The Mid-Columbia Center for Living provides mental health services. The Wasco-Sherman Public Health Department provides public health services.

The split of females to males in Sherman County is almost exactly the same. The males edge out the females just slightly with 50.7% to 49.3%.

The median age is 41.8 years. A breakout by age shows 79% of the population is under the age of 62 and 21% is over 62.<sup>viii</sup>

Out of the total population of 1900 in individuals between the ages of 5 to 20 there are 26 who have a disability out of 456; in individuals between the ages of 21 and 64 there are 169 with a disability out of 1,029; and individuals between the ages of 65 and over there are 114 out of 350.<sup>ix</sup>

## Employment and Economics

Sherman County has an economy based on agriculture, cattle, tourism, and wind power. It is nestled in the heart of the Columbia Plateau and wheat is the main crop. With the addition of wind turbines, area land owners are able to capitalize on this natural resource, which once seemed to be a mere nuisance. The three rivers in the county provide for tourism.

There are approximately 892 people in the labor force in the population over 16 years old in Sherman County, of which 728 are in non-agricultural based occupations. The per capita median personal annual income is \$17,448. The family median income is \$42,562. Of the 892 workers over age 16, 809 commute to work. Private wage and salary workers make up the largest class of worker with 435. Government workers is next with 221 and self-employed workers in their own non-incorporated businesses is 171. The leading industry is agriculture and the leading occupational category is management, professional, and related occupations.<sup>x</sup>

Sherman County continues to run an unemployment rate of between 11% and 15%. It is also listed as a severely distressed county by the Oregon Economic & Community Development Department.<sup>xi</sup>

## Housing in Sherman County

Housing development types and year-built dates are important factors in mitigation planning. Certain housing types tend to be less disaster resistant and warrant special attention; mobile homes, for example, are generally more prone to wind and water damage than standard stick-built homes. Generally, the older the home the greater the risk of damage from natural disasters. This is because stricter building codes have been developed following improved scientific understanding of plate tectonics and earthquake risk. For example, structures built after the late 1960s in the Northwest and California use earthquake resistant designs and construction techniques. In addition, FEMA began assisting communities with floodplain mapping during the 1970s, and communities developed ordinances that required homes in the floodplain to be elevated to one foot above Base Flood Elevation. Housing characteristics for Sherman County are provided in the tables below.

There are a total of 935 housing units in Sherman County of which 593 are one unit detached housing. There are 282 manufactured home units

in the county. The rest of the housing units are one unit attached all the way up to 20 or more units attached. Three-hundred and twenty-eight were built in 1939 or earlier. One-hundred and fifty-five were built between 1940 and 1959. One-hundred and three were built between 1960 and 1969 and one-hundred and eighty-five were built between 1970 and 1979. One-hundred and thirty-eight have four rooms; one-hundred and ninety-three of the structures have five rooms; one-hundred and eighty-one have six rooms; and one-hundred and twelve have nine or more.<sup>xii</sup>

The majority of the occupied housing units heat with electricity, followed by fuel oil or kerosene.<sup>xiii</sup>

The value of the majority owner occupied units runs between \$50,000 and \$99,999 with the number of them being 151; the next highest is under \$50,000 with there being 59 units. The median value is \$77,400.<sup>xiv</sup>

## Land and Development

In Moro a retirement center was built and in the Klondike area Phase I and II of the wind turbines to harness the natural resource of wind for power have been completed.

At this time there are no other known residential or commercial developments planned in Sherman County. In 2002 there were only 4 residential construction building permits issued.<sup>xv</sup>

Sherman County has a certified industrial site.<sup>xvi</sup>

## Transportation and Commuting Patterns

Sherman County has three major arterial roads in the county. The largest road and most heavily traveled is Interstate 84, also known as Hwy 2, which runs along the Columbia River. Rufus and Biggs are located along I-84 /Hwy 2. Route 206, also known as Hwy 300, connects Condon to Wasco. The third arterial road is Hwy 97 which connects Biggs to Wasco, Grass Valley, Moro and Kent.

Winter storms, debris flows, falling rocks, and flooding are some of the causes of these roads becoming impassable.

There are 132 workers involved with the transportation industry, as well as moving materials and individuals.<sup>xvii</sup>

The mode of transportation for county residents is private vehicle with the exception of special transportation vehicles to take the elderly and disabled to other cities for shopping and medical appointments.

There is a commercial transportation company which contracts with area schools to provide transportation to students and for charter services.<sup>xviii</sup>

The community of Wasco has a state airport which serves Wasco and all of Sherman County. It is owned by the Oregon Aeronautics Division.

The paved runway extends for 3,450 feet. There are no passenger or freight services by air.<sup>xix</sup>

There are 92 bridges in Sherman County. Most of the bridges have not been seismically retrofitted, creating a risk to those in the area who must commute over them. Eighty-one of the bridges are owned by the State Highway, ten are owned by the county, and one is owned by a city/municipality.<sup>xx</sup>

## Critical Facilities and Infrastructure

Critical facilities are those that support government and first responders' ability to take action in an emergency. They are a top priority in any comprehensive hazard mitigation plan. Individual communities should inventory their critical facilities to include locally designated shelters and other essential assets, such as fire stations, and water and waste treatment facilities. For more information on critical facilities and infrastructure, see Annex II.

There are four incorporated cities in Sherman County: Rufus, Wasco, Moro, and Grass Valley. Each of these communities has their own fire and rescue stations, and water and waste facilities. There is one school district plus the North Central Education Service District and one law enforcement agency stationed in the county, the Sherman County Sheriff's Office.

There is one major dam located on the Columbia River in Sherman County – the John Day Dam which is listed as having a high threat potential.<sup>xxi</sup>

Other infrastructure items are different for each community:

1) Grass Valley – ambulance service, clinic, and Air Life coverage; Sprint and AT&T telephone service; cable television service; the water source is ground water and the water system was installed in 1954. It was upgraded through a \$750,000 grant from OECDD; recently awarded a \$415,000 grant from USDA to upgrade the waste system; Grass Valley has individual septic tanks for waste water; they have propane through Cascade Propane in The Dalles and their electricity is provided by Pacific Power and Light; they do not have any community air service; there is no rail, freight, passenger, or marine service.<sup>xxii</sup>

2) Moro – ambulance service, clinic, and Air Life coverage; Sprint and AT&T telephone service; cable television service; the water source is ground water and the water system was installed in 1931. They have a new well which was upgraded in 2003. Moro has a new wastewater system; they have propane providers; electricity is from Pacific Power and Light; there is no community airport service; there is no rail, freight, passenger, or bus service.<sup>xxiii</sup>

3) Rufus – ambulance service and Air Life coverage; Sprint telephone and AT&T telephone service; no cable television service; they have a local internet service provider; their water source is ground water and their water system was upgraded in 2001; the wastewater

collection system was installed in 1974 and the City of Rufus is currently working to upgrade the sewage treatment plant and ponds as the system is at maximum capacity; they have propane providers; electricity is provided by Pacific Power and Light and Wasco Electric; there is no community airport service; there is no marine, rail, freight, or passenger service; Rufus has bus transportation through Greyhound Bus Company; they have scheduled freight carrier service through CSU Trucking.<sup>xxiv</sup>

4) Wasco – ambulance service, clinic, and Air Life coverage; they have cable television through J & N Cable and T.V. stations provided by Goldendale cable company; telephone service is provided by Sprint and AT&T; Wasco has three internet service providers; the water supply comes from ground water; the wastewater collection system was built in 1991 and has been upgraded; Pacific Power and Light supplies electricity, but there are no natural gas providers; Wasco has an airport; however, there are no marine, passenger, or freight services; there is no passenger bus or rail service.<sup>xxv</sup>

## Historic and Cultural Resources

Historic and cultural resources such as historic structures and landmarks can help to define a community and may also be sources of tourism dollars. Because of their role in defining and supporting the community, protecting these resources from the impact of disasters is important.

Sherman County was established in 1889 from the northeast corner of Wasco County and was named for General William Tecumseh Sherman. The county was settled in the 1870's by stockmen and by 1881 the homesteaders arrived. Since then, the county has been a wheat-growing area. The county is known for its canyons and rivers. The County Courthouse was built in Moro in 1899.<sup>xxvi</sup>

The Sherman County Historical Museum and Wall of History in the City Park are located in the city of Moro. Two buildings in Moro are listed on the National Register of Historical Places. The two listed are the John and Helen Moore House and the Sherman County Courthouse. Two other locations in Sherman are also listed on the National Register of Historical Places. The first is the Columbia Southern Railroad Passenger Station and Freight Warehouse in Wasco and the other is the Mack's Canyon Archeological Site in Grass Valley.<sup>xxvii</sup>

DeMoss Springs Memorial Park just north of Moro on Highway 97, marks the location of the traveling musical DeMoss family's 1880 town site. The park was once lined with streets named after poets and composers.

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<sup>i</sup> OSU's Oregon Climate Service

<sup>ii</sup> OSU's Oregon Climate Service

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- iii OSU's Oregon Climate Service
  - iv The Oregon Atlas
  - v Center for Population Research and Census, Portland State University
  - vi Center for Population Research and Census, Portland State University
  - vii Status of Oregon's Children County Data Book
  - viii U.S. Census Bureau
  - ix U.S. Census Bureau
  - x Oregon Economic & Community Development; U.S. Census Bureau
  - xi Oregon Economic & Community Development; U.S. Census Bureau
  - xii U.S. Census Bureau
  - xiii U.S. Census Bureau
  - xiv U.S. Census Bureau
  - xv Oregon Economic and Community Development
  - xvi Sherman County Steering Committee
  - xvii U.S. Census Bureau
  - xviii U.S. Census Bureau
  - xix Sherman County Website
  - xx Oregon Department of Transportation
  - xxi ONHW –State Resource Book - Source: Local Sheriff's office and the National Inventory of Dams
  - xxii Oregon Department of Economic and Community Development
  - xxiii Oregon Department of Economic and Community Development
  - xxiv Oregon Department of Economic and Community Development
  - xxv Oregon Department of Economic and Community Development
  - xxvi Sherman County Website
  - xxvii Sherman County Website; National Register of Historical Places

# Section 3

## Local Risk Assessment Summary

An important component of the Sherman County Natural Hazards Mitigation Plan is the risk assessment. The purpose of this section is to define the risk assessment process and to summarize the risk assessment findings for each hazard available at the local level.

The natural hazards addressed in this plan include: drought, earthquakes, floods, landslides/debris flows, volcanic events, wildfires, windstorms, and winter storms.

### What is a Risk Assessment?

The risk assessment process is used to identify and evaluate the impact of natural hazards on the human-built environment, businesses, social structure and services, and the natural environment of a community. Risk assessments provide information about the areas where the hazards may occur, the value of existing land and property in those areas, and an analysis of the potential risk to life property, and the environment that may result from natural hazard events. Specifically, the following elements are present in a risk assessment:

- 1) **Hazard Identification** identifies the geographic extent of the hazard, the intensity of the hazard, and the probability of its occurrence. Maps are frequently used to display hazard identification data. Sherman County identified eight major hazard that consistently affect or threaten its geographic area. These hazards – drought, earthquakes, floods, landslides/debris flows, volcanic events, wildfires, windstorms, and winter storms – were identified through a process that utilized input from a project steering committee, subject matter experts, the State Natural Hazard Risk Assessments, and historical records.
- 2) **Profiling Hazard Events** describes the causes and characteristics of each hazard, how they have affected the County in the past, and what part of the County's population, infrastructure, and environment have historically been vulnerable to each specific hazard. A profile of each hazard addressed in this plan from the State Natural Hazard Risk Assessment is provided in the plan's hazard annexes. For a more information on the history of hazard specific events, please see the hazard specific annex.
- 3) **Vulnerability Assessment/Inventorying Assets** combines the hazard identification with an inventory of existing (or planned) property and population that would be exposed to a hazard. Critical facilities are of particular concern because they provide essential products and services that are necessary to preserve the welfare and quality of life in Sherman County and fulfill

important public safety, emergency response, and/or disaster recovery functions.

- 4) ***Risk Analysis/Estimating Potential Losses*** involves estimating the damage, injuries, and financial losses likely to be sustained from hazard events in a geographic area over a given period of time. This level of analysis typically involves using mathematical models, such as HAZUS. The two measurable components of risk analysis are magnitude of the impact that may result from the hazard event and the likelihood of the hazard occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets. Where available, the best available data was used to determine the magnitude and likelihood of future natural hazard events. Where sufficient data was available, quantitative estimates for potential losses are included in the Hazard Annexes.
- 5) ***Assessing Vulnerability/Analyzing Development Trends*** provides a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions. This plan provides a comprehensive description of the characteristics of Sherman County in Section 2: Community Profile. The profile includes a description of the community's land use and development trends.

## **Risk Assessment Summary**

This section provides an overview of the risk assessments for the natural hazards affecting Sherman County.

As part of the County Hazard Risk Analysis, each county develops risk scores for Oregon's major natural hazards. This score, ranging from 24 (low) to 2409 (high), reflects the County's perceived risk for the particular hazard.

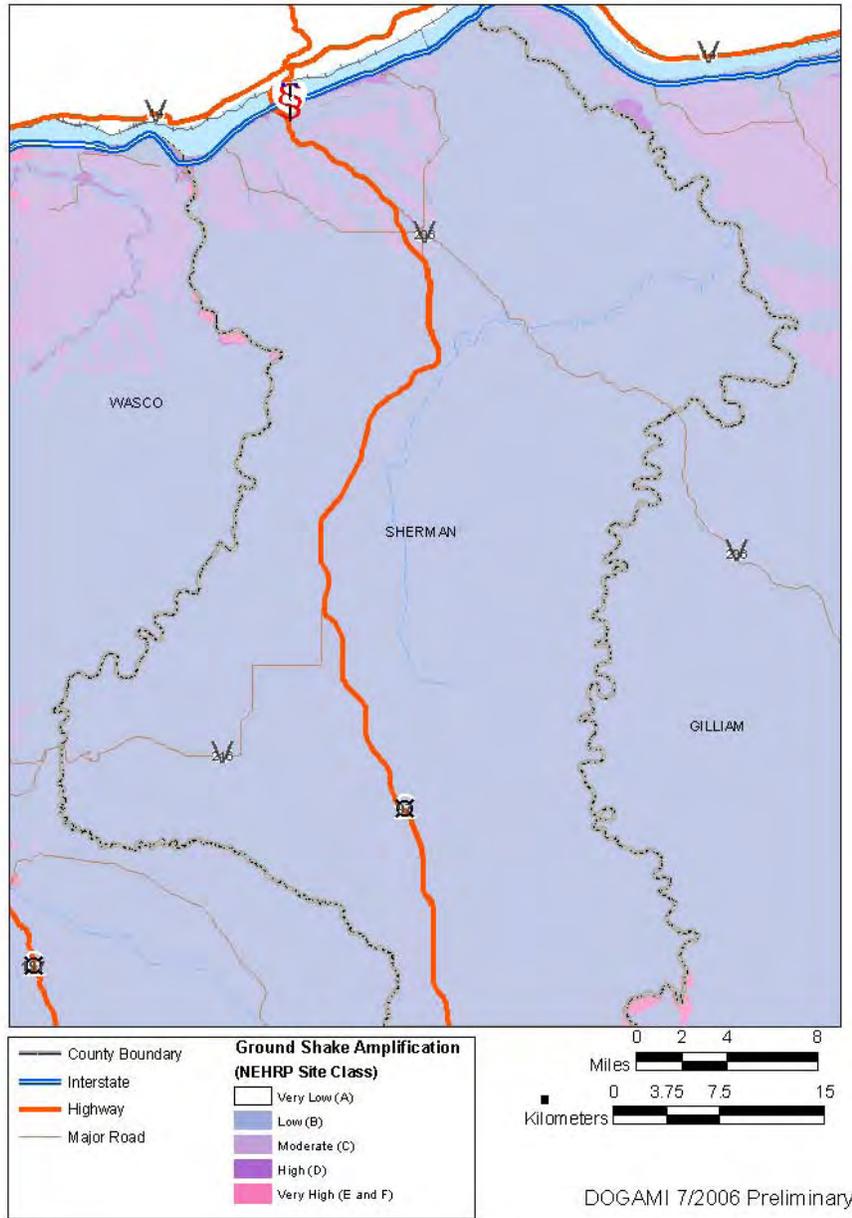
## Drought Risk Summary

Location of Hazard:	Extent of Hazard at the Location:
<ul style="list-style-type: none"> <li>• Countywide</li> </ul>	<ul style="list-style-type: none"> <li>• Countywide</li> </ul>
Previous Occurrences of the Hazard Within the Community:	
<p>1904-1905 – A statewide drought period of about 18 months.<sup>i</sup></p> <p>1917-1931 – A very dry period throughout Oregon with brief we spells during 1920-21 and 1927.<sup>ii</sup></p> <p>1939-1941 – A three- year intense drought in Oregon.<sup>iii</sup></p> <p>1959-1964 – Drought which affected eastern Oregon.<sup>iv</sup></p> <p>1985-1997 – A dry period with statewide droughts in 1992 and 1994.<sup>v</sup></p>	
Local Community's Self-Completed Drought Hazard Risk Rating:	
High	
Community's Probability a Future Hazard Event:	
High	
Community's Vulnerability to a Future Hazard Event:	
High	
Previous Mitigation Efforts:	
<ul style="list-style-type: none"> <li>• N/A</li> </ul>	

## Earthquake Risk Summary

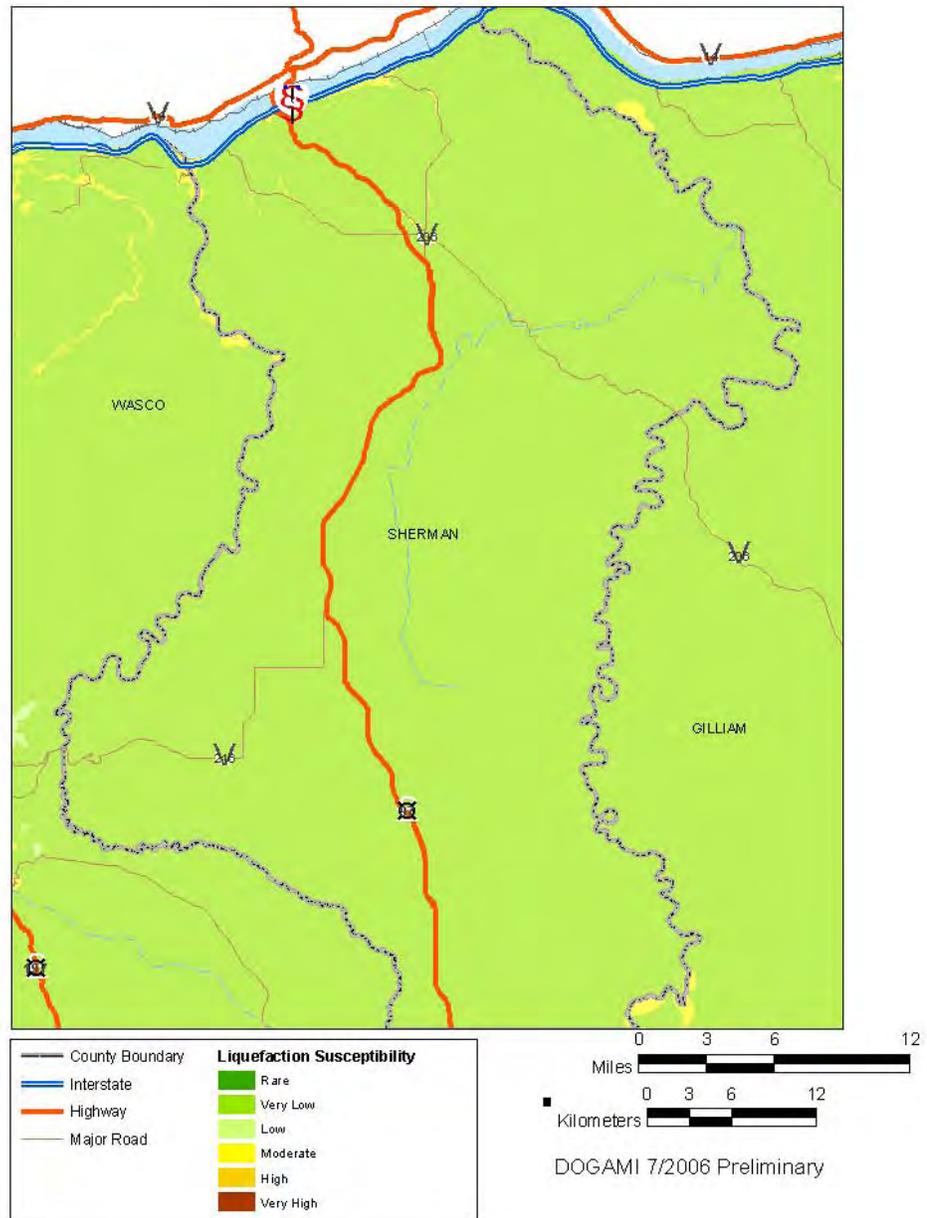
Location of Hazard:	Extent of Hazard at the Location:
<ul style="list-style-type: none"> <li>• None documented<sup>vi</sup></li> </ul> <p>See maps below:</p> <ul style="list-style-type: none"> <li>• Figure 3.1. Ground Shake Amplification</li> <li>• Figure 3.2. Liquefaction Susceptibility</li> <li>• Figure 3.3. Earthquake Induced Landslide Susceptibility</li> </ul>	<ul style="list-style-type: none"> <li>• None documented</li> </ul>
Previous Occurrences of the Hazard Within the Community:	
None documented	
Local Community's Self-Completed Drought Hazard Risk Rating:	
Low	
Community's Probability a Future Hazard Event:	
Low	
Community's Vulnerability to a Future Hazard Event	
Low	
Previous Mitigation Efforts:	
<ul style="list-style-type: none"> <li>• N/A</li> </ul>	

**Figure 3.1. Ground Shake Amplification – Sherman County**



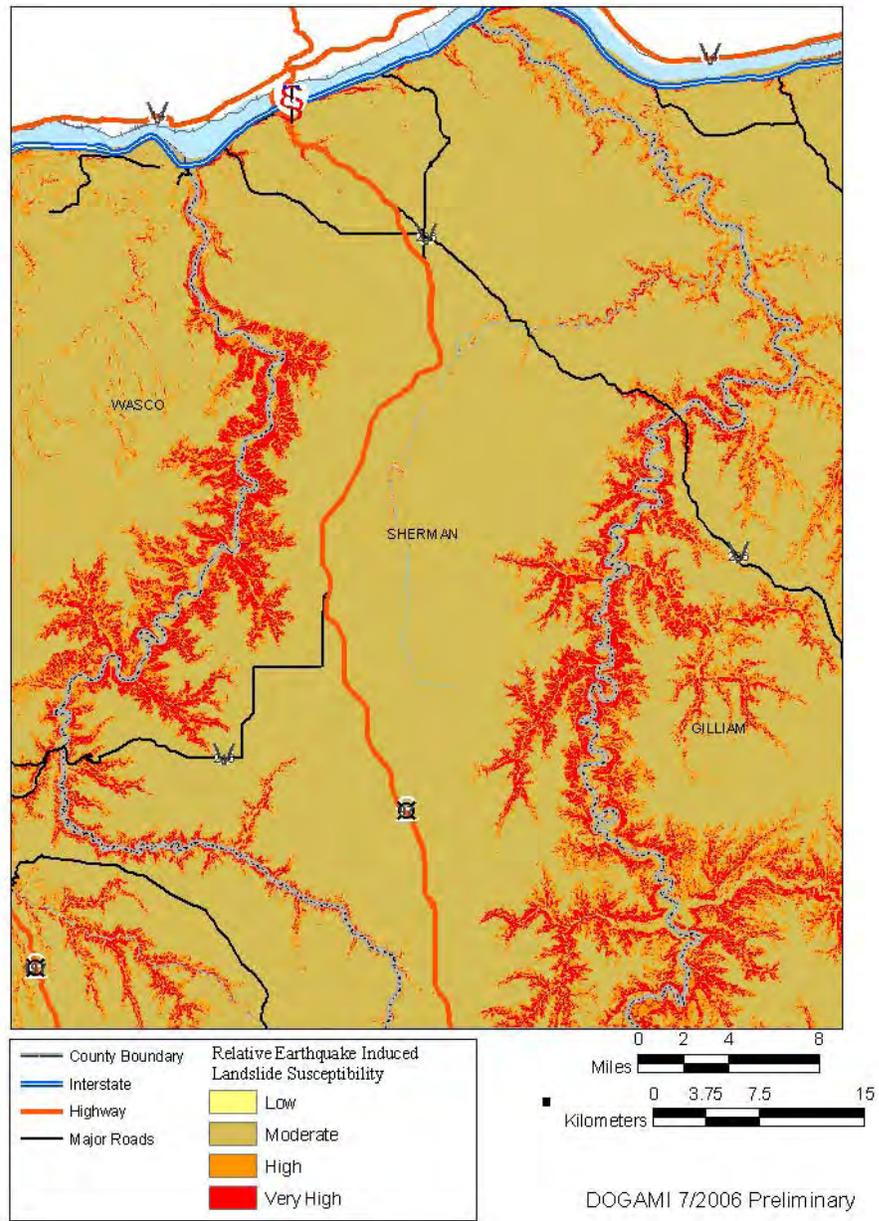
Source: Department of Geology and Mineral Industries, 2006.

**Figure 3.2. Liquefaction Susceptibility – Sherman County**



Source: Department of Geology and Mineral Industries, 2006.

**Figure 3.3. Earthquake Induced Landslide Susceptibility – Sherman County**



Source: Department of Geology and Mineral Industries, 2006.

# Flood Risk Summary

Location of Hazard:	Extent of Hazard at the Location:
<ul style="list-style-type: none"> <li>• Grass Valley Canyon</li> <li>• Hay Canyon</li> <li>• Barnum Creek</li> <li>• Gerklin Canyon</li> <li>• Medler</li> <li>• Helm Spring</li> <li>• Kaseberg Lane</li> <li>• McNab Lane</li> <li>• Dehler Lane</li> <li>• McDonald Ferry Lane</li> <li>• China Hollow Lane</li> <li>• Welk Road</li> <li>• McDermid Estate Lane</li> <li>• Biglow Road</li> </ul> <p style="margin-left: 40px;">Flood Insurance Rate Maps were completed in 1984.</p>	<ul style="list-style-type: none"> <li>• 80% to 100% of the County is affected by Flooding.</li> </ul>
Previous Occurrences of the Hazard Within the Community:	
<p>June 1894 – Main stem of Columbia River. As of this point in time it was the largest flood ever document along the Columbia River (1,200,000 cfs). It caused widespread damage in all of the Region 5 communities. It was caused by a large amount of snow melt.<sup>vii</sup></p> <p>January 1923 – There was widespread flooding in the Mid-Columbia Region. The weather was unseasonably warm and there was intense rain. The cause of the flooding was due to the rain melting the snow rapidly.<sup>viii</sup></p> <p>January 1933 – There was widespread flooding again in the Mid- Columbia Region. There were heavy mountain snow packs followed by rain and mild temperatures.<sup>ix</sup></p> <p>December 1955 – The Mid-Columbia Region was again the victim of mild temperatures and heavy rain on snow causing major flooding on farms and highways.<sup>x</sup></p> <p>December 1964 – There were record breaking floods throughout the Mid-Columbia Region. Heavy snow packs followed by intense rain caused terrible flood damage.<sup>xi</sup></p> <p>February 1986 – Widespread flooding and considerable damage, caused by large amounts of snow, followed by heavy rains.<sup>xii</sup></p> <p>Floods from winter storms in 1996 and 1997 – Caused damage to hwy 301, 42, and 300.<sup>xiii</sup></p>	

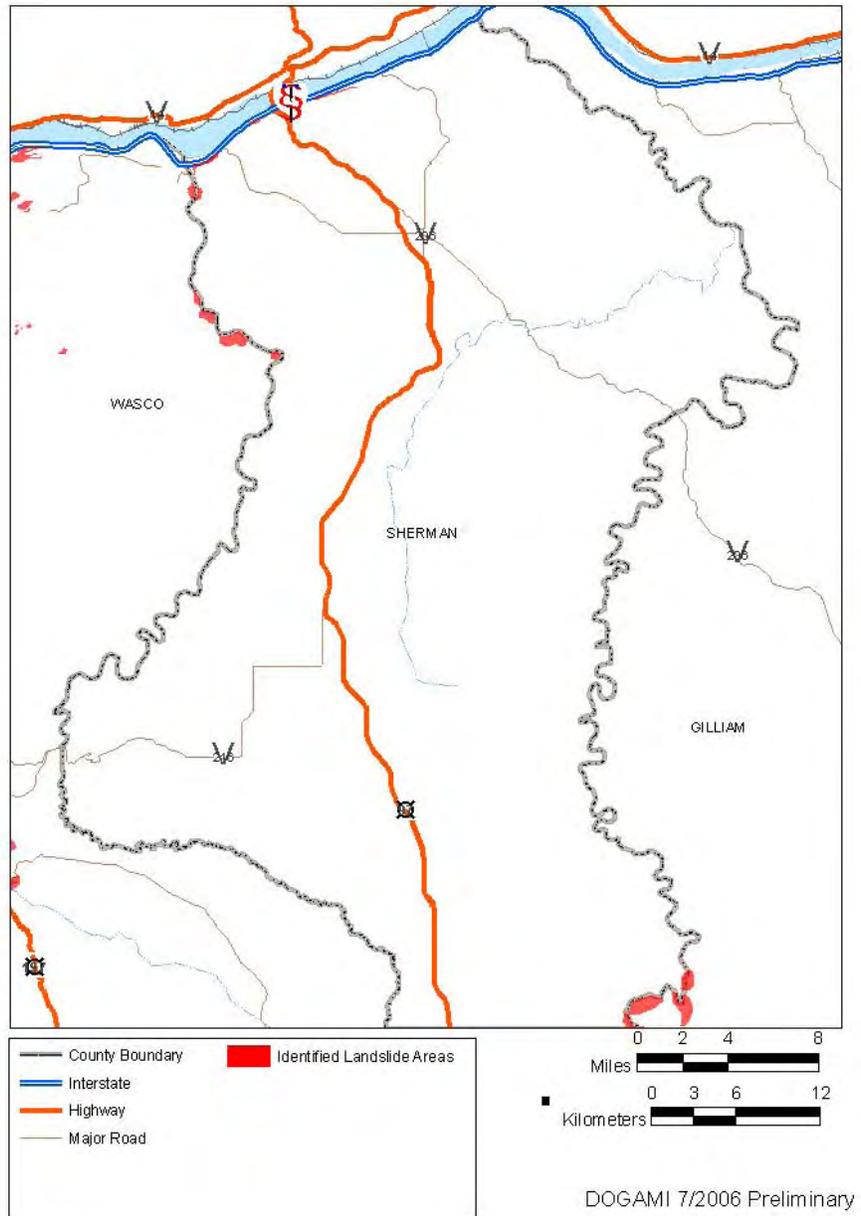
<p>Dates and Events Ongoing –</p> <p style="padding-left: 40px;">Columbia River<sup>xiv</sup></p> <p style="padding-left: 40px;">Deschutes River floods into homesteads and State Parks<sup>xv</sup></p> <p style="padding-left: 40px;">John Day River floods into homesteads and State Parks<sup>xvi</sup></p> <p>Rufus, Scott Canyon, Girking Canyon, Medler, Helm Springs, Kaseberg Lane, McNab Lane, Dehler Lane, McDonald Ferry Lane, China Hollow Lane, Mud Hollow Road, Welk Road, McDermid Estate Lane, Grass Valley Canyon, Hay Canyon, Barnum Creek and Biglow Road – all have had floods.<sup>xvii</sup></p> <p>August 12, 1963 – 1 inch of hail was dropped in Sherman County. No injuries or property damage was reported.<sup>xviii</sup></p> <p>August 5, 2003 – Flash Flood, Rufus, Heavy rain led to some flash flooding in the city of Rufus. City Hall, emergency services, three residential basements experienced flooding. Some road damage was reported.<sup>xix</sup></p>
Local Community's Self-Completed Flood Hazard Risk Rating:
High
Community's Probability a Future Flood Event:
High
Community's Vulnerability to a Future Flood Event:
High
Previous Mitigation Efforts:
<ul style="list-style-type: none"> <li>• Grass Valley, Rufus, Wasco and Sherman County participated in the NFIP. Sherman County FIRM 1984.</li> <li>• Under the NFIP, Sherman County has no repetitive flood loss properties, however, there may be undocumented repetitive flood loss properties that aren't accounted for through NFIP.</li> <li>• Sherman County's last CAV was completed on 4/1/1985.</li> <li>• The City of Rufus' last CAV was completed on 4/1/1985.</li> </ul>

## Landslides

Location of Hazard:	Extent of Hazard at the Location:
<ul style="list-style-type: none"> <li>• Scotts Canyon</li> <li>• Biggs Canyon</li> <li>• Fulton Canyon</li> <li>• Shearers Grade</li> <li>• Cottonwood Canyon</li> <li>• Locus Grove</li> <li>• Mud Hollow</li> <li>• Wasco – Condon Hwy – Brown Road to John Day River</li> </ul> <p>See map below:</p> <ul style="list-style-type: none"> <li>• Figure 3.4. Identified Landslides</li> </ul>	<ul style="list-style-type: none"> <li>• Seismic activity could markedly increase landslide danger particularly at Maddy’s Hump, which is located 1 mile east of Biggs. If it goes, half of Interstate 84 will go.</li> <li>• A large portion of the County could be affected by Landslides and Debris Flows.</li> </ul>
<p>Previous Occurrences of the Hazard Within the Community:</p>	
<p>Dates and Events Ongoing –</p> <p>Hwy 206E</p> <p>Scott Canyon</p> <p>Fulton Canyon</p> <p>Girking Canyon</p> <p>Deschutes River</p> <p>John Day River</p> <p>Biggs Canyon</p> <p>Hwy 30 between Biggs Jct. and Rufus</p> <p>Mud Hollow</p> <p>Locust Grove area</p> <p>Schearers Grade and Canyon Bridge on Hwy 216</p> <p>Brown Road down to John Day River</p> <p>Cottonwood<sup>xx</sup></p> <p>Maddy’s Hump.<sup>xxi</sup> There has been no formal study done of this situation, but the hump is above the road and easy to view. The steering committee was very concerned about this situation.</p> <p>In February 1996 a storm event causing landslides, resulted in 27 counties being declared a Federal disaster. Sherman County was among those 27 counties.<sup>xxii</sup></p>	

Local Community's Self-Completed Landslide Hazard Risk Rating:
Medium
Community's Probability a Future Landslide Event:
Medium
Community's Vulnerability to a Future Landslide Event:
Medium
Previous Mitigation Efforts:
<ul style="list-style-type: none"> <li>• N/A</li> </ul>

**Figure 3.4. Identified Landslides – Sherman County**



Source: Department of Geology and Mineral Industries, 2006.

## Volcanic Event

Location of Hazard:	Extent of Hazard at the Location:
<ul style="list-style-type: none"> <li>The only concern for Sherman County is for the ash fallout. Other wise there is no real danger.</li> </ul>	<ul style="list-style-type: none"> <li>Entire County in regards to ash fallout.</li> </ul>
Previous Occurrences of the Hazard Within the Community	
Other than receiving some of the ash flow when Mt. St. Helens blew, there have been no documented problems from volcanos.	
Local Community's Self-Completed Volcanic Event Hazard Risk Rating	
Low	
Community's Probability a Future Volcanic Event:	
Low	
Community's Vulnerability to a Future Volcanic Event:	
Low	
Previous Mitigation Efforts:	
<ul style="list-style-type: none"> <li>N/A</li> </ul>	

## Wildfire

Location of Hazard:	Extent of Hazard at the Location:
<ul style="list-style-type: none"> <li>• Countywide.</li> <li>• Note: See Annex I – Identification and Assessment of Communities at Risk for additional information.</li> </ul>	<ul style="list-style-type: none"> <li>• In particular there are areas of most concern.</li> <li>• Breaks of the John Day River</li> <li>• Breaks of the Deschutes River</li> <li>• Wheat Fields</li> <li>• Natural Vegetation areas</li> <li>• Homesteads adjacent to BLM land</li> <li>• Fire sweeping up Deschutes and John Day River Canyons.</li> </ul>
Previous Occurrences of the Hazard Within the Community:	
<p>1983 –The Moro Fire<sup>xxiii</sup></p> <p>Many fires along the breaks of the Deschutes and John Day Rivers<sup>xxiv</sup></p> <p>Railroad fires<sup>xxv</sup></p> <p>On-Going- The summer weather, terrain, crops and natural vegetation of Sherman County lends itself to the on going problem of wildfires. Most have not been historically kept track of<sup>xxvi</sup></p>	
Local Community's Self-Completed Wildfire Hazard Risk Rating	
High	
Community's Probability a Future Wildfire Event:	
High	
Community's Vulnerability to a Future Wildfire Event:	
High	
Previous Mitigation Efforts:	
<ul style="list-style-type: none"> <li>• N/A The Oregon Department of Forestry does not protect any lands in Sherman County. Most of the BLM land is along the rivers. No known fuel reduction projects have taken place on their land.</li> </ul>	

## Windstorm

Location of Hazard:	Extent of Hazard at the Location:
<ul style="list-style-type: none"> <li>Countywide</li> </ul>	<ul style="list-style-type: none"> <li>Particularly the North End of the County</li> </ul>
Previous Occurrences of the Hazard Within the Community:	
<p>April 1957 – A Tornado did minor damage on some of the rangeland.<sup>xxvii</sup></p> <p>November 10-11 1951 – Windstorm causing widespread damage; down transmission and utility lines. Wind speeds up to 40-60 mph with gusts of 75-80 mph.<sup>xxviii</sup></p> <p>December 1951 – Damage to buildings and utility lines.<sup>xxix</sup></p> <p>December 1955 – Wind speeds 55-65 mph with 69 mph gusts. Considerable damage to buildings and utility lines.<sup>xxx</sup></p> <p>November 1958 – Wind speeds at 51 mph with 71 mph gusts. Every major highway in state blocked by fallen trees.<sup>xxxi</sup></p> <p>October 1962 – Columbus Day Storm- The most destructive windstorm in the history of Oregon. Some parts of state had 116 mph winds.<sup>xxxii</sup></p> <p>November 1981 – Severe wind storm.<sup>xxxiii</sup></p> <p>March – 1991 Severe wind storm.<sup>xxxiv</sup></p> <p>December 1995 – Severe wind storm with widespread damage.<sup>xxxv</sup></p> <p>North End of Sherman County gets Windstorms.<sup>xxxvi</sup></p> <p>Entire County’s farming is affected by high winds. The roads are affected by the wind, making travel dangerous.<sup>xxxvii</sup></p>	
Local Community's Self-Completed Windstorm Hazard Risk Rating:	
High	
Community's Probability a Future Windstorm Event:	
High	
Community's Vulnerability to a Future Windstorm Event:	
Medium	
Previous Mitigation Efforts: <i>(If your community has already conducted windstorm mitigation efforts, such as tree and limb maintenance programs, then briefly document those efforts here)</i>	
<ul style="list-style-type: none"> <li>N/A</li> </ul>	

## Winter Storm

Location of Hazard:	Extent of Hazard at the Location:
<ul style="list-style-type: none"> <li>• Countywide</li> </ul>	<ul style="list-style-type: none"> <li>• Icy-low visibility especially the south end of Sherman County – Hwy 97 at mp22 south drifting snow</li> <li>• Freezing canyons and Hwys</li> <li>• Hay Canyon</li> <li>• Canyon going down to the River between Wasco and Condon</li> </ul>
Previous Occurrences of the Hazard Within the Community:	
<p>December 1861 – Storm produced between one and three feet of snow.<sup>xxxviii</sup></p> <p>January 1916 – Very heavy snowfall, especially in the mountains from two separate storms.<sup>xxxix</sup></p> <p>January and February 1937 – Deep snow drifts.<sup>xl</sup></p> <p>January 1950 – Record snow falls with considerable property damage.<sup>xli</sup></p> <p>March 1960 – Winter storms caused many automobile accidents.<sup>xlii</sup></p> <p>January 1969 – Heavy snow falls.<sup>xliii</sup></p> <p>January 1980 – Series of storms which resulted in many injuries and power outages.<sup>xliv</sup></p> <p>February 1985 – Heavy snow in mountains; downed power lines.<sup>xlvi</sup></p> <p>February 1986 – Central and Eastern Oregon received heavy snows resulting in broken power lines and traffic accidents.<sup>xlvi</sup></p> <p>March 1988 – Strong winds with heavy snows.<sup>xlvii</sup></p> <p>February 1990 – Heavy snows.<sup>xlviii</sup></p> <p>Winter of 1992-1993 – Very heavy snow.<sup>xlix</sup></p> <p>Winter of 1998-1999 – One of the snowiest winters in Oregon history.<sup>l</sup></p> <p>Sherman County is plagued by icy roads, fog, low visibility and snow throughout the County, but particularly on their main highways 206E, 97 and I-84. On Hwys 206E and 97 drifting snow is a major problem along with freezing canyon and highway roads.<sup>li</sup></p> <p>December 26, 2003 through January 14, 2004 – Sherman County one of Oregon’s Counties to be designated a disaster county by FEMA due to a severe winter storm. The declaration date was February 13, 2004.<sup>lii</sup></p>	
Local Community's Self-Completed Winter Storm Hazard Risk Rating:	
High	
Community's Probability a Future Winter Storm Event:	
High	

Community's Vulnerability to a Future Winter Storm Event:
Medium
Previous Mitigation Efforts: <i>(If your community has already conducted winter storm mitigation efforts, such as public outreach, then briefly document those efforts here)</i>
<ul style="list-style-type: none"> <li>N/A</li> </ul>

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- <sup>i</sup> Taylor, George H., and Ray Hatton, 1999 The Oregon Weather Book
  - <sup>ii</sup> Taylor, George H., and Ray Hatton, 1999 The Oregon Weather Book
  - <sup>iii</sup> Taylor, George H., and Ray Hatton, 1999 The Oregon Weather Book
  - <sup>iv</sup> Taylor, George H., and Ray Hatton, 1999 The Oregon Weather Book
  - <sup>v</sup> Taylor, George H., and Ray Hatton, 1999 The Oregon Weather Book
  - <sup>vi</sup> DOGAMI would have any data available as to location and extent
  - <sup>vii</sup> Taylor, George and Raymond Hatton, 1999, The Oregon Weather Book; FEMA Flood Insurance Studies for Gilliam, Sherman, Hood River, Umatilla and Wasco Counties; National Climatic Center Data
  - <sup>viii</sup> Taylor, George and Raymond Hatton, 1999, The Oregon Weather Book; FEMA Flood Insurance Studies for Gilliam, Sherman, Hood River, Umatilla and Wasco Counties; National Climatic Center Data
  - <sup>ix</sup> Taylor, George and Raymond Hatton, 1999, The Oregon Weather Book; National Climatic Data Center
  - <sup>x</sup> Taylor, George and Raymond Hatton, 1999, The Oregon Weather Book; FEMA Flood Insurance Studies for Gilliam, Sherman, Hood River, Umatilla and Wasco Counties; National Climatic Center Data
  - <sup>xi</sup> Taylor, George and Raymond Hatton, 1999, The Oregon Weather Book; FEMA Flood Insurance Studies for Gilliam, Sherman, Hood River, Umatilla and Wasco Counties; National Climatic Center Data
  - <sup>xii</sup> Taylor, George and Raymond Hatton, 1999, The Oregon Weather Book
  - <sup>xiii</sup> Oregon Department of Transportation
  - <sup>xiv</sup> FEMA Flood Insurance Studies for Gilliam, Sherman, Hood River, Umatilla and Wasco Counties
  - <sup>xv</sup> FEMA Flood Insurance Studies for Gilliam, Sherman, Hood River, Umatilla and Wasco Counties
  - <sup>xvi</sup> FEMA Flood Insurance Studies for Gilliam, Sherman, Hood River, Umatilla and Wasco Counties
  - <sup>xvii</sup> Sherman County Steering Committee Members
  - <sup>xviii</sup> National Climatic Data Center
  - <sup>xix</sup> National Climatic Data Center
  - <sup>xx</sup> Sherman County Steering Committee
  - <sup>xxi</sup> Sherman County Steering Committee

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- xxii Oregon Department of Geology and Mineral Industries Special Paper 34; DOGAMI has landslide maps of the areas
- xxiii Oregon Emergency Management, State Natural Hazards Mitigation Plan, 2003, Wild land/ Urban Interface chapter
- xxiv Oregon Emergency Management, State Natural Hazards Mitigation Plan, 2003, Wild land/ Urban Interface chapter; Sherman County Steering Committee
- xxv Oregon Emergency Management, State Natural Hazards Mitigation Plan, 2003, Wild land/ Urban Interface chapter; Sherman County Steering Committee
- xxvi Sherman County Steering Committee
- xxvii Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xxviii Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xxix Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xxx Taylor, George and Ray Hatton, 1999, The Oregon Weather Book; FEMA-1405-DR-OR, February 7, 2002, Hazard Mitigation Team Survey Report, Severe Windstorms in Western Oregon
- xxxi Taylor, George and Ray Hatton, 1999, The Oregon Weather Book; FEMA Fema-1405-DR-OR, February 7, 2002, Hazard Mitigation Team Survey Report, Severe Windstorms in Western Oregon
- xxxii Taylor, George and Ray Hatton, 1999, The Oregon Weather Book; FEMA Fema-1405-DR-OR, February 7, 2002, Hazard Mitigation Team Survey Report, Severe Windstorms in Western Oregon
- xxxiii Taylor, George and Ray Hatton, 1999, The Oregon Weather Book; FEMA Fema-1405-DR-OR, February 7, 2002, Hazard Mitigation Team Survey Report, Severe Windstorms in Western Oregon
- xxxiv Taylor, George and Ray Hatton, 1999, The Oregon Weather Book; FEMA Fema-1405-DR-OR, February 7, 2002, Hazard Mitigation Team Survey Report, Severe Windstorms in Western Oregon
- xxxv Taylor, George and Ray Hatton, 1999, The Oregon Weather Book; FEMA Fema-1405-DR-OR, February 7, 2002, Hazard Mitigation Team Survey Report, Severe Windstorms in Western Oregon
- xxxvi Taylor, George and Ray Hatton, 1999, The Oregon Weather Book; FEMA Fema-1405-DR-OR, February 7, 2002, Hazard Mitigation Team Survey Report, Severe Windstorms in Western Oregon; Sherman County Steering Committee
- xxxvii Sherman County Steering Committee
- xxxviii Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xxxix Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xl Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xli Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xlii Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xliii Taylor, George and Ray Hatton, 1999, The Oregon Weather Book

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- xliv Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xlv Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xlvi Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xlvii Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xlviii Taylor, George and Ray Hatton, 1999, The Oregon Weather Book
- xlix Sherman County Steering Committee
- <sup>1</sup> Taylor, George and Ray Hatton, 1999, The Oregon Weather book
- li Sherman County Steering Committee
- lii FEMA GOV.NEWS DR-1510-OREGON

# Section 4:

## Goals and Action Items

This section describes the components that guide implementation of the identified mitigation strategies and is based on strategic planning principles.

- *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 community 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.

### Mitigation Plan Goals

The plan goals help guide the direction of future activities aimed at reducing risk and preventing loss from natural hazards. The goals listed here serve as checkpoints as agencies and organizations begin implementing mitigation action items.

These goals were established by the Sherman County Hazard Mitigation Steering Committee and Stakeholders and were approved by the Cities and County Government. They are regional goals shared by Gilliam, Sherman, and Wheeler Counties.

- Ability to respond effectively and swiftly
- Safety of life and property
- Increased cooperation and collaboration between groups and agencies

These goals were established by the Sherman County Hazard Mitigation Steering Committee and Stakeholders, and were approved by the Cities and County Government. They are regional goals shared by Gilliam, Sherman, and Wheeler Counties.

### 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 both address multi-hazard (MH) and hazard-specific issues.

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 at the end of this section.

## **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.

## **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. This section should also include a description of how the mitigation activity may be implemented through existing community plans, policies and programs.

## **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 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 both short and long-term activities. Each action item includes an estimate of the timeline for implementation. *Short-term action items (ST)* are activities that may be implemented with existing resources and authorities in one

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

## **Action Items**

The following pages provide a list of mitigation actions Sherman County can take to prepare itself in the event of a natural disaster. Although the actions are countywide, they also provide a direct benefit to the incorporated cities of Sherman County. The four incorporated cities in Sherman – Grass Valley, Moro, Rufus, and Wasco – have limited resources and rely on the county to provide emergency services. Any actions that improve the capabilities of those services will benefit the county and the communities.

## Multi-Hazard #1

Proposed Action Item: MH#1	Alignment with Plan Goals:
Complete an inventory of public buildings that may be particularly vulnerable to natural hazards in Sherman County.	Goal 2: Safety of life and property  Goal 3: Increased cooperation and collaboration between groups and agencies.
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Sherman County is vulnerable to a number of natural hazards that can affect public facilities. In a self-completed hazard analysis, the county rated its risk to drought, flood, wildfire, wind, and winter storm as high, and medium for landslides. The probability that each hazard will recur is rated high. The State of Oregon’s Natural Hazard Mitigation Plan also indicates Sherman County’s vulnerability to drought, wildfire, flood, 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.</li> <li>• 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)(ii)(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.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify and analyze mitigation measures specifically actions and projects addressing the effects of hazards on existing buildings and infrastructure [201.6(c)(3)(ii)]. This inventory of public facilities that are vulnerable to natural hazards will allow the County to meet this requirement.</li> <li>• 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.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• 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.</li> <li>• Identify important historic and cultural resources, especially buildings or structures on the national register, vulnerable to natural hazards that should be preserved.</li> <li>• Utilize outcomes of DOGAMI’s efforts on Senate Bill 2 seismic hazard inventory and risk assessment: <a href="http://www.oregongeology.com/sub/projects/rvs/default.htm">http://www.oregongeology.com/sub/projects/rvs/default.htm</a></li> <li>• 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.</li> <li>• Identify specific vulnerabilities to public facilities for each natural hazard, especially those constructed of unreinforced masonry that are vulnerable to earthquakes.</li> <li>• Prioritize facilities based on vulnerability.</li> <li>• Identify actions communities can take to reduce a facility’s vulnerability to a natural hazard.</li> <li>• Incorporated communities should coordinate with the county to identify vulnerable facilities to mitigate their risk to natural hazards.</li> </ul>	

<b>Coordinating Organization:</b>		Sherman County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Sherman County Advisory Committee Members, Sherman County		Cities of Wasco, Moro, Grass Valley, and Rufus, OEM, DOGAMI, FEMA	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
Short Term			
<b>Form Submitted by:</b>			

## Multi-Hazard #2

<b>Proposed Action Item: MH#2</b>		<b>Alignment with Plan Goals:</b>	
Seek funding for the implementation of priority projects that reduce the vulnerability of critical public facilities in Sherman County.		Goal 2: Safety of life and property Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• Sherman County is vulnerable to a number of natural hazards that can affect public facilities. In a self-completed hazard analysis, the county rated its risk to drought, flood, wildfire, wind, and winter storm as high, and medium for landslides. The probability that each hazard will recur is rated high. The State of Oregon's Natural Hazard Mitigation Plan also indicates Sherman County's vulnerability to drought, wildfire, flood, as high. Each natural hazard can pose significant risks to public facilities. Once the county and communities have completed an inventory of critical public facilities, obtaining funding will help implement mitigation projects to reduce overall vulnerability to natural hazards.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify and analyze mitigation measures specifically actions and projects addressing the effects of hazards on existing buildings and infrastructure [201.6(c)(3)(ii)].</li> <li>• 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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• The cities should coordinate with the county to identify city-specific, critical public facilities that are vulnerable to natural hazards, and coordinate funding opportunities with the county to fund mitigation projects for city-specific public facilities.</li> <li>• Coordinate with local and state agencies to identify funding opportunities for specific projects.</li> <li>• When available, implement mitigation actions identified in the building inventory process identified in Multi-hazard Action #1.</li> <li>• Funding may become available from the state through Senate Bills 2-5 dealing with seismic vulnerability of critical facilities and schools.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Sherman County Advisory Committee Members, Sherman County		Cities of Wasco, Moro, Grass Valley, and Rufus, OEM, DOGAMI, FEMA	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
	<u>Long Term</u>		
<b>Form Submitted by:</b>			

## Multi-Hazard #3

<b>Proposed Action Item: MH#3</b>		<b>Alignment with Plan Goals:</b>	
Work with utilities operating in Sherman County to establish tree-pruning programs around transmission lines and trunk distribution lines.		Goal 2: Safety of life and property Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>In certain natural hazards, such as wind and winter storms, electric utilities can be severely affected. Sherman County rated itself high on a self-completed hazard risk rating study for both wind and winter storms. In addition, the State of Oregon's Natural Hazard Mitigation Plan indicates that Sherman County has a high probability and medium vulnerability to wind storms, and a medium probability and vulnerability to winter storms. Tree falls have the potential to damage buildings and infrastructure, block roadways, and down overhead power lines, causing electric power failures. Tree pruning helps reduce the vulnerability of trees to natural hazards, mitigating the potential damage they could cause to buildings and infrastructure. Implementing programs to complete tree pruning helps to maximize time, money, and other resources.</li> <li>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 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.</li> <li>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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>The communities should coordinate with the county and the utilities to establish tree-pruning programs.</li> <li>Identify tree-pruning programs other communities have successfully implemented.</li> <li>Meet with utilities to discuss tree pruning programs and implementation measures.</li> <li>Conduct public outreach on this effort through appropriate channels such as utility bill inserts or other methods.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Emergency Management.	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Pacific Power and Light, Wasco Rural Electric,		Sherman County, communities of Rufus, Wasco, Moro, and Grass Valley.	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
<u>Short term</u>			

**Form Submitted by:**

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## Multi-Hazard #4

<b>Proposed Action Item: MH#4</b>		<b>Alignment with Plan Goals:</b>	
Reduce the effects of winter storms on existing utility lines		Goal 2: Safety of life and property  Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• Sherman County is vulnerable to a number of natural hazards. In a self-completed hazard analysis, the county rated its risk to winter storm as high. The probability that this hazard will recur is rated high.</li> <li>• During 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.</li> <li>• 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)]. Supporting and encouraging utility providers to use hazard resistant construction methods for new utility construction reduce damage to utilities and buildings.</li> <li>• 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. The Cities and the County services as well as local businesses all rely on the supply of power to the communities.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• Seek funding to intersperse new power poles between existing poles where extra long spans have created service provision issues in the past.</li> <li>• In the pre-disaster mode, seek FEMA's Pre-Disaster Mitigation grant funds. Following a Presidentially declared disaster, the Co-op may seek funds through FEMA's Hazard Mitigation Grant Program.</li> </ul>			
<b>Coordinating Organization:</b>		PacifiCorp and Wasco Electric Cooperative	
<b>Internal Partners:</b>		<b>External Partners:</b>	
		Sherman County, Cities of Grass Valley, Moro, Rufus, and Wasco	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
Short Term			
<b>Form Submitted by:</b>			

## Multi-Hazard #5

<b>Proposed Action Item: MH#5</b>		<b>Alignment with Plan Goals:</b>	
Develop and maintain a comprehensive impact database on severe natural hazard events in Sherman County.		Goal 2: Safety of life and property Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• Sherman County is vulnerable to a number of natural hazards. In a self-completed hazard analysis, the county rated its risk to drought, flood, wildfire, wind, and winter storm as high, and medium for landslides. The probability that each hazard will recur is rated high. The State of Oregon’s Natural Hazard Mitigation Plan also indicates Sherman County’s vulnerability to drought, wildfire, flood, as high. Each natural hazard can 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.</li> <li>• 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.</li> <li>• 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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• The communities and the county should coordinate efforts to develop and maintain an impact database.</li> <li>• Identify a responsible agency to collect natural hazards information to help establish and maintain baseline and historic records of hazard events;</li> <li>• Document future events including impacts and losses;</li> <li>• Identify public infrastructure and facilities subject to closures due to snowfall and ice hazards during winter storms; and</li> <li>• Develop partnerships between utility providers and county and city public works agencies to document known hazard areas and minimize risks.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Planning, GIS		Cities of Rufus, Moro, Wasco, Grass Valley, National Weather Service, National Oceanic and Atmospheric Administration (NOAA), ODOT, Oregon Climate Service, Overhead Utilities	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
Ongoing			
<b>Form Submitted by:</b>			

## Multi-Hazard #6

<b>Proposed Action Item: MH#6</b>		<b>Alignment with Plan Goals:</b>	
Seek funding for generators and satellite phones for critical facilities		Goal 2: Safety of life and property Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>The Steering Committee identified the need for generators and satellite phones at schools, medical centers, pump houses, Road Department and Emergency Operations Center.</li> <li>Sherman County is vulnerable to a number of natural hazards. In a self-completed hazard analysis, the county rated its risk to drought, wildfire, wind, and winter storm as high, and medium for flood. The probability that each hazard will recur is rated high, except for flood which is rated medium. The State of Oregon's Natural Hazard Mitigation Plan also indicates Sherman County's vulnerability to drought and winter storm as high. Each natural hazard can 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.</li> <li>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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>Seek funding source for emergency back-up generator and emergency communications like satellite phones. (NOTE: FEMA mitigation programs will NOT fund generators).</li> <li>Identify all critical facilities without generators and satellite phones</li> <li>Prioritize need for generators/satellites at critical facilities</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Planning, GIS		Cities of Grass Valley, Moro, Rufus and Wasco, National Weather Service, National Oceanic and Atmospheric Administration (NOAA), ODOT, Oregon Climate Service, Overhead Utilities	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
Ongoing			
<b>Form Submitted by:</b>			

## Multi-Hazard #7

<b>Proposed Action Item: MH#7</b>		<b>Alignment with Plan Goals:</b>	
Identify opportunities to reduce existing barriers to interagency cooperation and work together reduce risk and loss from natural hazards		Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• The Steering Committee identified the need to create interagency agreements to help reduce barriers to collaboration.</li> <li>• Gilliam, Sherman and Wheeler Counties often work together various projects already and have identified similar mitigation actions.</li> <li>• 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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• Develop interagency agreements to better coordinate risk reduction activities within the County and within the three county area.</li> <li>• Identify opportunities to work together to leverage limited resources on commonly identified projects.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Emergency Services	
<b>Internal Partners:</b>		<b>External Partners:</b>	
		Cities of Grass Valley, Moro Rufus, and Wasco, Gilliam County, Wheeler County	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
Ongoing			
<b>Form Submitted by:</b>			

## Drought #1

<b>Proposed Action Item: DR#1</b>		<b>Alignment with Plan Goals:</b>	
Include information regarding droughts in a brochure of natural hazards and mail/make available to county residents and the public.		Goal 1: Ability to respond affectively and swiftly Goal 2: Safety of life and property Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• Drought situations increase the risk of fire hazards.</li> <li>• Drought situations cause visibility hazards.</li> <li>• Drought situations cause critical water shortages for humans, animals and vegetation.</li> <li>• 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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• Educate the public on water conservation.</li> <li>• Educate the public on Erosion control.</li> <li>• Educate the public regarding drought resistant plants.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Emergency Management County	
<b>Internal Partners:</b>		<b>External Partners:</b>	
County Court, County Road Dept., Sheriff, Planning		Cities of Grass Valley, Rufus, Moro, Wasco; OSU Ext., ODOT, SWCD, NRCS, City Public Works, FSA, Oregon EMS, Ore. Dept. of Agriculture, FEMA, Utilities, Railroad	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
X Some	X Some		
<b>Form Submitted by:</b>	Susan C. Brewer		

## Earthquake #1

<b>Proposed Action Item:</b>		<b>Alignment with Plan Goals:</b>	
Include information regarding earthquakes in a brochure of natural hazards and mail/make available to county residents and the public.		Goal 1: Ability to respond affectively and swiftly Goal 2: Safety of life and property Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• People need to know what to expect.</li> <li>• People need to know what they should do and have to prepare for an earthquake.</li> <li>• People need to know what to do and where to go.</li> <li>• Planning for a hazard helps to reduce the risk of injuries and loss of life.</li> <li>• 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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• Educate the public regarding earthquakes.</li> <li>• Make sure citizens know which buildings are deemed shelters.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Planning, County Court, Medical clinics, Sheriff, Wasco/Sherman Public Health, EMS, Road Dept.		Cities of Grass Valley, Rufus, Moro, Wasco; Railroad, utilities, schools, city public works, DOGAMI, ODOT, Farm Agencies, Corp of Engineers, Red Cross, FEMA, OEM	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
X Some	X Some		
<b>Form Submitted by:</b>	Susan C. Brewer		

## Flood #1

<b>Proposed Action Item: FL#1</b>		<b>Alignment with Plan Goals:</b>	
Include information regarding flooding in a brochure of natural hazards and mail/make available to county residents and the public.		Goal 1: Ability to respond affectively and swiftly Goal 2: Safety of life and property Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• Landslides and Debris Flows can happen with out any or little warning.</li> <li>• People need to know what to expect.</li> <li>• People need to know what they should do and not do in the event of a Landslide/Debris Flow.</li> <li>• Need to plan for the reduction in potential economic losses.</li> <li>• 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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• Education regarding good Erosion control.</li> <li>• Educate the public on what to do in a flood.</li> <li>• Educate the public regarding not driving through flooded roads.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Planning, County Court, Road Dept., EMS, Sheriff, Medical Clinic		Cities of Grass Valley, Rufus, Moro, Wasco; Railroads, utilities, ODOT, Farm Agencies, U.S. Army Corps of Engineers, OEM, FEMA, OEIU, Senior and Disabled Services, Medical	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
X			
<b>Form Submitted by:</b>		Susan C. Brewer	

## Flood #2

<b>Proposed Action Item:</b>		<b>Alignment with Plan Goals:</b>	
Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.		Goal 2: Safety of life and property	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• Actively participate with DLCD and FEMA during future Community Assistance Visits.</li> <li>• Conduct an assessment of the floodplain ordinances to ensure they reflect current flood hazards and situations, and meet NFIP requirements.</li> <li>• The cities should coordinate with the county to ensure that floodplain ordinances and NFIP regulations are maintained and enforced.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Cities of Grass Valley, Moro, Rufus, and Wasco		FEMA, OEM, DLCD	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	

<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	
<b>Form Submitted by:</b>		

### Flood #3

<b>Proposed Action Item:</b>		<b>Alignment with Plan Goals:</b>
Develop a database of repetitive flood loss properties not covered by the National Flood Insurance Program		Goal 2: Safety of life and property
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• 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.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify mitigation actions that address existing buildings and infrastructure [201.6(e)(3)(ii)]. Developing mitigation actions for repetitive flood loss properties can significantly diminish the impact and damage from flooding on these properties.</li> <li>• 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.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• Develop a database of repetitive flood loss properties not covered by the NFIP to track flood damage and to use when identifying mitigation actions.</li> <li>• 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.</li> <li>• Work with homeowners to identify potential mitigation measures to be funded through either Pre-Disaster Mitigation or Flood Mitigation Assistance.</li> <li>• Develop countywide stormwater management strategies to address repetitive loss properties.</li> </ul>		
<b>Coordinating Organization:</b>	Sherman County Office of Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>
Sherman County, cities of Grass Valley, Moro, Rufus, and Wasco		FEMA, OEM, DLCD
<b>Timeline:</b>		<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	

<b>Form Submitted by:</b>		

## Landslide #1

<b>Proposed Action Item:</b>		<b>Alignment with Plan Goals:</b>	
Include information regarding Landslides/Debris Flows in a brochure of natural hazards and mail/make available to county residents and the public		Goal 1: Ability to respond affectively and swiftly Goal 2: Safety of life and property Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• Landslides and Debris Flows can happen with out any or little warning.</li> <li>• People need to know what to expect.</li> <li>• People need to know what they should do and not do in the event of a Landslide/Debris Flow.</li> <li>• Need to plan for the reduction in potential economic losses.</li> <li>• 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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• Educate the public in regards to what to do if they come across a landslide or debris flow.</li> <li>• Educate the public on better ways to provide drainage and structural improvements to reduce economic losses.</li> <li>• Educate the public to pay attention to weather broadcasts and potential hazard warnings.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Planning, County Court, EM, Road Dept., Sheriff.		Cities of Grass Valley, Rufus, Moro, Wasco; Railroads, utilities, ODOT, OSKP, OEM, Railroads, public works, red cross, farm agencies, Oregon Dept. of Fish and Wildlife	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
X Some	X Some		
<b>Form Submitted by:</b>		Susan C. Brewer	

## Volcanic Event #1

<b>Proposed Action Item: VE#1</b>		<b>Alignment with Plan Goals:</b>	
Include information regarding volcanoes in a brochure of natural hazards and mail/make available to county residents and the public.		Goal 1: Ability to respond affectively and swiftly Goal 2: Safety of life and property Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• The main concern in this county from an erupting volcano will be the ash fallout.</li> <li>• Understanding of a hazard risks, empowers the public to use their resources more effectively to prepare for it.</li> <li>• With limited agency resources available, it is necessary for the residents and general public to be able to respond.</li> <li>• 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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• Educate the public regarding staying indoors.</li> <li>• Discuss what to expect and do if a volcano erupts, with children in school.</li> <li>• Have information regarding volcanoes readily available to residents of the county and general public.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Emergency Management, Sheriff, 911, Road Dept., Senior Services, Planning, County Court, Public Health, Medical Clinics		Cities of Grass Valley, Rufus, Moro, Wasco; Medical Clinics, Media, EMS, Schools, ODOT, Red Cross, railroads, utilities, public works, USGS, OEM, DEQ, Medical	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
_____X			
<b>Form Submitted by:</b>		Susan C. Brewer	

## Wildfire #1

<b>Proposed Action Item: WF#1</b>		<b>Alignment with Plan Goals:</b>	
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).		Goal 2: Safety of life and property.  Goal 3: Increased cooperation and collaboration among groups and agencies	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• In a self-completed hazard analysis, Sherman County reported itself as having high risk and vulnerability for wildfire as well as a high probability of future wildfire events. Developing a CWPP can assist Sherman County in identifying mitigation partnerships, methods, and activities specifically for reducing its wildfire risk.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates that Sherman County's probability for a future fire in the WUI is high (that the county would be likely to have a major WUI fire event in the next 10-35 years) and the county's vulnerability to a future WUI fire is high. Developing a CWPP can assist Sherman County in identifying mitigation partnerships, methods, and activities specifically for reducing its WUI fire risk.</li> <li>• The Healthy Forests Restoration Act of 2003 requires at-risk WUI communities to develop CWPPs in order to be eligible to receive certain federal funds for mitigation projects. Being eligible for federal funds can assist the county in funding WUI fire mitigation projects, assisting the county in reducing its overall WUI fire risk.</li> <li>• 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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• Research existing materials that provide assistance in developing a CWPP.</li> <li>• Research existing CWPPs and local, state, and federal regulations and requirements for WUI fire mitigation.</li> <li>• Identify key community stakeholders to involve in the mitigation planning process.</li> <li>• Create and convene a Sherman County CWPP Steering Committee.</li> <li>• Using the background research that has been conducted, have the Steering Committee identify how to meet HFRA's requirements for a CWPP so that the needs, values, and situation of Sherman County are addressed.</li> <li>• Partner with ODF and USFS/BLM to complete the plan</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Sherman County, Public Works		Cities of Grass Valley, Rufus, Moro, Wasco, ODF; Fire Districts; State Fire Marshall; Local Cities; OEM; BLM; USFS; Utilities; Local WUI Property Owners	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
<u>Short Term</u>			

**Form Submitted by:**

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## Wildfire #2

<b>Proposed Action Item: WF#2</b>		<b>Alignment with Plan Goals:</b>
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 2: Safety of life and property Goal 3: Increased cooperation and collaboration between groups and agencies.
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• If appropriate and available residents need to know of the existence of the County Wildfire Protection Plan.</li> <li>• Those responsible for protection need to know where water sources are in the county.</li> <li>• Need to know which evacuation roads need to be repaired.</li> <li>• Need to be sure Mutual aid agreements are in place.</li> <li>• Not all road departments not equipped with personal safety gear and often times their equipment is utilized on fires.</li> <li>• 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.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• If appropriate and available follow County Wildfire Protection Plan.</li> <li>• Educate the public on what to do in a wildfire.</li> <li>• Educate public on 30 foot fuel reduction and debris removal around homes.</li> <li>• Educate public on fire resistant roof, shelter and shrubs.</li> </ul>		
<b>Coordinating Organization:</b>	Sherman County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>
Road Dept., 911, Sheriff, Emergency Management Services, County Court, Rural Fire Dept., Planning		Cities of Grass Valley, Rufus, Moro, Wasco; Utilities, railroads, cities fire dept., medical, BLM, mutual aid partners, Oregon Dept. of Forestry, State Fire Marshall, OEM, Red Cross, OSP, ODOT, Ore. Dept. of Fish and Wildlife.
<b>Timeline:</b>		<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	
<b>X Some</b>	<b>X Some</b>	
<b>Form Submitted by:</b>	Susan C. Brewer	

## Wildfire #3

<b>Proposed Action Item: WF#3</b>		<b>Alignment with Plan Goals:</b>	
Provide County Road Department with fire fighting training and equipment		Goal 2: Safety of life and property. Goal 3: Increased cooperation and collaboration among groups and agencies	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>In a self-completed hazard analysis, Sherman County reported itself as having high risk and vulnerability for wildfire as well as a high probability of future wildfire events. Developing a CWPP can assist Sherman County in identifying mitigation partnerships, methods, and activities specifically for reducing its wildfire risk.</li> <li>The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates that Sherman County's probability for a future fire in the WUI is high (that the county would be likely to have a major WUI fire event in the next 10-35 years) and the county's vulnerability to a future WUI fire is high. Developing a CWPP can assist Sherman County in identifying mitigation partnerships, methods, and activities specifically for reducing its WUI fire risk.</li> <li>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.</li> <li>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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>Identify appropriate training for Road Department Staff</li> <li>Seek funding to support training</li> <li>Identify appropriate funding source for the purchase of fire fighting equipment such as fire pants, shirts, fire shelters, and web gear. Potential funding sources may include DHS' Assistance to Firefighters Grant.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Road Department	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Sherman County, Public Works		Cities of Grass Valley, Moro, Rufus, Wasco, ODF; Fire Districts; State Fire Marshall; Local Cities; OEM; BLM; USFS; Utilities; Local WUI Property Owners	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
<u>Short Term</u>			
<b>Form Submitted by:</b>	Susan C. Brewer		

## Windstorm #1

<b>Proposed Action Item: WS#1</b>		<b>Alignment with Plan Goals:</b>	
Include information regarding wind storms in a brochure of natural hazards and mail/make available to county residents and the public		Goal 2: Safety of life and property Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• Windstorms increase the risk of down communication and power lines.</li> <li>• Windstorms can increase the risk of debris on roads.</li> <li>• Windstorms can cause poor visibility in areas where soil is loose.</li> <li>• Windstorms can cause tree limbs to produce risks to homeowners/tenants.</li> <li>• Windstorms are sometimes accompanied by heavy moisture.</li> <li>• Windstorms can be a catalyst for traffic accidents.</li> <li>• 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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• Educate the public on what to do in a windstorm.</li> <li>• In some areas improve access to ODOT Reader Boards.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Emergency Management, Road Dept., 911, Sheriff, Senior Services, County Court, Medical		Cities of Grass Valley, Rufus, Moro, Wasco; Fire Dept., Utilities, ODOT, Media, Red Cross, City Public Works, Utilities, OEM, Other Medical, Railroads	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
<input checked="" type="checkbox"/> X			
<b>Form Submitted by:</b>		Susan C. Brewer	

## Winter Storm #1

<b>Proposed Action Item: WS#1</b>		<b>Alignment with Plan Goals:</b>
Educate farmers about ways to protect livestock from the effects of winter storms		Goal 2: Safety of life and property
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• Sherman County is vulnerable to a number of natural hazards that can affect public facilities. In a self-completed hazard analysis, the county rated its risk to winter storm as high. The probability that this hazard will recur is rated high. This natural hazard can pose significant risks to public facilities. By encouraging farmers to better protect their livestock from winter storms, impacts to the local economy can be minimized.</li> <li>• According to the Sherman County Community Profile, Agriculture is the industry with the largest workforce in the County.</li> <li>• 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.</li> <li>• 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.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• The County and cities should partner with Oregon State University Extension Service and the Oregon Department of Agriculture for this effort.</li> <li>• Installation of snow fences to reduce drifting snow on roads and paths, which could block access to barns, feed and water.</li> <li>• Horses and livestock should have a shelter where they can be protected from wind, snow, ice and rain.</li> <li>• Grazing animals should have access to a protected supply of food and non-frozen water</li> </ul>		
<b>Coordinating Organization:</b>		Sherman County
<b>Internal Partners:</b>		<b>External Partners:</b>
		Cities of Grass Valley, Moro, Rufus, and Wasco, OSU Extension, Oregon Department of Agriculture
<b>Timeline:</b>		<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	
	Long Term	
<b>Form Submitted by:</b>	Susan C. Brewer	

## Winter Storm #2

<b>Proposed Action Item:</b>		<b>Alignment with Plan Goals:</b>	
Include information regarding Winter storms in a brochure of natural hazards and mail/make available to county residents and the public.		Goal 2: Safety of life and property Goal 3: Increased cooperation and collaboration between groups and agencies.	
<b>Rationale for Proposed Action Item:</b>			
<ul style="list-style-type: none"> <li>• Winter Storms increase the risk of down communication and power lines.</li> <li>• Winter Storms can increase the risk of driving on roads.</li> <li>• Winter Storms can increase the risk of low visibility on roads.</li> <li>• Winter Storms can increase the risk of trees and tree limbs on homes.</li> <li>• Winter Storms can increase the risk of running out of household supplies.</li> <li>• Winter Storms can increase the risk of personal and vehicle accidents and injuries.</li> <li>• 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.</li> </ul>			
<b>Ideas for Implementation:</b>			
<ul style="list-style-type: none"> <li>• Educate the public on what to do in a winter storm.</li> </ul>			
<b>Coordinating Organization:</b>		Sherman County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Planning, County Court, Sheriff, EMS, Road Dept., Medical Clinic		Cities of Grass Valley, Rufus, Moro, Wasco; Railroads, Utilities, ODOT, Public Works, OEM, Medical	
<b>Timeline:</b>		<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)		
Some Items X	Some Items X		
<b>Form Submitted by:</b>	Susan C. Brewer		

## Section 5:

# Plan Implementation and Maintenance

The section details the formal process that will ensure that Sherman County 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. This section also includes an explanation of how the County intends to incorporate the mitigation strategies outlined in this 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. Finally, this section describes how the County will integrate public participation throughout the plan maintenance and implementation process.

## Implementing the Plan

After the Plan is locally reviewed and deemed complete the Emergency Management department will be responsible for submitting it to the State Hazard Mitigation Officer at Oregon Emergency Management. Oregon Emergency Management will then submit the Plan 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. 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.

## Convener

The County Court and 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 lead Convener agency will be the Emergency Management Department. The emergency management personnel will work closely with the emergency management personnel from the

other two counties in the region, Gilliam and Wheeler. All three county Hazard Mitigation plans 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, key plan stakeholders and tri-county regional partners
- Identify emergency management related funding sources for natural hazard mitigation projects or contract for these services
- Incorporate, maintain, and update Sherman County's natural hazards risk GIS data elements
- Utilize the Risk Assessment as a tool for prioritizing proposed natural hazard risk reduction projects
- Monitor and implement the one year and five year update schedule
- Schedule semi-annual steering committee meetings
- Keep the County Court updated on the progress of implementing the plan
- Educate new Commissioners on the County Court regarding the plan

## **Coordinating Body**

The Steering Committee will serve as the coordinating body for the mitigation plan. Potential roles and responsibilities of the coordinating body could include:

- Serving as the local evaluation committee for funding programs such as 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 in accordance with the prescribed maintenance schedule
- 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 Natural Hazards Mitigation Plan:

- Sherman County Court
- City of Grass Valley
- City of Moro
- City of Wasco
- City of Rufus
- Sherman County Fire Defense Board
- Sherman County Planning
- Sherman County Road Master
- ODOT
- Sherman county Sheriff's Department
- Sherman County EMS
- Guests

To make the coordination and review of Sherman County Hazard Mitigation Plan as broad and useful as possible, the steering committee will engage additional stakeholders and other relevant hazard mitigation organizations and agencies to implement the identified action items.

The steering committee will meet semi-annually and annually to review the plan.

## **Implementation through Existing Programs**

The 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 improvement plans, 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 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 should implement the Natural Hazards 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.<sup>i</sup> Implementing the Natural Hazards Mitigation Plan's action items through such plans and policies increases their likelihood of being supported and implemented.

Existing plans, policies and programs can be found in Appendix H of this plan. Examples of these include:

- Emergency Operations and Response Plan
- Transportation Plan
- Comprehensive land Use Plan
- County Road Improvement Plan
- Lower John Day Partnership Plan
- County Plan
- City Hazard Assessment and Response Plans
- Water Shed Council Plans
- U.S. Department of Agriculture Plan

## **Plan Maintenance**

Plan maintenance is a critical component of the natural hazard mitigation plan. Proper maintenance of the plan will ensure that this plan will maximize Sherman County's efforts to reduce the risks posed by natural hazards. This section was developed by the University of Oregon's Oregon Natural Hazards Workgroup and includes a process to ensure that a regular review and update of the plan occurs. The steering committee and local staff will be responsible for implementing this process in addition to maintaining and updating the plan through a series of meetings outlined in the maintenance schedule below.

### **Semi-Annual Meeting**

The Committee will meet on a semi-annual bases to:

- Review existing action items to determine appropriateness for funding
- Identify issues that may not have been identified when the plan was developed
- Prioritize potential mitigation projects using the methodology described below

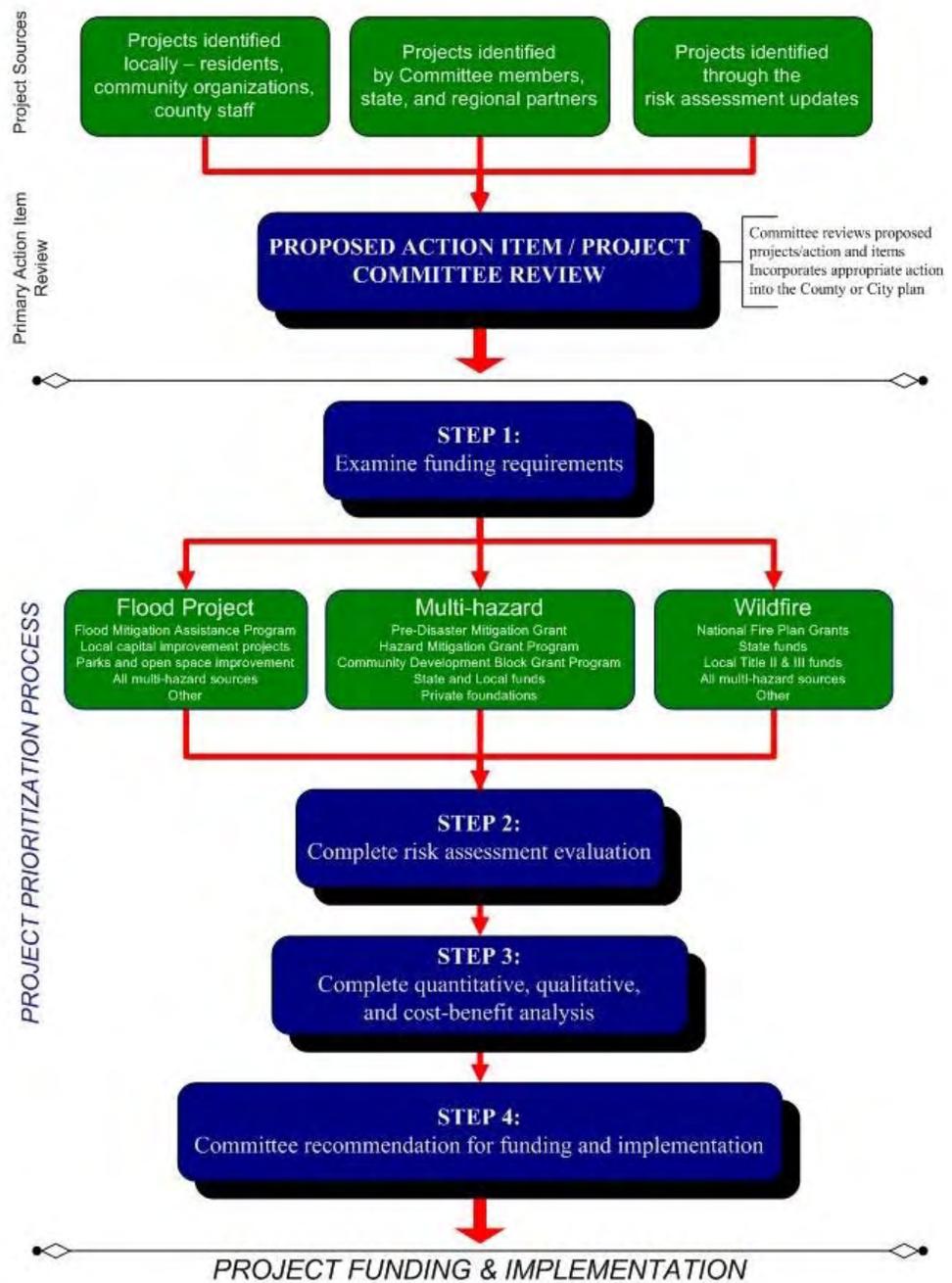
The convener will be responsible for documenting the outcome of the semi-annual meetings. The process the Committee will use to prioritize mitigation projects is detailed in the section below.

### **Project Prioritization Process**

The Disaster Mitigation Act of 2000 (via the Pre-Disaster Mitigation Program) requires that County identify a process for prioritizing potential actions. Potential mitigation activities will 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.

Depending on the potential project's intent and implementation methods, several funding sources may be appropriate. 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, National Fire Plan (NFP), Title II funds, Title III funds, Community Development Block Grants (CDBG), local general funds, and private foundations. Some of these examples are used in the figure 5.1 on the next page to illustrate the project development and prioritization process.

**Figure 5.1: Project Prioritization Process Overview**



Source: Community Service Center's Oregon Natural Hazards Workgroup at the University of Oregon, 2006

**Step 1: Examine funding requirements**

The Steering Committee will identify how best to implement individual actions into the appropriate existing plan, policy, or program. The committee will examine the selected funding stream's requirements to ensure that the mitigation activity would be eligible

through the funding source. The Committee may consult with the funding entity, Oregon Emergency Management, or other appropriate state or regional organization about the project's eligibility.

### **Step 2: Complete risk assessment evaluation**

The second step in prioritizing the plan's action items was to examine which hazards they are associated with and where these hazards rank in terms of community risk. The committee will determine whether or not the plan's risk assessment supports the implementation of the mitigation activity. This determination will be based on the location of the potential activity and the proximity to known hazard areas, historic hazard occurrence, and the probability of future occurrence documented in the Plan. To rank the hazards, community's natural hazard risk assessment was utilized. This risk assessment identified various hazards that may threaten community infrastructure and population in a range from:

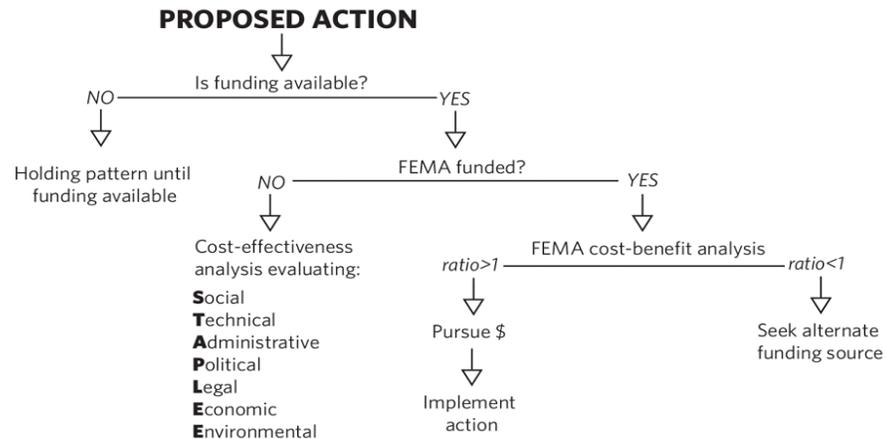
- Low
- Medium
- High

Each of the action items in the plan addresses risk from one or more of these hazards.

### **Step 3: Complete quantitative and qualitative assessment, and economic analysis**

The third step is to identify the costs and benefits associated with 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 can assist communities 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 can provide 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 5.2 shows decision criteria for selecting the method of analysis.

**Figure 5.2: Project Prioritization Process Overview**



Source: Community Service Center's Oregon Natural Hazards Workgroup at the University of Oregon, 2006.

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 natural hazard action item prioritization by the University of Oregon's Oregon Natural Hazards Workgroup. See *Appendix E: Economic Analysis of Natural Hazard Mitigation Projects* for a description of the STAPLE/E evaluation methodology.

#### **Step 4: Committee recommendation**

Based on the steps above, the committee will recommend whether or not the mitigation activity should be moved forward. If the committee decides to move forward with the action, the coordinating organization designated for the activity will be responsible for taking further action and documenting success upon project completion. The Committee will convene a meeting to review the issues surrounding grant applications and shared

knowledge and or resources. This process will afford greater coordination and less competition for limited funds.

The Committee and the community's leadership have the option to implement any of the action items at any time, (regardless of the prioritized order). This allows the committee to consider mitigation strategies as new opportunities arise, such as funding for action items that may not be of highest priority. This methodology is used by the Committee to initially prioritize the plan's action items, in addition to maintaining the action list during annual review and update.

## **Annual Meeting**

The steering committee will meet annually to review updates of the Risk Assessment data and findings, discuss methods of continued public involvement, and document successes and lessons learned based on actions that were accomplished during the past year. The convener will be responsible for documenting the outcomes of the annual.

The plan's format allows the County 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 Sherman County.

## **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. During this plan update, the following questions should be asked to determine what actions are necessary to update the plan. The convener will be responsible for convening the Committee to address the questions outlined below.

- Are the plan goals still applicable?
- Do the plan's priorities align with State priorities?
- Are there new partners that should be brought to the table?
- Are there new local, regional, state, or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the plan was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Do existing actions need to be reprioritized for implementation?

- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the plan accurately address the impacts of this event?

The questions above will help the committee determine what components of the mitigation plan need updating. The Committee will be responsible for updating any deficiencies found in the plan based on the questions above.

## **Continued Public Involvement & Participation**

Sherman County is dedicated to involving the public directly in the continual reshaping and updating of the Natural Hazard Mitigation Plan. Although members of the Steering Committee represent the public to some extent, the public will also have the opportunity to provide feedback about the Plan.

During plan development, public participation was incorporated into every stage of the plan development process.

All meetings were open to the public. There were small numbers from the public in attendance, but their input was appreciated and valued.

During the resolution process by the cities and County Commissioners, the public was encouraged to attend and provide input.

New stakeholders and the public will be encouraged to attend the semi-annual and annual updates of the plan and to volunteer on sub-committees for fund raising, hazard project work, identification of new stakeholders and revisions and re-assessment of identified hazards and action plans.

Once the plan has been approved by the cities, County and FEMA it will be available to the public for review at the Emergency Management office and on the Oregon Natural Hazards Workgroup (ONHW) website.

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<sup>i</sup> Burby, Raymond J., ed. 1998. *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*.

# **Annex I: Identifying and Assessment of Communities at Risk**

The purpose of this section is to provide background on the wildfire hazard for Sherman County. This includes a list of Communities at Risk as well as the methodology for determining Communities at Risk.

High Risk Communities July 29, 2005

Following, is a list of jurisdictions (communities), sorted by county, that have at least 28 persons per square mile within 8 km of a high risk watershed. This list was developed as an interim measure until the complete assessment is finished. Populated areas outside a city, fire district, federally recognized Indian reservation, or national park, are assigned to the county.

BAKER	BAKER (County)
BAKER	Baker City (City)
BAKER	BAKER RFPD (RFPD)
BAKER	EAGLE VALLEY RFPD (RFPD)
BAKER	Haines (City)
BAKER	HAINES FIRE PROTECTION DIST. (RFPD)
BAKER	Halfway (City)
BAKER	KEATING RFPD (RFPD)
BAKER	NORTH POWDER FIRE DEPT (RFPD)
BAKER	PINE VALLEY RFPD (RFPD)
BAKER	Richland (City)
BAKER	Sumpter (City)
BAKER	Unity (City)
CLACKAMAS	CLACKAMAS (County)
CLACKAMAS	HOODLAND RFPD (RFPD)
CLACKAMAS	SANDY RFPD #72 (RFPD)
COOS	BRIDGE VOL RFPD (RFPD)
COOS	COOS (County)
CROOK	CROOK (County)
CROOK	Prineville (City)
CROOK	Prineville (RFPD)
CROOK	REDMOND FIRE DEPT (RFPD)
CURRY	AGNESS-ILLAHE VOL (RFPD)
CURRY	CURRY (County)
CURRY	OPHIR RFPD (RFPD)
CURRY	SQUAW VALLEY N BANK RFPD (RFPD)
DESCHUTES	Bend (City)
DESCHUTES	BEND FD (RFPD)
DESCHUTES	BLACK BUTTE RANCH RFPD (RFPD)
DESCHUTES	CLOVERDALE RFPD (RFPD)
DESCHUTES	CROOKED RIVER RANCH RFPD (RFPD)
DESCHUTES	DESCHUTES (County)
DESCHUTES	LAPINE RFPD (RFPD)
DESCHUTES	Prineville (RFPD)
DESCHUTES	Redmond (City)
DESCHUTES	REDMOND FIRE DEPT (RFPD)
DESCHUTES	Sisters (City)
DESCHUTES	SISTERS-CAMP SHERMAN RFPD (RFPD)
DESCHUTES	Sunriver (RFPD)
DOUGLAS	AZALEA VOLS (RFPD)
DOUGLAS	Calapooya (RFPD)
DOUGLAS	CAMAS VALLEY VOL RFD (RFPD)
DOUGLAS	Canyonville (City)
DOUGLAS	CANYONVILLE SOUTH UMPQUA FD (RFPD)
DOUGLAS	Cow Creek (Reservation)
DOUGLAS	DAYS CREEK RFD (RFPD)
DOUGLAS	DOUGLAS (County)
DOUGLAS	DOUGLAS CO FIRE DIST #2 (RFPD)
DOUGLAS	Douglas CO Fire District #5 (RFPD)

DOUGLAS Drain (City)  
 DOUGLAS DRAIN RFPD (RFPD)  
 DOUGLAS Elkton (City)  
 DOUGLAS ELKTON RFPD (RFPD)  
 DOUGLAS FAIR OAKS RFPD (RFPD)  
 DOUGLAS Glendale (City)  
 DOUGLAS GLENDALE RFPD (RFPD)  
 DOUGLAS GLIDE RFPD (RFPD)  
 DOUGLAS KELLOGG RFD (RFPD)  
 DOUGLAS LOOKINGGLASS RFD (RFPD)  
 DOUGLAS MILO RFPD (RFPD)  
 DOUGLAS Myrtle Creek (City)  
 DOUGLAS MYRTLE CREEK FD (RFPD)  
 DOUGLAS Oakland (City)  
 DOUGLAS OAKLAND RFPD (RFPD)  
 DOUGLAS RICE HILL RFD (RFPD)  
 DOUGLAS Riddle (City)  
 DOUGLAS Riddle RFPD (RFPD)  
 DOUGLAS Roseburg (City)  
 DOUGLAS Sutherlin (City)  
 DOUGLAS TENMILE RFPD (RFPD)  
 DOUGLAS TILLER RFPD (RFPD)  
 DOUGLAS TRI CITY FIRE DIST #4 (DOUG) (RFPD)  
 DOUGLAS Winston (City)  
 DOUGLAS Yoncalla (City)  
 DOUGLAS YONCALLA RFPD (RFPD)  
 GILLIAM GILLIAM (County)  
 GILLIAM Lonerock (City)  
 GILLIAM South Gilliam County (RFPD)  
 GRANT Canyon City (City)  
 GRANT Dayville (City)  
 GRANT Granite (City)  
 GRANT GRANT (County)  
 GRANT John Day (City)  
 GRANT JOHN DAY FIRE DEPT (RFPD)  
 GRANT Long Creek (City)  
 GRANT Monument (City)  
 GRANT MT VERNON FD (RFPD)  
 GRANT Mt. Vernon (City)  
 GRANT Prairie City (City)  
 GRANT PRAIRIE CITY FIRE DEPT (RFPD)  
 GRANT Seneca (City)  
 HARNEY Burns (City)  
 HARNEY Burns Paiute (Reservation)  
 HARNEY HARNEY (County)  
 HOOD RIVER Cascade Locks (City)  
 HOOD RIVER DEE RFPD (RFPD)  
 HOOD RIVER Hood River (City)  
 HOOD RIVER HOOD RIVER (County)  
 HOOD RIVER MOSIER FD (RFPD)  
 HOOD RIVER ODELL RFPD (RFPD)  
 HOOD RIVER PARKDALE RFPD (RFPD)  
 HOOD RIVER PINE GROVE RFPD (RFPD)  
 HOOD RIVER Warm Springs (Reservation)  
 HOOD RIVER WEST SIDE RFPD (RFPD)  
 JACKSON APPLEGATE RFPD #9 (RFPD)  
 JACKSON Ashland (City)

JACKSON Butte Falls (City)  
JACKSON Central Point (City)  
JACKSON COLESTIN RFPD (RFPD)  
JACKSON Eagle Point (City)  
JACKSON EVANS VALLEY FIRE DIST #6 (RFPD)  
JACKSON Gold Hill (City)  
JACKSON JACKSON (County)  
JACKSON JACKSON CO FD #3 (RFPD)  
JACKSON JACKSON CO RFPD #4 (RFPD)  
JACKSON JACKSON CO RFPD #5 (RFPD)  
JACKSON Jacksonville (City)  
JACKSON LAKE CREEK RFPD #8 (RFPD)  
JACKSON Medford (City)  
JACKSON MEDFORD F&R (RFPD)  
JACKSON Phoenix (City)  
JACKSON PROSPECT RFPD (RFPD)  
JACKSON Rogue River (City)  
JACKSON ROGUE RIVER RFPD (RFPD)  
JACKSON RURAL METRO FIRE DEPT (RFPD)  
JACKSON Shady Cove (City)  
JACKSON Talent (City)  
JEFFERSON Camp Sherman (RFPD)  
JEFFERSON CROOKED RIVER RANCH RFPD (RFPD)  
JEFFERSON Culver (City)  
JEFFERSON JEFFERSON (County)  
JEFFERSON Madras (City)  
JEFFERSON Metolius (City)  
JEFFERSON North Unit (RFPD)  
JEFFERSON REDMOND FIRE DEPT (RFPD)  
JEFFERSON Warm Springs (Reservation)  
JEFFERSON WARM SPRINGS FIRE SFTY (RFPD)  
JOSEPHINE APPLGATE RFPD #9 (RFPD)  
JOSEPHINE Cave Junction (City)  
JOSEPHINE Grants Pass (City)  
JOSEPHINE ILLINOIS VALLEY RFPD (RFPD)  
JOSEPHINE JOSEPHINE (County)  
JOSEPHINE Oregon Caves NM (NPS)  
JOSEPHINE ROGUE RIVER RFPD (RFPD)  
JOSEPHINE RURAL METRO FIRE DEPT (RFPD)  
JOSEPHINE WILLIAMS RFPD (RFPD)  
JOSEPHINE WOLF CREEK RFPD (RFPD)  
KLAMATH BLY RFPD (RFPD)  
KLAMATH Bonanza (City)  
KLAMATH BONANZA RFPD (RFPD)  
KLAMATH CHEMULT RFPD (RFPD)  
KLAMATH Chiloquin (City)  
KLAMATH CHILOQUIN-AGENCY LK RFPD (RFPD)  
KLAMATH Crater Lake NP (NPS)  
KLAMATH CRESCENT RFPD (RFPD)  
KLAMATH HARRIMAN RFPD (RFPD)  
KLAMATH KENO RFPD (RFPD)  
KLAMATH Klamath (County)  
KLAMATH Klamath (Reservation)  
KLAMATH KLAMATH CO FD #3 (RFPD)  
KLAMATH KLAMATH CO FD #5 (RFPD)  
KLAMATH KLAMATH CO FIRE DIST #1 (RFPD)  
KLAMATH Klamath Falls (City)

KLAMATH	LAPINE RFPD (RFPD)
KLAMATH	MALIN RFPD (RFPD)
LAKE	LAKE (County)
LAKE	Lakeview (City)
LAKE	LAKEVIEW FIRE DEPT (RFPD)
LAKE	NEW PINE CREEK RFPD (RFPD)
LAKE	Paisley (City)
LAKE	SILVER LAKE RFPD (RFPD)
LAKE	THOMAS CREEK/WESTSIDE RFPD (RFPD)
LANE	BLUE RIVER FD (RFPD)
LANE	DEXTER RFPD (RFPD)
LANE	DRAIN RFPD (RFPD)
LANE	LANE (County)
LANE	LORANE RFPD (RFPD)
LANE	LOWELL RFPD (RFPD)
LANE	MCKENZIE F&R (RFPD)
LANE	Oakridge (City)
LANE	UPPER MCKENZIE RFPD (RFPD)
LANE	Westfir (City)
LANE	WESTFIR FIRE DEPT (RFPD)
MORROW	HEPPNER FD (RFPD)
MULTNOMAH	MULTNOMAH (County)
MULTNOMAH	MULTNOMAH CO RFPD #14 (RFPD)
MULTNOMAH	SANDY RFPD #72 (RFPD)
UMATILLA	Adams (City)
UMATILLA	EAST UMATILLA CO RFPD (RFPD)
UMATILLA	ECHO RFPD (RFPD)
UMATILLA	Lower Mckay (RFPD)
UMATILLA	Mckay (RFPD)
UMATILLA	Milton-Freewater (City)
UMATILLA	Pendleton (City)
UMATILLA	Pilot Rock (City)
UMATILLA	PILOT ROCK RFPD (RFPD)
UMATILLA	Riverside (RFPD)
UMATILLA	Ukiah (City)
UMATILLA	UMATILLA (County)
UMATILLA	Umatilla (Reservation)
UNION	Cove (City)
UNION	COVE RFPD (RFPD)
UNION	Elgin (City)
UNION	ELGIN VOL FIRE DEPT (RFPD)
UNION	HAINES FIRE PROTECTION DIST. (RFPD)
UNION	Imbler (City)
UNION	IMBLER RFPD (RFPD)
UNION	Island City (City)
UNION	La Grande (City)
UNION	LA GRANDE RFPD (RFPD)
UNION	North Powder (City)
UNION	NORTH POWDER FIRE DEPT (RFPD)
UNION	Summerville (City)
UNION	Union (City)
UNION	UNION (County)
UNION	UNION EMERGENCY SERVICES (RFPD)
WALLOWA	Enterprise (City)
WALLOWA	Joseph (City)
WALLOWA	Lostine (City)
WALLOWA	Wallowa (City)

WALLOWA	WALLOWA (County)
WALLOWA	WALLOWA FD (RFPD)
WASCO	Dufur (City)
WASCO	JUNIPER FLATS RFPD (RFPD)
WASCO	Maupin (City)
WASCO	MID-COLUMBIA F&R (RFPD)
WASCO	Mosier (City)
WASCO	MOSIER FD (RFPD)
WASCO	PINE GROVE RFPD (RFPD)
WASCO	PINE HOLLOW VOL (RFPD)
WASCO	The Dalles (City)
WASCO	TYGH VALLEY VOL FD (RFPD)
WASCO	Wamic (RFPD)
WASCO	Warm Springs (Reservation)
WASCO	WASCO (County)
WHEELER	Fossil (City)
WHEELER	Mitchell (City)
WHEELER	Spray (City)
WHEELER	WHEELER (County)
WHEELER	WHEELER POINT VOL FIRE ASSOC (RFPD)

High Risk Communities July 29, 2005

Following, is a list of jurisdictions (communities) that have at least 28 persons per square mile within 8 km of a high risk watershed. This list was developed as an interim measure until the complete assessment is finished. Populated areas outside a city, fire district, federally recognized Indian reservation, or national park, are assigned to the county.

Name

AGNESS-ILLAHE VOL (RFPD)  
APPLEGATE RFPD #9 (RFPD)  
AZALEA VOLs (RFPD)  
Adams (City)  
Ashland (City)  
BAKER (County)  
BAKER RFPD (RFPD)  
BEND FD (RFPD)  
BLACK BUTTE RANCH RFPD (RFPD)  
BLUE RIVER FD (RFPD)  
BLY RFPD (RFPD)  
BONANZA RFPD (RFPD)  
BRIDGE VOL RFPD (RFPD)  
Baker City (City)  
Bend (City)  
Bonanza (City)  
Burns (City)  
Burns Paiute (Reservation)  
Butte Falls (City)  
CAMAS VALLEY VOL RFD (RFPD)  
CANYONVILLE SOUTH UMPQUA FD (RFPD)  
CHEMULT RFPD (RFPD)  
CHILOQUIN-AGENCY LK RFPD (RFPD)  
CLACKAMAS (County)  
CLOVERDALE RFPD (RFPD)  
COLESTIN RFPD (RFPD)  
COOS (County)  
COVE RFPD (RFPD)  
CRESCENT RFPD (RFPD)  
CROOK (County)  
CROOKED RIVER RANCH RFPD (RFPD)  
CURRY (County)  
Calapooya (RFPD)  
Camp Sherman (RFPD)  
Canyon City (City)  
Canyonville (City)  
Cascade Locks (City)  
Cave Junction (City)  
Central Point (City)  
Chiloquin (City)  
Cove (City)  
Cow Creek (Reservation)  
Crater Lake NP (NPS)  
Culver (City)  
DAYS CREEK RFD (RFPD)  
DEE RFPD (RFPD)  
DESCHUTES (County)  
DEXTER RFPD (RFPD)

DOUGLAS (County)  
DOUGLAS CO FIRE DIST #2 (RFPD)  
DRAIN RFPD (RFPD)  
Dayville (City)  
Douglas CO Fire District #5 (RFPD)  
Drain (City)  
Dufur (City)  
EAGLE VALLEY RFPD (RFPD)  
EAST UMATILLA CO RFPD (RFPD)  
ECHO RFPD (RFPD)  
ELGIN VOL FIRE DEPT (RFPD)  
ELKTON RFPD (RFPD)  
EVANS VALLEY FIRE DIST #6 (RFPD)  
Eagle Point (City)  
Elgin (City)  
Elkton (City)  
Enterprise (City)  
FAIR OAKS RFPD (RFPD)  
Fossil (City)  
GILLIAM (County)  
GLENDALE RFPD (RFPD)  
GLIDE RFPD (RFPD)  
GRANT (County)  
Glendale (City)  
Gold Hill (City)  
Granite (City)  
Grants Pass (City)  
HAINES FIRE PROTECTION DIST. (RFPD)  
HARNEY (County)  
HARRIMAN RFPD (RFPD)  
HEPPNER FD (RFPD)  
HOOD RIVER (County)  
HOODLAND RFPD (RFPD)  
Haines (City)  
Halfway (City)  
Hood River (City)  
ILLINOIS VALLEY RFPD (RFPD)  
IMBLER RFPD (RFPD)  
Imbler (City)  
Island City (City)  
JACKSON (County)  
JACKSON CO FD #3 (RFPD)  
JACKSON CO RFPD #4 (RFPD)  
JACKSON CO RFPD #5 (RFPD)  
JEFFERSON (County)  
JOHN DAY FIRE DEPT (RFPD)  
JOSEPHINE (County)  
JUNIPER FLATS RFPD (RFPD)  
Jacksonville (City)  
John Day (City)  
Joseph (City)  
KEATING RFPD (RFPD)  
KELLOGG RFD (RFPD)  
KENO RFPD (RFPD)  
KLAMATH CO FD #3 (RFPD)  
KLAMATH CO FD #5 (RFPD)  
KLAMATH CO FIRE DIST #1 (RFPD)

Klamath (Reservation)  
Klamath Falls (City)  
LA GRANDE RFPD (RFPD)  
LAKE (County)  
LAKE CREEK RFPD #8 (RFPD)  
LAKEVIEW FIRE DEPT (RFPD)  
LANE (County)  
LAPINE RFPD (RFPD)  
LOOKINGGLASS RFD (RFPD)  
LORANE RFPD (RFPD)  
LOWELL RFPD (RFPD)  
La Grande (City)  
Lakeview (City)  
Lonerock (City)  
Long Creek (City)  
Lostine (City)  
Lower Mckay (RFPD)  
MALIN RFPD (RFPD)  
MCKENZIE F&R (RFPD)  
MEDFORD F&R (RFPD)  
MID-COLUMBIA F&R (RFPD)  
MILO RFPD (RFPD)  
MOSIER FD (RFPD)  
MT VERNON FD (RFPD)  
MULTNOMAH (County)  
MULTNOMAH CO RFPD #14 (RFPD)  
MYRTLE CREEK FD (RFPD)  
Madras (City)  
Maupin (City)  
Mckay (RFPD)  
Medford (City)  
Metolius (City)  
Milton-Freewater (City)  
Mitchell (City)  
Monument (City)  
Mosier (City)  
Mt. Vernon (City)  
Myrtle Creek (City)  
NEW PINE CREEK RFPD (RFPD)  
NORTH POWDER FIRE DEPT (RFPD)  
North Powder (City)  
North Unit (RFPD)  
OAKLAND RFPD (RFPD)  
ODELL RFPD (RFPD)  
OPHIR RFPD (RFPD)  
Oakland (City)  
Oakridge (City)  
Oregon Caves NM (NPS)  
PARKDALE RFPD (RFPD)  
PILOT ROCK RFPD (RFPD)  
PINE GROVE RFPD (RFPD)  
PINE HOLLOW VOL (RFPD)  
PINE VALLEY RFPD (RFPD)  
PRAIRIE CITY FIRE DEPT (RFPD)  
PROSPECT RFPD (RFPD)  
Paisley (City)  
Pendleton (City)

Phoenix (City)  
Pilot Rock (City)  
Prairie City (City)  
Prineville (City)  
Prineville (RFPD)  
REDMOND FIRE DEPT (RFPD)  
RICE HILL RFD (RFPD)  
ROGUE RIVER RFPD (RFPD)  
RURAL METRO FIRE DEPT (RFPD)  
Redmond (City)  
Richland (City)  
Riddle (City)  
Riddle RFPD (RFPD)  
Riverside (RFPD)  
Rogue River (City)  
Roseburg (City)  
SANDY RFPD #72 (RFPD)  
SILVER LAKE RFPD (RFPD)  
SISTERS-CAMP SHERMAN RFPD (RFPD)  
SQUAW VALLEY N BANK RFPD (RFPD)  
Seneca (City)  
Shady Cove (City)  
Sisters (City)  
South Gilliam County (RFPD)  
Spray (City)  
Summerville (City)  
Sumpter (City)  
Sunriver (RFPD)  
Sutherlin (City)  
TENMILE RFPD (RFPD)  
THOMAS CREEK/WESTSIDE RFPD (RFPD)  
TILLER RFPD (RFPD)  
TRI CITY FIRE DIST #4 (DOUG) (RFPD)  
TYGH VALLEY VOL FD (RFPD)  
Talent (City)  
The Dalles (City)  
UMATILLA (County)  
UNION (County)  
UNION EMERGENCY SERVICES (RFPD)  
UPPER MCKENZIE RFPD (RFPD)  
Ukiah (City)  
Umatilla (Reservation)  
Union (City)  
Unity (City)  
WALLOWA (County)  
WALLOWA FD (RFPD)  
WARM SPRINGS FIRE SFTY (RFPD)  
WASCO (County)  
WEST SIDE RFPD (RFPD)  
WESTFIR FIRE DEPT (RFPD)  
WHEELER (County)  
WHEELER POINT VOL FIRE ASSOC (RFPD)  
WILLIAMS RFPD (RFPD)  
WOLF CREEK RFPD (RFPD)  
Wallowa (City)  
Wamic (RFPD)  
Warm Springs (Reservation)

Westfir (City)  
Winston (City)  
YONCALLA RFPD (RFPD)  
Yoncalla (City)  
Grants Pass (City)  
Klamath Falls (City)  
Klamath (County)

# **IDENTIFYING AND ASSESSMENT OF COMMUNITIES AT RISK IN OREGON**

## ***Draft Version 4.0***

***October 18, 2004***

**Scope:** This assessment methodology provides for a “seamless” process for identification and wildfire risk assessment of Oregon’s communities that is appropriate at all levels resolution – from statewide to community to parcel.

**Background:** Assessment of wildfire’s threat to communities in Oregon is occurring at several levels.

- The state will be using the National Association of State Forester’s (NASF) *Field Guide* during the next 12 months with the desired outcome to identify and assess Oregon’s communities to meet the needs of the “Collaborative Fuels Treatment MOU” and Task e, Goal 4 of the *Implementation Plan for the 10-Year Comprehensive Strategy*.
- The state is also beginning implementation of Oregon’s Forestland-Urban Fire Protection Act of 1997 (SB360), which will use procedures contained in Oregon Administrative Rules to identify and classify forestlands in nearly every county in the state over the next 10 years.
- Many counties and communities are beginning a wildfire assessment with the desired outcome to:
  - Meet federal FEMA requirements for a wildfire mitigation plan (Title 44 CFR Part 201 of The Disaster Mitigation Act of 2000) and
  - Prioritize Title III and National Fire Plan projects.
- Additionally, individual communities and watershed councils are completing neighborhood level assessments as part of their neighborhood/community fire plans.
- The Healthy Forests Restoration Act of 2003 (HFRA) and a new federal fire management planning process addresses community fire plans and identification of WUI lands within and adjacent to “at-risk” communities.

**Purpose:** Provide a tiered collaborative process that best serves the various needs at the appropriate resolutions of assessment. – from statewide to an individual neighborhood. The assessment includes all lands and ownerships and collaboratively considers the complexity of ownership patterns, resource management issues and stakeholder interests. The higher quality local assessments will be used to further refine the statewide assessment.

### **Process Overview**

ODF, with cooperators through a statewide steering committee will:

- Design and conduct a coarse scale statewide risk assessment to initially prioritize fire mitigation needs.
- Set standards and provide certain data for counties and communities to conduct a fire risk assessment.
- Initiate and maintain a risk assessment map and database for the state.

Counties and communities will:

- Using statewide standards, collaboratively further identify unique communities within their jurisdiction.
- Using statewide standards, collaboratively further refine the risk assessment
- Submit results to ODF for approval to be up-dated in statewide risk assessment.

# **IDENTIFYING AND ASSESSMENT OF COMMUNITIES AT RISK IN OREGON**

## **Draft Version 4.0**

### **Identifying/Naming Communities to be Assessed**

**Background:** Under agreement of the NAFS and federal agencies, states are responsible for identification of communities at risk. For management of nearby federal lands, communities, through an approved *Community Wildfire Protection Plan (CWPP)*, will identify areas (Wildland-Urban Interface) within and adjacent to these state-identified communities using criteria contained in the HFRA. In areas not covered by a CWPP, federal agencies will determine the WUI boundary.

NASF Guidance defines *community* as “a group of people living in the same locality and under the same government.”

The HFRA defines an “at-risk community” as:

- 1) An area comprised of:
  - Where humans and their development meet or intermix with wildland fuel (federal register definition, January 4, 2001, which uses a structure density of 1 per 40 acres or population of 28 person per square mile), or
  - Or a group of homes and other structures with basic infrastructure and services within or adjacent to federal land;
- 2) in which conditions are conducive to a large scale wildland fire event; and
- 3) for which a significant threat to human life or property exists as a result of a wildland fire disturbance event.

For its list of communities at risk in Oregon, ODF defines *community at risk* as ***a geographic area within and surrounding permanent dwellings with basic infrastructure and services, under a common fire protection jurisdiction or government, for which there is a significant threat due to wildfire.***

#### **Identifying communities for initial statewide assessment:**

- Geographic areas where at least 1 structure per 40 acres meet or intermix with wildland fuel are identified (federal register criteria).
- Adjacent landscapes that contain vegetation creating a risk to the community, generally a sixth field watershed, and municipal watersheds.
- These geographic areas are subdivided by the boundary of the jurisdictional with primary constitutional authority for protection of life from wildfire (Cities, fire districts, and county board of commissioners for “unprotected” areas).

#### **Identifying communities for county and community assessments:**

- For the purpose of providing a better community risk assessment and fire plan (and development of community wildfire protection plans under the HFRA), the jurisdictional areas identified at the statewide level should be divided into logical community boundaries collaboratively with fire districts, cities and counties. An unincorporated *rural community* without a common government or fire district providing structural fire protection is defined as consisting primarily of permanent residential dwellings but also at least two other land uses that provide commercial, industrial, or public uses (e.g. schools, churches, grange halls, post offices) to the community, surrounding rural area or persons traveling through the area (Oregon Department of Land Conservation and Development 1994).

# ***IDENTIFYING AND ASSESSMENT OF COMMUNITIES AT RISK IN OREGON***

## ***Draft Version 4.0***

### **Assessment of Risk Factors**

Related to wildfire assessment, it is clear that one-size-does-not-fit-all. However, nearly all assessment models consider **risk, hazard, protection capabilities and values protected**. In addition, an assessment of the **vulnerability of values at risk** is needed for community down to parcel level assessments. Complex assessment worksheets available through Firewise, NFPA, RAMS, Western Fire Chiefs Association, International Fire Code Institute, and various states can be boiled into these groupings. FEMA requires risk assessments to profile hazards, vulnerabilities, and impacts in terms of location, extent, previous occurrence, and potential dollar loss to vulnerable assets.

Consistent with the NASF Guidance, an adjective rating of *Low, Moderate, or High* will be used to describe each factor (an additional *Very High* rating is allowed for Hazard) for the statewide assessment. However, field-testing has shown that there is a need for finer resolution of the data to accommodate local assessments. For example, it's possible that nearly every community in a county could receive a statewide rating of High for a factor. This would do little to help a local government or community prioritize areas of concern. To maintain the integrity of the statewide rating, yet provide of local needs, a point system that provides for a wide range of points for each factor is used. However, when this assessment is rolled up to the state, the statewide score system will be used

This paper provides a process for consistently assigning these adjective values. It uses *best available data* (BAD) for various resolutions of assessment.

### **Weighting of Factors**

Risk: 40 Points

Hazard: 80 Points

Protection Capability: 40 points

Values at Risk: 50 Points

Structural Vulnerability: 90 Points

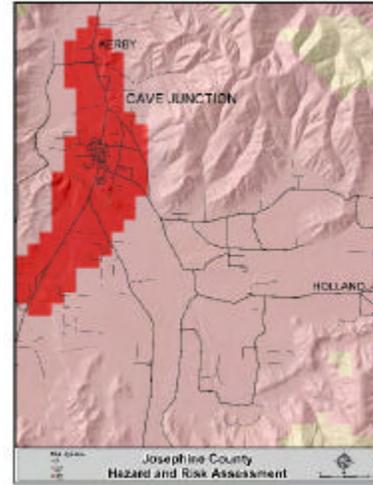
**IDENTIFYING AND ASSESSMENT OF COMMUNITIES AT RISK IN OREGON**  
**Draft Version 4.0**

**Risk: What is the likelihood of a fire occurring?**

Statewide: Use historic wildfire occurrence provided by ODF, OSFM, and federal land management agencies and tribes.

<b>Historic fire occurrence</b>	<b>Points</b>
<u>Fire occurrence - per 1000 acres per 10 years</u>	
(Low) 0-1	5
(Moderate) .1-1.1	20
(High) 1.1+	40

Local: Use of historic fire occurrence alone would be adequate (see Josephine County Example). However, in addition, an assessment of **ignition risk potential** may help local communities better assess potential fire starts and design appropriate fire prevention strategies into a fire plan. The list of ignition sources in the RAMS model is a good source: *Transmission power lines, above ground distribution lines, power substations, active logging, construction, debris burning, slash burning, mining, dispersed camping, developed camping, off-road vehicle use, flammables present, fireworks, mowing dry grass, woodcutting, equipment use, target shooting, military training, arson, cultural activities, railroad, federal/state highway, county road, public access roads, camps/resorts/stables, schools, business, ranch/farm, lightning prone, dump*



**Historic fire occurrence**

<u>Fire occurrence - per 1000 acres per 10 years</u>	
0-0.1	5
0.1 –1.1	10
1.1+	20

**Ignition Risk**

<u>Home density (homes per 10 acres)</u>	
0-.9 (rural)	0
1-5.0 (suburban)	5
5.1+ (urban)	10

<u>Other risk factors present in vicinity</u>	
< 1/3 present	0
1/3-2/3 present	5
> 2/3 present	10

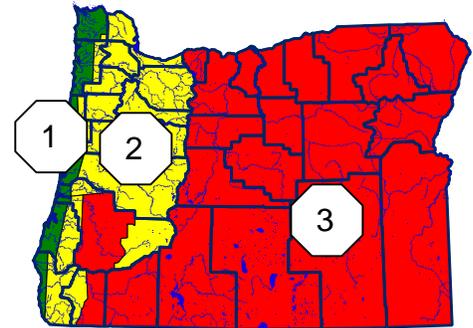
<u>Category</u>	<u>Rating</u>	<u>From</u>	<u>To</u>
Low		0	13
Moderate		13	27
High		27	40

**IDENTIFYING AND ASSESSMENT OF COMMUNITIES AT RISK IN OREGON**  
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**Hazard:** What is the resistance to control once a wildfire starts, being the weather, topography and fuel that adversely affects suppression efforts

Hazard is closely associated with fire weather, topography, and fuels (the fire behavior triangle).

**Weather Hazard Factor Value:** All levels: The number of days per season that forest fuels are capable of producing a significant fire event is important to consider. The reference for establishing the wildfire weather hazard factor is data provided by the Oregon Department of Forestry, which was developed following an analysis of daily wildfire danger rating indices in each regulated use area of the state and which is described in Table 1 of OAR 629-044-0230.



State/Community/Parcel	
OAR Table 1	Points
Non-forest in any zone (mask out)	0
1	0
2	20
3	40

**Topographic Hazard Factor Value:**

All levels: Slope and aspect affect both the intensity and rate of spread of a wildfire. Elevation affects the type of vegetation and the length of the season. The topography hazard factor is determined by considering slope, aspect, and elevation using DEM's. Each factor is added together to determine the topographic value:

Topography	Points
<u>Slope</u>	
0-25%	0
26-40%	2
>40%	3
<u>Aspect</u>	
N, NW, NE	0
W, E	3
S, SW, SE	5
<u>Elevation feet above sea level</u>	
5001+ feet	0
3501-5000 feet	1
0-3500 feet	2

**IDENTIFYING AND ASSESSMENT OF COMMUNITIES AT RISK IN OREGON**  
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**Natural Vegetative Fuel Hazard Factor Value:**

Given high-to-extreme fire danger for a geographic area, vegetation is the primary factor affecting the intensity of the fire, thus the resistance to control and the potential threat to protected resources (lives, property, and resources). It also affects the amount and travel distance of burning embers that again, significantly impact the resistance to control and the potential threat to protected resources

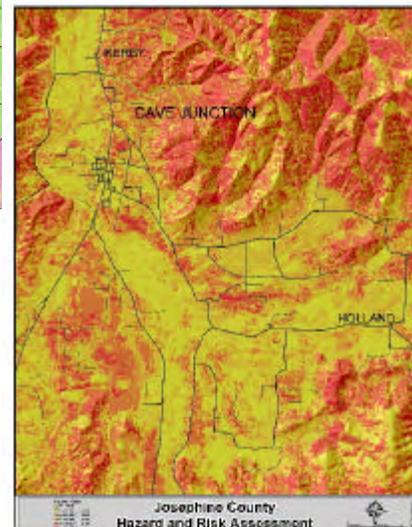
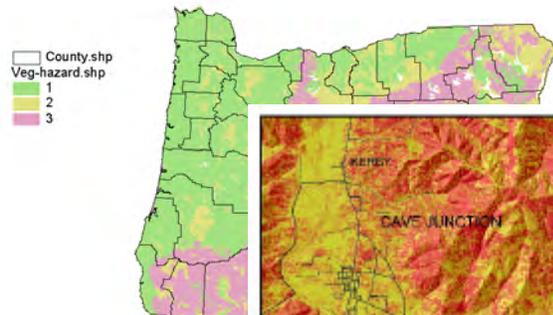
Determine by using fire behavior fuel models and/or potential flame length.

State/Community/Parcel*		
Fuel Hazard Factor	Fuel Model	Fire Characteristics
1	Grass (1) Low/less flammable brush (5) and short-needle timber litter (8)	Typically produces a flame length of up to 5 feet, a wildfire that exhibits very little spotting, torching, or crowning, and which results in a burned area that can normally be entered within 15 minutes.
2	Grass/Timber (2) Moderate brush, conifer reproduction, open sage and juniper (6)	Typically produces a flame length of 5 to 8 feet, a wildfire that exhibits sporadic spotting, torching, or crowning, and which results in a burned area that can normally be entered within one hour. Mixed severity.
3	Tall flammable grasses (3) Heavy/flammable brush (4), and mature timber with slash (10)	Typically produces a flame length of over 8 feet, a wildfire that exhibits frequent spotting, torching, or crowning, and which results in a burned area that normally cannot be entered for over one hour. Stand replacement severity.

Statewide: Best available data statewide will likely be a combination of grid vegetation and the GAP vegetation types with a cross-walk to hazard value (determined by an expert panel representing all areas – similar to Colorado assessment). Below is a sample of vegetation hazard value statewide using GAP data as a test (no collaboration or statewide input).

**Vegetation (fuel model)**  
**SB360 - Natural Vegetative**  
**Fuel Hazard**

	Points
Non-forest	0
1	5
2	15
3	30



**IDENTIFYING AND ASSESSMENT OF COMMUNITIES AT RISK IN OREGON**  
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Local: The quality of fuels data varies significantly statewide. The best available data should be used to determine the expected fire behavior. Where data exists to determine crown fire potential, use the point system that follows:

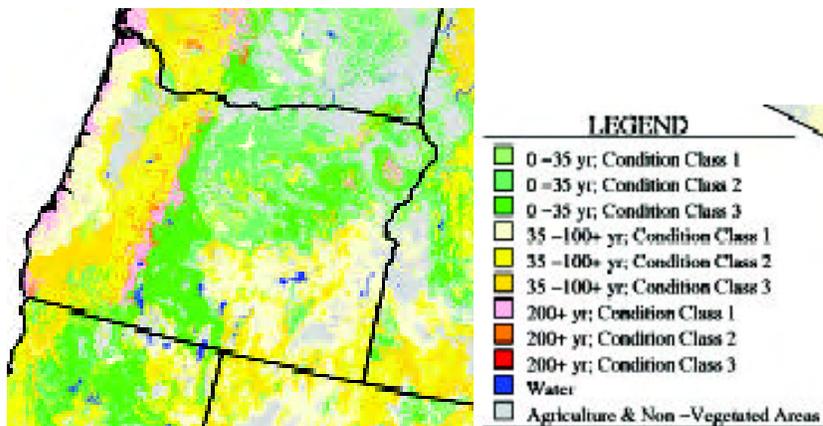
<b>Vegetation (fuel model)</b>	<b>Points</b>
<u>SB360 - Natural Vegetative Fuel Hazard</u>	
Non-forest	0
1	5
2	15
3	20

Areas exposed to crown potential (including areas of insect and disease infestation, wind throw, and slash)

Passive - Low	0
Active - Moderate	5
Independent - High	10

Note: Federal land management agencies are moving toward *condition class* rather than fuel model to assess hazard and prioritize projects. Discussions have begun with Region 6 staff as to how best coordinate this potential conflict. The good news is that condition class will likely be a close fit to the cross walk from vegetation to natural vegetation hazard. The clip below from a national condition class map (<http://www.fs.fed.us/fire/fuelman/curcond2000/maps/frcc2000.pdf>) shows similar results, except for the west slope of the Cascades (which could be resolved in development of the cross-walk).

<u>Category Rating</u>	<u>To</u>
Low	9
Moderate	40
High	60
Extreme	80

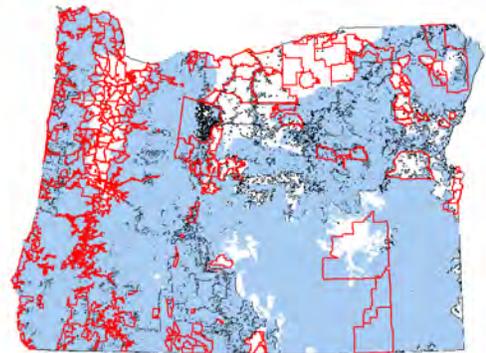


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**Protection Capabilities: What are the risks associated with wildfire protection capabilities, including capacity and resources to undertake fire prevention measures?**

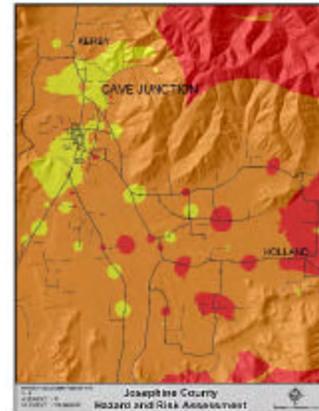
Protection capability is a combination of the capacities of the fire protection agencies, local government and community organizations. A high score represents high risk/low protection capability.

Statewide: Best available data to evaluation protection capability on a statewide basic is the absence or presence of structural and wildland protection agencies, using structural fire district boundaries and wildland protection boundaries.



Fire response	Points
Organized response	
Both structural and wildland	5
Wildland response only	15
No organized response	40

County and local: This system starts by assessing the fire response and then is increased based upon proven mitigation efforts of the community that will make the fire response effective. To assist with local assessments and planning, these factors should be identified and mapped as factors that will either increase or decrease the effectiveness of the protection system (i.e., areas with limited fire access that would lead to planning escape routes, safety zones, and/or road brushing projects). Generally, areas more than 300 feet for a road or driveway should be considered a limited response.



Fire response	Points
Organized structural response < 10 minutes	0
Inside fire district, but structural response > 10 minutes	8
No structural protection, wildland response < 20 min	15
No structural response & wildland protection > 20 minutes	36

Community preparedness	Points
Organized stakeholder group, community fire plan, phone tree, mitigation efforts	0
Primarily agency efforts (mailings, fire free, etc)	2
No effort	4

Category Rating	From	To
Low Risk	0	9
Moderate Risk	10	16
High Risk	17	40

**IDENTIFYING AND ASSESSMENT OF COMMUNITIES AT RISK IN OREGON**  
**Draft Version 4.0**

**Values Protected: What are the human and economic values associated with communities or landscapes (NASF definition)?**

Statewide: Assessment of values is best accomplished at the local level. However, although protection priorities vary between agencies, protection of life is number one for all. In addition to number of lives at risk, identification of population or structure density accomplishes an assessment of associated values of community infrastructure and property.

<b>Life/Property</b>	<b>Points</b>
<u>Population density (per square mile)</u>	
28-111(rural)	10
112-559(suburban)	30
560+(urban)	50

County and local: Values at risk and setting protection priorities is best accomplished locally. For a general assessment of life, either population density (above) or home density (below) is appropriate. However, identification and evaluation of additional human and economic values is needed for FEMA and community fire planning. It's important to identify **community** values at risk from wildfire

<b>Life/Property</b>	<b>Points</b>
<u>Homes - density (homes per 10 acres)</u>	
.1 -.9 (rural)	10
1-5.0 (suburban)	30
5.1+ (urban)	50

**OR**

<b>Life/Property</b>	<b>Points</b>
<u>Homes - density (homes per 10 acres)</u>	
.1 -.9 (rural)	2
1-5.0 (suburban)	15
5.1+ (urban)	30
<u>Community Infrastructure</u>	
Presence of an identified community infrastructure (examples below)	
None	0
One present	10
More than one present	20

Power substations & corridors, communication sites and facilities, transportation corridors, major manufacturing and utilities facilities, municipal watersheds, water storage and distribution, fuel storage facilities, hospitals and health care facilities, landfills and waste treatment facilities, schools, churches, community centers, and stores.

<b>Category Rating</b>	<b>From</b>	<b>To</b>
<b>Low</b>	<b>0</b>	<b>15</b>
<b>Moderate</b>	<b>16</b>	<b>30</b>
<b>High</b>	<b>31</b>	<b>50</b>

**IDENTIFYING AND ASSESSMENT OF COMMUNITIES AT RISK IN OREGON**  
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**Structural Vulnerability: What is the likelihood that structures will be destroyed by wildfire?**

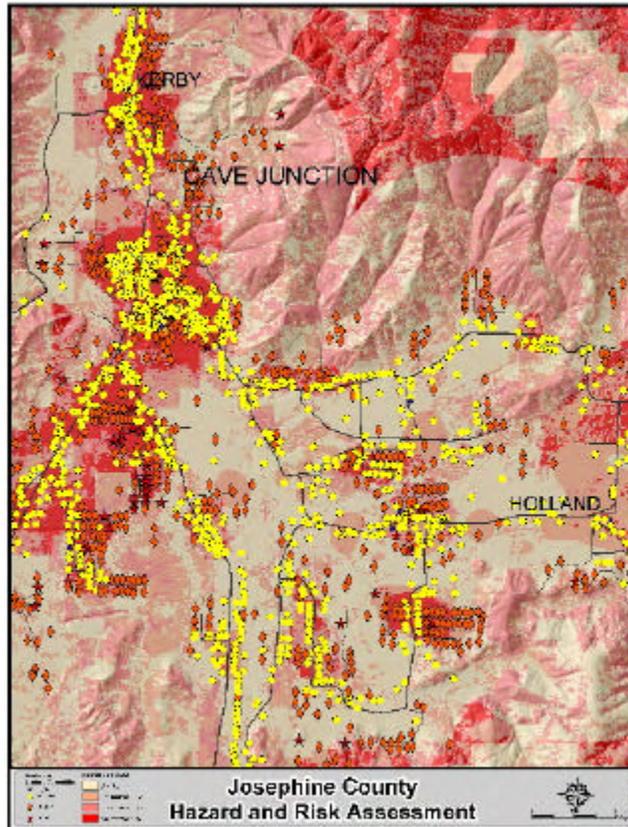
Risk, hazard, and protection capabilities account of 90% of the likelihood of a wildfire event threatening life and property. However, factors controlled by landowners within what is now being called the home ignition zone account for 90% of the likelihood of a wildfire threatening the structures. The three primary factors are roofing assembly, defensible space, and presence of suppression action (access).

Statewide: It's not practical to evaluate structural vulnerability at the statewide level.

Local: An assessment of structural vulnerability is best accomplished by on-site visits. The results are best displayed as points over the completed risk assessment (see example to left). Areas of "red-on-red" are at highest risk of loss of structures.

Viewing factors individually will assist in determining what is causing the problem. Mapping of what is causing access issues (dead-end roads, poor bridges, heavy roadside fuel) etc) will be helpful in planning mitigation.

The table below displays two options of scoring. You can use local ordinances or the NFPA's 1144 (the portion dealing with structural vulnerability).



**IDENTIFYING AND ASSESSMENT OF COMMUNITIES AT RISK IN OREGON**  
**Draft Version 4.0**

<b>Structure</b>	Local	NFPA
<u>Flammable roofing</u>		
Non-wood roofing	0	
Wood roofing	30	
<u>Roofing assembly</u>		
Class A roofing		0
Class B roof		5
Class C roof		10
Non-rated roof		20
<u>Building materials</u>		
Fire-resistant siding, eves and deck		0
Fire-resistant siding, eves and combustible deck		5
Combustible siding and deck		10
<u>Building setback to slopes &gt; 30%</u>		
0 - 30 feet to slope		1
> 30 feet from slope		5
<b>Defensible space</b>		
<u>Defensible space</u>		
Meets local requirements	0	
Non-compliant with local standards	30	
> 100 feet		1
71-100 feet		3
30-70 feet		10
< 30 feet		25
<u>Separation of adjacent homes contribute to fire spread</u>		
> 100 feet apart		0
60-100 feet apart		3
< 60 feet apart		5
<b>Fire access</b>		
<u>Roads and driveways</u>		
Within 300 feet of access that meets local requirements	0	
Non-compliant with local standards	30	
<u>Ingress/egress</u>		
TWO or more roads in/out		0
ONE road in/out		7
<u>Road width</u>		
> 24 feet		0
24-20 feet		2
<20 feet		4
<u>All-season road condition</u>		
Surfaced, grade < 5%		0
Surfaced, grade > 5%		1
Non-surfaced, grade < 5%		1
Non-surfaced, grade > 5%		3
Other than all-season		4

**IDENTIFYING AND ASSESSMENT OF COMMUNITIES AT RISK IN OREGON**  
**Draft Version 4.0**

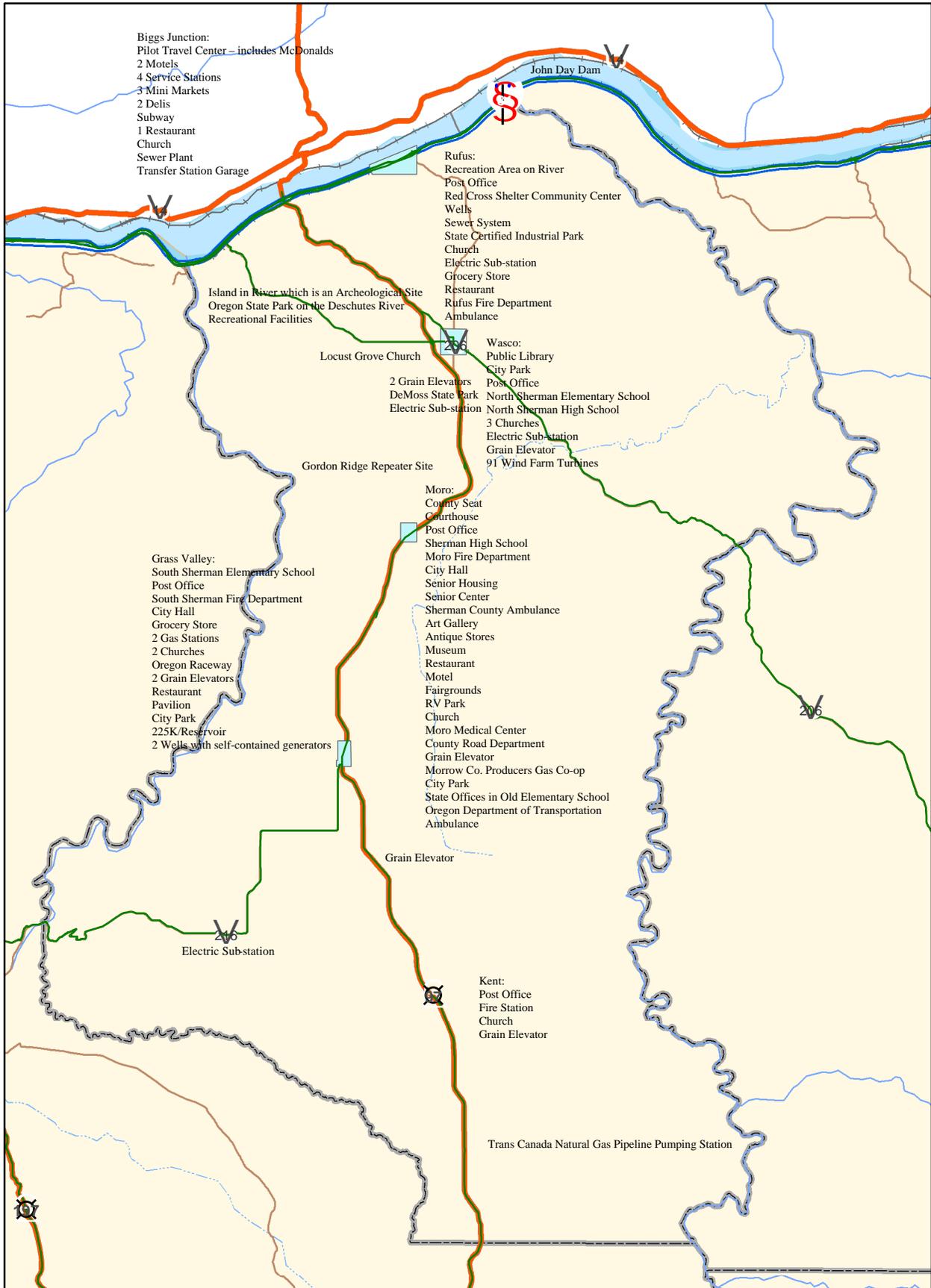
<u>Fire service access</u>		
< 300 feet with turnaround		0
> 300 feet with turnaround		2
< 300 feet without turnaround		4
> 300 feet without turnaround		5
<u>Street signs</u>		
Present - 4 inch and reflective		0
Absent		5

<u>Category</u>	<u>Rating</u>	<u>From</u>	<u>To</u>
	Low	0	30
	Moderate	31	60
	High	61	90

## **Annex II:**

# **Community Asset Maps**

The purpose of this section is to provide a map of Sherman County assets as well as a list of public buildings.



Ref Code	Name	Address	City	Zip
Sher_erc01	Sherman County Emergency Svc	309 Dewey St	Moro	97039
Sher_fir01	North Sherman County RFPD	811 Armsworthy St	Wasco	97065
Sher_fir02	South Sherman Fire District	109 Sw 2nd St	Grass Valley	97029
Sher_fir03	Moro RFPD	309 Dewey St	Moro	97039
Sher_fir05	Rufus VFD	400 Main St	Rufus	97050
Sher_pol01	Sherman County Sheriff	500 Court St	Moro	97039
Sher_sch01	So Sherman Elementary	212 Ne North St	Grass Valley	97029
Sher_sch02	Sherman High	65912 High School Lp	Moro	97039
Sher_sch03	North Sherman Elementary	1 Barnett St	Wasco	97065

# **Annex III: Resolutions**

The purpose of this section is to document the adoption resolutions for the participating communities.

DUPLICATE

RECEIVED

JAN 17 2008

Oregon Emergency Management

FILED: 9:00 a.m.

December 6, 2007

LINDA CORNIE  
COUNTY CLERK

BY: *[Signature]*  
Commissioner's Journal  
Book: E Page: 444  
File: 170  
Item: 6

IN THE COUNTY COURT OF THE STATE OF OREGON

IN AND FOR THE COUNTY OF SHERMAN

In the Matter of Adopting the )  
Sherman County Natural Hazards )  
Mitigation Plan )

Resolution No. 8-11-2007

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

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property 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, Oregon Multi-Hazard Mitigation Plan" dated April 2007 and pre-approved it, dated October 2007, contingent upon this official adoption of the participating governments and entities;

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

Be it further resolved, Sherman County will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable the Plan's final approval.

APPROVED this 5<sup>th</sup> day of December, 2007.

ATTEST:

*[Signature]*  
Clerk/Deputy Clerk

RECEIVED

JAN 17 2008

Oregon Emergency Management

SHERMAN COUNTY COURT

*[Signature]*  
Gary Thompson, Judge

*[Signature]*  
Sherry Kaseberg, Commissioner

*[Signature]*  
Steve Burnet, Commissioner

RESOLUTION NO. 07-12-18RESOLUTION ADOPTING THE CITY OF WASCO REPRESENTATION IN  
THE SHERMAN COUNTY MULTI-JURISDICTION HAZARD MITIGATION PLAN

WHEREAS, the City of Wasco is vulnerable to the human and economic costs of natural, technological and societal disasters, and

WHEREAS, the City Council of the City of Wasco recognizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

WHEREAS, the City of Wasco has participated in the development of 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's representatives and staff have 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, and

WHEREAS, these proposed projects and programs have been incorporated into the Sherman County Multi-jurisdiction Natural Hazards Mitigation Plan that has been prepared and promulgated for consideration and implementation by the cities of Sherman County; NOW THEREFORE

THE COUNCIL OF THE CITY OF WASCO RESOLVES AS FOLLOWS:

*Section 1.* The Council of the City of Wasco hereby accepts and approves of its section of the Sherman County Multi-jurisdiction Hazard Mitigation Plan as a reasonable process to identify and plan for potential hazards in the City of Wasco and Sherman County,

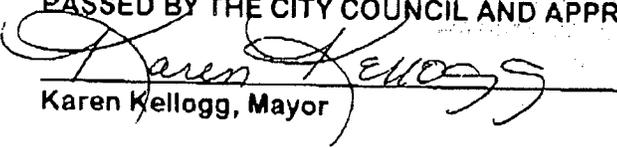
*Section 2.* The agency personnel of the City of Wasco are requested and instructed to pursue available funding opportunities for implementation of the actions and proposals designated therein,

*Section 3.* The City of Wasco will, upon receipt of such funding or other necessary resources, seek to implement the mitigation proposals identified by the Jurisdiction's Hazard Mitigation Planning Committee, and

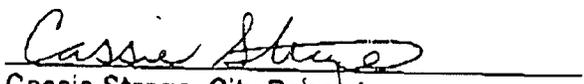
*Section 4.* The City of Wasco will continue to participate in the updating and expansion of the Sherman County Multi-Jurisdiction Hazard Mitigation Plan in the years ahead, and

*Section 5.* The City of Wasco will further seek to encourage the businesses, industries and community groups operating within and/or for the benefit of the City of Wasco to also participate in the updating and expansion of the Sherman County Multi-Jurisdiction Hazard Mitigation Plan in the years ahead.

PASSED BY THE CITY COUNCIL AND APPROVED BY THE MAYOR, Dec. 18, 2007

  
Karen Kellogg, Mayor

ATTEST:

  
Cassie Strege, City Recorder

RESOLUTION NO. 12-07

**A RESOLUTION ADOPTING THE CITY OF RUFUS' REPRESENTATION IN THE SHERMAN COUNTY MULTI-JURISDICTION HAZARD MITIGATION PLAN**

**WHEREAS**, the City of Rufus is vulnerable to the human and economic costs of natural, technological and societal disasters, and

**WHEREAS**, the City Council of the City of Rufus recognizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

**WHEREAS**, the City of Rufus has participated in the development of the Sherman County Multi-Jurisdiction Natural Hazard Mitigation Plan, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities, and

**WHEREAS**, the City of Rufus' representatives and staff have 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, and

**WHEREAS**, these proposed projects and programs have been incorporated into the Sherman County Multi-Jurisdiction Natural Hazard Mitigation Plan that has been prepared and promulgated for consideration and Implementation by the cities of Sherman County; **NOW THEREFORE**

**THE COUNCIL OF THE CITY OF RUFUS RESOLVES AS FOLLOWS:**

**Section 1.** The Council of the City of Rufus hereby accepts and approves of its section of the Sherman County Multi-Jurisdiction Hazard Mitigation Plan as a reasonable process to identify and plan for potential hazards in The City of Rufus and Sherman County.

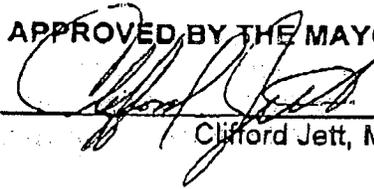
**Section 2.** The agency personnel of the City of Rufus are requested and instructed to pursue available funding opportunities for implementation of the actions and proposals designated therein.

**Section 3.** The City of Rufus will, upon receipt of such funding or other necessary resources, seek to implement the mitigation proposals identified by the Jurisdiction's Hazard Mitigation Planning Committee, and

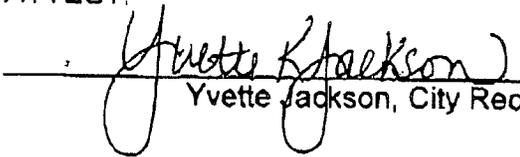
**Section 4.** The City of Rufus will continue to participate in the updating and expansion of the Sherman County Multi-Jurisdiction Hazard Mitigation Plan in the years ahead, and

**Section 5.** The City of Rufus will further seek to encourage the businesses, industries and community groups operating within and/or for the benefit of the City of Rufus to also participate in the updating and expansion of the Sherman County Multi-Jurisdiction Hazard Mitigation Plan in the years ahead.

**PASSED BY THE CITY COUNCIL AND APPROVED BY THE MAYOR, December 5, 2007**

  
\_\_\_\_\_  
Clifford Jett, Mayor

ATTEST:

  
\_\_\_\_\_  
Yvette Jackson, City Recorder

RESOLUTION NO. 2007-10

RESOLUTION ADOPTING THE CITY OF MORO REPRESENTATION IN THE SHERMAN COUNTY MULTI-JURISDICTION HAZARD MITIGATION PLAN

WHEREAS, the City of Moro is vulnerable to the human and economic costs of natural, technological and societal disasters, and

WHEREAS, the City Council of the City of Moro recognizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

WHEREAS, the City of Moro has participated in the development of 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's representatives and staff have 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, and

WHEREAS, these proposed projects and programs have been incorporated into the Sherman County Multi-jurisdiction Natural Hazards Mitigation Plan that has been prepared and promulgated for consideration and implementation by the cities of Sherman County; NOW THEREFORE

THE COUNCIL OF THE CITY OF MORO RESOLVES AS FOLLOWS:

Section 1. The Council of the City of Moro hereby accepts and approves of its section of the Sherman County Multi-jurisdiction Hazard Mitigation Plan as a reasonable process to identify and plan for potential hazards in the City of Moro and Sherman County.

Section 2. The agency personnel of the City of Moro are requested and instructed to pursue available funding opportunities for implementation of the actions and proposals designated therein.

Section 3. The City of Moro will, upon receipt of such funding or other necessary resources, seek to implement the mitigation proposals identified by the Jurisdiction's Hazard Mitigation Planning Committee, and

Section 4. The City of Moro will continue to participate in the updating and expansion of the Sherman County Multi-Jurisdiction Hazard Mitigation Plan in the years ahead, and

Section 5. The City of Moro will further seek to encourage the businesses, industries and community groups operating within and/or for the benefit of the City of Moro to also participate in the updating and expansion of the Sherman County Multi-Jurisdiction Hazard Mitigation Plan in the years ahead.

PASSED BY THE CITY COUNCIL AND APPROVED BY THE MAYOR, January 8, 2008

John M. Waldron
John Waldron, Mayor

ATTEST:
Rene Moore
Rene Moore, City Administrator

RESOLUTION NO. 1-2008

**RESOLUTION ADOPTING THE CITY OF GRASS VALLEY REPRESENTATION IN  
THE SHERMAN COUNTY MULTI-JURISDICTION HAZARD MITIGATION PLAN**

**WHEREAS**, the City of Grass Valley is vulnerable to the human and economic costs of natural, technological and societal disasters, and

**WHEREAS**, the City Council of the City of Grass Valley recognizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community, and

**WHEREAS**, the City of Grass Valley has participated in the development of 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's representatives and staff have 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, and

**WHEREAS**, these proposed projects and programs have been incorporated into the Sherman County Multi-jurisdiction Natural Hazards Mitigation Plan that has been prepared and promulgated for consideration and implementation by the cities of Sherman County; **NOW THEREFORE**

**THE COUNCIL OF THE CITY OF GRASS VALLEY RESOLVES AS FOLLOWS:**

*Section 1.* The Council of the City of Grass Valley hereby accepts and approves of its section of the Sherman County Multi-jurisdiction Hazard Mitigation Plan as a reasonable process to identify and plan for potential hazards in the City of Grass Valley and Sherman County,

*Section 2.* The agency personnel of the City of Grass Valley are requested and instructed to pursue available funding opportunities for implementation of the actions and proposals designated therein,

*Section 3.* The City of Grass Valley will, upon receipt of such funding or other necessary resources, seek to implement the mitigation proposals identified by the Jurisdiction's Hazard Mitigation Planning Committee, and

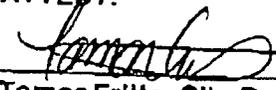
*Section 4.* The City of Grass Valley will continue to participate in the updating and expansion of the Sherman County Multi-Jurisdiction Hazard Mitigation Plan in the years ahead, and

*Section 5.* The City of Grass Valley will further seek to encourage the businesses, industries and community groups operating within and/or for the benefit of the City of Grass Valley to also participate in the updating and expansion of the Sherman County Multi-Jurisdiction Hazard Mitigation Plan in the years ahead.

**PASSED BY THE CITY COUNCIL AND APPROVED BY THE MAYOR, January 7, 2008**

  
Sharon Brewer, Mayor

**ATTEST:**

  
Tamar Fritts, City Recorder

# Appendix A: Resource Directory

The following appendix includes local, regional, state and federal resources for some of the hazards addressed in the plan. The directory also includes key publications and additional resources. This appendix was developed by the Community Service Center's Oregon Natural Hazards Workgroup at the University of Oregon for use by Pre-Disaster Mitigation Communities.

## Multi-Hazard Mitigation Resources

### County Resources

The Sherman County Emergency Management (EM) Office is responsible for coordinating and overseeing hazard mitigation activities and planning. In the event of an incident, the EM Coordinator is responsible for coordination and setting up of an incident command center.

Contact: Sherman County Emergency Services (EMS) Director

Address: P.O. Box 139, Moro, OR 97039-0139

Phone: 541-565-3100

Fax: 541-565-3024

Director: Shawn Payne

### Regional Resources

Regional resources for Sherman County consist of their Emergency Management Office; the Gilliam County Emergency Management Office and the Wheeler County Emergency Management Office.

Contact: Gilliam County Emergency Management (EM) Coordinator

Address: P.O. Box 427 Condon, OR 97823

Phone: 541-384-2857

Fax: 541-384-2878

Coordinator: Chris Fitzsimmons

Contact: Wheeler County Emergency Management Coordinator Marj. Sharp

Address: Wheeler County Resource Center, P.O.B 327, Fossil, OR 97830

Phone: 541-763-2372

Fax: 541-763-3299

## State Resources

### Department of Land Conservation and Development (DLCD)

DLCD administers the state's Land Use Planning Program. The program is based on 19 Statewide Planning Goals, including Goal 7, related to natural hazards, with flood as its major focus. DLCD serves as the federally designated agency to coordinate floodplain management in Oregon. They also conduct various landslide related mitigation activities. In order to help local governments address natural hazards effectively, DLCD provides technical assistance such as conducting workshops, reviewing local land use plan amendments, and working interactively with other agencies.

**Contact:** Natural Hazards Program Manager, DLCD  
**Address:** 635 Capitol St. NE, Suite 200, Salem, OR 97301-2540  
**Phone:** (503) 373-0050  
**Fax:** (503) 378-6033  
**Website:** <http://www.oregon.gov/LCD/HAZ/index.shtml>  
**Oregon Floodplain Coordinator:** (503) 373-0050 ext. 250

### Oregon State Police (OSP)-Office of Emergency Management (OEM)

OEM administers FEMA's Hazard Mitigation Grant Program, which provides post-disaster monies for acquisition, elevation, relocation, and demolition of structures located in the floodplain. OEM also administers FEMA's Flood Mitigation Assistance Program. This program provides assistance for NFIP insured structures only. OEM also helps local jurisdictions to develop hazard mitigation plans. OEM is heavily involved in flood damage assessment and works mainly with disaster recovery and hazard mitigation programs. OEM provides training for local governments through workshops on recovery and mitigation. OEM also helps implement and manage federal disaster recovery programs.

**Contact:** Office of Emergency Management  
**Address:** PO Box 14370, Salem, OR 97309-5062  
**Phone:** (503) 378-2911  
**Fax:** (503) 373-7833  
**Website:** <http://www.oregon.gov/OOHS/OEM/index.shtml>  
**OEM Hazard Mitigation Officer:** (503) 378-2911 xt. 22247  
**Recovery and Mitigation Specialist:** (503) 378-2911 xt. 22240

### Oregon Department of Geology and Mineral Industries (DOGAMI)

The mission of the Department of Geology and Mineral Industries is to serve a broad public by providing a cost-effective source of geologic information for Oregonians and to use that information in partnership to reduce the future loss of life and property due to potentially devastating earthquakes, tsunamis, landslides, floods, and other geologic hazards. The Department has mapped earthquake hazards in most of western Oregon.

**Contact:** Deputy State Geologist, Seismic, Tsunami, and Coastal Hazards Team Leaders  
**Address:** 800 NE Oregon St., Suite 965, Portland, Oregon 97232  
**Phone:** (971) 673-1555  
**Fax:** (971) 673-1562

**Website:** <http://www.oregongeology.com>

## **Federal Resources**

### **Federal Emergency Management Agency (FEMA)**

FEMA provides maps of flood hazard areas, various publications related to flood mitigation, funding for flood mitigation projects, and technical assistance. FEMA also operates the National Flood Insurance Program. FEMA's mission is "to reduce loss of life and property and protect the nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response and recovery." FEMA Region X serves the northwestern states of Alaska, Idaho, Oregon, and Washington.

**Contact:** FEMA, Federal Regional Center, Region 10  
**Address:** 228<sup>th</sup> St. SW, Bothell, WA 98021-9796  
**Phone:** (425) 487-4678  
**Website:** <http://www.fema.gov>

### **United States Geological Survey (USGS)**

The USGS website provides current stream flow conditions at USGS gauging stations in Oregon and throughout the Pacific Northwest. The Oregon USGS office is responsible for water-resources investigations for Oregon and part of southern Washington. Their office cooperates with more than 40 local, state, and federal agencies in Oregon. Cooperative activities include water-resources data collection and interpretive water-availability and water-quality studies.

**Contact:** USGS Oregon District Office  
**Address:** 10615 S.E. Cherry Blossom Dr., Portland, OR 97216  
**Phone:** (503) 251-3200  
**Fax:** (503) 251-3470  
**Website:** <http://oregon.usgs.gov>  
**Email:** [dc\\_or@usgs.gov](mailto:dc_or@usgs.gov)

### **National Oceanic and Atmospheric Administration (NOAA)**

NOAA's historical role has been to predict environmental changes, protect life and property, provide decision makers with reliable scientific information, and foster global environmental stewardship.

**Contact:** National Oceanic and Atmospheric Administration  
**Address:** 14th Street & Constitution Avenue, NW, Room 6013, Washington, DC 20230  
**Phone:** (202) 482-6090  
**Fax:** (202) 482-3154  
**Website:** <http://www.noaa.gov>  
**Email:** [answers@noaa.gov](mailto:answers@noaa.gov)

## **National Weather Service,**

The National Weather Service provides flood watches, warnings, and informational statements for rivers in Sherman County. The Pendleton Bureau serves Sherman County.

**Contact:** National Weather Service, Portland Bureau  
**Address:** P.O. Box 2946, Portland, OR 97208-2946  
**Phone:** (503) 261-9246 or (503) 261-9247  
**Fax:** (503) 808-4875  
**Website:** <http://www.wrh.noaa.gov/pqr/>

**Contact:** National Weather Service, Medford Bureau  
**Address:** 4003 Cirrus Drive, Medford, OR 97504-4198  
**Phone:** (541) 776-4303  
**Website:** <http://www.wrh.noaa.gov/mfr/>

**Contact:** National Weather Service, Pendleton Bureau  
**Address:** 2001 NW 56<sup>th</sup> Drive, Pendleton, OR 97801  
**Phone:** (541) 276-7832  
**Website:** <http://www.wrh.noaa.gov/pdt/>

**Contact:** National Weather Service, Boise Bureau  
**Address:** NIFC Building 3807, Boise, ID 83705-5354  
**Phone:** (208) 334-9860  
**Website:** <http://www.wrh.noaa.gov/>

## **Additional Resources**

### **American Red Cross**

The American Red Cross is a humanitarian organization, led by volunteers, that provides relief to victims of disasters and helps people prevent, prepare for, and respond to emergencies. The Oregon Trail Chapter was chartered as a Red Cross unit in 1917. The chapter serves the residents of Clackamas, Columbia, Multnomah, Washington, Yamhill, and Tillamook counties. The Oregon Trail Chapter provides a variety of community services which are consistent with the Red Cross mission and meet the specific needs of this area, including disaster planning, preparedness, and education.

**Contact:** American Red Cross, Oregon mountain River Chapter  
**Address:** 2680 Twin Knolls Drive, Bend, OR, 97701  
**Phone:** 541-382-2142  
**Fax:** 541-382-2405  
**Website:**  
**Email:**

### **Institute for Business & Home Safety (IBHS)**

IBHS was created as an initiative of the insurance industry to reduce damage and losses caused by natural disasters. This website provides educational resources and on-line publications for insurers, businesses, and homeowners who are interested in taking the initiative to minimize future damages and losses.

**Contact:** Institute for Business and Home Safety  
**Address:** 4775 E. Fowler Avenue, Tampa, FL 33617  
**Phone:** (813) 286-3400  
**Fax:** (813) 286-9960  
**E-mail:** [info@ibhs.org](mailto:info@ibhs.org)  
**Website:** <http://www.ibhs.org/>

## **Flood Mitigation Resources**

### **State Resources**

#### **Oregon Department of Fish and Wildlife (ODFW)**

ODFW's mission is to protect and enhance Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations. ODFW regulates stream activity and engages in stream enhancement activities.

**Contact:** ODFW  
**Address:** 3406 Cherry Avenue N.E., Salem, OR 97303  
**Phone:** (503) 947-6000  
**Website:** <http://www.dfw.state.or.us/>  
**Email:** [Odfw.Info@state.or.us](mailto:Odfw.Info@state.or.us)

#### **Oregon Department of State Lands (DSL)**

DSL is a regulatory agency, responsible for administration of Oregon's Removal-Fill Law. This law is intended to protect, conserve, and make the best use of the state's water resources. It generally requires a permit from DSL to remove, fill, or alter more than 50 cubic yards of material within the bed or banks of waters of the state. Exceptions are in state scenic waterways and areas designated essential salmon habitat, where a permit is required for all in-stream activity, regardless of size. DSL and the US Army Corps of Engineers may issue these permits jointly.

**Contact:** Department of State Lands  
**Address:** 775 Summer Street NE, Suite 100, Salem, OR 97301-1279  
**Phone:** (503) 378-3805  
**Fax:** (503) 378-4844  
**Website:** <http://statelands.dsl.state.or.us/>  
**Assistant Director:** (503) 378-3805, ext. 279  
**Western Region Manager:** (503) 378-3805, ext. 246

## **Oregon Water Resources Department (WRD)**

The WRD's mission is to serve the public by practicing and promoting wise long-term water management. The WRD provides services through 19 watermaster offices throughout the state. In addition, five regional offices provide services based on geographic regions. The Department's main administration is performed from the central office in Salem.

**Contact:** WRD  
**Address:** 725 Summer Street NE, Suite A, Salem, OR 97301-1271  
**Phone:** (503) 986-0900  
**Website:** <http://www.wrd.state.or.us/OWRD/index.shtml>

## **Federal Resources**

### **Bureau of Reclamation**

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. The Bureau of Reclamation owns Scoggins Dam in Washington County and prepares emergency action plans for events at the dam.

**Contact:** Bureau of Reclamation, Pacific Northwest Region  
**Address:** 1150 N. Curtis Road, Boise, ID 83706  
**Phone:** (208) 378-5012  
**Website:** <http://137.77.133.1/pn/index.html>

### **Army Corps of Engineers**

The Corps of Engineers administers a permit program to ensure that the nation's waterways are used in the public interest. Any person, firm, or agency planning to work in waters of the United States must first obtain a permit from the Army Corps of Engineers. In Oregon, joint permits may be issued with the Division of State Lands. The Corps is responsible for the protection and development of the nation's water resources, including navigation, flood control, energy production through hydropower management, water supply storage and recreation.

**Contact:** US Army Corps of Engineers-Portland District, Floodplain Information Branch  
**Address:** P.O. Box 2946, Portland, OR 97208-2946  
**Phone:** (503) 808-5150  
**Website:** <http://www.nwp.usace.army.mil/>

**Soil and Water Conservation District (SWCD)**

The SWCD works in partnership with the Natural Resource Conservation Service to promote soil and water conservation in Sherman County. SWCD works with agricultural interests and landowners to provide information on natural resource conservation practices. The partnership blends individual member resources to offer technical and financial assistance in planning and applying natural resource conservation practices and systems. Areas of focus include: erosion management, wetlands preservation and restoration, resource inventories, watershed assessments, and conservation education.

**Contact:** Sherman County Soil and Water Conservation District

**Address:** P.O. Box 405, Moro, OR 97039

**Phone:** 541-565-3216

**Fax:** 541-565-3430

**Website:**

**National Resources Conservation Service (NRCS), US Department of Agriculture (USDA)**

NRCS provides a suite of federal programs designed to assist state and local governments, and landowners in mitigating the impacts of flood events. The Watershed Surveys and Planning Program and the Small Watershed Program provide technical and financial assistance to help participants solve natural resource and related economic problems on a watershed basis. The Wetlands Reserve Program and the Flood Risk Reduction Program provide financial incentives to landowners to put aside land that is either a wetland resource or experiences frequent flooding. The Emergency Watershed Protection Program (EWP) provides technical and financial assistance for clearing debris from clogged waterways, restoring vegetation, and stabilizing riverbanks. The measures taken under the EWP must be environmentally and economically sound and generally benefit more than one property.

**Contact:** USDA-NRCS

**Address:** 302 Scott Street, Moro, OR 97039

**Phone:** 541-565-3551

**Fax:** 541-565-3414

**Website:**

## Additional Resources

### ***The National Flood Insurance Program***

The National Flood Insurance Program (NFIP) Website is a subsection of the Federal Emergency Management Agency (FEMA) site (<http://www.fema.gov>). The NFIP information is intended for both the general public and the many organizations and agencies participating in the program. It includes information about the NFIP and other flood disaster assistance available from the Federal Government. It also provides access to the newly revised NFIP booklet: *Answers to Questions about the National Flood Insurance Program*.

**Contact:** The National Flood Insurance Program  
**Phone:** (888) FLOOD29 or (800) 427-5593  
**Website:** <http://www.fema.gov/business/nfip/index.shtm>

### **The Association of State Floodplain Managers**

The Association of State Floodplain Managers is an organization of professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning, and recovery. ASFPM fosters communication among those responsible for flood hazard activities, provides technical advice to governments and other entities about proposed actions or policies that will affect flood hazards, and encourages flood hazard research, education, and training. The ASFPM Web site includes information on how to become a member, the organization's constitution and bylaws, directories of officers and committees, a publications list, information on upcoming conferences, a history of the association, and other useful information and Internet links.

**Contact:** The Association of State Floodplain Managers  
**Address:** 2809 Fish Hatchery Road, Madison, WI 53713  
**Phone:** (608) 274-0123  
**Website:** <http://www.floods.org>

### **USGS Water Resources**

This web page offers current US water news; extensive current (including real-time) and historical water data; numerous fact sheets and other publications; various technical resources; descriptions of ongoing water survey programs; local water information; and connections to other sources of water information.

**Contact:** USGS Water Resources  
**Phone:** (503) 251-3200  
**Website:** <http://or.water.usgs.gov/>  
**Email:** [info-or@usgs.gov](mailto:info-or@usgs.gov)

### **Office of Hydrologic Development, National Weather Service**

The National Weather Service's Office of Hydrologic Development (OHD) and its Hydrological Information Center offer information on floods and other aquatic disasters. This site offers current and historical data including an archive of past flood summaries, information on current hydrologic conditions, water supply outlooks, an Automated Local Flood Warning Systems Handbook, Natural Disaster Survey Reports, and other scientific publications on hydrology and flooding.

**Contact:** Office of Hydrologic Development, National Weather Service

**Website:** <http://www.nws.noaa.gov/oh/>

### **The Floodplain Management Association**

The Floodplain Management website was established by the Floodplain Management Association (FMA) to serve the entire floodplain management community. It includes full-text articles, a calendar of upcoming events, a list of positions available, an index of publications available free or at nominal cost, a list of associations, a list of firms and consultants in floodplain management, an index of newsletters dealing with flood issues (with hypertext links if available), a section on the basics of floodplain management, a list of frequently asked questions (FAQs) about the Website, and, of course, a copious catalog of Web links.

**Contact:** Floodplain Managers Association

**Website:** <http://www.floodplain.org>

**Email:** [admin@floodplain.org](mailto:admin@floodplain.org)

### **Northwest Regional Floodplain Managers Association (NORFMA)**

This site is a resource for floodplains, fisheries, and river engineering information for the Northwest. This site provides technical information, articles, and Internet links in the field of floodplain and fisheries management

**Contact:** Northwest Regional Floodplain Managers Association

**Website:** <http://www.norfma.org/>

### **Publications**

*Planning for Natural Hazards: The Oregon Technical Resource Guide*, Department of Land Conservation and Development (July 2000).

Produced by the Community Planning Workshop for the Department of Land Conservation and Development, this is a natural hazards planning and mitigation resource for Oregon cities and counties. It provides hazard-specific resources and plan evaluation tools. The document was written for local government employees and officials. The Technical Resource Guide includes a natural hazards comprehensive plan review, a hazard mitigation legal issues guide, and five hazard-specific technical resource guides, including: flooding, wildfires, landslides, coastal hazards,

and earthquakes. This document is available online. You can also write, call, or fax to obtain this document:

**Contact:** Natural Hazards Program Manager, Department of Land Conservation and Development  
**Address:** 635 Capitol St. NE, Suite 200, Salem, OR 97301-2540  
**Phone:** (503) 373-0050  
**Fax:** (503) 378-6033  
**Website:** <http://www.oregon.gov/LCD/HAZ/publications.shtml>

*NFIP Community Rating System Coordinator's Manual.* FEMA/NFIP. Indianapolis, IN.

This informative brochure explains how the Community Rating System works and what the benefits are to communities. It explains in detail the CRS point system, and what activities communities can pursue to earn points. These points then add up to the “rating” for the community, and flood insurance premium discounts are calculated based upon that “rating.” The brochure also provides a table on the percent discount realized for each rating (1-10). Instructions on how to apply to be a CRS community are also included.

**Contact:** NFIP Community Rating System  
**Phone:** (800) 480-2520 or (317) 848-2898  
**Website:** <http://training.fema.gov/EMIWeb/CRS/> (select resources)

*Floodplain Management: A Local Floodplain Administrator's Guide to the NFIP.* FEMA-Region 10. Bothell, WA.

This document discusses floodplain processes and terminology. It contains floodplain management and mitigation strategies, as well as information on the NFIP, CRS, Community Assistance Visits, and floodplain development standards.

**Contact:** National Flood Insurance Program  
**Phone:** (800) 480-2520  
**Website:** [http://www.oregon.gov/LCD/HAZ/docs/floods/localofficial\\_4th.pdf](http://www.oregon.gov/LCD/HAZ/docs/floods/localofficial_4th.pdf)

*Reducing Losses in High Risk Flood Hazard Areas: A Guidebook for Local Officials,* (February 1987), FEMA-116.

This guidebook offers a table on actions that communities can take to reduce flood losses. It also offers a table with sources for floodplain mapping assistance for the various types of flooding hazards. There is information on various types of flood hazards with regard to existing mitigation efforts and options for action (policy and programs, mapping, regulatory, non-regulatory). Types of flooding which are covered include alluvial fan, areas behind levees, areas below unsafe dams, coastal flooding, flash floods, fluctuating lake level floods, ground failure triggered by earthquakes, ice jam flooding, and mudslides.

**Contact:** Federal Emergency Management Agency  
**Phone:** (800) 480-2520  
**Website:** <http://www.fema.gov/hazard/flood/pubs/lib116.shtm>

*Oregon Model Flood Damage Prevention Ordinance*, (January 1999), FEMA/DLCD.

This is an example of how to write an ordinance that complies with NFIP/FEMA standards. Communities can simply adopt this ordinance, word for word, filling in the blanks specific to their community or jurisdiction.

**Contact:** Department of Land Conservation and Development  
**Phone:** (503) 373-0050  
**Website:** <http://www.oregon.gov/LCD/HAZ/docs/floods/floodord.pdf>

## Wildfire Resource Directory

### State Resources

#### **Oregon Department of Consumer and Business Services**

The Building Codes Division of Oregon's Department of Consumer and Business Services is responsible for administering statewide building codes. Its responsibilities include adoption of statewide construction standards that help create disaster-resistant buildings, particularly for flood, wildfire, wind, foundation stability, and seismic hazards. Information about wildfire-related building codes is found through this department.

**Contact:** Building Codes Division  
**Address:** 1535 Edgewater St. NW, P.O. Box 14470, Salem, OR 97309  
**Phone:** (503) 373-4133  
**Fax:** (503) 378-2322  
**Website:** <http://www.cbs.state.or.us/external/bcd>

#### **Oregon Department of Forestry (ODF)**

ODF's Fire Prevention Unit is involved in interface wildfire mitigation and provides information about Oregon's Wildfire Hazard Zones. The Protection From Fire section of the ODF website includes Oregon-specific fire protection resources. Wildfire condition reports can be accessed on the website as well. ODF's Protection from Fire Program works to do the following:

- Clarify roles of ODF, landowners, and other agencies in relation to wildland fire protection in Oregon;
- Strengthen the role of forest landowners and the forest industry in the protection system;
- Understand and respond to needs for improving forest health conditions and the role/use of prescribed fire in relation to mixed ownerships, forest fuels and insects and disease; and

- Understand and respond to needs for improving the wildland/urban interface situation.

**Contact:** Oregon Department of Forestry, Fire Prevention Unit  
**Address:** 2600 State Street, Salem, Oregon 97310  
**Phone:** (503) 945-7440  
**Website:** [http://www.oregon.gov/ODF/FIRE/fire\\_protection.shtml](http://www.oregon.gov/ODF/FIRE/fire_protection.shtml)

### **Office of the State Fire Marshal (OSFM)**

The Prevention Unit of Oregon's Office of the State Fire Marshal contains 19 Deputy State Fire Marshals located in various regions. The responsibilities of these deputies include public education for local fire districts and inspection of businesses, public assemblies, schools, daycare centers, and adult foster homes. The State Fire Marshal's Community Education Services unit works to keep Oregonians safe from fires and injury by providing them with the knowledge to protect themselves and their property.

**Contact:** Oregon State Fire Marshal  
**Address:** 4760 Portland Road NE, Salem, Oregon 97305-1760  
**Phone:** (503) 378-3473  
**Fax:** (503) 373-1825  
**Website:** <http://159.121.82.250/> Oregon Laws on Fire Protection:  
[http://159.121.82.250/SFM\\_Admin/firelaws.htm](http://159.121.82.250/SFM_Admin/firelaws.htm)  
**Email:** [Oregon.sfm@state.or.us](mailto:Oregon.sfm@state.or.us)

## **Federal Resources and Programs**

### **Federal Wildland Fire Policy, Wildland/Urban Interface Protection**

This is a report describing federal policy and interface fire. Areas of needed improvement are identified and addressed through recommended goals and actions.

**Website:** <http://www.fs.fed.us/fire/management/policy.html>

### **National Fire Protection Association (NFPA)**

This is the principal federal agency involved in the National Wildland/Urban Interface Fire Protection Initiative. NFPA has information on the Initiative's programs and documents. Other members of the initiative include: the National Association of State Foresters, the US Department of Agriculture Forest Service, the US Department of the Interior, and the United States Fire Administration.

**Contact:** Public Fire Protection Division  
**Address:** 1 Battery March Park, P.O. Box 9101, Quincy, MA 02269-9101  
**Phone:** (617) 770-3000  
**Website:** [www.nfpa.org](http://www.nfpa.org)

### **National Interagency Fire Center (NIFC)**

The NIFC in Boise, Idaho is the nation's support center for wildland firefighting. Seven federal agencies work together to coordinate and support wildland fire and disaster operations. These agencies include the Bureau of Indian Affairs, Bureau of Land Management, Forest Service, Fish and Wildlife Service, National Park Service, National Weather Service, and Office of Aircraft Services.

**Contact:** National Interagency Fire Center  
**Address:** 3833 S. Development Avenue, Boise, Idaho 83705-5354  
**Phone:** (208) 387-5512  
**Website:** <http://www.nifc.gov/>

### **United States Fire Administration (USFA) of the Federal Emergency Management Agency (FEMA)**

As an entity of the Federal Emergency Management Agency, the mission of the USFA is to reduce life and economic losses due to fire and related emergencies through leadership, advocacy, coordination, and support.

**Contact:** USFA, Planning Branch, Mitigation Directorate  
**Address:** 16825 S. Seton Ave., Emmitsburg, MD 21727  
**Phone:** (301) 447-1000  
**Website:** <http://www.fema.gov/hazard/wildfire/index.shtm> - Wildfire Mitigation Planning  
<http://www.usfa.fema.gov/index.htm> - USFA Homepage  
<http://www.usfa.fema.gov/wildfire/> - USFA Resources on Wildfire

### **United States Forest Service (USFS)**

The USFS is a federal land management organization established to manage the nation's federally owned forests. As part of the Department of Agriculture, it provides timber for people, forage for cattle and wildlife, habitat for fish, plants, and animals, and recreation lands throughout the country.

The USFS offers a possible link from local jurisdictions to federal grant programs.

**Contact:** USDA Forest Service - Pacific Northwest Region  
**Address:** 333 SW First Avenue, Portland, Oregon 97204-3440;  
P.O. Box 3623, Portland, OR 97208-3623  
**Phone:** 503-808-2468  
**Website:** <http://www.fs.fed.us/r6/welcome.htm>

## **Additional Resources**

### **FireFree Program to Promote Home Safety**

In a pioneering effort to address wildfire danger in Bend, Oregon, four local agencies and a Fortune 500 corporation joined together to create "FireFree! Get In The Zone," a public education campaign designed to increase resident participation in wildfire safety and mitigate losses. Spearheaded by SAFECO Corporation, the partnership includes the Bend Fire Department, Deschutes County Rural Fire Protection District #2, Bend City

Planning, and The Deschutes National Forest. The Oregon Department of Forestry and a number of local government agencies and businesses have joined the program.

**Contact:** FireFree  
**Address:** 63377 Jamison St., Bend, OR 97701  
**Phone:** (541) 318-0459  
**E-mail:** dcrfpd2@dcrfpd2.com  
**Website:** <http://www.firefree.org>

### **Firewise – The National Wildland/Urban Interface Fire program**

Firewise maintains a Website designed for people who live in wildfire-prone areas, but it also can be of use to local planners and decision makers. The site offers online wildfire protection information and checklists, as well as listings of other publications, videos, and conferences.

**Contact:** Firewise  
**Address:** PO Box 9101, Quincy, MA 02269-9101  
**Phone:** (617) 984-7056  
**E-mail:** [firewise@firewise.org](mailto:firewise@firewise.org)  
**Website:** <http://www.firewise.org/>

## **Publications**

*National Fire Protection Association Standard 299: Protection of Life and Property from Wildfire.* National Wildland/Urban Interface Fire Protection Program, (1991). National Fire Protection Association, Washington, D.C.

This document, developed by the NFPA Forest and Rural Fire Protection Committee, provides criteria for fire agencies, land use planners, architects, developers, and local governments to use in the development of areas that may be threatened by wildfire. To obtain this resource:

**Contact:** National Fire Protection Association Publications  
**Phone:** (800) 344-3555  
**Website:** <http://www.nfpa.org> or <http://www.firewise.org>

*An International Collection of Wildland-Urban Interface Resource Materials* (Information Report NOR-X-344). Hirsch, K., Pinedo, M., & Greenlee, J. (1996). Edmonton, Alberta: Canadian Forest Service.

This is a comprehensive bibliography of interface wildfire materials. Over 2,000 resources are included, grouped under the categories of general and technical reports, newspaper articles, and public education materials. The citation format allows the reader to obtain most items through a library or directly from the publisher. The bibliography is available in hard copy or diskette at no cost. It is also available in downloadable PDF form. To obtain this resource:

**Contact:** Canadian Forest Service, Northern Forestry Centre, I-Zone Series  
**Phone:** (780) 435-7210  
**Website:** [http://www.pfc.cfs.nrcan.gc.ca/cgi-bin/bstore/catalog\\_e.pl?catalog=11794](http://www.pfc.cfs.nrcan.gc.ca/cgi-bin/bstore/catalog_e.pl?catalog=11794)

*Wildland/Urban Interface Fire Hazard Assessment Methodology*. National Wildland/Urban Interface Fire Protection Program, (1998), NFPA, Washington, D.C. To obtain this resource:

**Contact:** Firewise (NFPA Public Fire Protection Division)  
**Phone:** (617) 984-7486  
**Website:** <http://www.firewise.org>

*Fire Protection in the Wildland/Urban Interface: Everyone's Responsibility*. National Wildland/Urban Interface Fire Protection Program. (1998). Washington, D.C.: Author. To obtain this resource:

**Contact:** Firewise (NFPA Public Fire Protection Division)  
**Phone:** (617) 984-7486  
**Website:** <http://www.firewise.org>

*Planning for Natural Hazards: The Oregon Technical Resource Guide*, Department of Land Conservation and Development (July 2000).

Produced by the Community Planning Workshop for the Department of Land Conservation and Development, this is a natural hazards planning and mitigation resource for Oregon cities and counties. It provides hazard-specific resources and plan evaluation tools. The document was written for local staffs and officials. The Technical Resource Guide includes a natural hazards comprehensive plan review, a hazard mitigation legal issues guide, and five hazard-specific technical resource guides, including: flooding, wildfires, landslides, coastal hazards, and earthquakes. This document is available online. You can also write, call, or fax to obtain this document:

**Contact:** Natural Hazards Program Manager  
**Address:** 635 Capitol St. NE, Suite 200, Salem, OR 97301-2540  
**Phone:** (503) 373-0050  
**Fax:** (503) 378-6033  
**Website:** <http://www.oregon.gov/LCD/HAZ/index.shtml>

*Burning Questions. A Social Science Research Plan for Federal Wildland Fire Management*, Machlis, G., Kaplan, A., Tuler, S., Bagby, K., and McKendry, J. (2002) National Wildfire Coordinating Group.

The plan covers a wide range of topics and questions related to the human dimensions of federal wildland fire management. Both the beneficial and harmful affects of wildland fire are considered. The plan includes research in the social sciences or anthropology, economics, geography, psychology, political science, and sociology, as well as interdisciplinary fields of research. The plan is national in scale but recognizes the importance of regional variation in wildland fire issues.

**Contact:** Cooperative Park Studies Unit  
**Address:** 635 Capitol St. NE, Suite 200, Salem, OR 97301-2540  
**Phone:** (208) 885-7054  
**Fax:** (503) 378-6033  
**Website:** <http://www.psu.uidaho.edu/>

# Severe Weather Event Resource Directory

## State Resources

### Oregon Climate Service

The Oregon Climate Service collects, manages, and maintains Oregon weather and climate data. OCS provides weather and climate information to those within and outside the state of Oregon and educates the citizens of Oregon on current and emerging climate issues. OCS also performs independent research related to weather and climate issues.

**Contact:** Oregon Climate Service  
**Address:** Oregon Climate Service, Oregon State University  
Strand Ag Hall Room 316, Corvallis, OR 97331-2209  
**Phone:** (541) 737-5705  
**Website:** <http://www.ocs.orst.edu>  
**Email:** [oregon@oce.orst.edu](mailto:oregon@oce.orst.edu)

## Additional Resources

### ***Public Assistance Debris Management Guide, Federal Emergency Management Agency (July 2000).***

The Debris Management Guide was developed to assist local officials in planning, mobilizing, organizing, and controlling large-scale debris clearance, removal, and disposal operations. Debris management is generally associated with post-disaster recovery. While it should be compliant with local and county emergency operations plans, developing strategies to ensure strong debris management is a way to integrate debris management within mitigation activities. The *Public Assistance Debris Management Guide* is available in hard copy or on the FEMA website.

**Contact:** FEMA Distribution Center  
**Address:** 130 228th Street, SW, Bothell, WA 98021-9796  
**Phone:** (800) 480-2520  
**Fax:** (425) 487-4622  
**Website:** <http://www.fema.gov/government/grant/pa/dmgtoc.shtm>

# Landslide Resource Directory

## State Resources

### Oregon Department of Forestry (ODF)

The mission of the Oregon Department of Forestry is to serve the people of Oregon through the protection, management, and promotion of a healthy forest environment, which will enhance Oregon's livability and economy for today and tomorrow. ODF regulates forest operations to reduce the risk of serious injury or death from rapidly moving landslides related to forest operations, and assists local governments in the siting review of permanent dwellings on and adjacent to forestlands in further review areas.

**Contact:** Oregon Department of Forestry  
**Address:** 2600 State Street, Salem OR 97310  
**Phone:** (503) 945-7212  
**Website:** <http://www.odf.state.or.us>

### *Oregon Department of Forestry Debris Flow Warning Page*

The ODF debris flow warning page provides communities with up-to-date access to information regarding potential debris flows. As the lead agency, ODF is responsible for forecasting and measuring rainfall from storms that may trigger debris flows. Advisories and warnings are issued as appropriate. Information is broadcast over NOAA weather radio and on the Law Enforcement Data System. DOGAMI provides additional information on debris flows to the media that convey the information to the public. ODOT also provides warnings to motorists during periods determined to be of highest risk for rapidly moving landslides along areas on state highways with a history of being most vulnerable. Information is available on the ODF website at [www.odf.state.or.us](http://www.odf.state.or.us).

### **Oregon Department of Geology and Mineral Industries (DOGAMI)**

DOGAMI is an important agency for landslide mitigation activities in Oregon. Some key functions of DOGAMI are development of geologic data, producing maps, and acting as lead regulator for mining and drilling for geological resources. The agency also provides technical resources for communities and provides public education on geologic hazards. DOGAMI provides data and geologic information to local, state, and federal natural resource agencies, industry, and private groups.

**Contact:** DOGAMI  
**Address:** 800 NE Oregon Street, Suite 965, Portland, Oregon 97232  
**Phone:** (971) 673-1555  
**Fax:** (971) 673-1562  
**Website:** [www.oregongeology.com](http://www.oregongeology.com)  
**Email:** [info@naturenw.org](mailto:info@naturenw.org)

### **Nature of the Northwest**

Oregon Department of Geology and Mineral Industries and the USDA Forest Service jointly operate the Nature of the Northwest Information Center. The Center offers a selection of maps and publications from state, federal, and private agencies.

**Contact:** The Nature of the Northwest Information Center  
**Address:** 800 NE Oregon Street #5, Suite 177, Portland, Oregon 97232  
**Phone:** (503) 872- 2750  
**Fax:** (503) 731-4066  
**Website:** <http://www.naturenw.org>  
**Email:** [Nature.of.Northwest@state.or.us](mailto:Nature.of.Northwest@state.or.us)

### **Oregon Department of Transportation (ODOT)**

ODOT provides warnings to motorists during periods determined to be of highest risk of rapidly moving landslides along areas on state highways with a history of being most vulnerable to rapidly moving landslides. ODOT

also monitors for landslide activity and responds to slide events on state highways.

**Contact:** ODOT Transportation Building  
**Address:** 355 Capitol St. NE, Salem, OR 97310  
**Phone:** (888) 275-6368  
**Website:** <http://www.odot.state.or.us>

### **Portland State University, Department of Geology**

Portland State University conducts research and prepares inventories and reports for communities throughout Oregon. Research and projects conducted through the Department of Geology at Portland State University include an inventory of landslides for the Portland metropolitan region after the 1996 and 1997 floods and a subsequent susceptibility report and planning document for Metro in Portland.

**Contact:** Portland State University, Department of Geology  
**Address:** 17 Cramer Hall; 1721 SW Broadway, Box 751, Portland, OR 97207  
**Phone:** (503) 725-3389  
**Website:** <http://www.geol.pdx.edu>

## **Federal Resources**

### **Natural Resource Conservation Service (NRCS)**

The NRCS produces soil surveys. These may be useful to local governments who are assessing areas with potential development limitations including steep slopes and soil types. They operate many programs dealing with the protection of natural resources.

**Contact:** NRCS, Oregon Branch  
**Address:** 101 S.W. Main Street, Suite 1300, Portland, OR 97204  
**Phone:** (503) 414-3200  
**Fax:** (503) 414-3103  
**Website:** <http://www.or.nrcs.usda.gov>

### **US Geological Survey, National Landslide Information Center (NLIC)**

The NLIC website provides good information on the programs and resources regarding landslides. The page includes information on the National Landslide Hazards Program Information Center, a bibliography, publications, and current projects. USGS scientists are working to reduce long-term losses and casualties from landslide hazards through better understanding of the causes and mechanisms of ground failure both nationally and worldwide.

**Contact:** National Landslide Information Center  
**Phone:** (800) 654-4966  
**Website:** <http://www.usgs.gov/hazards/landslides/>

## Additional Resources

### American Planning Association (APA)

The APA's research department embarked on a program to bring together solutions from multiple disciplines into a single source. It will help serve local planning efforts in identifying landslide hazards during the planning process so as to minimize exposure to landslide risks. The APA's website highlights planning efforts to reduce risk and loss from landslides.

**Contact:** Principal Investigator, Landslides Project  
**Address:** Research Department, American Planning Association  
122 S. Michigan Ave., Suite 1600  
Chicago, Illinois 60603-6107  
**Phone:** (312) 431-9100  
**Fax:** (312) 431-9985  
**Website:** <http://www.planning.org/landslides>  
**Email:** [landslides@planning.org](mailto:landslides@planning.org)

### State of Washington, Department of Ecology

The Washington State Department of Ecology has a landslide website with tips for reducing risk, warning signs, and maps.

**Contact:** Department of Ecology  
**Address:** PO Box 47600, Olympia, WA 98504-7600  
**Website:** <http://www.ecy.wa.gov/programs/sea/landslides>  
**Email:** [hshi461@ecy.wa.gov](mailto:hshi461@ecy.wa.gov)

## Publications

*Planning for Natural Hazards: The Oregon Technical Resource Guide*, Department of Land Conservation and Development (July 2000).

Produced by the Community Planning Workshop for the Department of Land Conservation and Development, this is a natural hazards planning and mitigation resource for Oregon cities and counties. It provides hazard-specific resources and plan evaluation tools. The document was written for local government employees and officials. The Technical Resource Guide includes a natural hazards comprehensive plan review, a hazard mitigation legal issues guide, and five hazard-specific technical resource guides, including: flooding, wildfires, landslides, coastal hazards, and earthquakes. You can write, call, fax, or go on-line to obtain this document.

**Contact:** Natural Hazards Program Manager, DLCDC  
**Address:** 635 Capitol St. NE, Suite 200, Salem, OR 97301-2540  
**Phone:** (503) 373-0050  
**Fax:** (503) 378-6033  
**Website:** <http://www.oregon.gov/LCD/HAZ/index.shtml>

*Mileti, Dennis, Disasters by Design: A Reassessment of Natural Hazards in the United States (1999) Joseph Henry Press.*

This book offers a way to view, study, and manage hazards in the United States that will help foster disaster-resilient communities, higher

environmental quality, inter- and intragenerational equity, economic sustainability, and an improved quality of life. The volume provides an overview of what is known about natural hazards, recovery, and mitigation; reveals how research findings have been translated into policies and programs; and advances a sustainable hazard mitigation research agenda.

Olshansky, Robert B., *Planning for Hillside Development* (1996) American Planning Association.

This document describes the history, purpose, and functions of hillside development and regulation and the role of planning, and provides excerpts from hillside plans, ordinances, and guidelines from communities throughout the US.

Olshansky, Robert B. & Rogers, J. David, *Unstable Ground: Landslide Policy in the United States* (1987) Ecology Law Quarterly.

This is about the history and policy of landslide mitigation in the US.

*Public Assistance Debris Management Guide* (July 2000) Federal Emergency Management Agency

The Debris Management Guide was developed to assist local officials in planning, mobilizing, organizing, and controlling large-scale debris clearance, removal, and disposal operations. Debris management is generally associated with post-disaster recovery. While it should be compliant with local and county emergency operations plans, developing strategies to ensure strong debris management is a way to integrate debris management within mitigation activities. The Guide is available in hard copy or on the FEMA website.

**Contact:** FEMA Distribution Center  
**Address:** 130 228th Street, SW, Bothell, WA 98021-9796  
**Phone:** (800) 480-2520  
**Website:** <http://www.fema.gov/government/grant/pa/dmgtoc.shtm>

*USGS Landslide Program Brochure*. National Landslide Information Center (NLIC), United States Geologic Survey

The brochure provides good, general information in simple terminology on the importance of landslide studies and a list of databases, outreach, and exhibits maintained by the NLIC. The brochure also includes information on the types and causes of landslides, rockfalls, and flows.

**Contact:** USGS- MS 966, Box 25046  
**Address:** Denver, Federal Center, Denver, CO 80225  
**Phone:** (800) 654-4966  
**Web:** <http://geohazards.cr.usgs.gov/>

# Earthquake

## State Resources

### **Oregon Department of Consumer & Business Services-Building Codes Division**

The Building Codes Division (BCD) sets statewide standards for design, construction, and alteration of buildings that include resistance to seismic forces. BCD is active on several earthquake committees and funds construction related continuing education programs. BCD registers persons qualified to inspect buildings as safe or unsafe to occupy following an earthquake and works with OEM to assign inspection teams where they are needed.

**Contact:** Building Codes Division  
**Address:** 1535 Edgewater St. NW, P.O. Box 14470, Salem, Oregon 97309  
**Phone:** (503) 378-4133  
**Fax:** (503) 378-2322  
**Website:** <http://www.cbs.state.or.us/external/bcd/>

### **The Nature of the Northwest Information Center**

The Nature of the Northwest Information Center is operated jointly by the Oregon Department of Geology and Mineral Industries and the USDA Forest Service. It offers selections of maps and publications from state, federal, and private agencies. DOGAMI's earthquake hazard maps can be ordered from this site.

**Address:** Suite 177, 800 NE Oregon Street # 5, Portland, Oregon 97232  
**Phone:** (503) 872-2750  
**Fax:** (503) 731-4066  
**Email:** [Nature.of.NW@state.or.us](mailto:Nature.of.NW@state.or.us)  
**Website:** <http://www.naturenw.org/geo-earthquakes.htm>

## Federal Resources

### **US Geological Survey (USGS)**

The USGS is an active seismic research organization that also provides funding for research. (For an example of such research, see Recommended Seismic Publications below).

**Contact:** USGS, National Earthquake Information Center  
**Address:** Box 25046; DFC, MS 967; Denver, Colorado 80225  
**Phone:** (303) 273-8500  
**Fax:** (303) 273-8450  
**Website:** <http://neic.usgs.gov>

### **Building Seismic Safety Council (BSSC)**

The Building Seismic Safety Council (BSSC), established by the National Institute of Building Sciences (NIBS), deals with complex regulatory, technical, social, and economic issues and develops and promotes building earthquake risk mitigation regulatory provisions for the nation.

**Address:** 1090 Vermont Avenue, NW, Suite 700, Washington, DC 20005  
**Phone:** (202) 289-7800  
**Fax:** (202) 289-1092  
**Website:** <http://www.bssconline.org/>

### **Western States Seismic Policy Council (WSSPC)**

The WSSPC is a regional organization that includes representatives of the earthquake programs of thirteen states (Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon Utah, Washington, and Wyoming), three U.S. territories (American Samoa, Commonwealth of the Northern Mariana Islands and Guam), one Canadian Province (British Columbia), and one Canadian Territory (Yukon). The primary aims of the organization have been: to improve public understanding of seismic risk; to improve earthquake preparedness; and, to provide a cooperative forum to enhance transfer of mitigation technologies at the local, state, interstate, and national levels.

The mission of the Council is to provide a forum to advance earthquake hazard reduction programs throughout the western region and to develop, recommend, and present seismic policies and programs through information exchange, research and education.

**Contact:** WSSPC, Executive Director  
**Address:** 121 Second Street, 4th Floor, San Francisco, CA 94105  
**Phone:** (415) 974-6435  
**Fax:** (415) 974-1747  
**Email:** [wsspc@wsspc.com](mailto:wsspc@wsspc.com)  
**Website:** <http://www.wsspc.org/>

### **Cascadia Region Earthquake Workgroup (CREW)**

CREW provides information on regional earthquake hazards, facts and mitigation strategies for the home and business office. CREW is a coalition of private and public representative s working together to improve the ability of Cascadia Region communities to reduce the effects of earthquake events. Members are from Oregon, Washington, California, and British Columbia. Goals are to:

- Promote efforts to reduce the loss of life and property.
- Conduct education efforts to motivate key decision makers to reduce risks associated with earthquakes.
- Foster productive linkages between scientists, critical infrastructure providers, businesses and governmental agencies in order to improve the viability of communities after an earthquake.

**Contact:** CREW, Executive Director  
**Address:** 1330A S. 2nd Street, #105, Mount Vernon, WA 97273  
**Phone:** (360) 336-5494  
**Fax:** (360) 336-2837  
**Website:** <http://www.crew.org/>

## Additional Resources

### Publications

*Planning for Natural Hazards: The Oregon Technical Resource Guide*, Department of Land Conservation and Development (July 2000).

Produced by the Community Planning Workshop for the Department of Land Conservation and Development, this is a natural hazards planning and mitigation resource for Oregon cities and counties. It provides hazard-specific resources and plan evaluation tools. The document was written for local government employees and officials. The Technical Resource Guide includes a natural hazards comprehensive plan review, a hazard mitigation legal issues guide, and five hazard-specific technical resource guides, including: flooding, wildfires, landslides, coastal hazards, and earthquakes. You can write, call, fax, or go on-line to obtain this document.

**Contact:** Natural Hazards Program Manager, DLCD  
**Address:** 635 Capitol St. NE, Suite 200, Salem, OR 97301-2540  
**Phone:** (503) 373-0050  
**Fax:** (503) 378-6033  
**Website:** <http://www.oregon.gov/LCD/HAZ/index.shtml>

*Environmental, Groundwater and Engineering Geology: Applications for Oregon – Earthquake Risks and Mitigation in Oregon*, Yumei Wang, (1998) Oregon Department of Geology and Mineral Industries, Star Publishing.

This paper deals with earthquake risks in Oregon, what is being done today, and what policies and programs are in action to help prevent loss and damage from seismic events. This article also gives a good list of organizations that are doing work in this field within the state. This article is somewhat technical but provides vital information to communities around the state.

**Contact:** DOGAMI  
**Address:** 800 NE Oregon St., Suite 965, Portland, Oregon 97232  
**Phone:** (971) 673-1555  
**Fax:** (971) 673-1562  
**Website:** [www.oregongeology.com](http://www.oregongeology.com)

*Special Paper 29: Earthquake damage in Oregon: Preliminary estimates of future earthquake losses*, Yumei Wang, Oregon Department Of Geology And Mineral Industries.

Wang, a geotechnical engineer, analyzed all faults with a 10% chance of causing an earthquake in the next 50 years and projected potential damage. Wang stresses that these are preliminary figures. "There are two things we could not incorporate into this study that would significantly increase these figures. One is a tsunami. The other is an inventory of unreinforced brick or masonry buildings."

**Contact:** DOGAMI  
**Address:** 800 NE Oregon St., Suite 965, Portland, Oregon 97232  
**Phone:** (971) 673-1555  
**Fax:** (971) 673-1562  
**Website:** [www.oregongeology.com](http://www.oregongeology.com)

*Land Use Planning for Earthquake Hazard Mitigation: A Handbook for Planners, Wolfe, Myer R. et. al., (1986) University of Colorado, Institute of Behavioral Science, National Science Foundation.*

This handbook provides techniques that planners and others can utilize to help mitigate for seismic hazards. It provides information on the effects of earthquakes, sources on risk assessment, and effects of earthquakes on the built environment. The handbook also gives examples on application and implementation of planning techniques to be used by local communities.

**Contact:** Natural Hazards Research and Applications Information Center  
**Address:** University of Colorado, 482 UCB, Boulder, CO 80309-0482  
**Phone:** (303) 492-6818  
**Fax:** (303) 492-2151  
**Website:** <http://www.colorado.edu/UCB/Research/IBS/hazards>

*Using Earthquake Hazard Maps: A Guide for Local Governments in the Portland Metropolitan Region; Evaluation of Earthquake Hazard Maps for the Portland Metropolitan Region Spangle Associates, (1998/1999) Urban Planning and Research, Portola Valley, California.*

These two publications are useful for local governments concerned with land use in earthquake hazard areas. The proximity of Washington County to Portland and their interactive communities make these guides applicable to the County. The publications are written in clear and simplistic language and address issues such as how to apply earthquake hazard maps for land use decisions.

**Contact:** DOGAMI  
**Address:** 800 NE Oregon St., Suite 965, Portland, Oregon 97232  
**Phone:** (971) 673-1555  
**Fax:** (971) 673-1562  
**Website:** [www.oregongeology.com](http://www.oregongeology.com)

*Public Assistance Debris Management Guide*, Federal Emergency Management Agency (July 2000).

The Debris Management Guide was developed to assist local officials in planning, mobilizing, organizing, and controlling large-scale debris clearance, removal, and disposal operations. Debris management is generally associated with post-disaster recovery. While it should be compliant with local and county emergency operations plans, developing strategies to ensure strong debris management is a way to integrate debris management within mitigation activities. The *Public Assistance Debris Management Guide* is available in hard copy or on the FEMA website.

**Contact:** FEMA Distribution Center  
**Address:** 130 228th Street, SW, Bothell, WA 98021-9796  
**Phone:** (800) 480-2520  
**Fax:** (425) 487-4622  
**Website:** <http://www.fema.gov/government/grant/pa/dmgtoc.shtm>

# **Appendix B: Steering Committee and Public Meetings**

The purpose of this section is to document the public process utilized to develop this plan. The following includes agendas, sign-in sheets and minutes from Steering Committee meetings.

**Pre Disaster Mitigation Meeting  
November 3, 2005  
7:00 – 9:00 PM  
Sherman County Courthouse**

**MEETING AGENDA**

- 1.0 Introductions
- 2.0 Steering Committee explanation
- 3.0 Identifying potential hazards in Sherman County
- 4.0 Identifying Stake Holders in Sherman County
- 5.0 Additional questions & comments
- 6.0 Adjourn



# SHERMAN COUNTY

500 COURT STREET  
P.O. BOX 365  
MORO, OREGON 97039

Established  
February 25, 1889

Gary Thompson  
Judge  
565-3416

Sherry Kaseberg  
Commissioner  
565-3416

Steven Burnet  
Commissioner  
565-3416

Linda Cornie  
Clerk  
565-3606

Richard Stradley  
Assessor  
565-3505

Marnene Benson  
Treasurer  
565-3553

Ronald McDermid  
Justice of the Peace  
565-3572

Brad Lohrey  
Sheriff  
565-3622

Mark Coles  
Road Master  
565-3271

501 4th Street

October 26, 2005

Dear

Sherman County is in the process of developing a Natural Hazards Mitigation Plan. In order for Sherman County to qualify for future mitigation funds, the Federal Government has mandated that we develop this plan. We have contracted with Vision Consulting to develop the plan.

The first step of developing the Natural Hazards Mitigation Plan is to put together a steering committee. The initial meeting will be to cover what will be needed for the remainder of the planning process. This meeting will last no longer than 2 hours. We have put together a list of stakeholders, which are mostly public officials.

In order for this plan to be representative of Sherman County's needs, it is very important to have as many representatives as possible. Your participation in this planning process would be truly appreciated. If you are unable to attend and would like to send a designee, that would be fine. The meeting will be held as follows:

Date: Thurs., November 3, 2005  
Time: 7:00-9:00PM  
Location: Sherman County Courthouse

Thank you in advance for your assistance and participation.

Sincerely,

---

Gary Thompson, Judge  
Sherman County Court

---

Shawn Payne, Director  
Sherman County Emergency Services

**Sherman County Natural Hazards Mitigation Plan  
Steering Committee Meeting**

**Thursday, November 3, 2005**

<u>Mileage</u>	Name	Representing	
	Shaun Payne	Emergency Management	} <u>Officials</u>
6 miles	Georgia Macnab	Sherman Co. Planning Director	
	Mark Jones	Road Dept.	
20	BRAD LOHREY	Sherman Co Sheriff	
20	Gary Thompson	Sherman County	
40	Clifford Jett	City of Rufus	} <u>Volunte</u>
1	Jerrilea Mayfield	S.C. Ambulance Sherman County Health District	

7:00 PM - 9:00 PM = 2 hrs.

5 officials @ \$25.00/hr x 2 hrs = \$250.00  
 1 vol. @ \$15.00/hr x 2 hrs = 30.00  
 mileage 87 miles @ .485 42.20

PDM Plan Steering Committee  
November 03, 2005  
List of invitees

- Neil Pattee, City of Grass Valley Mayor or designee
  - John Waldren, City of Moro Mayor or designee
  - Karen Kellogg, City of Wasco Mayor or designee
  - ✓ Cliff Jett, City of Rufus Mayor or designee
  - ✓ Gary Thompson, Sherman County Judge
  - ✓ Georgia Macnab, Sherman County Planning Director
  - ✓ Brad Lohrey, Sherman County Sheriff
  - ✓ Mark Coles, Sherman County Public Works Director
  - ✓ Jerrilea Mayfield, Sherman County EMS/Clinic
  - Jim Payne, Sherman County Fire Chief
  - Andy Anderson, ODOT
  - ✓ Shawn Payne, Sherman County Emergency Management
- 
- ✓ Indicates attendance

Pre Disaster Mitigation Plan Steering Committee Meeting  
 March 14, 2006

NAME	REPRESENTING	Sections 1, 2 & 3 Homework Time	Mileage Roundtrip
Clifford Zett	Rufas	2.05	38
Neil PATTEE	GRASS VALLEY	1.0	19
Georgia Macnab	<del>#</del> Sherman	3 hrs	6
John Waldron	MORO		<del>134</del>
Jim Payne	MORO FD	1 hr.	—
Frank Rivera	Sherman County Sheriff	—	—
Gary Thompson	Sherman County	4 hrs	20
Mark Coles	Sherman Co. Road Dept	2 hrs.	0
Brad Lohrey	Sherman Co. Sheriff	2 hrs.	0
Jerrilea Mayfield	Sherman Co. EMS/Health District	2 hrs.	0
Andy Anderson	ODOT	1 hr.	0
Shaun Payne	Sherman Co. Emerg Mgmt	—	0

NOT in attendance  
 made corrections &  
 turned into the Brewer.

PDM Steering Committee  
March 14, 2006  
List of Invitees

- ✓ Neil Pattee, City of Grass Valley Mayor or designee
- ✓ John Waldron, City of Moro or designee
- Karen Kellogg, City of Wasco Mayor or designee
- ✓ Cliff Jett, City of Rufus Mayor or designee
- ✓ Gary Thompson, Sherman County Judge
- ✓ Georgia Macnab, Sherman County Planning Director
- Brad Lohrey, Sherman County Sheriff
- Mark Coles, Sherman County Public Works Director
- Jerrilea Mayfield, Sherman County EMS/Clinic
- ✓ Jim Payne, Moro Fire Department
- Andy Anderson, ODOT
- ✓ Shawn Payne, Sherman County Emergency Management

✓ Indicates attendance

**STEERING COMMITTEE MEETING #2**  
SHERMAN COUNTY 3-14-06

1. Sign In / Mileage if any
2. Review Sections #1, #2 and first part of #3
3. Do Work Sheet
4. Plot Work Sheet on Map
5. Assess vulnerability of communities and regions to natural hazards
6. Assess community sensitivity and resilience to natural hazards
7. Identify potential mitigation, preparedness, response and recovery strategies.

*Sherman County Emergency Services  
Shawn Payne, Director  
P.O. Box 139  
Moro, Oregon 97039-0139  
541.565.3100 541.565.3024 Fax  
emergencysew@earthlink.net*

February 17, 2006

Dear:

It is time once again for the Natural Hazards Mitigation Plan Steering Committee to meet. Sherman County is moving right along with the process. Sue Brewer, with Vision Consulting is doing a great job.

This meeting is designed to finalize the risk assessment for Sherman County. We will be providing some great maps for reference during the work session. The meeting will take no longer than 2 hours, I promise.

In order for this plan to be truly representative of Sherman County's needs, it is very important to have as many representatives as possible. Your participation in this planning process would be truly appreciated. If you are unable to attend and would like to send a designee, that would be fine. The meeting will be held as follows:

Date: Tuesday, March 14, 2006

Time: 6:30 PM

Location: Moro Fire Station  
309 Dewey Street

Thank you in advance for your assistance and participation.

Sincerely,

---

Shawn Payne, Director  
Sherman County Emergency Services

*Sherman County Emergency Services  
Shawn Payne, Director  
P.O. Box 139  
Moro, Oregon 97039-0139  
541.565.3100 541.565.3024 Fax  
emergencysew@earthlink.net*

March 9, 2006

Re: Pre-Disaster Mitigation Plan

Dear Steering Committee Members:

Sue Brewer with Vision Consulting has requested that you review these documents prior to our meeting on March 14, 2006. This will allow more time for discussion at the meeting and will also enable us to keep the meeting to the allotted time of 2 hours. If you have any questions or corrections, please feel free to make notations on your copy.

I apologize for the short notice, but I just received this today. Thank you once again for your time and expertise on this project.

Sincerely,



Shawn Payne, Director  
Sherman County Emergency Services

*Sherman County Emergency Services  
Shawn Payne, Director  
P. O. Box 139  
Moro, Oregon 97039-0139  
541.565.3100 541.565.3024 Fax  
emergencyserv@earthlink.net*

May 1, 2006

Dear Darryl:

Sherman County is in the process of developing a Natural Hazards Mitigation Plan. In order for Sherman County to qualify for future mitigation funds, the Federal Government has mandated that we develop this plan. We have contracted with Vision Consulting to develop the plan.

The first part of this process was to identify and meet with a Steering Committee. The next process includes identifying stakeholders and meeting with them. These are people who could be affected by mitigation or may have some valuable input in the development of this plan. This meeting will last no longer than 2 hours.

In order for this plan to be representative of Sherman County's needs, it is very important to have as many representatives as possible. Your participation in this planning process would be greatly appreciated. If you are unable to attend and would like to send a designee, that would be fine. The meeting will be held as follows:

Date: Wednesday, May 24, 2006  
Time: 2:00 – 4:00 PM  
Location: Moro Fire Department

Thank you in advance for your assistance and participation.

Sincerely,



Shawn Payne, Director  
Sherman County Emergency Services

*Sherman County Emergency Services  
Shawn Payne, Director  
P.O. Box 139  
Moro, Oregon 97039-0139  
541.565.3100 541.565.3024 Fax  
emergencysew@earthlink.net*

May 15, 2006

Dear:

This is a reminder regarding the Sherman County Natural Hazards Mitigation Plan Stakeholders meeting. In order for Sherman County to qualify for future mitigation funds, the Federal Government has mandated that we develop this plan. We have contracted with Vision Consulting to develop the plan.

The first part of this process was to identify and meet with a Steering Committee. The next process includes identifying stakeholders and meeting with them. These are people who could be affected by mitigation or may have some valuable input in the development of this plan. This meeting will last no longer than 2 hours.

In order for this plan to be representative of Sherman County's needs, it is very important to have as many representatives as possible. Your participation in this planning process would be greatly appreciated. If you are unable to attend and would like to send a designee, that would be fine. The meeting will be held as follows:

Date: Wednesday, May 24, 2006  
Time: 2:00 – 4:00 PM  
Location: Moro Fire Department

Thank you in advance for your assistance and participation.

Sincerely,

Shawn Payne, Director  
Sherman County Emergency Services

**Pre Disaster Mitigation Stakeholders Meeting  
May 24, 2006  
2:00 – 4:00 PM  
Moro Fire Station**

**MEETING AGENDA**

- 1.0 Introductions
- 2.0 Definition of a Stakeholder
- 3.0 Risk Assessment – Bill Burns
- 4.0 Identifying and mapping hazards in Sherman County, past and future
- 5.0 Adjourn

**PDM Stakeholders Meeting  
May 24, 2006  
List of Invitees**

- ✓ John English, City of Moro Public Works
- David Fritts, City of Grass Valley Public Works
- ✓ Ron Jensen, City of Rufus Public Works
- Greg Gosson, City of Wasco Public Works
- Karen Kellogg, City of Wasco Mayor
- Hannah Setje, American Red Cross
- Bonneville Power Administration
- Raleigh Curtis, Mid Columbia Producers
- Robert Latimer, PG&E Gas Transmission
- ✓ Mark Urness, Oregon State Parks
- Mike Benefield, Bureau of Land Management
- Mary Gumm, Sprint Telephone Company
- Russ Bourgeois, Pacific Power and Light
- ✓ Jeff Davis, Wasco Electric Cooperative
- ✓ Sgt. Wilcox, Oregon State Police
- ✓ Kathy Schwartz, Wasco-Sherman Public Health
- ✓ Jerrilea Mayfield, Sherman County Health District
- Angie Thompson, Sherman County School District
- Rod Asher, Sherman County Fire Defense Board
- Bob Stone, Sherman County EMS

*20 invites*

- ✓ Indicates attendance

Pre Disaster Mitigation Plan Stakeholder Meeting  
 May 24, 2006

PRINT NAME	REPRESENTING	Mileage Roundtrip
Bill Downs	DOGAWT	260
Susan Brewer	Vision Consulting	60
Mark Hennes	Oregon State Parks Deciduous	42
<del>Jeff Davis</del>	Wasco Electric Coop	60
JOHN ENGLISH	CITY OF MODO	—
Ron Jensen	City of Rusus	40
Kathy Schwab	Waco Sherman Health Dept.	80
Shaun Payne	Sherman County Emergency Services	—
JIMIE WILCOX	OREGON STATE POLICE	60
Jerrilea Mayfield	Sherman County Health District	1

**PDM Steering Committee**  
**June 21, 2006**  
**List of Invitees**

	<b>NAME</b>	<b>REPRESENTING</b>	<b>ADDRESS</b>
Attended			
	Neil Pattee, Mayor	City of Grass Valley	Grass Valley, Oregon 97029
X	John Waldron, Mayor	City of Moro	P.O. Box 231 Moro, OR 97039
	Karen Kellogg, Mayor	City of Wasco	P.O. Box 245 Wasco, OR 97065
	Cliff Jett, Mayor	City of Rufus	P.O. Box 846 Rufus, OR 97050
	Gary Thompson, Judge	Sherman County Court	P.O. Box 365 Moro, OR 97039
	Georgia Macnab, Planner	Sherman County Planning Dept.	P.O. Box 381 Moro, OR 97039
	Brad Lohrey, Sheriff	Sherman County Sheriff's Office	P.O. Box 424 Moro, OR 97039
X	Mark Coles, Road Master	Sherman County Road Dept.	P.O. Box 365 Moro, OR 97039
	Jerrilea Mayfield	Sherman County Health Dist./EMS	P.O. Box 135 Moro, OR 97039
	Bob Stone, Assist. Chief	Moro Fire Department	P.O. Box 2 Moro, OR 97039
X	Bert Perisho	ODOT	P.O. Box 281 Moro, OR 97039
	Rose Gentry, CEM	ODOT	800 Airport Road, SE Salem, OR 97301-4798
X	Lorri Benefield, Assist.	BLM	3050 NE 3 <sup>rd</sup> Street Prineville, OR 97754
X	Rod Asher, Chief	Sherman Co. Fire Defense Board	P.O. Box 462 Wasco, OR 97065
X	Shawn Payne, Director	Sherman Co. Emergency Mgmt.	P.O. Box 139 Moro, OR 97039

*Sherman County Emergency Services  
Shawn Payne, Director  
P.O. Box 139  
Moro, Oregon 97039-0139  
541.565.3100 541.565.3024 Fax  
emergencysw@earthlink.net*

June 06, 2006

Lorri Benefield  
Assistant Fire Staff  
Bureau of Land Management  
3050 NE 3<sup>rd</sup> Street  
Prineville, Oregon 97754

**COPY**

Dear Ms. Benefield:

It is time once again for the Natural Hazards Mitigation Plan Steering Committee to meet. Sherman County is moving right along with the process. Sue Brewer, with Vision Consulting is doing a great job.

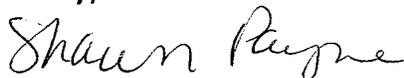
This meeting is designed to identify action items based on the hazards that we have recognized in past work sessions. This meeting will take no more than 2 hours, probably less.

In order for this plan to be truly representative of Sherman County's needs, it is very important to have as many representatives as possible. Your participation in this planning process would be truly appreciated. If you are unable to attend and would like to send a designee, that would be fine. The meeting will be held as follows:

Date: Wednesday, June 21, 2006  
Time: 9:30 AM  
Location: Moro Fire Station  
309 Dewey Street

Thank you in advance for your assistance and participation.

Sincerely,



Shawn Payne, Director  
Sherman County Emergency Services

Pre Disaster Mitigation Planning Steering Committee Meeting  
June 21, 2006  
9:30 AM – 11:30 AM  
Moro Fire Station

## AGENDA

- 1.0 Introductions
- 2.0 Work Session Objectives
- 3.0 Identifying Action Items for Plan
- 4.0 Adjourn



**Pre Disaster Mitigation Planning Steering Committee Meeting**  
**August 7, 2006**  
**10:00AM – 12:00PM**  
**Moro Fire Station**

## **AGENDA**

- 1.0 Introductions
- 2.0 Identifying Action Items, Goals and Solutions for Plan
- 3.0 Adjourn

*Sherman County Emergency Services  
Shawn Payne, Director  
P.O. Box 139  
Moro, Oregon 97039-0139  
541.565.3100 541.565.3024 Fax  
emergencysew@earthlink.net*

July 20, 2006

Rod Asher, Chief  
Sherman County Fire Defense Board  
P.O. Box 462  
Wasco, Oregon 97065

Dear Rod:

It is time once again for the Pre Disaster Mitigation Plan Steering Committee to meet. This meeting is designed to continue our work on identifying action items, goals and solutions regarding natural hazards. This meeting will take no longer than 2 hours, probably less.

In order for this plan to be truly representative of Sherman County's needs, it is very important to have as many representatives as possible. Your continued participation in this planning process is truly appreciated. If you are unable to attend, please try to send a designee in your place. The meeting will be held as follows:

Date: Monday, August 7, 2006

Time: 10:00 AM

Location: Moro Fire Station  
309 Dewey Street

Thank you in advance for your assistance and participation.

Sincerely,

Shawn Payne, Director  
Sherman County Emergency Services

**COPY**



**PDM Steering Committee**  
**August 7, 2006**  
**List of Invitees**

Attended	NAME	REPRESENTING	ADDRESS
	Neil Pattee, Mayor	City of Grass Valley	Grass Valley, Oregon 97029
	John Waldron, Mayor	City of Moro	P.O. Box 231 Moro, OR 97039
	Karen Kellogg, Mayor	City of Wasco	P.O. Box 245 Wasco, OR 97065
	Cliff Jett, Mayor	City of Rufus	P.O. Box 846 Rufus, OR 97050
X	Gary Thompson, Judge	Sherman County Court	P.O. Box 365 Moro, OR 97039
X	Georgia Macnab, Planner	Sherman County Planning Dept.	P.O. Box 381 Moro, OR 97039
	Brad Lohrey, Sheriff	Sherman County Sheriff's Office	P.O. Box 424 Moro, OR 97039
	Mark Coles, Road Master	Sherman County Road Dept.	P.O. Box 365 Moro, OR 97039
X	Jerrilea Mayfield	Sherman County Health Dist./EMS	P.O. Box 135 Moro, OR 97039
X	Bob Stone, Assist. Chief	Moro Fire Department	P.O. Box 2 Moro, OR 97039
	Andy Anderson	ODOT	P.O. Box 281 Moro, OR 97039
	Rose Gentry, CEM	ODOT	800 Airport Road, SE Salem, OR 97301-4798
	Lorri Benefield, Assist.	BLM	3050 NE 3 <sup>rd</sup> Street Prineville, OR 97754
X	Rod Asher, Chief	Sherman Co. Fire Defense Board	P.O. Box 462 Wasco, OR 97065
X	Shawn Payne, Director	Sherman Co. Emergency Mgmt.	P.O. Box 139 Moro, OR 97039

# Memo

**To:** Region 5 Pre-Disaster Mitigation Communities  
**From:** Oregon Natural Hazard Workgroup at the University of Oregon  
**Date:** November 15, 2005  
**Re:** November 15 Phone Bridge Minutes

## Participants

Andre LeDuc, ONHW	Dennis Olson, Umatilla County
Krista Mitchell, ONHW	Ray Denny, Umatilla County
Julie Foster, ONHW	Shawn Payne, Sherman County
Sam Sugita, ONHW	Michael Pasternak, Hood River and Wasco Counties
Kate Lenzser, ONHW	Anne Debbaut, Hood River County
Dennis Sigirst, OEM	Lynn Rasmussen, Wasco County
Stan Prihar, OEM	Carla McLane, Morrow County
Chris Fitzimmons, Gilliam County	Lori Timmons, Morrow County
Tom Groat, Umatilla County	Nancy , Hood River County
Bill Burns, DOGAMI	

## Billing and Reporting Information

Julie Foster, Grants Administrator for Oregon Natural Hazards Workgroup (ONHW), presented an overview of some of the issues with billing information. Some of the main points include:

The project is a Federal grant awarded to Oregon Emergency Management which has contracted with the ONHW at the University of Oregon to be the lead agency. ONHW has, in turn, sub-contracted with each of the counties and with DOGAMI to complete portions of the project.

This is a cost-reimbursable grant and therefore all of the sub-agreements are cost-reimbursable. We can only reimburse your agency for costs that you incur for the purpose of the completion of the work as described in the scope of work.

All costs must be considered allowable and allocable, necessary and reasonable, and verifiable and accounted for in the institutional records. This is true for both direct costs AND matching costs. Matching costs can not be from federal funds.

We are asking that you invoice us **quarterly** with the first invoice for the October-December quarter, due in January.

ONHW and OEM will be scheduling individual meetings with each of the communities, either immediately before or after the January training, to go over

documentation for the first invoice. Please be prepared to have that first invoice ready before the training on January 25<sup>th</sup>, and please bring with you any backup documentation (like receipts) for ONHW and OEM to go over with you.

You must include the 25% match on each invoice. We can only reimburse you for 75 cents on the dollar for the total project costs which include your match. If you do not have enough documentable match you will have to hold off on invoicing some costs until you have the required match available.

Document, document, document. Please be sure that your existing record keeping system allows you to document costs as allowable and allocable, etc. It is fine to use the systems that your community already has. However, if you don't have systems in place, you may use some of the sample forms that we provided at the October training. These are now available on the website (<http://www.oregonshowcase.org/region5/index.htm>) for you to use and modify to your particular needs.

Sample documents are on the website. Not meant to replace existing systems if you have them but just examples of what we use on campus. Feel free to modify to your needs. Note: there is no sample invoice, use whatever form your community uses. If the community does not have a form, we can post a UO example.

Please be sure that you have an appropriate effort certification system in place. Again, you can use the UO forms (provided to you at the October training) as a template if you do not currently have a system of your own in place. A sample will be uploaded to the website by the end of the week.

For volunteer effort tracking, make sure you have a good tracking system in place. Documenting the date, the number of hours volunteered, and the volunteers' signatures are sufficient for FEMA requirements. You can also value a volunteer's time at the volunteer's hourly wage, or by using a rate accepted by the State. You will want to provide documentation of either the volunteer's hourly wage, or a description of the State policy.

For reimbursing mileage costs, you can use the state or federally accepted rates, or the rate used by your community. You can use the State or federal rates even if they are higher than what you originally included in your scope of work and budget. But make sure to include the appropriate backup documentation.

The CFDA number will get distributed to all of the communities.

Feel free to contact Julie with any questions. The best way to contact her is by e-mail at: [jdfoster@uoregon.edu](mailto:jdfoster@uoregon.edu). Julie's office hours are Monday, Tuesday, Thursday and Friday from 10:00 am – 2:00 pm.

Andre LeDuc from ONHW presented information about project reporting:

Quarterly reports should be tied to the County's scope of work.

Quarterly reports should include a simple description of what step(s) were accomplished during the quarter, what tasks were associated with completing the step(s), and any products or outputs yielded.

Documenting the phone bridges can assist with the requirements for documenting your planning process.

The first quarter tasks that you will be reporting on will be related to Step 1 and your plan's introduction and community profile.

ONHW will put a sample on the website for people to view.

### Community Updates

Each community provided an update of what they have been doing since the October Training:

Hood River and Wasco Counties: Both counties have been focusing on creating their Steering Committees and the first drafts of their plans' introduction and community profile sections. Each county is hoping to have their first steering committee meetings in mid-January, at which time they hope to present the first drafts of the plans' introductions and community profiles.

Gilliam, Sherman, and Wheeler Counties: All three counties have just recently held their first steering committee meetings. Sue Brewer will next be working toward the first quarter report. The counties are hoping to hold their next steering committee meetings in January after the Risk Assessment Training. Sherman County has additionally begun to identify some of its hazards and started working on its community profile.

Morrow County: Morrow County has signed the contract.

Umatilla County: Umatilla County has signed the contract.

### Next Steps

Some of the things you should be thinking about and working on between now and the January Training include:

- Holding steering committee meetings if you have not already done so;
- Documenting the planning process, including who was invited and who participated, so that you can include it in an appendix to meet FEMA requirements;
- Working on your community profile;
- Look at the stakeholder interview technical memo on the website if you are interested in conducting stakeholder interviews;
- Documenting historic hazard occurrences for your community: important resources include your local data (event reports often housed with Emergency Management or Public Works), and the *State Natural Hazards Risk Assessment's* regional profiles; and
- Using the Action Item Worksheets to document needs that may be starting to come up so that they are not lost between now and the Goals/Action Item Training in Spring.

**December Phone Bridge:**

Thursday December 15<sup>th</sup>, 2005 1:00 – 2:30 pm

A detailed agenda and instructions for dialing in will be provided closer to the date of the phone bridge.

**January Pre-Disaster Mitigation Training: Vulnerability Assessment (Step 4)**

Wednesday January 25<sup>th</sup>, Noon – 5:00 pm

Thursday January 26<sup>th</sup>, 8:00 am – Noon

Columbia Gorge Community College Lecture Hall

400 East Scenic Drive, The Dalles, OR 97058

A detailed training agenda will be available closer to the date of the training.

ONHW will work with each community to set up one-on-one time either before or after the training to address invoicing and plan development.

Please let Krista know by November 30<sup>th</sup> if you don't have access to large scale (table-top) County maps for the Risk Assessment mapping exercise.

# Memorandum

**To:** Region 5 Pre-Disaster Mitigation Communities  
**From:** Oregon Natural Hazard Workgroup at the University of Oregon  
**Date:** December 16, 2005  
**Re:** December 15 Phone Bridge Minutes

## Participants

Andre LeDuc, ONHW	Michael Pasternak, Hood River and Wasco Counties
Krista Mitchell, ONHW	Carla McLane, Morrow County
Julie Foster, ONHW	Lori Timmons, Morrow County
Dennis Olson, Umatilla County	Dennis Sigrist, OEM
Chris Fitzsimmons, Gilliam County	Sue Brewer, Sherman-Gilliam-Wheeler
JR Cook, Umatilla County	Jeff , FEMA Region X

## Billing Questions – Julie Foster, Community Service Center, UO

Note: Billing is separate from reporting

*When are invoices due?*

Invoices should be submitted quarterly, within 30 days of the end of the quarter. However, for the first quarter, Julie will be holding site visits with each community to review the invoices either before or after the January training in The Dalles. We are asking that you fax Julie a copy of your invoice by Friday, January 20<sup>th</sup> so that she can review it prior to the individual meetings. Please bring any back-up documentation with you to the training as well. Krista will work with you individually to set up meeting times. Please mail or e-mail invoices to Julie at:

Julie Foster  
 Community Service Center  
 1209 University of Oregon  
 Eugene, OR 97403-1209  
[jdf@uoregon.edu](mailto:jdf@uoregon.edu)

Activity Reporting System form is posted on-line. Sample form UO uses to certify labor and effort for federally funded projects.

## Partner Updates – Dennis Sigrist, OEM

The FY06 offering of the Pre-Disaster Mitigation Grants opened on November 21<sup>st</sup>. To be eligible for project grants, the community’s mitigation plan must be pre-approved by FEMA by February 3<sup>rd</sup>.

The State intends to use the action items identified in community mitigation plans as a resource to identify potential actions for pre-disaster grants as well as project funding in post-disaster situations.

## Community Updates

Each community provided an update of what they have been doing since the last phone bridge:

*Hood River and Wasco Counties:* The Introduction and Profile sections are almost complete and will be sent to ONHW for review. Both counties will hold Steering Committee meetings the week prior to the January training. Efforts to identify historic hazard events has not occurred yet.

*Gilliam, Sherman, and Wheeler Counties:* All three counties have held their first steering committee meetings. All three counties have draft of the Introduction section and have begun identifying historic events to plug into Section 3. The community profiles are being developed for all three counties. The next series of Steering Committee meetings is set for February.

*Morrow County:* Looking to have the County Court approve the Steering Committee after the 1st of January. Efforts have been taken to coordinate with a committee working to develop a community wildfire protection plan, which will serve as the wildfire chapter of the all-hazards plan.

*Umatilla County:* Met with the County Administrator to discuss the project.

**Planning Process Resources:** There is a memo posted on the web page that provides sources for finding historic event data. The information in Section 3 should focus specifically on the local impacts and events. The regional hazard assessments are a good place to start to get dates for certain hazard events, but to get the specific local impacts, you may need to use the regional event dates to search in your local newspaper archives, historical societies, NOAA storm database or other local documents.

## Planning Process Questions

*How should you use work plans and other memos to document the process that you used?*

You can place work plans, meeting minutes, and other process documents in an Appendix. You will also want to summarize those steps in the Introduction section under the different planning steps. For instance, under Step 4, you will want to summarize the steps you took to develop the Risk Assessment Summaries (for instance: data search for events in newspaper, NOAA, and Steering committee brainstorm; held workshop to identify community assets at risk; etc). Including the work plans and detailed notes on the process is important to assist in institutionalizing the mitigation plan in your community. If the person who developed the plan leaves, documenting the process will allow someone new to step in and understand what steps were taken and where they should go next.

## January Training

Wednesday, January 25th: 12:30 pm – 5:00 pm

Thursday, January 26th: 8:30 am – 1:00 pm

Columbia Gorge Community College

400 East Scenic Drive, The Dalles, OR 97058

Lecture Hall – 3rd floor of Building 2 (same location as October training)

Note: lunch and/or snacks will not be provided through the PDM grant, but the College's cafeteria will be open if you would like to purchase food at any time during the training.

This training is focused on Step 4 of the planning process – the risk assessment. The training draws upon Partnerships resources from ONHW, the US Geological Survey, and the Department of Geology and Mineral Industries. The training is very 'hands on' and will include an issue identification and community asset mapping exercise. The intent of these sessions is to provide you with a process and methods to use with your Steering Committees to complete the county's risk assessments. We have invited several additional partners to assist with the community mapping exercise. Representatives from the following agencies have been invited: Department of Land Conservation and Development,

Oregon Department of Transportation, Bonneville Power Administration, US Army Corps of Engineers, and several economic development organizations. Regional partner attendance has not been confirmed at this time.

What to Bring:

*Training Manual* – you will receive additional planning resources to be added to the manual.

*Community GIS Staff* – please invite your community’s GIS staff to attend the training to assist in the community mapping exercise.

*Local hazard data* – so that you have an understanding of the geographic extent of the hazards in your community.

*Community Base Maps* - For the mapping exercise, we are asking each community to bring a base map of the county. We will provide trace paper for the exercises so that the maps don’t get marked up. A base map that includes: roads, aerial photography, rivers and streams, relief and/or land cover would be helpful for the exercise. At a minimum, the maps should include jurisdictional boundaries and roads to help identify specific locations in the county. We also would encourage you to bring enlarged maps of the cities within the county as well. Larger sized maps are ideal for this exercise. USGS and DOGAMI will also have base maps available for those communities who do not have access to local base maps.

*Quarterly invoicing documentation* – for individual meetings with Julie Foster.

Where to stay?

ONHW has reserved a block of rooms at the Best Western River City Inn in The Dalles. To make a reservation, call 541.296.9107 and request a room from the Community Service Center block. ONHW is not covering lodging expenses, so you will need a credit card to make a reservation.

### **April Training – Goal and Action Items**

To avoid future training conflicts, we have scheduled the spring goal and action item training for Thursday, April 27<sup>th</sup> at the Port of Morrow facility in Boardman.

### **Reporting**

Narrative quarterly reports are due to ONHW by the 5<sup>th</sup> of month immediately following the end of the quarter. ONHW must then compile all the quarterly reports from the communities into one report for OEM by the 15<sup>th</sup>. A sample report is available on-line. Electronic versions of the quarterly reports should be e-mailed to Andre by the 5<sup>th</sup> – [onhw@uoregon.edu](mailto:onhw@uoregon.edu) and signed hardcopies should be mailed as well. Mail to:

Andre LeDuc  
Oregon Natural Hazards Workgroup  
1209 University of Oregon  
Eugene, OR 97403-1209

### **Next Phone Bridge**

Because of the training next month, there will be no phone bridge in January.

# Memo

**To:** Region 5 Pre-Disaster Mitigation Communities  
**From:** Oregon Natural Hazard Workgroup at the University of Oregon  
**Date:** March 23, 2006  
**Re:** **March 23 Phone Bridge Minutes**

## Participants

Andre LeDuc, ONHW	Carla McLane, Morrow County
Krista Mitchell, ONHW	Lori Timmons, Morrow County
Julie Foster, ONHW	Marj Sharp, Wheeler County
Kate Lenzser, ONHW	Chris Fitzsimmons, Gilliam County
Bill Burns, DOGAMI	Sue Brewer, Gilliam, Sherman, Wheeler Counties

## Partner Announcements

Bill Burns, Engineering Geologist with the Department of Geology and Mineral Industries (DOGAMI), offered to attend local risk assessment meetings for all of the counties. Bill had been asked by Michael Pasternak of Hood River and Wasco Counties to attend a risk assessment meeting being held for local stakeholders of the two counties, and wanted to offer the same opportunity to the other counties as well. Bill can provide meeting attendees with the regional information being collected by DOGAMI so that they can focus on specific local issues.

Bill Burns also provided an update on DOGAMI's work on the regional risk assessment:

Work on the regional risk assessment is coming along, and DOGAMI is hoping to have the landside hazard maps and some of the earthquake hazard maps completed by the April trainings.

## Community Planning Updates

Each community provided an update of what they have been doing since the January Training:

Gilliam, Sherman, and Wheeler Counties: All three counties have held their second steering committee meetings. In addition, all three counties have Section 1 (up to the April Training), Section 2, and Section 3 (up to the July Training) completed. Each county is looking to hold community meetings where stakeholders will be invited to help identify the hazard risks within their communities.

Morrow County: The County Court has recently appointed the ten-member steering committee. The county will soon be in contact with each steering committee member to inform them of the agenda and objectives of the planning process, which will include four meetings over the next six months in order to meet the September

deadline. The county has also set up a stakeholder mapping event to identify local hazard risks on May 16<sup>th</sup>.

### **Community Planning Question and Answer**

There were no planning questions from the communities.

### **Outreach Efforts**

Krista Mitchell, Project Coordinator with Oregon Natural Hazards Workgroup (ONHW) provided an update on the two outreach efforts that are currently underway, the Household Survey and the Open For Business Toolkit Training:

Household Survey: Thank you to all the communities for helping ONHW compile the mailing list. The survey sample has been created and is weighted based on the size of each county's population. ONHW is hoping to mail the survey within the next three weeks. There will be pre-postcard sent out first to inform residents that the survey will be coming. Roughly a week after the pre-post card, ONHW will send out the survey itself, with a cover letter that includes county contacts and a prepaid return envelope. Roughly two weeks after the first survey is mailed, ONHW will send a second survey to residents who did not respond and ask for them to complete and return the survey.

After the surveys are returned, Kamala Englin, Research Intern with ONHW, will be doing the survey analysis. The analysis will be used to complete an appendix that can be incorporated into each county's plan.

Open For Business Toolkit Training: There is an online, CD, and paper version of the Institute for Business and Home Safety's (IBHS) Open For Business contingency planning toolkit. For the training, IBHS is providing "match" and providing the training attendees with free access to the online toolkit.

For the training, ONHW would ask the communities to help identify who should be at the training. ONHW is targeting small business service providers, social service providers, and also small businesses. ONHW would like to ask the communities to use the invitation list spreadsheet that Krista e-mailed out to help identify who should be invited to the training. Please return the invitation lists to Krista by April 14<sup>th</sup> at [kristam@uoregon.edu](mailto:kristam@uoregon.edu).

There will be two training sessions: The first will be at the Blue Mountain Community College's Hermiston Campus on the afternoon of Wednesday May 24<sup>th</sup>. The second will be at the Columbia Gorge Community College in The Dalles on the afternoon of Thursday May 25<sup>th</sup>.

### **April Training Update**

André LeDuc, Program Director with ONHW, provided an update on the April Training:

Individual meetings have been scheduled with each community. These meetings are to help each community examine what they have already accomplished and help them identify ways to move forward to complete the next steps. ONHW will be helping each community learn how to step through goal setting and action item development activities.

Krista Mitchell will be sending out individual e-mail to all of the communities regarding their individual meetings with ONHW.

Carla McLane, Planning Director for Morrow County, gave an update on the field trip to visit the dairy, and asked what people wanted to see specifically:

The trip is scheduled for the afternoon of Wednesday April 26<sup>th</sup>. Carla will need to know how many people are planning on attending to be able to arrange for the right number of four-wheel drive vehicles.

André LeDuc expressed interest in going to get a feel for how big the impact on the region would be if a business as large as the dairy was caused to close because of a natural hazard event.

Bill Burns expressed interest in going to see what types of seismic rehabilitation the dairy had done, as well as what types of hazard prevention and mitigation activities the dairy had engaged in.

### **Billing and Reporting Questions**

ONHW wanted to thank all of the communities for being timely on their previous quarterly reports. ONHW would like to ask for all of the next quarterly reports to be submitted by April 5<sup>th</sup>.

*Do we have to create new reports? Or can we add on to the first one?*

Communities can add new bullet points to their existing reports. The important thing is to add new bullet points for the main activities that you've engaged in from January to March.

*Will the other quarterly reports be returned faster than the first one?*

The first quarterly report takes longer to process than the rest. Payments for the rest of the quarterly reports will be faster than the first.

Julie Foster, Grants Administrator for ONHW, wanted to remind all the communities to please provide all backup documentation with the invoices. The more information the better.

### **Next Phone Bridge**

The next phone bridge is scheduled for Thursday May 18<sup>th</sup>. Please contact ONHW if you will be unable to make the May phone bridge so that ONHW can contact you separately.

A detailed agenda and instructions for dialing in will be provided closer to the date of the phone bridge.

# Memo

**To:** Region 5 Pre-Disaster Mitigation Communities  
**From:** Oregon Natural Hazard Workgroup at the University of Oregon  
**Date:** May 18, 2006  
**Re:** May 18 Phone Bridge Minutes

## Participants

Andre LeDuc, ONHW	Carla McLane, Morrow County
Krista Mitchell, ONHW	Lori Timmons, Morrow County
Julie Foster, ONHW	Dennis Sigrist, OEM
Dan Keller, ONHW	Mike Pasternak, Hood River and Wasco Counties
Chris Fitzsimmons, Gilliam County	Sharon Loper, FEMA
Sue Brewer, Gilliam, Sherman, Wheeler Counties	

## Partner Announcements/Community Planning Updates

**Michael Pasternak** of Hood River and Wasco Counties mentioned projects he is working on, including the hazard annexes, community risk assessments, the stakeholder interviews, and his plan for utilizing connections with RARE. Mike plans to submit his article for the Partnerships in Action Newsletter to Dan Keller, research intern with ONHW, within a few days.

**Andre LeDuc**, director of ONHW, spoke about creating a “Cliffs Notes” version of action items to be distributed to communities to help communities better identify and prioritize their action items. This compilation of recommended action items will be used to represent what items should be prioritized from a state or regional perspective. As part of this discussion, Andre mentioned the need to mitigate repetitive loss in regard to any natural hazard.

**Sue Brewer** of Gilliam, Sherman, and Wheeler counties also spoke about the hazard annexes. She also spoke about the stakeholder forum process, and its implementation with Bill next week.

**Carla McLane and Lori Timmons** of Morrow County reported on the steering committee meeting that was held in April. They also spoke about the stakeholder event this past Tuesday, reporting that roughly 30 people attended, and it was good to see new faces at the event. However, some key players, including all local utility companies, were absent from the event. Personal interviews will probably be conducted with representatives from the utility companies, and perhaps others. Andre asks if Carla and Lori would like a no cost extension and they decline, at least for now. Lori specified that she is working with PDM.

**Dennis Sigrist, SHMO**, emphasized that communities should go through pre-approval process with FEMA before adopting their plan. Also, in relation to repetitive loss, he referred people to work with FMA (Flood Mitigation Assistance) as happened in Multnomah County.

**Andre** gave an update about the household survey, saying there is currently about a 1/3-response rate. Ideally, the report will be complete and shared in July. Andre emphasized that communities may be surprised by what the report produces, as happened in Lane Co. The report is something you can put in an annex or appendix to the plan. Andre also said there are currently 6-10 individuals signed up for each of the Open for Business trainings. Feel free to attend the trainings, contact Krista to RSVP. The first session is on Wednesday, May 24<sup>th</sup> at Blue Mountain Community College in Hermiston in Columbia Hall, Room 210 from 1:30 – 5:00 pm. The second is on Thursday, May 25<sup>th</sup> at Columbia Gorge Community College, Building 1, Room 1.351 from 1:30 – 5:00 pm. Finally, Andre reminded everyone to thoroughly document the processes for the stakeholder and public forums (i.e. state who was there and the forum was unique).

**Sharon** agreed with Andre that is important to document who the stakeholders are in a particular stakeholder forum.

### **Billing issues**

There were no billing issues.

### **Closing comments and upcoming events**

**Andre** notified everyone that the quarterly reports are due on July 6. Because Andre will be out on paternity leave at that time, the reports will need to be sent Julie Foster (jdfoster@uoregon.edu). A reminder email will be sent when the date gets closer.

**Krista Mitchell** is planning to schedule a tour of the John Day dam. She is working with the Army Corps of Engineers to schedule this visit. Several group members expressed an interest in attending the visit. This tour will be scheduled in conjunction with the August site visits for Plan Implementation & Maintenance which will most likely take place the second week of August.

**Mike** notified Andre and Krista about the Oregon Rural Policy Forums, saying the ONHW may want to send a representative to the next event (July?) because at the last event there was no discussion about natural hazard mitigation. Specifically, ONHW may want to appear at the “policy breakout” sessions.

### **Next Phone Bridge**

The next phone bridge is scheduled for Thursday June 22<sup>nd</sup> at 10:30 am. Please contact ONHW if you will be unable to make the May phone bridge so that ONHW can contact you separately.

A detailed agenda and instructions for dialing in will be provided closer to the date of the phone bridge.

# Memo

**To:** Region 5 Pre-Disaster Mitigation Communities  
**From:** Oregon Natural Hazard Workgroup at the University of Oregon  
**Date:** June 22, 2006  
**Re:** June 22nd Phone Bridge Minutes

## Participants

Krista Mitchell, ONHW	Chris Fitzsimmons, Gilliam County
Dan Keller, ONHW	Marj Sharp, Wheeler County
Carla McLane, Morrow County	
Sue Brewer, Gilliam, Sherman, and Wheeler Counties	
Julie Foster, ONHW	
Dennis Sigrist, OEM	

## Check-ins

**Dennis Sigrist, SHMO**, announced Oregon’s success in securing two pre disaster mitigation grants for 2006. Of the five applications submitted by Oregon counties, two were selected to receive funds, earning a total of \$1.3 million. Because Oregon counties were competing with counties around the nation for a share of the \$50 million available from FEMA, securing \$1.3 million is a success.

**Carla McLane** of Morrow County announced that, despite their late start, they have hosted two of their four scheduled steering committee meetings. In their recent stakeholder forum, thirty of the eighty invited guests attended, and the event was a success. Since the forum, they have met with many groups for follow up meetings, including representatives from the irrigation district. They are making progress in other areas as well, such as in crafting Section 4 goals and action items from their meeting on May 19<sup>th</sup>. Carla mused that having a tornado occur helped spur this process along. She concluded by saying there are no cities that have disasters not already covered in the county plan.

**Sue Brewer** of Gilliam, Sherman, and Wheeler counties announced that stakeholder meetings have been held in all three counties. The planning processes are coming along well in each community.

**Michael Pasternak** from Hood River and Wasco Counties couldn't call in, but submitted the following update via email. The stakeholder interviews are nearly complete with roughly 25 completed for each county. He is getting very good feedback. Amongst other feedback, he is getting great ideas for action items. However, it is difficult to get people to follow up after interviews. To deal with this challenge, he will document information from the stakeholder interviews in the action item forms, and continue trying to conduct follow-ups when necessary.

Michael also plans to link the mission statement and goals to the county mission statement and strategic goals. He spoke with the Hood River County commissioner Maui Mayer who wants to see a plan on the County Needs and Issues list (a working document for project funding and implementation). Maui also wants a one-page summary for BOC of what the plan can do for the County, to be completed before Michael leaves. Michael is also waiting on key documents from Wasco County (the Wasco 2000 Plan, and the Wasco County Strategic Action Plan), which he should have by week's end, or early next week. There will be Goals and Action Items Steering Committee meetings on July 10<sup>th</sup> and 12<sup>th</sup>. For outreach and awareness, Michael is working to set up the Gorge radio interview in addition to printing wildfire pamphlets to distribute through county building departments and local building suppliers. For meetings with the cities of Hood River and The Dalles, conference rooms have been booked, but he does not have names for steering committee members yet. In Cascade Locks, a room has not been booked yet, nor does he know the names of steering committee members.

**Krista Mitchell**, Project Coordinator for ONHW, announced upcoming trainings and events for August. The next regional training will be held on Tuesday, August 8<sup>th</sup> at the Columbia Gorge Community College and will cover plan implementation, adoption, and maintenance. There will also be a session on how to move from plan development to implementation and will include information on cost-benefit analysis. Following Tuesday's training, there will be a visit to the John Day Dam on Wednesday for anyone who is interested in attending. Krista will schedule site visits with individual communities both before and after these events.

**Dennis Sigrist** contributed to Krista's update by informing everyone about the Very Limited Data Module, which provides a cursory examination of benefits and costs for plans and projects.

**Krista Mitchell** provided two more updates. First, the Partnership website has been updated. All plan development resources are located in the 'Oregon Pre-Disaster Mitigation' navigational bar, and then select 'Plan Development Resources' from the left. If you are having difficulty navigating the new site, email Krista for assistance. Additionally, Krista and Andre will be out of the office for the majority of July. Krista will be reachable via email and voicemail.

### **Billing:**

**Julie Foster** of ONHW checked in with billing information. She expects to receive billing by mid July. Because she will be out of the office for a portion of July, you may not hear from her until late July or early August for your billing.

### **Reporting:**

Quarterly reports are due to ONHW by **Friday, July 7<sup>th</sup>**. Since Andre and Krista will both be out of the office, please email electronic copies to Julie Foster [jdfoster@uoregon.edu](mailto:jdfoster@uoregon.edu) and follow up by mailing a hardcopy to her as well.

### **Next Phone Bridge:**

The next phone bridge is scheduled for Wednesday Sept 13<sup>th</sup> at 10:30 am. The July phone bridge will not be held because neither Krista nor Andre will be in the office, and the meetings held in August will replace the August phone bridge. Please contact ONHW if you will be unable to make the September phone bridge so that ONHW can contact you separately.

A detailed agenda and instructions for dialing in will be provided closer to the date of the phone bridge.

# Memorandum

**To:** Region 5 Pre-Disaster Mitigation Communities  
**From:** Oregon Natural Hazard Workgroup at the University of Oregon  
**Date:** September 20, 2006  
**Re:** September 20 Phone Bridge Minutes

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## Participants

Krista Mitchell, ONHW	Lori Timmons, Morrow County
Dennis Olson, Umatilla County	Marj Sharp, Wheeler County
Bill Burns, DOGAMI	Chris Fitzsimmons, Gilliam County
Sue Brewer, Gilliam, Sherman, Wheeler Counties	Brenda Jenkins, Wasco County

## Partner Announcements

Bill Burns, Engineering Geologist with the Department of Geology and Mineral Industries (DOGAMI), continues to work on updating regional hazard characteristics for the earthquake, landslide, volcanic event, and flood hazards.

## Community Planning Updates

Each community provided an update of what they have been doing since the August Training:

Gilliam, Sherman, and Wheeler Counties: DOGAMI is working on digitizing some of maps for the county plans. The counties are currently finishing up the documentation of action items. The final steering committee meetings focused on plan implementation will be scheduled soon.

Morrow County: The County has completed a draft plan and is in the process of completing updates to plan sections based on an ONHW review of the draft plan. The steering committee has recommended forwarding the draft plan to OEM and FEMA for review.

Umatilla County City Addendums: The County plan is nearly finished and should be going before the Board soon. The Cities have reviewed the draft County plan and will continue planning efforts once the final plan has been finished. The City of Pendleton has begun to identify action items.

Hood River County: The plan is being forwarded on to OEM for FEMA review.

Wasco County: The plan is being forwarded on to OEM for FEMA review.

## Community Planning Question and Answer

There were no planning questions from the communities.

### Regional Profile

Krista Mitchell, Project Coordinator with Oregon Natural Hazards Workgroup (ONHW) provided an update on the Regional Profile. ONHW developed this report as part of the regional planning initiative funded by the Pre-Disaster Mitigation Grant. In addition to serving as a regional resource for local planning initiatives, this also serves as the regional profile for the State's enhanced natural hazard mitigation plan. This report is intended to be used as a planning process document by communities developing local natural hazard mitigation plans. Communities should use this report to identify additional rationale for the action items developed in the plan.

Using the best available secondary data, the regional profile includes a *Geographic Profile*, that provides a physical geographic description of the region, a *Demographic Profile* that discusses the population in the Mid-Columbia region, an *Infrastructure Profile* that addresses the region's critical facilities and systems of transportation and power transmission, and an *Economic Profile* that discusses the scale and scope of the regional economy with a focus on key industries. In addition to describing characteristics and trends, each profile section identifies the traits that indicate sensitivity to natural hazards. This report should be included in local plans as an appendix (this report was previously identified as Appendix D: Economic Analysis).

### Plan Wrap Up

Krista Mitchell reviewed the process for finishing up the plans and getting them in the cue for FEMA review. ONHW staff is available to review draft sections of the plan if they have not already done so. ONHW can provide general feedback in terms of the FEMA planning requirements. Once the community has a draft plan in place, the following steps should be taken to submit it to FEMA for review:

1. Assemble 1 hardcopy of the entire plan (appendices and annexes)
2. Assemble 1 electronic copy of the entire plan (pdf preferred) and burn to a disk
3. Mail hardcopy and electronic copy to the State Hazard Mitigation Officer at Oregon Emergency Management
4. OEM forwards the plan to FEMA on behalf of the community
5. OEM will forward the community the review outcome: either pre-approval, or comments for further revision.
  - a. If the community receives a pre-approval, go on to step 6.
  - b. If the community receives comments, those comments should be addressed. Hard copies and electronic copies of the revisions (only) should be re-submitted to OEM.
6. Once the community receives FEMA's pre-approval, the community should begin the local adoption process.
7. Proof of local adoption should be forwarded to OEM upon completion.
8. The community will receive a final approval letter indicating that the community is eligible for FEMA funding programs.

These mitigation plans are non-regulatory and therefore should be adopted via resolution. The resource CD distributed at the final training in The Dalles included sample resolution language. Feel free to contact ONHW or OEM for additional assistance in drafting the resolution language.

### **Billing and Reporting Questions**

ONHW wanted to thank all of the communities for being timely on their previous quarterly reports. ONHW would like to ask for all of the next quarterly reports (signed hardcopy and electronic copies) to be submitted to Andre LeDuc by October 6<sup>th</sup>.

*Are expenses incurred after September 30<sup>th</sup> eligible for reimbursement without a contract extension?*

Krista is going to check with Andre and Julie on this question. Communities can expect an email response.

Julie Foster, Julie Foster, Grants Administrator for ONHW, wanted to remind all the communities to please provide all backup documentation with the invoices. The more information the better.

### **Next Phone Bridge**

The next phone bridge is scheduled for Thursday October 19<sup>th</sup> at 10:30 am. Please contact ONHW if you will be unable to make the May phone bridge so that ONHW can contact you separately.

A detailed agenda and instructions for dialing in will be provided closer to the date of the phone bridge.

# Memorandum

**To:** Region 5 Pre-Disaster Mitigation Communities  
**From:** Oregon Natural Hazard Workgroup at the University of Oregon  
**Date:** October 19, 2006  
**Re:** **October 19 Phone Bridge Minutes**

## Participants

Krista Mitchell, ONHW	Lori Timmons, Morrow County
Carla McLane, Morrow County	Marj Sharp, Wheeler County
Ray Denny, Umatilla County	Anne Debbaut, Hood River County
Andrea Gosson, Wasco County	

## Community Planning Updates

Plans for Morrow, Wasco, Gilliam, Sherman, and Wheeler Counties have been forwarded to OEM and FEMA Region X for review. Hood River and Umatilla Counties will be forwarding the plans for review in the near future.

## Community Planning Question and Answer

There were no planning questions from the communities.

## Plan Wrap Up

Krista Mitchell reviewed the process for finishing up the plans and getting them in the cue for FEMA review. ONHW staff is available to review draft sections of the plan if they have not already done so. ONHW can provide general feedback in terms of the FEMA planning requirements. Once the community has a draft plan in place, the following steps should be taken to submit it to FEMA for review:

1. Assemble 1 hardcopy of the entire plan (appendices and annexes)
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4. OEM forwards the plan to FEMA on behalf of the community
5. OEM will forward the community the review outcome: either pre-approval, or comments for further revision.
  - a. If the community receives a pre-approval, go on to step 6.
  - b. If the community receives comments, those comments should be addressed. Hard copies and electronic copies of the revisions (only) should be re-submitted to OEM.

6. Once the community receives FEMA's pre-approval, the community should begin the local adoption process.
7. Proof of local adoption should be forwarded to OEM upon completion.
8. The community will receive a final approval letter indicating that the community is eligible for FEMA funding programs.

These mitigation plans are non-regulatory and therefore should be adopted via resolution. The resource CD distributed at the final training in The Dalles included sample resolution language. Krista will distribute the resolution language via email. The FEMA review process will most likely take more than the 45 window due to staffing issues at the region. For the latest information on your community's place in the review queue, contact Dennis Sigrist, State Hazard Mitigation Officer, [dsigrist@oem.state.or.us](mailto:dsigrist@oem.state.or.us) or 503.378.2911 ext. 22247.

### **Billing and Reporting Questions**

ONHW wanted to thank all of the communities for submitting quarterly reports. The next quarterly report will be due to ONHW by Tuesday, January 9<sup>th</sup>. For most communities the plans were/will be submitted to FEMA during the current quarter and should be documented in the quarterly report due in January.

Wheeler County asked about a second contract extension after December 31<sup>st</sup> given the FEMA review turn around time and the fact that some County Commissions/Judges only meet once a month. Most likely some communities will have plan adoption activities taking place in January and February. ONHW will check back in with communities at the end of November to see if there is a need for a contract extension beyond December 31<sup>st</sup>.

Morrow County indicated that their current contract extension was held up due to changes in Board membership.

### **Next Phone Bridge**

At this time, a phone bridge has not been scheduled for November. If the need arises for a phone bridge, ONHW will contact communities to schedule the call.

*Sherman County Emergency Services  
Shawn Payne, Director  
P.O. Box 139  
Moro, Oregon 97039-0139  
541.565.3100 541.565.3024 Fax  
emergencysev@earthlink.net*

November 16, 2007

John Waldron, Mayor  
City of Moro  
P.O. Box 231  
Moro, Oregon 97039

**COPY**

Dear John:

It is time once again for the Pre Disaster Mitigation Plan Steering Committee to meet. The plan was recently approved by FEMA and now is ready to bring before the Steering Committee for final review. This meeting will take no longer than 2 hours, probably less.

In order for this plan to be truly representative of Sherman County's needs, it is very important to have as many representatives as possible. Your continued participation in this planning process is truly appreciated. If you are unable to attend, please try to send a designee in your place. The meeting will be held as follows:

Date: Tuesday, November 27th

Time: 7:00 PM

Location: Moro Fire Station  
309 Dewey Street

Light refreshments will be served. Thank you for your assistance and participation.

Sincerely,

Shawn Payne, Director  
Sherman County Emergency Services



# **Appendix C: Regional Household Preparedness Survey**

The purpose of this section is to document the findings from the regional household preparedness survey.

# Household Natural Hazards Preparedness Survey

## Survey Report for:

(The Mid-Columbia Region)

Gilliam County, Oregon  
Hood River County, Oregon  
Morrow County, Oregon  
Sherman County, Oregon  
Umatilla County, Oregon  
Wasco County, Oregon  
Wheeler County, Oregon

## Prepared by:

**Oregon Natural Hazards  
Workgroup**

Community Service Center  
1209 University of Oregon  
Eugene, OR 97403-1209  
Phone: 541.346.3889  
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Email: [onhw@uoregon.edu](mailto:onhw@uoregon.edu)  
<http://www.oregonshowcase.org>

**August 2006**



# Special Thanks & Acknowledgements

## **The Community Service Center would like to thank the following individuals for their assistance on this project:**

Chris Fitzsimmons, Gilliam County

Ray Denny, Umatilla County

Carla McLane, Morrow County

Dennis Olson, Umatilla County

Michael Pasternak, Hood River and Wasco Counties

Shawn Payne, Sherman County

Marj Sharp, Wheeler County

## **Project Manager:**

Kamala Englin, Oregon Natural Hazards Workgroup

## **Project Advisors:**

Krista Mitchell, Project Coordinator, Oregon Natural Hazards Workgroup

André LeDuc, Director, Oregon Natural Hazards Workgroup

Robert Parker, Managing Director, Community Service Center

*This survey was developed and implemented as part of a regional planning initiative funded through the Federal Emergency Management Agency's Pre-Disaster Mitigation Competitive Grant Program. The Mid-Columbia Region grant was awarded to support the development of natural hazard mitigation plans for the region. The region's planning process utilized a seven-step planning process, plan framework, and plan development support (including the development of this report) provided by the Oregon Natural Hazards Workgroup at the University of Oregon.*

# Appendix C: Household Risk Perception Survey

## Survey Purpose and Use

The purpose of the survey is 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 of what people have done to prepare for a natural hazard, and desired individual and community strategies for risk reduction.

## Background

The Federal Emergency Management Agency (FEMA) published Interim Rule 44 CFR Part 201 in February 2002, requiring all states and communities to develop natural hazard mitigation plans by November 2003. These planning and mitigation requirements for states and communities are being accomplished through the Pre-Disaster Mitigation Program (PDM). Oregon Natural Hazards Workgroup (ONHW) at the University of Oregon, as the coordinator of the *Partners for Disaster Resistance and Resilience: Oregon Showcase State Program*, is working with Oregon Emergency Management (OEM) and the PDM Program to assist local governments with their natural hazard mitigation planning efforts. As part of the PDM Program, ONHW is assisting the Mid-Columbia region of Oregon with the citizen involvement components of the natural hazard mitigation planning process.

Citizen involvement is a key component in the natural hazard mitigation planning process. Citizens have the opportunity to voice their ideas, interests and concerns about the impact of natural disasters on their communities. To that end, the Disaster Mitigation Act of 2000<sup>1</sup>

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<sup>1</sup> National Archives and Records Administration. 2002. Federal Emergency Management Agency 44 CFR Parts 201 and 206 Hazard Mitigation Planning and Hazard Mitigation Grant Program; Interim Final Rule in Federal Register.

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.

The benefits of citizen involvement, according to Bierle<sup>2</sup>, include the following: (1) educate and inform public; (2) incorporate public values into decision making; (3) improve substantially the quality of decisions; (4) increase trust in institutions; (5) reduce conflict; and (6) ensure cost effectiveness.

## Methodology

To conduct the household survey, ONHW adapted the eight page survey administered statewide in 2002 to better understand the perceptions of risk to natural hazards held by citizens, as well as the level of preparedness and types of risk reduction activities in which citizens have engaged. (See Appendix A) For the Mid-Columbia region survey, ONHW adapted the statewide survey to include questions about citizens' support for different types of community planning actions. Planning actions mentioned included protecting critical facilities, disclosing natural hazard risks during real estate transactions, and the use of tax dollars to compensate land owners for not developing in hazardous areas.

The survey was sent to 1200 households in the Mid Columbia Gorge region, which includes: Hood River, Wasco, Sherman, Gilliam, Wheeler, Morrow and Umatilla Counties. The households were randomly selected and population weighted based on mailing lists provided to ONHW by each of the counties. The following table documents the individual county list sources.

**Table 1.1: County Mailing List Sources, 2006**

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<sup>2</sup> Bierle, T. 1999. "Using social goals to evaluate public participation in environmental decisions." *Policy Studies Review*. 16(3/4) ,75-103.

<b>County</b>	<b>List Source</b>
Gilliam	911 Addressing
Hood River	Voter Registration
Morrow	Voter Registration
Sherman	Sherman County Ambulance Service Membership List
Umatilla	Voter Registration
Wasco	Wasco County GIS: Tax Lot Database
Wheeler	Voter Registration

Source: Oregon Natural Hazards Workgroup

The mailing contained a cover letter, the survey instrument, and a postage-paid return envelope. Completed surveys were returned to ONHW. A second mailing was sent to households who did not respond to the first mailing, approximately three weeks later. ONHW received 276 valid responses, for a 23% response rate.

## Limitations

The study identifies key issues about how members of the Mid-Columbia communities perceive their risk to natural hazards, providing a snapshot of those perceptions at a single point in time. As such, survey responses may reflect external issues, such as heightened concern about terrorism and the current state of the economy. This study was not intended to be representative of the perceptions of all residents, and cannot be generalized to the public.

A challenge is that the survey was not tailored to each community in which it was implemented and natural hazards are not evenly dispersed throughout the state. For example, the survey asked respondents about their level of concern about coastal erosion. Coastal erosion is only an issue in coastal areas of the state. Not surprisingly, the level of concern for coastal erosion is highest in coastal communities and is less significant for those who do not live there. Thus, coastal erosion is a specific concern for respondents who live near this hazard that they are susceptible to every day, just as those who live in the floodplain or near a volcanic hazard may have increased awareness of those hazards.

## Organization of Report

The survey results are organized into the following sections:

**Characteristics of Survey Respondents:** This section reports information about respondent characteristics including: educational attainment, home ownership, age, and household income.

**Perception of Risk:** This section creates a profile of survey respondents and identifies:

- The hazards experienced;
- General level of concern over natural hazards risk;

- Respondent perceptions of threats posed by natural hazards;
- Perceptions of the effectiveness of various education and outreach material in raising natural hazard awareness; and
- Preferred avenues for information dissemination.

**Level of Preparedness:** This section provides an overview of household level natural hazard preparedness activities in the Mid-Columbia region.

**Natural Hazard Risk Reduction:** This section describes the types of structural and nonstructural measures that are being implemented by survey respondents, and the types of resources or programs that might increase risk reduction activities.

**Community Natural Hazard Preparedness:** This section describes citizens' priorities for planning for natural hazards and the community-wide strategies respondents support.

**Written Responses to Open-Ended Questions:** This section includes the transcripts of the open-ended questions and comments.

## Characteristics of Survey Respondents

Demographic questions provide a statistical overview of the characteristics of the respondents. This section of the survey asked respondents about their age and gender, their level of education, and how long they have lived in Oregon. The survey also included questions regarding respondents' present housing.

There were 276 people who responded to the survey giving the survey a 23% response rate. Of the seven counties the survey was mailed to, the most surveys returned came from residents of Umatilla County (51.9%). This is not surprising as Umatilla has by far the greatest number of residents in the region with 70,548 of the 131,141 Mid-Columbia residents (2000 U.S. Census). Proportionally, the highest percentage of respondents per county was in Wheeler County where 0.5% of the total population responded to the survey.

Table 2.1 shows the percentage of people who responded to the survey by county.

**Table 2.1. Percent of Surveys Received Per County**

<b>County</b>	<b>Percent of surveys received</b>
Gilliam	3%
Sherman	3%
Wheeler	3%
Morrow	7.5%
Hood River	13.4%
Wasco	18.3%
Umatilla	51.9%

Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006).

## Gender and Age

Women accounted for 57% of survey respondents even though they represented less than 50% of the population in the region according to the 2000 Census. The median age of survey respondents was 61 years even though the median age of Mid-Columbia residents, according to the U.S. Census,<sup>3</sup> was 39.5. Table 2.2 compares the ages of survey respondents to the 2000 U.S. Census. This shows that younger people were underrepresented while older people were overrepresented.

**Table 2.2. Percentage of Mid-Columbia Population and Survey Respondents in Each Age Classification (persons 20 and over)**

<b>Age Category</b>	<b>Mid-Columbia (from U.S. Census)</b>	<b>Survey Respondents</b>
20-24	4.6%	1.5%
25-34	10.7%	5.2%
35-44	14.9%	8.4%
45-54	14.5%	24.3%
55-59	5.5%	14.9%
60-64	5.1%	16.4%
65-74	8.6%	14.5%
75-84	5.6%	10.7%
85 & over	1.9%	3.0%

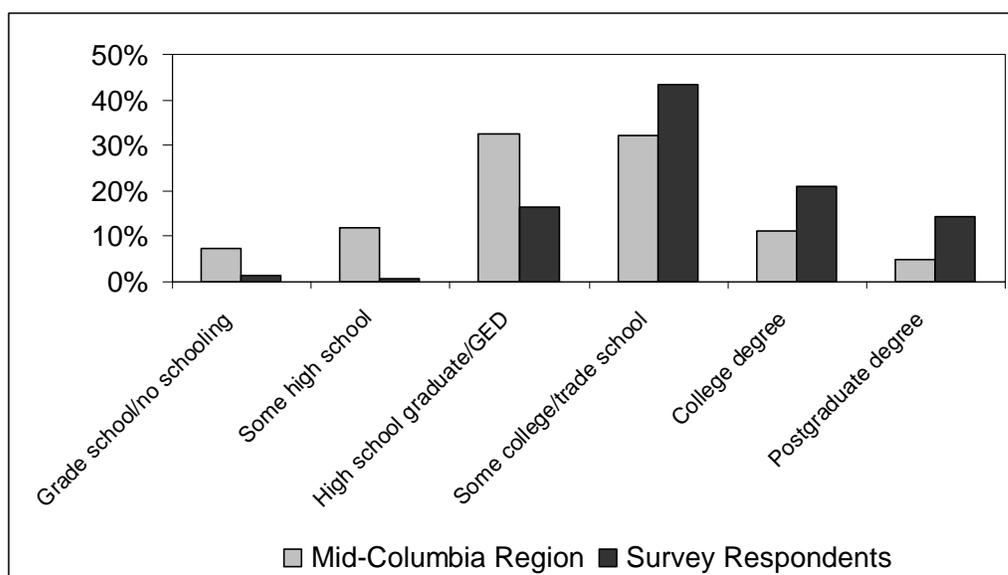
Source: U.S. Census Bureau: [www.census.gov](http://www.census.gov) (2000) and Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006).

<sup>3</sup> U.S. Census data presented in this report is an average of data from each of the seven counties represented in the Mid-Columbia region.

## Level of Education

In general, survey respondents were relatively well educated. Figure 2.1 compares the level of education of survey respondents with the 2000 U.S. Census. About 79% of survey respondents have had some college or trade school or have a college or postgraduate degree. In contrast, figures from the Census show that an average of 48% of Mid-Columbia residents have attended some college or trade school or obtained an associate, bachelor or postgraduate degree. Therefore, survey respondents were more likely to have completed a higher educational level than the overall population of the Mid-Columbia region.

**Figure 2.1. Level of Education of the Mid-Columbia Population and Survey Respondents**

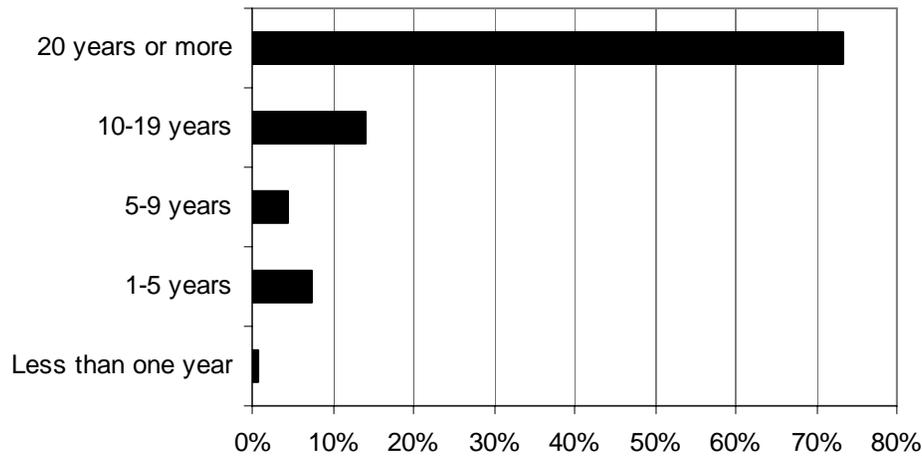


Source: U.S. Census Bureau: [www.census.gov](http://www.census.gov) (2000) and Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

## Oregon Residency

Over 73% percent of survey respondents have lived in Oregon for 20 years or more (see Figure 2). Respondents who have lived in Oregon for fewer than 20 years have most commonly moved from California (18%), Washington (17%), and Colorado (5%).

**Figure 2.2. Length of Time Survey Respondents Have Lived in Oregon**



Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

## Housing Characteristics

Homeownership is an important variable in education and outreach programs. 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 resistance. Table 2.3 compares the percentage of homeowners from the survey and the U.S. Census. Almost 88% of survey respondents are homeowners, compared to the 66% reported by the U.S. Census. The survey sample over represents the number of homeowners and considerably under represents the number of renters.

**Table 2.3. Percentage of Mid-Columbia Population and Survey Respondents Who Own or Rent Their Home**

	Mid-Columbia	Survey Respondents
<b>Occupied housing units</b>		
Owner-occupied housing units	66.0%	87.7%
Renter-occupied housing units	34.0%	12.3%

Source: U.S. Census Bureau: [www.census.gov](http://www.census.gov) (2000) and Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

Almost 74% of survey respondents live in single-family homes, 16% live in manufactured homes, 3% in apartments, and 3% live in duplexes. In addition, 77% said they have access to the internet.

## Perception of Risk

It is helpful to understand community members' experiences and perceptions of risk to natural hazards to make informed decisions about natural hazard risk reduction activities. The survey asked respondents for information regarding their personal experiences with natural disasters and their level of concern for specific hazards in the Mid-Columbia region. The primary objective of these questions was to create a "natural hazard profile" of respondents to better understand how Mid-Columbia residents perceive natural hazards.

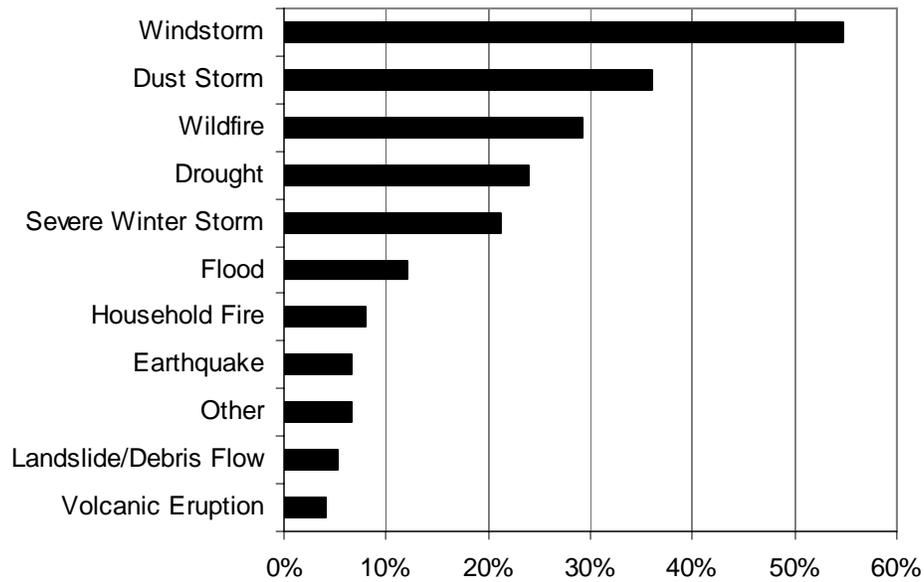
To understand the effectiveness of current outreach activities regarding home and family safety, the survey asked respondents about the types of information they receive on how to make their home and family safer. By identifying communication tools that have been effectively used in the past, local government agencies and organizations can continue to make use of or augment the use of these outreach materials.

## General Level of Concern

The survey results indicate that about 27% 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.

Of those respondents who have experienced a natural disaster in the last five years, 55% experienced windstorms, 36% experienced dust storms, and 29% experienced wildfires. Figure 3.1 illustrates the disasters experienced in the past five years in the Mid-Columbia region.

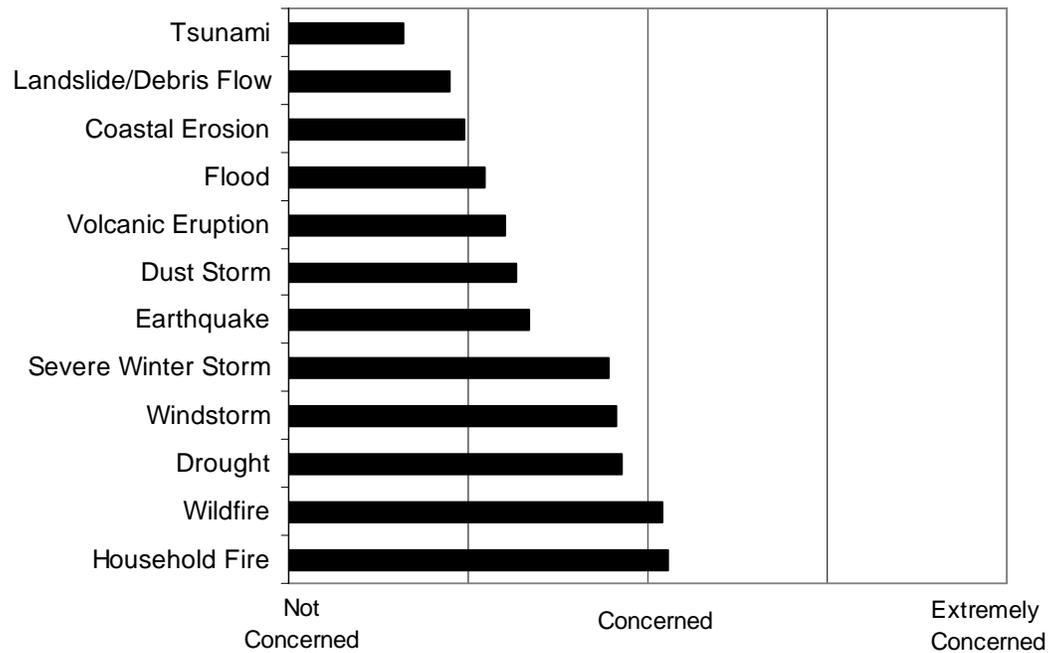
**Figure 3.1. Percent of Disasters Experienced by Survey Respondents Within the Past Five Years**



Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

The survey asked respondents to rank their personal level of concern for specific natural disasters affecting their community. Figure 3.2 shows the general level of concern about natural hazards in the Mid-Columbia region.

**Figure 3.2. Survey Respondents' General Level of Concern about Natural Hazards in the Mid-Columbia Region**



Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

Even though windstorms were the most common natural disaster experienced by survey respondents, results show that respondents were most concerned about household fire and wildfire. The respondents are least concerned about landslide/debris flows and tsunamis. See Table 3.1.

**Table 3.1. Survey Respondents' Level of Concern Regarding Natural Hazards in the Mid-Columbia Region**

Hazard Type	Extremely Concerned	Very Concerned	Concerned	Somewhat Concerned	Not Concerned
Drought	9%	20%	33%	24%	15%
Dust Storm	5%	12%	26%	17%	40%
Earthquake	5%	11%	26%	30%	28%
Flood	3%	10%	22%	26%	40%
Landslide/Debris Flow	1%	7%	19%	27%	46%
Wildfire	17%	24%	26%	18%	15%
Household Fire	19%	18%	32%	21%	11%
Tsunami	3%	5%	11%	17%	64%
Volcanic Eruption	5%	8%	21%	32%	33%
Wind Storm	9%	21%	27%	30%	13%
Coastal Erosion	9%	21%	27%	30%	13%
Severe Winter Storm	8%	20%	31%	26%	16%

Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

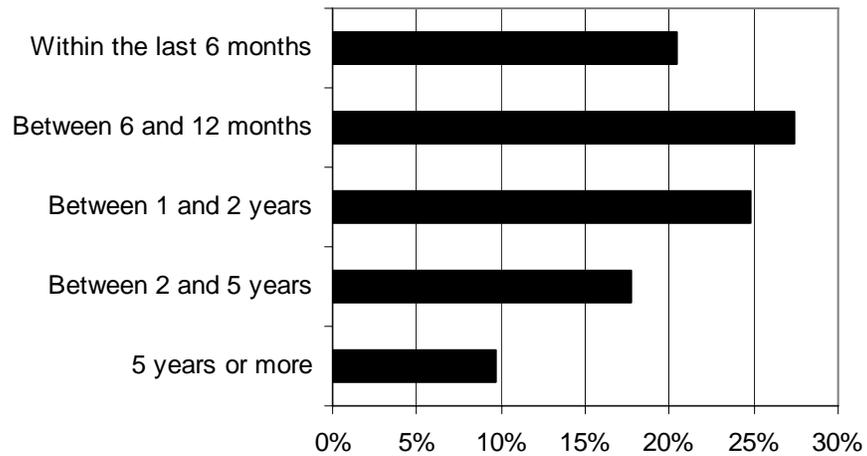
## Information Distribution

One of the objectives of the survey was to assess the amount and effectiveness of outreach activities focusing on natural hazards. The survey asked a series of questions on information and outreach.

### Recent information and sources

Over 46% of respondents indicated that they have received information regarding home and family safety at some time in the past. Of those who have received information, 20% received the information within the last six months and 27% received information six months to one year ago (see Figure 3.3). This suggests that, while outreach is occurring, it is reaching fewer than half of the households in the Mid-Columbia region and that many of the households have not received any information in over a year.

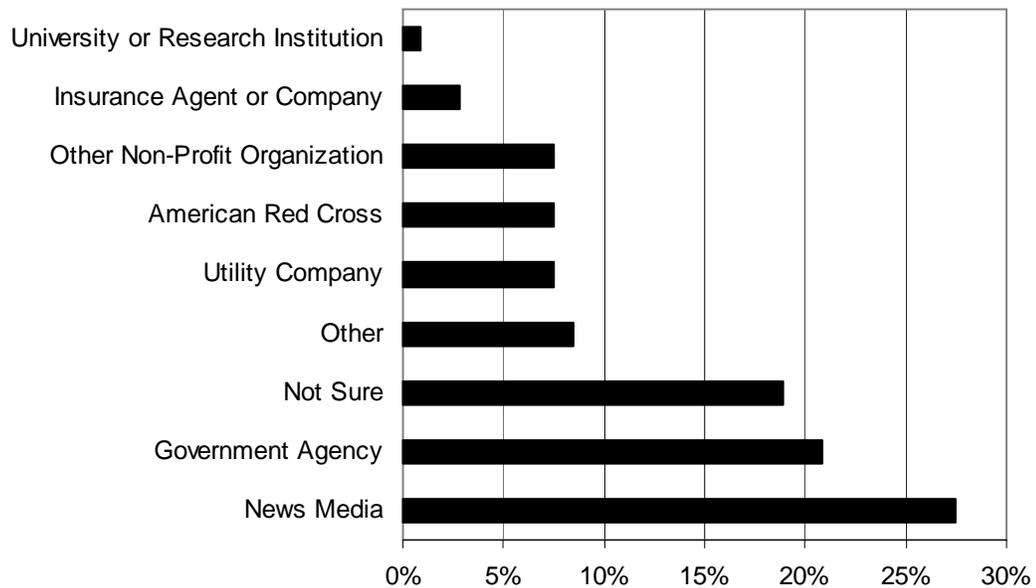
**Figure 3.3. Survey Respondents' History of Receiving Information on Family and Home Safety**



Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

Of the respondents who received information on natural hazard preparedness, the news media (26%) and government agencies (21%) were the sources that supplied the most respondents with information. Figure 3.4 shows the sources respondents last received information from.

**Figure 3.4. Sources of Respondents' Most Recent Information**



Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

### **Preferred Sources and Formats of Information**

To develop and implement effective outreach and education activities, it is important to understand the mechanisms for information dissemination. It is interesting to compare the sources of information with which sources the respondents perceive to be the most trustworthy. Only 7.5% said they last received information from the American Red Cross yet the Red Cross was the most trusted source of information (40%). The second most trusted source was the utility company (38%) which also had only 7.5% of respondents stating that that was where their last safety information came from. Table 3.2 shows the sources respondents trust the most for providing this information.

**Table 3.2. Survey Respondents' Most Trusted Sources of Information on Household Preparedness**

<b>Source</b>	<b>Percent of Respondents</b>
American Red Cross	40%
Utility company	38%
University or research institution	34%
Insurance agent or company	34%
Government agency	31%
News media	28%
Other non-profit organization	14%
Not sure	14%
Other	7%

Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

When asked what the most effective way was to receive information, respondents indicated that television news (53%), mail (49%), and newspaper stories (48%) were the most effective. Table 3.3 shows the effectiveness rating of information dissemination methods presented in the survey.

**Table 3.3. Survey Respondents' Rating of Various Information Sources in Terms of Outreach Effectiveness**

<b>Source</b>	<b>Percent of Respondents</b>
Television news	53%
Mail	49%
Newspaper stories	48%
Radio news	38%
Fact sheet/brochure	35%
Fire department/rescue	30%
Internet	23%
Public workshops/meetings	20%
University or research institution	17%
Schools	15%
Newspaper ads	11%
Television ads	11%
Books	9%
Radio ads	8%
Chamber of Commerce	8%
Magazine	7%
Outdoor advertisement	7%
Other	6%

Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

## Level of Preparedness

There are many steps people can take to prepare their households for a natural disaster or emergency. Preparing for a disaster can improve the safety and comfort of the members of a household immediately following a natural disaster or emergency. The survey asked respondents about what steps their households have taken or plan to take to increase their disaster preparedness.

### Types of Household Preparedness Activities

Forty-five percent of respondents talked with members of their households about what to do in the case of a natural disaster or emergency. In addition, 41% were trained in first aid or CPR during the past year and 37% prepared a “Disaster Supply Kit” which entails storing extra food, water, and other emergency supplies. Table 4.1 summarizes the activities respondents indicated they have done, plan to do, have not done, or were unable to do to prepare for natural disasters.

**Table 4.1. Survey Respondents’ Household Disaster Preparedness Activities**

<b>Preparedness Activity</b>	<b>Have Done</b>	<b>Plan To Do</b>	<b>Not Done</b>	<b>Unable To Do</b>
Attended meetings or received written information on natural disasters or emergency preparedness?	32%	4%	59%	5%
Talked with members in your household about what to do in case of a natural disaster or emergency?	45%	12%	40%	3%
Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?	29%	17%	51%	2%
Prepared a "Disaster Supply Kit" (Stored extra food, water, batteries, or other emergency supplies)?	37%	22%	40%	1%
In the last year, has anyone in your household been trained in First Aid or Cardio-Pulmonary Resuscitation (CPR)?	41%	4%	52%	3%

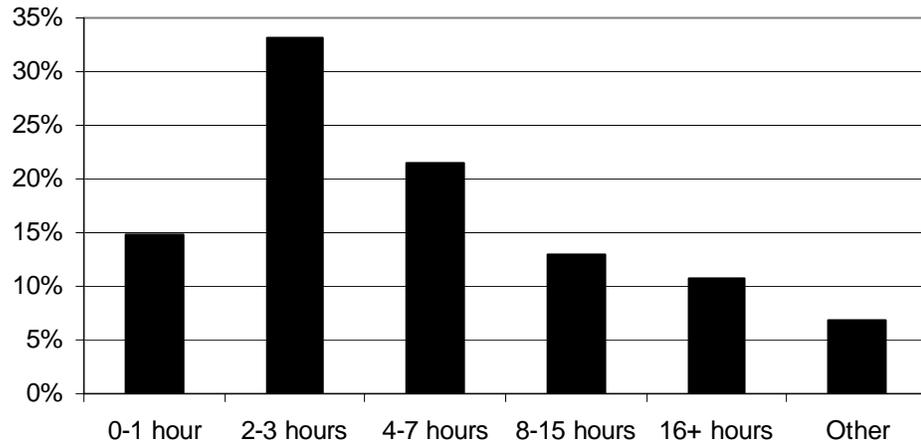
Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

### Willingness to Participate in Risk Reduction Activities

Understanding how much time per year respondents are willing to spend on preparing themselves and their households for a natural disaster or emergency event can help a community focus its educational efforts. Over 33% of the respondents said they would be willing to spend two to three hours per year preparing themselves and about 21% said they would be willing to spend four to seven hours per year on

preparedness activities. Figure 4.1 shows the number of hours per year the respondents were willing to spend preparing themselves and/or their households for a natural disaster.

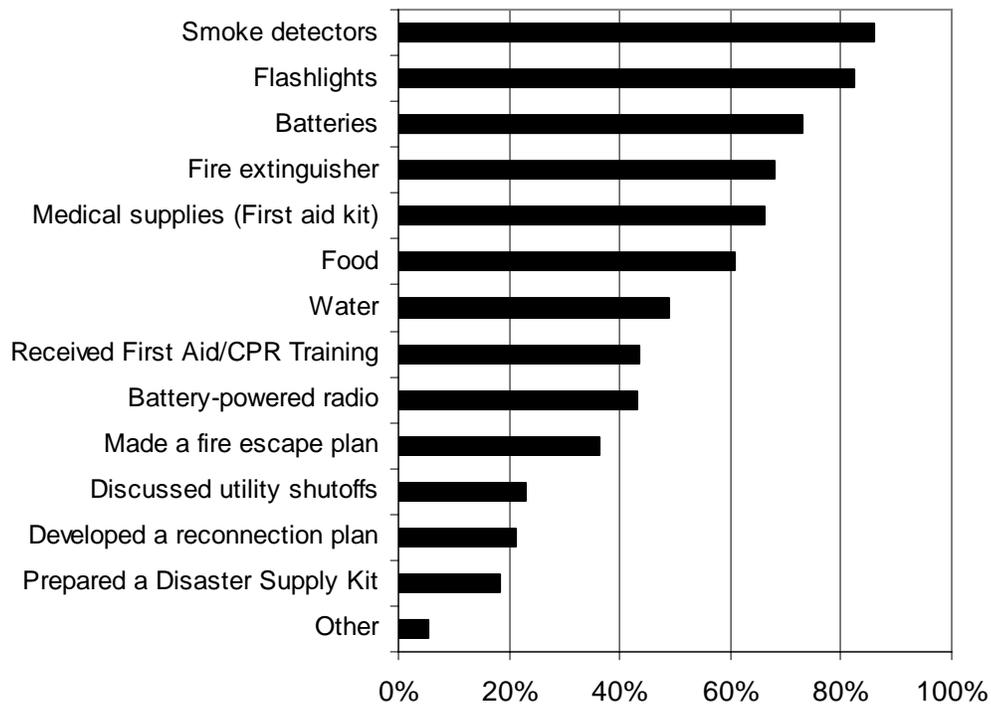
**Figure 4.1. Hours Per Year Survey Respondents Were Willing to Spend on Preparedness Activities**



Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

Figure 4.2 illustrates the steps respondents have taken to be better prepared for a natural disaster or emergency event. Placing smoke detectors on every level of the home (86%) and having flashlights in the home (83%) were the most common preparedness action taken. Preparing a disaster supply kit (18%) and developing a plan to reconnect with household members (21%) were the least common actions taken.

**Figure 4.2. Preparedness Steps Taken by Survey Respondents**



Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

### **Property and Financial Recovery**

The need to have adequate provisions for financial and property recovery when natural disasters do occur is a necessary component of natural hazard preparedness. Twelve and a half percent of the respondents indicated they have flood insurance leaving 88% without it. However 73% of those who don't have flood insurance indicated the reason is because their home is not located in the floodplain and 8% felt it was not necessary. More people have earthquake insurance. Nineteen and a half percent of respondents indicated they have earthquake insurance. The top two reasons given by those who don't have earthquake insurance were that they never considered it (35%) or that it is not necessary (25%).

**Table 4.2. Survey Respondents' Reasons For Not Having Flood and/or Earthquake Insurance**

<b>Flood Insurance</b>	<b>Percent of Respondents</b>	<b>Earthquake Insurance</b>	<b>Percent of Respondents</b>
Not located in the floodplain	73%	Never considered	35%
Not necessary	8%	Not necessary	25%
Too expensive	6%	Not familiar	13%
Never considered	4%	Too expensive	10%
Other	4%	Other	8%
Not familiar	4%	Not available	5%
Deductibles too high	2%	Deductibles too high	4%

Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

# Natural Hazard Risk Reduction

This chapter provides information on the long-term risk reduction activities Mid-Columbia residents have already taken or are willing to take. This chapter also explores the dollar amount respondents are willing to spend in order to reduce risks and the types of incentives that would motivate the respondents to take risk reduction steps.

## Home and Life Safety

Only 34% of the respondents considered the possible occurrence of a natural hazard when they bought or moved into their current homes. While 34% of the respondents indicated they would be willing to spend more money on a home that had disaster-resistant features, almost 43% said they did not know whether they would be willing.

Almost 66% of respondents indicated they are willing to make their home more resistant to natural disasters. Table 5.1 illustrates how much respondents are willing to spend to better protect their homes from natural disasters.

**Table 5.1. Amount Survey Respondents Are Willing to Spend**

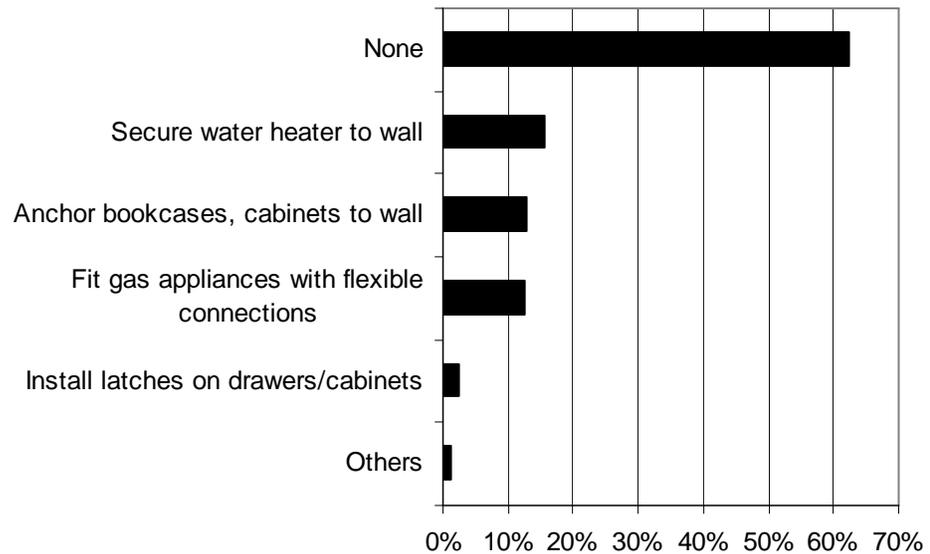
<b>Amount</b>	<b>Percent of Respondents</b>
Less than \$100	4%
\$100-\$499	8%
\$500-\$999	6%
\$1000-\$2499	15%
\$2500-\$4999	6%
\$5000 and above	4%
Nothing	3%
Don't Know	39%
What ever it takes	6%
Other	8%

Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

## Nonstructural and Structural Home Modifications

While 62% of respondents said they have not completed any nonstructural modifications in their homes to prepare for earthquakes, Figure 5.1 shows that some respondents have taken such steps as securing water heaters to the wall and fitting gas appliances with flexible connectors.

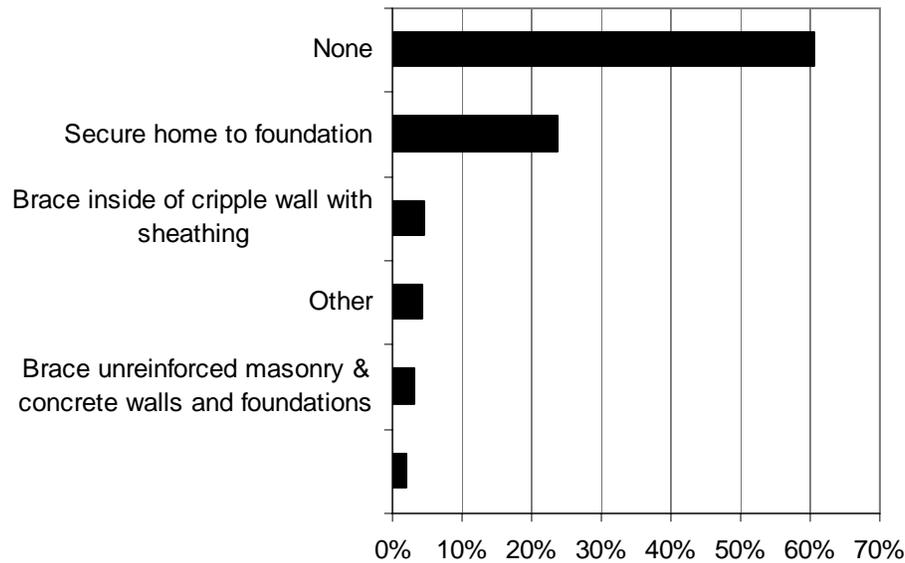
**Figure 5.1. Nonstructural Modifications Survey Respondents Have Made to Their Homes**



Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

Respondents also reported making some structural modifications to make their homes more resistant to earthquakes. However, almost 61% of the respondents have not completed any structural modifications. Figure 5.2 indicates that the most common step taken is securing the home to the foundation.

**Figure 5.2. Structural Modifications Survey Respondents' Have Made to Their Homes**



Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

## Incentives

Approximately 67% of the respondents indicated that tax breaks or incentives would motivate them to take additional steps to better protect their homes from natural disasters. Over 59% also indicated that insurance discounts would be a motivator (See Table 5.2).

**Table 5.2. Survey Respondents' Preferred Incentives for Protecting Homes**

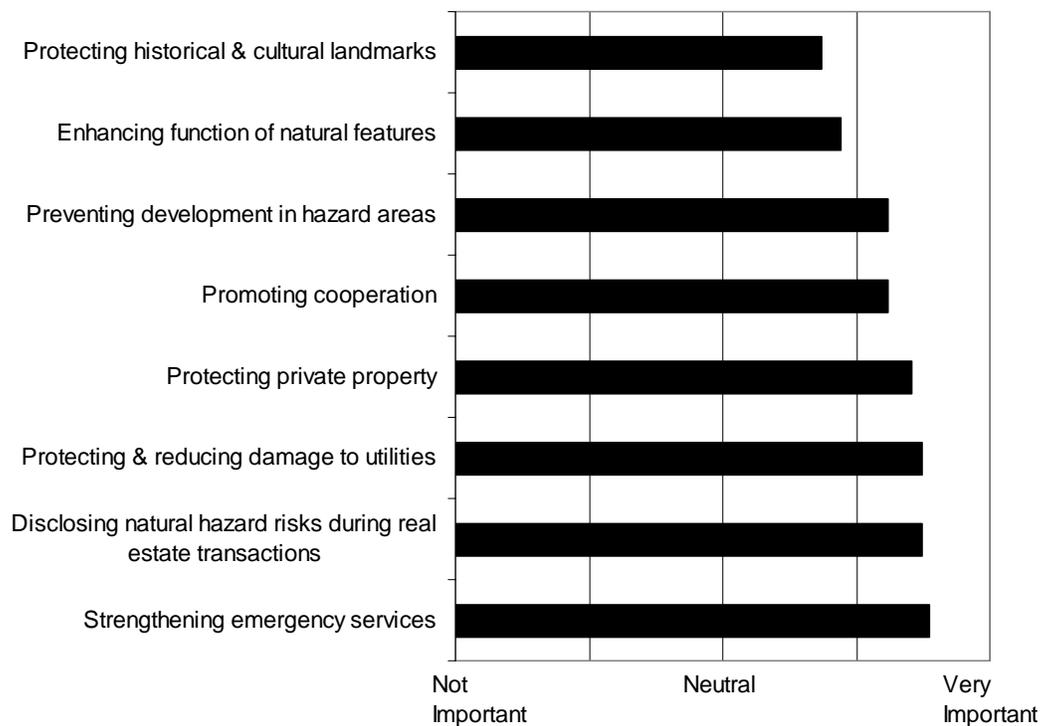
Incentive	Percent of Respondents
Tax break or incentive	67%
Insurance discount	59%
Low interest rate loan	25%
Mortgage discount	23%
None	17%
Lower new home construction costs	17%
Other	6%

Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

# Community Natural Hazard Preparedness

To assist those preparing the communities' natural hazard mitigation plans, it is essential to understand the importance community members place on specific community-level risk reduction actions. These questions could help Mid-Columbia communities determine their citizens' priorities when planning for natural hazards. They also provide an idea of which types of strategies to reduce the communities' risk the citizens would be willing support. Figure 6.1 illustrates the important respondents placed on each statement.

**Figure 6.1. Survey Respondents' General Level of Importance for Goal Statements**



Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

As shown in Table 6.1, 96% of respondents indicated that it is very important or somewhat important for the community to protect critical facilities. In addition, over 91% indicated that it is very important or somewhat important to protect and reduce damage to utilities and strengthen emergency services.

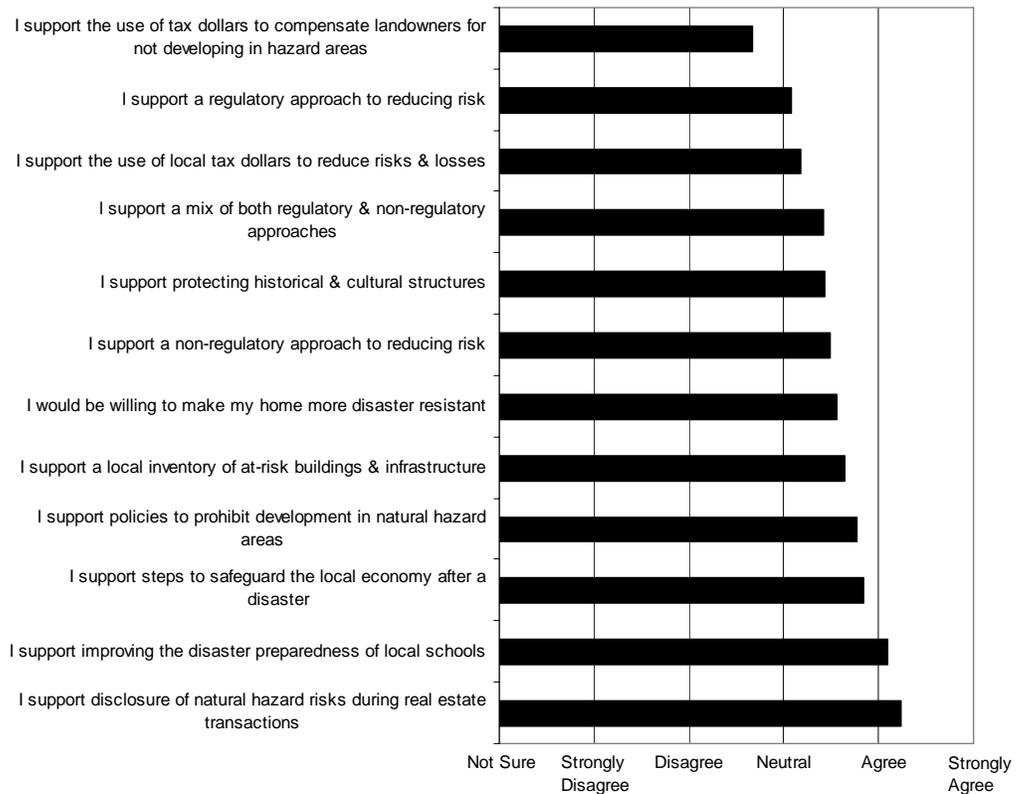
**Table 6.1. Survey Respondents' Goal Prioritization**

<b>Statements</b>	<b>Very Important</b>	<b>Somewhat Important</b>	<b>Neutral</b>	<b>Not Very Important</b>	<b>Not Important</b>
Protecting private property	58%	31%	10%	0%	2%
Protecting critical facilities	81%	15%	3%	1%	0%
Preventing development in hazard areas	48%	33%	15%	2%	2%
Enhancing the function of natural features	33%	36%	21%	5%	5%
Protecting historical and cultural landmarks	22%	44%	22%	8%	3%
Promoting cooperation among public agencies, citizens, non-profit organizations, and businesses	47%	34%	16%	3%	1%
Protecting and reducing utility damage	61%	31%	7%	1%	1%
Strengthening emergency services	66%	26%	6%	2%	1%
Disclosing natural hazard risks during real estate transactions	64%	25%	9%	1%	1%

Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

There are a number of activities a community can undertake to reduce the risk from natural hazards. These activities can be both regulatory and non-regulatory. Figure 6.2 shows respondents' general level of agreement regarding the community-wide strategies included in the survey.

**Figure 6.2. Survey Respondents' General Level of Agreement Regarding Community-wide Strategies**



Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

Table 12 illustrates that 85.8% of the respondents strongly agree or agree that they support improving the disaster preparedness of local schools. Also, 85% said they strongly agree or agree that they support disclosure of natural hazard risks during real estate transactions.

**Table 6.2. Survey Respondents' Agreement Regarding Community-wide Strategies**

<b>Strategies</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>	<b>Strongly Disagree</b>	<b>Not Sure</b>
I support a regulatory approach to reducing risk	11%	34%	25%	17%	9%	5%
I support a non-regulatory approach to reducing risk	18%	41%	26%	9%	1%	6%
I support a mix of both regulatory and non-regulatory approaches to reducing risk	18%	36%	28%	12%	3%	4%
I support policies to prohibit development in areas subject to natural hazards	26%	45%	15%	10%	2%	2%
I support the use of tax dollars (federal and/or local) to compensate land owners for not developing in areas subject to natural hazards	9%	21%	23%	26%	17%	4%
I support the use of local tax dollars to reduce risks and losses from natural disasters	7%	42%	26%	14%	7%	4%
I support protecting historical and cultural structures	12%	42%	34%	8%	3%	3%
I would be willing to make my home more disaster-resistant	9%	53%	30%	4%	1%	3%
I support steps to safeguard the local economy following a disaster event	14%	63%	20%	2%	0%	2%
I support improving the disaster preparedness of local schools	30%	56%	11%	2%	0%	1%
I support a local inventory of at-risk buildings and infrastructure	14%	51%	29%	3%	0%	3%
I support the disclosure of natural hazard risks during real estate transactions	44%	41%	11%	3%	0%	1%

Source: Household Natural Hazards Preparedness Survey, Oregon Natural Hazards Workgroup, (June 2006)

# Written Responses to Open-Ended Survey Questions

## **Q1.1 Which of these natural disasters have you or someone in your household experienced?**

These are the “other” responses:

- Ice storm on top of heavy snow
- Hail storm
- Not in but only sideline observer – my grandson fought the wildfire
- Hail & wind
- Minor drought

## **Q3.2 From whom did you last receive information about how to make your household and home safer from natural disasters?**

Several people mentioned various governments or agencies as the last source of information:

- City of Pendleton
- Local fire department
- Volunteer fire department
- CSEPP (Chemical Stockpile Emergency Preparedness Program)

Other non-governmental organizations were also mentioned as sources including:

- Employee newsletter
- Boy Scout merit badge
- Church of Jesus Christ of Latter Day Saints
- School

Some respondents also mentioned more informal sources of information:

- Online internet
- Common sense
- Friends & neighbors
- Fire & heater smoke alarms
- When we lived in California

## **Q4 Who would you most trust to provide you with information about how to make your household and home safer from natural disasters?**

The most often mentioned other source for information was various local agencies including three people mentioning the fire department. Other specific local sources included the Gilliam County Sheriff's Department and Sherman Health. Other comments include:

- Not sure, not government or university
- Radio
- Google.com
- Home owners
- Local task force/focus groups w/professional disaster relief
- Self (2)
- Gilliam Co Sheriff Dept
- Sherman Health
- Wildfire is the only disaster applicable to this area
- Combination of above (referring to all the categories listed in the survey question)
- Fire dept. (3)
- Others who have been through natural disasters
- Local help
- Local agency

**Q5 What is the most effective way for you to receive information about how to make your household and home safer from natural disasters?**

Some of the "other" responses to this question can be categorized into local government or agency sources:

- Sheriff Department
- Local tribal readiness office
- Local agency
- Local government.

Two federal sources were also mentioned:

- US Forest Service
- Army depot.

Two people listed church-related resources:

- Church officials
- [www.lds.org](http://www.lds.org) (Latter Day Saints).

Another two people mentioned alarm systems:

- Local alarm systems

- Radio alert system

Other responses included:

- Observation
- Grants
- Not sure I need to be communicated to

**Q7 Building a disaster supply kit, receiving First Aid training and developing a household/family emergency plan are all inexpensive activities that require a personal time commitment. How much time (per year) are you willing to spend on preparing yourself/household for a natural disaster or emergency event?**

In response to this question, one person wrote, “we are ready.” Many of the other responses fit into a category of “whatever it takes” or “as much as necessary”:

- Whatever it takes (4)
- This is ongoing
- As much time as needed to get the job done
- As necessary (2)
- More.

Other responses were:

- Done these at an early age. None available in this remote area. We are at the exit age of life.
- I was in a security position for 12 years. I learned on the job.
- Disabled (2)
- Live alone
- We are ready

**Q8 What steps, if any, have you or someone in your household taken to prepare for a natural disaster?**

Several respondents wrote about extra supplies and safety mechanisms, including:

- Keep one vehicle full of gas, have backup generator, have cooking fuel & heating fuel on hand, have backup solar charger for all batteries, have extra clothes & food packed in a vehicle at all times & water purification (Storing things)
- Medicine
- Bought walkie talkies w/8 mile radius
- Extra fuel for heat
- Have all above but not in one spot
- Installed gas powered fire pump on 2000 gal swimming pool

- Gasoline, kerosene, firewood, tent & bedrolls, vehicles, cooking utensils
- Purchased generator, water filtration, home fire sprinklers, reduced/removed combustible vegetation around home, metal roof – non-combustible siding, weather alert radio.

Three people mentioned emergency plans:

- Discussed areas of evacuation (escape plans and action planning)
- We are in CSEPP notification area for evacuation from nerve gas leak at the Umatilla Army Depot. (We are prepared to shelter in place also.)
- I think a plan for neighbors who are disabled would be wise or at least know who is and where they are. Animals should be taken into account also.

The other responses were:

- Not really prepared
- Caregiver takes care of these things
- There will be no phones or electric

**Q9.1 If “NO”, what is the main reason your household does not have insurance for flood events?**

Four people mentioned that they don’t need flood insurance:

- I live in the desert
- Not sure TD has ever flooded. Less than 2 yrs in the area.
- Only Noah’s flood could reach this high
- Thought we were in a floodplain, but found we aren’t

Three people said they were not able to acquire flood insurance or it was not offered to them:

- Can’t get it
- Not obtainable
- Not offered (2)

Three people had other comments:

- Landlord’s responsibility
- Government program
- Risk versus benefit (meaning the probability of risk is not high enough to receive benefits)

**Q10.1 IF “NO”, what is the main reason your household does not have earthquake insurance?**

Many of the respondents who do not have earthquake insurance said that it was unnecessary for them to purchase because:

- Not located on a fault

- 70 to 80 yrs never had more than a tremor, if that
- We live on a mountainside!
- Not concerned/do not need it (5)

One respondent said he or she “plans to look into it” and two people said they were unable to obtain it:

- Can’t meet requirements by insurance company to get coverage because house is older
- Plan to look into it
- No response from insurance company.

There were two other comments:

- Policy speaks to collapse
- Risk versus benefit (meaning the probability of risk is not high enough to receive benefits)

**Q13.1 How much are you willing to spend to better protect your home from natural disasters?**

Many of the written responses were about how much the respondents could afford and how necessary the protection was.

- As I can do it
- Would depend on situation or feel the need for
- Whatever I can afford
- Would depend on what we could afford versus protection we would be provided
- It depends on how necessary it is and how much it would cost
- Being retired – within reason
- Will try cheapest way

One respondent mentioned that financial assistance would be necessary in order for him or her to protect the home:

- Would need financial assist. To get protection.

In addition, three respondents would not spend additional money to protect their homes. They provided a couple reasons for this:

- We’re in a 30 yr old double wide. Only one insurance co will cover it. We’d buy a newer one.
- Don’t own our home
- Don’t need

**Q14 What nonstructural or structural modifications for earthquakes have you made to your home?**

Three people wrote about additional nonstructural modifications to their homes. These were:

- Created a fire fuel free zone around home
- Large anchor bolts
- Fire & smoke detectors

There were more written responses about structural home modifications. They ranged from removal of a hazardous fireplace, to structural advantages built into new additions, to living in a recently build homes that were constructed with hazards in mind. Comments included:

- New addition is well secured to foundation
- Removed non-functional chimney
- Restored 100 year old house, mainly structural improvements
- New home built 2003-04
- All done at construction
- Heavier roofing, ty down, ext
- Built barn between house and rim above us.

**Q15 Which of the following incentives, if any, would motivate you to take additional steps to better protect your home from a natural disaster?**

Many of the respondents discussed why they did not take additional steps to protect themselves rather than discussing motivational techniques. Renting a home can be a disincentive to take additional steps to better prepare a home from a natural disaster. Four people wrote about renting a home as a reason for not taking additional steps:

- I rent (2)
- Move to a house – we currently live in a rented 2-story apartment
- Will own home in about 1 yr, wish I had this info earlier

Other reasons for not taking additional steps included:

- If I lived in a fault zone, if I lived in a flood plain, if I were not surrounded by irrigated land. (If the respondent lived in a fault zone or flood plain, he or she would be motivated to take additional steps.)
- Our home is solid & built well
- My plan is to build a new home.

Seven people did mention what would motivate them to take additional safety preparedness steps:

- Rental deduction
- Local grant money specific to local needs (ie, high hazard area = high grant for modifications)
- To know more about efficiency for gas heater & gas hot H<sub>2</sub>O tank, to get credit for installation of more efficient furnace. Contractor did not know or advise us.

- Just do it!
- Safety of my family
- Shared cost program
- Free

One person never thought about it before and said:

- Just thought everyone did those (took steps to protect the home) – never really thought about it.

**Q17 Are there any other issues regarding the reduction of risk and loss associated with natural disasters that you feel are important?**

This question received comments covering several main themes including: location of development, maintenance techniques, regulations and government, man-made disasters, education/communication, personal responsibility and choice, and insurance. Many respondents discussed multiple topics in their comments. In these situations, the comment has been listed twice with a reference to where the comment is also located.

The **location of development** in natural hazard areas was a concern for some respondents. Some respondents felt that development in known hazard areas should be discontinued or reduced. Here are their comments:

- Its common sense to prohibit development in disaster-prone areas – planning departments should consider this as a matter of course in their zoning decisions just as they should consider the ability of a region to sustain development with regard to water, sewage, power, infrastructure, etc. To compensate any landowners not to develop in areas subject to natural disaster is to allow blackmail & is bad public policy.
- Not building in flood plains. Clearing debris, timber, etc., around homes & outbuildings. (This statement is also included in the following section on maintenance.)
- Don't build a whole city under water level
- Reducing houses in forested areas and floodplains
- The development in areas known to flood such as lower Oregon City & portions of Keizer should not be continued. Many developments along the coast are very vulnerable to a tsunami. Those areas will be hit someday. I have seen a tsunami years ago and it will be worse than anyone thinks.
- I feel that people should be given information regarding building homes in flood plains and new construction in these areas should be discouraged or prevented & society should not bear the cost of developers and individuals who choose to build in these areas. (This comment is also listed in the education/communication section.)
- Many of the potential disasters we face are not natural, i.e. human-caused wildfire. Limit home construction in interface area or require fire-safe construction, ingress, egress, utilities, etc. Safety cannot be legislated; it must be an attitude of society. We should not expect or

tolerate human-caused hazards. (This comment is also in the human-caused, man-made section.)

Other people suggested **methods of prevention or maintenance** that reduce natural hazard risk.

- Construction projects by state and fed government that can create flooding landslides. Poor fill & cut design by forest logging, state highway coast for example.
- When fields are plowed by highways & the winds are high it causes severe dust storms. I feel that if trees are planted at the edge of the fields, there would be less accidents.
- Not building in flood plains. Clearing debris, timber, etc., around homes & outbuildings. (This statement is also located in the location of development section).
- One should never plant large trees around the house; during a wind storm large branches come down causing considerable damage.
- Tree removal in flood area in city limits of Pilot Rock – once bridges get blocked up damage risk increases. Regulations can prevent repairs/corrections. (This comment is also in the role of government and regulation section.)
- Reasonable road and address signs so emergency vehicles can find addresses, etc. (Double sets of confusing mileposts installed by ODOT on the Cow River Gorge Historic Highway, old Highway 30, are particularly stupid & dangerous.) Note: The mileposts do not match up to maps.

Several respondents had strong feelings about the **role of government and regulation** in natural hazard preparedness and disaster recovery.

- Tree removal in flood area in city limits of Pilot Rock – once bridges get blocked up damage risk increases. Regulations can prevent repairs/corrections. (This comment is also in the methods of prevention or maintenance section.)
- Keep the public informed of risks without making restrictive laws. (This comment is also in the communication/education section.)
- Warnings to citizens, if possible, to get prepared. Communities should annually or more often require its citizens where to go, what to do, etc, etc. There should be regular checking and double-checking by county, state, and federal authorities to see that cities are complying and penalized if not.
- Intelligent public officials who can do the job they get paid for doing
- What is the Bureau of Rec, water master office, & my fire district doing to protect my home?!
- Reduce the impression that FEMA is intended to come to the rescue. Make all people more aware of their surroundings and their risks and their own personal responsibility. More government is not the solution,

only a tool. (This comment is also in the communication/education section.)

- Reinstate Clinton's FEMA; do away w/George Bush's
- I believe that the insurance industry should have policies for coverage in place that would influence building in hazardous areas. Couple that with regulated full disclosure for real estate sales and there should be no need for regulatory legislation. (This comment is also in the insurance section.)
- Replace FEMA with a grant program to local emergency agencies  
Other people were more concerned about **human-caused or man-made disasters**. A few people expressed the opinion that there is nothing that can be done to prevent natural disasters.
- Many of the potential disasters we face are not natural, i.e. human-caused wildfire. Limit home construction in interface area or require fire-safe construction, ingress, egress, utilities, etc. Safety cannot be legislated; it must be an attitude of society. We should not expect or tolerate human-caused hazards. (This comment is also located in the location of development section.)
- Not worried about natural disasters, only man-made
- I really feel that there isn't much we can do to prevent acts of God. If they happen, we'll deal with it. Lookat Katrina – they did what they could & will pick up the pieces as well as they can.
- I am not as worried about natural disasters as I am about man destroying the earth with his inability to pull his head out of his greedy ass.
- There is nothing you can do to prevent natural disasters (acts of God) other than plan what to do if one happens to occur – plan, be prepared, & be informed.

**Education and communication** always play important roles in preparedness and recovery responses. People's comments on education and communication ranged from household communication to community preparedness training to including Spanish in communications.

- Realistic education for adults & children. NOT SCARE TATICS, no one believes them.
- Good communication system with monolingual Spanish speakers must be established in Hood River.
- Reduce the impression that FEMA is intended to come to the rescue. Make all people more aware of their surroundings and their risks and their own personal responsibility. (This comment is also in the regulation and government section.)
- "Use your head" and be prepared for oncoming disaster. Listen to media reports informing you that a disaster is forecast. Many Katrina victims had prior warning, but did not take it seriously enough.

- Communication ability
- Having a list of what to have on hand for different emergencies and knowing where to go in case of disaster. Should have a week each year for learning & having the info offered to those who would like it.
- I feel that people should be given information regarding building homes in flood plains and new construction in these areas should be discouraged or prevented & society should not bear the cost of developers and individuals who choose to build in these areas. (This comment is cross-listed in the location of development section.)
- Yes – it would be nice if everyone in our local community were educated on what to do and where to go for shelter or whatever.
- Keep the public informed of risks without making restrictive laws. (This comment is also in the regulation and government section.)
- The training of community members for service with the Red Cross provided locally on a regular schedule.

Three people talked about **personal responsibility and choice**. If people know that their home is in a hazard area, it is their responsibility to plan and prepare for the hazard.

- This is a lot like seatbelts and crash helmets – if anyone chooses to ignore these protections it should be on their head – no help if disaster strikes.
- Plan ahead!!! Responsibility for your own – then can help others.
- Disclose risk at public meetings. Make it clear that if you choose to live in at-risk area, you are not guaranteed bail-out from your problems. There are no guarantees in life.

Some people want the role of **insurance** companies to be increased or to expand their coverage areas.

- I believe that the insurance industry should have policies for coverage in place that would influence building in hazardous areas. Couple that with regulated full disclosure for real estate sales and there should be no need for regulatory legislation. (This comment is also located in the regulation and government section.)
- I think there should be insurance coverage readily available for outlying areas at a reasonable cost.
- I wish the insurance companies would just include them in their policies

**Large-scale disaster planning and health care** were the concerns of the some respondents.

- Adequate health care people and places for people affected
- In more populated areas the issue of riots & looting should be looked at. If there is an extreme & widespread disaster there will be unlawfulness and citizens should include how to avoid & protect themselves, family,

and property if need be. I feel that this is a “real” threat and byproduct of disasters in populated areas.

- The people, how to help them out during a nationwide disaster
- Stop the greed & graft when donated monies are given to aid disaster victims. Accountability for funds and actions or all this is just activity to create jobs that do nothing.
- What to do about seniors? Their meds – oxygen? Where to take them? How to get to them in a frontier area?

A few people mentioned **smaller-scale hazard warnings and preparation requirements**.

- Early warning for storms – other known existing problems – floods – etc.
- People living in flood places should be required to have boats & life jackets, one per person
- Affordable gas masks and transportation

Some respondents discussed **specific natural hazards** and how they would affect the region.

- Snow pack in mountains. Heavy rains on snow may cause flooding. Flooding over riverbanks & dikes.
- Earthquakes would totally isolate this community from outside help. Air services would be #1. We have wildfire around here, so are fight them! Floods would be minimal! One little river here!
- Forest fires. I live in an area with lots, lots, lots of trees. I live in the timber.

There were also a few unclassifiable responses.

- Protecting pets + livestock + wildlife
- Reduce traffic of toxins; reduce production of toxins, radioactive, etc.
- Using all means available to stop wildfires
- What helps are available?

Finally, one respondent said:

- Everything is pretty well covered.

**Q21 Please indicate your level of education.**

Only one response was in the “other” category:

- Specialty training

**Q25 If you have lived in Oregon for less than 20 years, in what state did you live before you moved to Oregon?**

The answer to this question was interesting because although the survey specifically listed California, Washington, and Idaho more respondents moved to the Mid-Columbia region from Colorado than Idaho (5.1% versus 3.4%).

Here are the responses:

- Arizona (2)
- Colorado (6)
- Kentucky
- Maryland
- Massachusetts
- Michigan
- Montana (4)
- Nevada
- New Jersey
- New Mexico
- Tennessee
- Texas
- Washington
- Wyoming
- Norway

**Q28 Do you rent/own a:**

- Ranch (2)
- Stick-built addition to manufactured home
- 19 ft travel trailer
- 2½ story home built in 1915
- Commercial building with living quarters
- We live/own our dwelling which is a duplex as well as an additional duplex
- Forest/grazing property

**Please feel free to provide any additional comments in the space provided.**

Three respondents discussed the need for **emergency education for the public and officials**. They felt they either lacked the information on how a particular hazard could affect their area or what to do/where to go in the case of an emergency.

- More than half of our town's houses are built on a hillside above the Columbia River. We also have a dam, and are of relative distance to Mt. Hood. Should the dam break, probably the lower half of the town would be wiped out within minutes. I'm not sure about the rest of the town on the hillsides. Should there be an earthquake, I'm not sure how that would affect us all. Wildfires are a hazard around us, more outside of our

city than directly in it. Should Mt. Hood suddenly erupt, well, I'm not sure what all that would affect in our town. To be honest, there are many natural disasters that could cause us all to be concerned 24/7, but which ones are more likely here? And how do you prepare for just the ones that might affect your area when you aren't sure which to prepare for? It would be nice to know the likelihood of each disaster in our area so we would know better how to prepare. Although, I must admit, your survey made me realize that I haven't done much to prepare at all. And that I should have done more by now. I will get started doing what I can!

- All of us living close to the Columbia River need to be educated on what to do and where to go – if The Dalles Dam or the John Day Dam were to rupture – if Mt. Hood were to rupture – or if an earthquake were to happen – we're not educated on what or where to go in our local areas.
- I feel that in our rural area we are not prepared for any kind of disaster. I really don't think that our leaders really know what they are going to do in actual case of a real disaster. We need more education on this. This does affect rich & poor. Thank you (comment also in govt.)

Several respondents discussed the importance of people taking **individual or personal responsibility** for their choices or actions. They stressed the importance of being responsible for themselves and their families rather than expecting an outside source to safeguard themselves and their possessions and provide compensation for destroyed property.

- Tax money should be used as little as possible. Individuals need to take more responsibility for safeguarding their own possessions. I would much rather pay for (or lose) for myself than to be forced to help pay for someone's loss if that person neglects to do what he can to protect his own things. Citizens must be willing to live with the consequences of his decision to build/live where a natural disaster may occur. Until or unless a person is forced to live in a dangerous area, it is that person's responsibility to safeguard his possessions. The government's responsibility is to inform the citizens of any dangers or considerations of living/building in a disaster zone. From there, it's the citizen's decision and risk.
- A lot of questions do not apply to us. As for insurance, we are insurance poor. Also, we live in a rural area. Nearest neighbor a mile away, so we have to take care of ourselves and glad of it.
- Because we live in the country, we probably feel that basically we are responsible for ourselves, except for fire, police, & ambulance, which our taxes and insurance help to pay for. Therefore, we feel that basically all people should be responsible for themselves. But, we realize that isn't reality, especially in towns, and that most services must be provided in order to people to survive. So, plan for the worst disaster and go from there. Good luck!
- 1) I feel very strongly that homes destroyed by floods in flood zones not be allowed to be reconstructed in the flood zones. Those who do shouldn't expect insurance companies to cover their homes, nor receive federal or

state aid to rebuild. 2) Each of us has to take personal responsibility in the location of our homes and our preparedness in meeting natural or other disasters and shouldn't expect governmental agencies to fully bear the burden of the costs to rebuild. 3) Volunteer fire departments in our area have been training for a variety of disasters, receiving funding through FEMA grants to do so. They should be commended for their efforts. (Hood River Area, WSFD.) (This comment is also located in the location of development section.)

- Early childhood education should stress the importance of individual responsibility for a safe environment. Nowhere except the U.S. can you cause a fire and not only not be shunned by society, but we will help you rebuild. Allowing building construction in flood, fire prone areas without adequate regard for bldg. techniques to reduce or eliminate major risk factors is ridiculous. This not only puts owners lives and property at risk but that of their neighbors and the emergency responders who are expected to protect us from ourselves.
- I believe timber land owners should be responsible for the fire threat on their property. They should have a fire prevention plan and clean up plan for their properties. Thinning, brush work, etc.

Two people thought changes to current **insurance** policies would be beneficial.

- Oregon's land use laws have addressed some of these problems which they have not done. They were hi-hacked by environmental extremists, & are no longer supported by the people of Oregon. I do not really trust the government to do the right thing. I would buy flood insurance if it was available from private companies. Actually, homeowners insurance should be expanded to cover all perils. (This comment is also located in the government section.)
- A lot of questions do not apply to us. As for insurance, we are insurance poor. Also, we live in a rural area. Nearest neighbor a mile away, so we have to take care of ourselves and glad of it.

Several respondents had comments about the **location of development** and related **planning and development codes**.

- 1) I feel very strongly that homes destroyed by floods in flood zones not be allowed to be reconstructed in the flood zones. Those who do shouldn't expect insurance companies to cover their homes, nor receive federal or state aid to rebuild. 2) Each of us has to take personal responsibility in the location of our homes and our preparedness in meeting natural or other disasters and shouldn't expect governmental agencies to fully bear the burden of the costs to rebuild. 3) Volunteer fire departments in our area have been training for a variety of disasters, receiving funding through FEMA grants to do so. They should be commended for their efforts. (Hood River Area, WSFD.) (This comment is also in the personal responsibility section.)
- Build where one wants does not mean we need to provide services or \$\$ when a disaster happens.

- Large expenditures for this sort of thing are unnecessary. 9-11 and Katrina have given much of our government agencies and education facilities a reason to spend money on things that may or not happen. All in the name of planning. (comment is also in funding section)
- Unfortunately, the scope of natural disasters is such that you can't depend on individual land owners to be able to do what needs to be done to be ready to be prepared. Building codes, zoning & properly educated planning staff at the local level need to set policies to support communities in this regard. Citizens should have cost-efficient resources available to them to deal with these issues as they can incorporate them into their lives (ie, a "lending library" of information, grants for funding improvements, staff to advise them, etc.). This is waving a "magic wand" but hey, you asked! :) (Also in
- We really need to enforce/create zoning and building codes that keep development out of natural resources; streams, river areas, & forest land. We should not authorize development in these areas. (also in location of dev section)

Concerns about **money** (how to spend it and who pays) are frequently contentious issues.

- Large expenditures for this sort of thing are unnecessary. 9-11 and Katrina have given much of our government agencies and education facilities a reason to spend money on things that may or not happen. All in the name of planning.
- I feel contingency funds should be set aside by the state for allocations to cities and counties in need of emergency services due to natural disasters. Fund could be used for prevention every so many years if natural disasters do not occur within that time period
- 1) Our home is located on 10 acres; 12 miles from fire dept (all uphill) – rural locations are subject to wildfire – our neighbor accidentally started a wildfire near our house. 2) Far too much effort and public money goes for flood protection of properties within the floodplains – perhaps we cannot protect every fool from their foolishness. 3) The Oregon State Police (Fire Marshall) spends much money gathering data about small amounts of propane, etc – the information IS NOT EVEN USED BY LOCAL FIRE DEPTS, too much paperwork.
- Tax money should be used as little as possible. Individuals need to take more responsibility for safeguarding their own possessions. I would much rather pay for (or lose) for myself than to be forced to help pay for someone's loss if that person neglects to do what he can to protect his own things. Citizens must be willing to live with the consequences of his decision to build/live where a natural disaster may occur. Until or unless a person is forced to live in a dangerous area, it is that person's responsibility to safeguard his possessions. The government's responsibility is to inform the citizens of any dangers or considerations of living/building in a disaster zone. From there, it's the citizen's decision and risk. (This comment is also in the individual responsibility section.)

Some respondents commented about the capability and role of **government** in natural hazard preparation and after natural disasters. The lack of **emergency services** was also mentioned.

- After New Orleans, I do not think government is capable of doing anything intelligent about natural disaster.
- I would hope government is more prepared to help our community better than they did down south – how sad it was to watch on the news.
- I feel that in our rural area we are not prepared for any kind of disaster. I really don't think that our leaders really know what they are going to do in actual case of a real disaster. We need more education on this. This does affect rich & poor. Thank you. (This comment also in the education section.)
- Gilliam County, Condon has 911, Sheriff Dept & no Red Cross. So the Sheriff Dept has it all. Red Cross will not come to Condon.
- 1) I feel very strongly that homes destroyed by floods in flood zones not be allowed to be reconstructed in the flood zones. Those who do shouldn't expect insurance companies to cover their homes, nor receive federal or state aid to rebuild. 2) Each of us has to take personal responsibility in the location of our homes and our preparedness in meeting natural or other disasters and shouldn't expect governmental agencies to fully bear the burden of the costs to rebuild. 3) Volunteer fire departments in our area have been training for a variety of disasters, receiving funding through FEMA grants to do so. They should be commended for their efforts. (Hood River Area, WSFD.) (This comment is also in the location of development section.)
- Oregon's land use laws have addressed some of these problems which they have not done. They were hi-jacked by environmental extremists, and are no longer supported by the people of Oregon. I do not really trust the government to do the right thing. I would buy flood insurance if it was available from private companies. Actually, homeowners insurance should be expanded to cover all perils. (This comment is also located in the insurance section.)

Another theme for some comments was **types of hazards** that should or should not be considered both in the Mid-Columbia region and Oregon.

- More relevant to this area of flat, irrigated former-desert are the risks of traffic accidents in dense fog or blowing dust.
- This whole county is dangerous because of Rimrock and deep canyons, and rough country. Population is very low here. Population is poor. Earthquakes would block all highways, dam the John Day River, and take out power. If terrorists bomb Hanford, traffic would be diverted through here and we don't have EMS/law enforcement to deal with it. The state would have to step up to the plate!
- It is difficult to imagine my level of "concern" when comparing life threatening events (e.g. volcanic eruption) with mere annoying problems (e.g. wind storm)( and economic disaster (drought). Also, my concerns are

more with events that have virtually no warning (tsunami) and those that have adequate warning (winter storm). The strategies to mitigate a bad outcome need to be different.

- Oregon is far too diverse a state to consider a “natural hazard” common to all parts of the state. Compare west of the Cascades to the high desert, or the Portland area with the rest of Oregon.

Several people offered **suggestions** about the types of preparation that should be made or considered.

- The best preparedness for our area where we have so much wind, windstorms, & hail storms, the Umatilla Army Depot (chemical depot) would be a storm cellar. I’ve lived in this area since 1940 & I’ve seen many kinds of storms, & wished I had a storm cellar.
- 1) To prevent wildfire spread, farmers who take CRP program should have fire buffer strip built into the CRP program – requiring the farmers to keep strips effective – we had the 60,000 acre fire a few years ago – we were lucky – buffer strips are the only way we will control this – too many farmers are not farming wheat anymore. 2) OLD cottonwoods fall into creek, plug channel & bridges – city of Pilot Rock needs to enforce floodway rules established by FEMA, and “oversee” a channel manage program – Pilot Rock has 4 bridges & foot bridges that can plug during floods – this can be done – everyone’s afraid of regulatory agencies giving out fines. To identify hazards is easy – no one wants to follow through.
- In some areas the flood plain designation appears to be given in a non-scientific manner. I have family in the Spokane County area – they have a 10 acre parcel which is surrounded by land that has been completely developed in the past 2 decades. They have been informed that their parcel is the “flood plain” and cannot be developed/a large percentage must be left undeveloped. Geologically the county does not seem to need any proof other than the necessity of no other undeveloped space left to absorb H<sub>2</sub>O. I agree that flood plains should not be developed, but there needs to be a more scientific & comprehensive plan. Land owners who have left space undeveloped should also then be reasonably reimbursed. It benefits us all to have some earth to re-absorb water, but a single land owner should not be financially punished.

Two respondents wrote to say **thank you**.

- It’s about time someone did this. Way to go! Keep up the great work!  
Sincerely, a thoughtfully concerned citizen, wife, and parent.
- Good luck on the survey

Finally, this last section contains **miscellaneous** comments.

- If I’d ever been in a disaster I’m sure some of my answers would be different. Was in storm in N.C., tho it was just heavy rains so went to movie at Base. It was cut short so went home & put rugs under the doors. Next AM all TV antennas were bent over & a new piece just completed a few months was lifted off the pilings & set down whole ¼ mile away. The fishing store & another building connected to pier were ok & they later

made them into rooms where we stayed for 2 nights for my husband's discharge papers & came then after 20 years in the Navy but last 5 yrs were spent at Marine bases since my husband was in Medical & Marines only have fighting men. 3 of my children attended U of O.

- 1) One question, why are you asking these questions? Do you know of a real disaster that's coming our way? I have heard before of the United States being split into 3 pieces from a severe earthquake. Most of California is man-made islands put together and the plates are very bad. Also New York & New Jersey are also in danger of shifting. Also along the Mississippi River. This is why I've been prepared for years. Not as much as I would like because of finances. Oregon will have its problems mostly with volcanoes & wildfires. Also coastal tsunamis.
- I know of a patented solution that, when sprayed on wood, will render it inflammable even when gasoline is applied and ignited. Why its sale and usage was somewhat squashed at the onset of its production is no mystery is it?
- The State of Oregon needs to protect the trees from being cut down, and not just timber forests either! Someone needs to stand up and protect the Columbia Gorge from a sewage dump. Has anyone taken into account the damage that will be done once the Warm Springs reservation builds their bloody casino? All the trash and pollution will destroy the salmon habitat for breeding grounds! We need to protect/save gas resources by raising the legal primary age limit to 18 years instead of 16 years. This would cut crime and teenage pregnancies!
- Please explain what the last question has to do with natural disaster.

# **Appendix D: Regional Profile and Hazard Assessment**

The purpose of this appendix is to: 1) document regional characteristics related to population and demographics, critical facilities and infrastructure, the economy and 2) document regional hazard information including hazard characteristics, histories, probability and vulnerability.

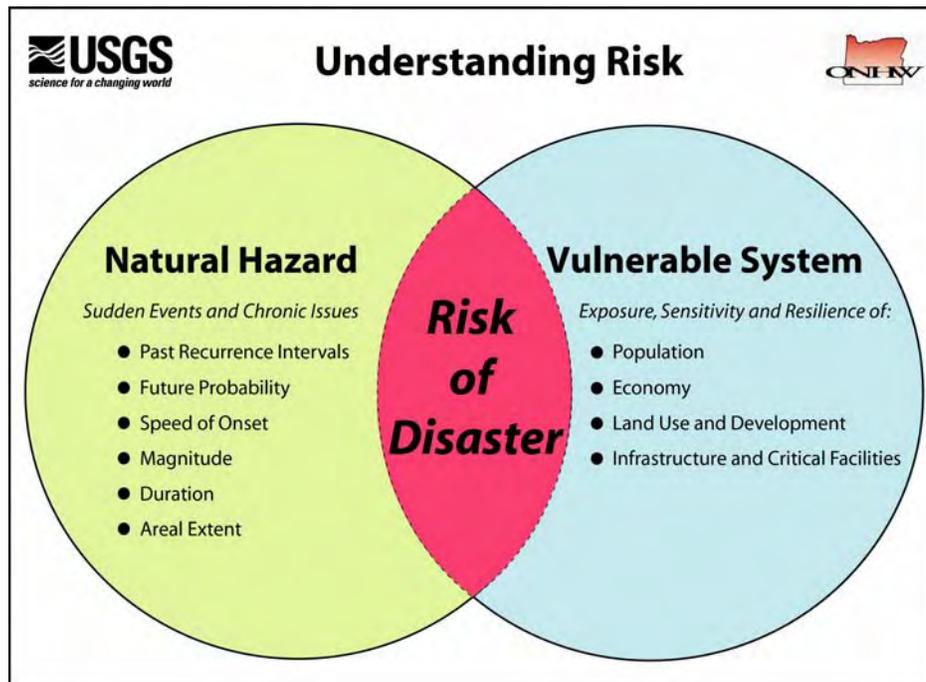
# Region 5: Mid-Columbia Natural Hazard Risk Profile

Hood River, Wasco, Sherman, Gilliam, Morrow, & Umatilla Counties

## Introduction and Purpose

Oregon faces a number of natural hazards with the potential to cause loss of life, injuries and substantial property damage. A natural disaster occurs when a natural hazard event interacts with a vulnerable human system. The following quote and graphic summarizes the difference between natural hazards and natural disasters:

*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.*<sup>1</sup>



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. A report submitted to Congress by the National Institute of Building Science's Multihazard Mitigation

Council (MMC) highlights that for every dollar spent on mitigation society can expect an average savings of \$4.00.<sup>2</sup>

## How to use this Report

The Oregon Natural Hazards Workgroup (ONHW) at the University of Oregon's Community Service Center developed this report as part of the regional planning initiative funded by the Pre-Disaster Mitigation Grant.\* In addition to serving as a regional resource for local planning initiatives, this also serves as the regional profile for the State's enhanced natural hazard mitigation plan. This report is intended to be used as a planning process document by communities developing local natural hazard mitigation plans. This regional report should be reviewed and updated by locals using the best available local data as the local plans serve as the foundation for the State Plan.

The information in this report should be paired with local data to identify issues for which mitigation action items can be developed. The report can be used in conjunction with the ONHW Sample Action Item Report to develop and document the community's action items. The Sample Action Item Report lists potential mitigation activities by category, such as population, economy, understanding of risk, and implementation. The report also provides state and national level rationale on why the sample action may be appropriate.

## Regional Overview

The Mid-Columbia region (Region 5 as identified in the state's natural hazard mitigation plan) includes Hood River, Wasco, Sherman, Gilliam, Morrow, and Umatilla Counties. This region is at relatively high risk from wildfires, winter storms, and windstorms. It also faces moderate to high risk from drought and from flooding along tributaries of major rivers, though the major rivers of the Columbia, John Day, and Lower Deschutes are all fairly resistant to flooding because of dams. The Mid-Columbia region is also at risk from landslides in steep sloped areas, with Wasco and Hood River counties being particularly vulnerable. Other risks for the region, though with less frequent occurrence, are the effects of earthquakes and Mt. Hood volcanic eruptions.

## Organization of Report

This report includes three sections that present a comprehensive profile of the region and its sensitivity to natural hazards.

### Regional Maps

#### **Critical Infrastructure Map- Updated maps coming soon**

Using 2003 data from Oregon Department of Transportation, this map shows the approximate location of critical infrastructure, including

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\* FEMA Pre-Disaster Mitigation Grant PDM-C-PL-10-OR2005-003

schools, hospitals, bridges, dams, and power stations. Knowing the location of critical infrastructure is important when determining the sensitivities of the region.

### **County Hazard Risk Analysis Maps- Updated maps coming soon**

These maps depict the counties' perceived risk for each natural hazard. Data for these maps comes from the County Hazard Risk Analysis in which each county develops risk scores for Oregon's major natural hazards. Scores are current as of March 2006.

### **Regional Profile and Natural Hazard Sensitivity Analysis**

Using the best available secondary data, the regional profile includes a *Geographic Profile*, that provides a physical geographic description of the region, a *Demographic Profile* that discusses the population in the Mid-Columbia region, an *Infrastructure Profile* that addresses the region's critical facilities and systems of transportation and power transmission, and an *Economic Profile* that discusses the scale and scope of the regional economy with a focus on key industries. In addition to describing characteristics and trends, each profile section identifies the traits that indicate sensitivity to natural hazards.

The data sources used in this section are all publicly available. This report examines the Mid-Columbia region as a whole and by individual counties when possible. Much of the demographic data was sourced from the 2000 U.S. Census; the economic data came from the 2002 Economic Census, the Bureau of Economic Analysis and the Oregon Department of Agriculture. State agency reports and plans and websites for private companies were also important sources of information.

### **Regional Natural Hazard Risk Assessment**

The regional natural hazard risk assessment section describes historical impacts, general location, extent, and severity of past natural hazard events as well as the probability for future events. This information is aggregated at the regional level and provides counties with a baseline understanding of past and potential natural hazards.

These assessments were based on best available data from various state agencies related to historical events, repetitive losses, county hazard analysis rankings, and general development trends. The risk assessment was written in 2003 as part of the State Natural Hazard Mitigation Plan.

# Mid-Columbia Region

The Mid-Columbia region has experienced a 19% increase in population since 1990. This growth pattern is projected to continue at a moderate rate over the next 20 years. Sixty percent of the region's population lives in incorporated areas with the other 40% living in unincorporated areas. Forty-three percent of the region's houses were built before 1960, 32% between 1960 and 1980, and 25% were built after 1980. The impact of a disaster can disrupt automobile traffic and shut down local transit systems across the region, making evacuation difficult. This is particularly important in this region where hazardous materials are being transported along Interstate 84 and nearby railroad lines. The average commute for workers in this region is 19 minutes each way. Seventy-six percent of the region's workers drive alone to work. Thirteen percent carpool, six percent walk or use other means, and five percent work at home. Most bridges in the area have not been seismically retrofitted, creating significant risk to the commuting population in areas at risk from earthquakes.

## REGION FACTS

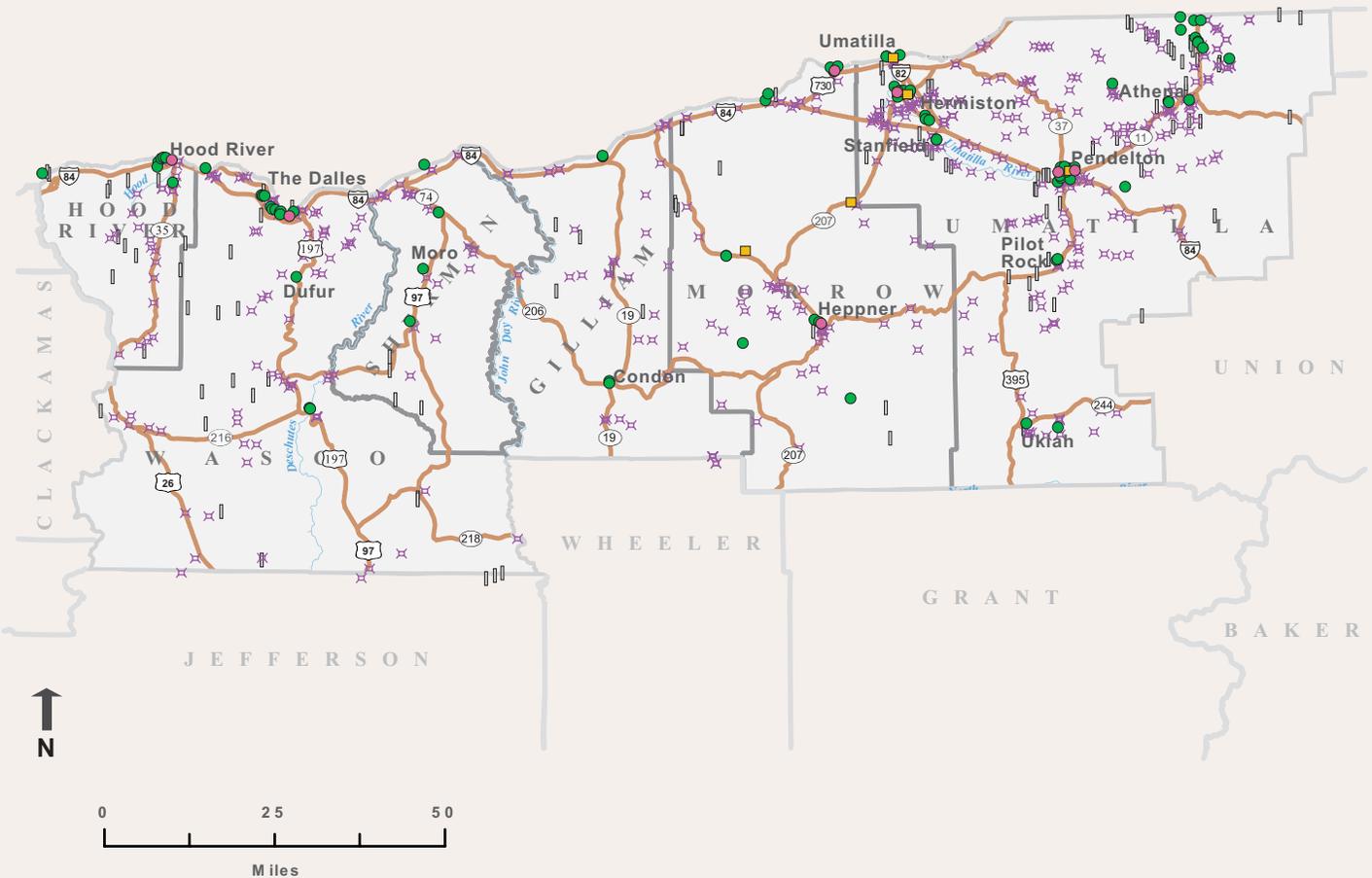
<b>Population:</b>		<b>Housing:</b>	
Total .....	129,594	Single-Family .....	64%
Rural .....	52,208	Multi-Family .....	12%
Urban.....	77,386	Mobile Homes .....	23%
		Boat, RV, Van, etc .....	1%



County	# of Hospitals	# of Hospital Beds	Police Stations	Fire & Rescue Stations	Power Plants	Dams	Bridges
Gilliam	0	0	3	2	0	0	66
Hood River	1	32	2	7	0	4	97
Morrow	1	44	2	5	2	10	117
Sherman	0	0	1	5	0	3	92
Umatilla	1	45	15	13	3	13	503
Wasco	2	98	2	2	0	9	221

## Critical Infrastructure

- School
- Hospital
- ✕ Bridge
- Power Substation
- Dam

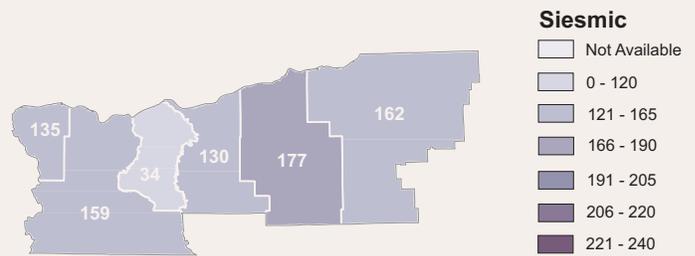


# County Hazard Analysis

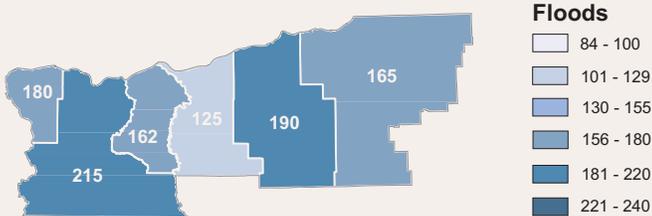
As part of the County Hazard Risk Analysis, each county develops risk scores for Oregon's major natural hazards. This score, ranging from 24 (low) to 240 (high), reflects the County's perceived risk for the particular hazard. Scores are current as of July 2003.

To obtain the most current scores, see <http://www.oregonshowcase.org> or contact Oregon State Police – Office of Emergency Management <http://www.osp.state.or.us/oem/>.

## Seismic



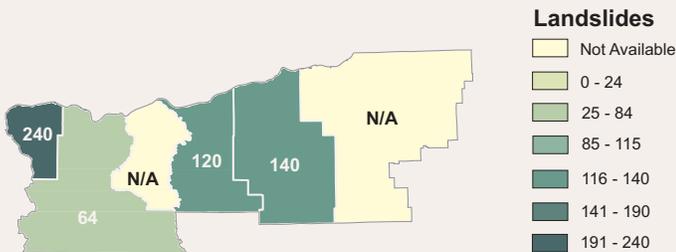
## Floods



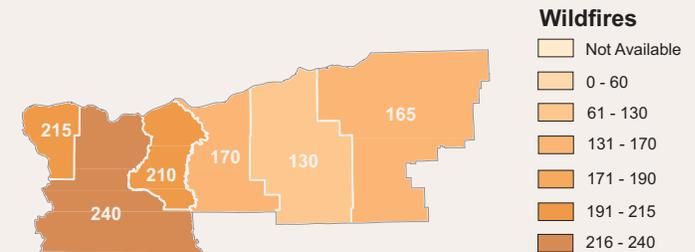
## Windstorms



## Landslides



## Wildfires



## Drought



## Volcanic



# Regional Profile and Sensitivity

## Section 1: Geography and Climate

The six-county area of the Mid-Columbia region is approximately 10,302 square miles in area. The Mid-Columbia region trends east-west and is bordered by the Columbia River to the north, high desert to the south, the Blue Mountains to the east, and the Cascade Mountains to the west. The Cascades receive considerable rainfall annually from storms and low-pressure systems coming in from the Pacific Ocean. Annual precipitation ranges from over 40 inches in western Hood River County to less than 10 inches in parts of Morrow and Umatilla Counties on the east side. The Cascades are volcanic in origin and are drained by hundreds of creeks, streams, rivers and lakes. Major rivers in the region include the Columbia, Deschutes, John Day, and Umatilla.<sup>3</sup>

## Section 2: Demographic profile

This section describes the Mid-Columbia region in terms of its population, demographics and development trends. Data is followed by a discussion of characteristics that indicate community vulnerability to natural hazards. Identifying populations that are particularly vulnerable enables communities to design targeted strategies to reduce their risk. Reviewing development trends provides further guidance on how communities can accommodate growth in a manner that increases resilience to natural hazards.

### Population and Demographics

In 2005, the estimated population of the Mid-Columbia region was 129,594, representing an increase of 2.8% since 2000. This growth pattern in the Mid-Columbia region is projected to continue at a moderate rate over the next 20 years, according to the Oregon Office of Economic Analysis. Table 1 displays the population change in each Mid-Columbia county, along with their respective average annual growth rates.

**Table 1. Population Growth, Mid Columbia Region, 2000-2005**

County	2000 Population	2005 Population	2000-2005		AAGR, 2000- 2005
			Population Change	% Change 2000-2005	
Gilliam	1,915	1,890	-25	-1.3%	-0.3%
Hood River	20,411	21,180	769	3.8%	0.8%
Morrow	10,995	11,945	950	8.6%	1.7%
Sherman	1,934	1,880	-54	-2.8%	-0.6%
Umatilla	70,548	72,395	1,847	2.6%	0.5%
Wasco	23,791	23,935	144	0.6%	0.1%
<b>Regional Total</b>	<b>129,594</b>	<b>133,225</b>	<b>3,631</b>	<b>2.8%</b>	<b>0.4%</b>

Source: Portland State University, Population Estimates, 2005.

The impact in terms of loss and the ability to recover vary among population groups following a disaster. Historically, 80% of the disaster burden falls on the public.<sup>4</sup> Of this number, a disproportionate burden is placed upon special needs groups, particularly minorities, and the poor. Minorities and the poor are more likely to be isolated in communities, are less likely to have the savings to rebuild after a disaster, and less likely to have access to transportation and medical care. Additionally, minorities and the poor are more likely to rent than own homes, and in the event of a natural disaster, where homeowners would gain homeowner insurance, renters often do not have rental insurance. As of 2003, 12% of the region's population was living in poverty. (A large percentage of these people presumably fall into both categories.)

Median household income can be used to compare economic areas as a whole, but does not reflect how the income is divided among area residents. Table 2 displays the median household income for the Mid-Columbia region, which was \$37,355 in 2003. This is below the national average of \$43,318 and the state's average of \$42,593. The two percent median household income growth between 2000 and 2003 in the region is consistent with the two percent State and three percent National growth over the same time period.

**Table 2. Median Household Income, Mid Columbia Region, 2000 and 2003**

<b>County</b>	<b>2000</b>	<b>2003</b>	<b>% Change 2000-2003</b>
Gilliam	\$35,086	\$37,999	8%
Hood River	\$38,916	\$38,531	-1%
Morrow	\$38,331	\$40,435	5%
Sherman	\$35,022	\$36,272	4%
Umatilla	\$35,916	\$36,790	2%
Wasco	\$36,625	\$34,105	-7%
<b>Regional Average:</b>	<b>\$36,649</b>	<b>\$37,355</b>	<b>2%</b>

Source: U.S. Census Bureau Small Area Income Poverty Estimates, 2003

In 2003, 13% of the nation's population was living in poverty, a slightly higher percentage than the Mid-Columbia regional poverty level. Oregon's state poverty average was 12%, the same as the Mid-Columbia regional average. While the median household incomes are lower in the region than the state as a whole, the similar poverty rate may be due to a lower cost of living. Table 3 details the county and regional poverty rates in 2003.

**Table 3. Poverty Rates, Mid Columbia Region, 2003**

County	Total Population in Poverty		Children Under 18 in Poverty	
	Number	%	Number	%
Gilliam	197	9%	65	12%
Hood River	2,471	13%	1,120	19%
Morrow	1,190	13%	623	20%
Sherman	252	13%	86	18%
Umatilla	9,210	14%	3,742	20%
Wasco	2,898	13%	1,100	21%
<b>Regional Average</b>		<b>12%</b>		<b>18%</b>

Source: U.S. Census Bureau Small Area Income Poverty Estimates, 2003

For hazard mitigation, low-income populations need special considerations, 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.

The age of the population is also an important consideration in hazard mitigation planning. In 2004, 28% of the regional population was under 14 or over 65 years of age.<sup>5</sup> Table 4 provides a breakdown of the percentages of youth and elderly in the Mid-Columbia region counties.

**Table 4. Mid Columbia Region Youth and Senior Populations, 2004**

County	0-14		65-74		75+	
	Number	%	Number	%	Number	%
Gilliam	312	16%	185	10%	198	10%
Hood River	4,695	22%	1,233	6%	1,380	7%
Morrow	2,890	24%	747	6%	537	4%
Sherman	313	17%	174	9%	209	11%
Umatilla	15,852	22%	4,472	6%	4,625	6%
Wasco	4,788	20%	1,911	8%	1,989	8%
<b>Regional Total and Average %:</b>	<b>28,850</b>	<b>20%</b>	<b>8,722</b>	<b>8%</b>	<b>8,938</b>	<b>8%</b>

Source: Portland State University Population Estimates, 2005

The high percentage of elderly individuals, particularly in Gilliam and Sherman Counties, require special consideration due to their sensitivities to heat and cold, their reliance upon transportation for medications, and their comparative difficulty in making home modifications that reduce risk to hazards.

Young people also represent a vulnerable segment of the population. In Hood River, Morrow, Umatilla and Wasco counties, at least 20% of the

population is within the 0-14 year age range. Special considerations should be given to young populations and schools, where children spend much of their time, during the natural hazard mitigation process. Children are more vulnerable to heat and cold, have fewer transportation options, and require assistance to access medical facilities.

Special consideration should also be given to populations who do not speak English as their primary language. These populations can be harder to reach with preparedness and mitigation information materials. They are less likely to be prepared if special attention is not given to language and culturally appropriate outreach techniques. In the Mid-Columbia region, most citizens speak English as their primary language. However, in every county in Oregon, Spanish is the second most prominent language. As Table 5 shows, 8% of the total population in the Mid-Columbia region speaks English less than “very well”.

**Table 5. Population over Age 5 that Speaks English Less than “Very Well,” Mid Columbia Region, 2000 Region**

<b>County</b>	<b>%Population</b>
Gilliam	1%
Hood River	15%
Morrow	14%
Sherman	3%
Umatilla	8%
Wasco	5%
<b>Regional Average:</b>	<b>8%</b>

Source: US Census Bureau, 2000 Census, Summary File 3

## **Housing and Development**

To accommodate rapid 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 and injury and property damage. Oregon has been successful in developing land use goals that incorporate mitigation while preserving rural and protected lands within urban growth areas. If Measure 37 is upheld, it may impact the ability of communities to regulate land-use protection measures in communities. 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.

The urban and rural growth pattern impacts how agencies prepare for emergencies as changes in development can increase risks associated with hazards. The Mid-Columbia region is growing more urban, with 5% population growth in incorporated areas between 2000 and 2005, versus a 4% population loss in unincorporated areas during the same

time period. Table 6 illustrates the trend in urban area population growth in the Mid-Columbia counties between 2000 and 2005.

**Table 6. Urban/Rural Populations, Mid Columbia Region, 2000-2005**

County	% Incorporated Population		% Change
	2000	2005	2000-2005
Gilliam	69%	72%	3%
Hood River	34%	36%	2%
Morrow	60%	59%	-1%
Sherman	59%	68%	9%
Umatilla	68%	72%	4%
Wasco	57%	59%	1%
<b>Regional Average:</b>	<b>58%</b>	<b>61%</b>	<b>3%</b>

Source: Portland State University Population Estimates, 2005

In addition to location, the character of the housing stock also affects the level of risk that communities face from natural hazards. Table 7 provides a breakdown by county of the various housing types available in 2000. Mobile homes and other non-permanent housing structures, which account for more than 30% of the housing in some Mid-Columbia counties, are particularly vulnerable to certain natural hazards, such as windstorms, and special attention should be given to securing these types of structures.

**Table 7. County Housing Profile, Mid-Columbia Region, 2000**

County	Single-Family	Multi-Family	Mobile Homes	Boat, RV, Van, etc.
Gilliam	76%	6%	17%	1%
Hood River	69%	17%	14%	0%
Morrow	51%	10%	36%	3%
Sherman	63%	4%	30%	2%
Umatilla	61%	19%	19%	1%
Wasco	63%	15%	21%	1%

Source: U.S. Bureau of the Census, Profile of Housing Characteristics 2000.

Table 7 shows that the majority of the housing stock is in single-family homes and this trend is continuing with new construction. In 2002, an estimated 94% of new housing was single-family units<sup>6</sup>. This trend suggests that hazard mitigation efforts should provide outreach and information that specifically addresses preparedness in detached housing units.

In addition to location and type of housing, the year housing structures were built has implications for community vulnerability. The older a home is, the greater the risk of damage from natural disaster. This is because structures built after the late 1960s in the Northwest and California used earthquake resistant designs and construction techniques. In addition, FEMA began assisting communities with floodplain mapping during the 1970s, and communities developed ordinances that required homes in the floodplain to be elevated to one foot over Base Flood Elevation. Knowing the age of a structure is helpful in targeting outreach regarding retrofitting and insurance for owners of older structures. Table 8 illustrates the percentage of homes built per county during certain periods of time.

**Table 8. Housing, Year Built, Mid-Columbia Region**

County	1939 or earlier - 1959	1960-1979	1980-2000
Gilliam	61%	22%	17%
Hood River	40%	29%	31%
Morrow	25%	40%	35%
Sherman	52%	31%	17%
Umatilla	38%	38%	24%
Wasco	44%	31%	25%

Source: U.S. Bureau of the Census, Profile of Housing Characteristics 2000.

### Section 3: Infrastructure Profile

This section of the report describes the infrastructure that supports Mid-Columbia communities and economies. Transportation networks, systems for power transmission, and critical facilities such as hospitals and police stations are all vital to the functioning of the region. 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. The information that is provided in this section of the profile can provide the basis for informed decisions about how to reduce the vulnerability of Mid-Columbia infrastructure to natural hazards.

#### Transportation

The Mid-Columbia region is an important freight corridor for the entire Pacific Northwest. The Columbia Gorge provides the only river-grade pass (i.e., the corridor does not include any major grades) through the Cascade Mountains from the Canadian border to California. The ability to pass through the Cascade Mountain Range on a relatively flat and straight surface is taken advantage of by many forms of transportation and shipping. There are three primary modes of transportation through the region: highways, railroad, and barges. There are also many small airports scattered throughout the region that are used primarily for passenger service.

## Roads and Bridges

There are two major highways that run through the Mid-Columbia region. I-84 is a major transportation corridor that connects Portland with eastern Oregon and beyond. I-84 is one of the few major east-west roads in Oregon, Washington, and Northern California that provides drivers with a river-grade crossing of the Cascades. U.S. 97 runs north-south through Sherman and Wasco Counties. U.S. 97 is the most important north-south transportation corridor east of the Cascades.<sup>7</sup>

Many commercial entities make use of the highways in the Mid-Columbia region. Trucks transported over 10 million tons of freight along I-84 in 2002 and the average daily truck volume was more than 3,000.<sup>8</sup> Trucks on the section of U.S. 97 between the I-84 junction and Shaniko in Wasco County transported between 4 and 9.99 million tons of freight in 2002. Truck volume averaged between 500 and 1,499 trucks per day.<sup>9</sup> U.S. 97 also serves as an important alternative route to I-5.

Highways are also heavily utilized by local traffic. Seventy six percent of workers in the Mid-Columbia commute by driving alone. According to Census 2000 data, the average commute for workers in the Mid-Columbia region is nineteen minutes each way. Additionally, in 2003, 39% of employees living in counties in the Mid-Columbia region worked outside of their home county.<sup>10</sup> A severe winter storm has the potential to disrupt the daily driving routine of thousands of people.

The recent population growth in the region has contributed to an increase of automobiles on the roads:

- Average daily traffic volume on I-84 recorded six miles west of The Dalles increased by about 14% between 1996 and 2005. Farther east on I-84, at about 4 miles west of Pendleton, the average daily traffic for the same time period increased by 24%. Judging from these trends, traffic levels will continue to increase.<sup>11</sup>
- Average daily traffic counts also increased by 9% between 1996 and 2005 on U.S. 97, one-half mile north of Moro in Sherman County.<sup>12</sup>

A large increase of automobiles can place stress on roads, bridges and infrastructure within the cities, and also in rural areas where there are fewer transit roads. Natural hazards can disrupt automobile traffic and shut down local transit systems across the area or region and make evacuations difficult. This is particularly important in this region, where hazardous materials are being transported along Interstate 84 and nearby railroad lines. An accident involving these hazardous materials could result in a dangerous situation.

The condition of bridges in the region is also a factor that affects risk from natural hazards. Most bridges are not seismically retrofitted, which is a particularly important issue for the Mid-Columbia region because of its risk from earthquakes. Incapacitated bridges can disrupt

traffic and exacerbate economic losses because of the inability of industries to transport services and products to clients. Table 9 shows the number of state, county, and city maintained bridges and culverts, and the number of historic covered bridges in the region. The bridges in the region are part of the state and interstate highway and maintained by the Oregon Department of Transportation.

**Table 9. Bridges and Culverts**

County	State Highway Bridges	State Highway Culverts	County Highway Bridges	County Highway Culverts	City/ Municipal Highway Bridges	City/ Municipal Highway Culverts	Historic Covered Bridges	2006 Total
Gilliam	16	35	17	0	0	0	0	68
Hood River	37	38	18	0	0	0	0	93
Morrow	25	35	43	1	10	1	0	115
Sherman	34	46	9	1	0	1	0	91
Umatilla	119	105	247	7	23	0	0	501
Wasco	58	46	88	24	5	0	0	221

Source: Oregon Department of Transportation, 2006.

### Railroads

Railroads are major providers of regional and national cargo and trade flows. Railroads that run through the Mid-Columbia region provide vital transportation links from the Pacific to the rest of the country. The Burlington Northern Santa Fe Railroad (BNSF) and the Union Pacific Railroad (UP) are the two major railroads in the region.

BNSF owns the tracks that run north-south along the Deschutes River which borders Sherman and Wasco Counties. The tracks run through Oregon to Southern California where the tracks turn east and continue to Texas.<sup>13</sup>

UP's tracks run east-west along the Columbia River. A major classification yard and a diesel locomotive maintenance shop are located in Hinkle near Hermiston in Umatilla County.<sup>14</sup>

Sixteen million tons of goods produced in Oregon are shipped out of state by railroad per year. The goods include lumber and wood products, pulp and paper, and miscellaneous mixed shipments.<sup>15</sup> Over 23 million tons of products originating in other states are annually shipped into Oregon by rail including wood, farm products, coal, and waste materials.<sup>16</sup> More than 22 million tons of products are shipped through Oregon annually by rail. More than 6 million tons of these products include grains and soybeans transported from the Northern Midwest to Washington.<sup>17</sup>

Rails are sensitive to icing from the winter storms that are common in the Mid-Columbia region. For industries in the region that utilize rail

transport, these disruptions in service can result in economic losses. As mentioned above, the potential for rail accidents caused by natural hazards can also have serious implications for the local communities if hazardous materials are involved.

### **Barges**

Five of the six counties that make up the Mid-Columbia region border the Columbia River. The Columbia meets the Snake River in Kennewick, Washington. The two rivers are frequently combined into one transportation system and are referred to as the Columbia/Snake River System. The Columbia/Snake region consists of all of the Columbia River east of Portland and the Snake River. The Columbia/Snake region generated 1,100 jobs directly related to waterborne cargo activity in 2000 with another 1,500 jobs created indirectly. Waterborne cargo activities created \$39 million of direct payroll and \$80 million in income from direct, indirect, and induced effects.<sup>18</sup> In addition, products shipped from the region reach Pacific Rim countries one day faster than those shipped from California and 10 days faster than those shipped from the Gulf Coast.<sup>19</sup>

Wheat and barley are the primary products transported by barge in the Columbia/Snake River system. In 2000, 5.3 million tons of grain were shipped down the Columbia River.<sup>20</sup> Barges also transported 1.1 million tons of forest products, 1.8 million tons of liquids, and 1.1 million tons of crude materials and miscellaneous products in 2000.<sup>21</sup>

Barge transport is sensitive to disruption from natural hazards that affect all forms of ground transportation. Barges are dependent upon ground transportation for loading and unloading goods and continuing their transportation supply chain. Barge transportation is also vulnerable to large-scale natural disasters, such as volcanic eruptions, which would result in channel infill and sediment in the Columbia River.

### **Airports**

The Mid-Columbia region has ten small airports. The Eastern Oregon Regional Airport in Pendleton, Umatilla County is the only commercial airport in the region. Horizon Air provides passenger service and Horizon Air, Federal Express, and United Parcel Service use the airport to provide scheduled freight services.<sup>22</sup> The Eastern Oregon Regional Airport transported 200 tons of freight in and out of the airport in 2000. In comparison, the La Grande airport handled 100 tons, Eugene-Mahlon Sweet Field handled 2,000 tons and Portland International transported 165,000 tons of freight in 2000.<sup>23</sup>

Flights face the potential for closure from a number of natural hazards that are common in the Mid-Columbia region, including windstorms and winter storms. Airports have strict guidelines regarding when conditions are safe for flight.

## Critical Facilities

Critical facilities are those facilities that are essential to government response and recovery activities (e.g., police and fire stations, public hospitals, public schools). Critical facilities in the Mid-Columbia region are displayed in Table 10 by county.

**Table 10. Mid Columbia Region Critical Facilities by county**

County	Hospitals		Police Station	Fire & Rescue Station	School Districts & Colleges
	# of Hospitals	# of Beds			
Gilliam	0	0	3	2	2 Districts
Hood River	1	25	2	6	1 District
Morrow	1	12	4	5	2 Districts
Sherman	0	0	1	5	1 District
Umatilla	3*	158*	11	16	10 Districts, 1 Community College
Wasco	1	49	2	8	3 Districts, 1 Community College

\*These totals include one psychiatric hospital with a 60-bed capacity.

Sources: State Hospital Licensing Department, Local Sheriff Offices, Oregon State Fire Marshall, Oregon Department of Education. Table updated July 2006.

In addition to those listed in Table 10, there are other critical and essential facilities that are vital to the continued delivery of key governmental services or that may significantly impact the public's ability to recover from emergencies. Some of these facilities, such as correctional institutions, public services buildings, law enforcement centers, courthouses, juvenile services buildings, public works facilities, and other public facilities should be detailed in the local and regional mitigation plans.

## Power Generation and Transmission

The Mid-Columbia region is an important thoroughway for oil and gas pipelines and electricity transmission lines. In addition, the region is also a major producer of hydropower. The infrastructure associated with power generation and transmission plays a critical role in supporting the regional economy.

There are four major dams on the Columbia River in the Mid-Columbia region: the Bonneville, the McNary, The Dalles, and the John Day. The McNary has the lowest maximum generation capacity at 1,120 megawatts (mw). The John Day Dam has the highest maximum generation capacity at 2,480 mw. These dams are, by far, the largest hydropower producers in Oregon. The next largest hydropower producing dam in Oregon is the Brownlee Dam on the lower Snake River. Its maximum power generation is 585 mw.<sup>24</sup>

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 and fatalities does exist, and the National Inventory of Dams (NID) has developed a listing of High Threat Potential Hazard dams for the nation. The state has developed a complementary inventory of dams in Oregon. Table 11 lists the dams included in these inventories.

**Table 11. Mid-Columbia Region Power Plants and Dams by County**

County	Power Plants	Dams		
		Dams <sup>†</sup> (State)	Dams <sup>†</sup> (National)	Threat Potential
Gilliam	0	0	0	0 High Threat
Hood River	0	10	5	1 High Threat
Morrow	2 power plants, 1053 MW	8	13	2 High Threat
Sherman	0	11	6	1 High Threat
Umatilla	3 power plants, 1137 MW	21	14	3 High Threat
Wasco	0	29	19	6 High Threat

Sources: Oregon Department of Energy, National Inventory of Dams. Table updated July 2006.

The electric, oil, and gas lines that run through the Mid-Columbia region are privately owned. A network of electricity transmission lines running through the Mid-Columbia region allows Oregon utility companies to exchange electricity with other states and Canada.<sup>25</sup> Most of the natural gas Oregon uses originates in Alberta, Canada. Two natural gas transmission pipelines run through the Mid-Columbia region. In addition, an oil pipeline runs through Umatilla County connecting Oregon with supplies of oil from the Rocky Mountain States and Canada.<sup>26</sup> These lines may be vulnerable to severe, but infrequent natural hazards, such as earthquakes.

<sup>†</sup> Note: The National Inventory of Dams includes all dams with either:

- a) a high or significant hazard rating
- b) a low hazard dam that exceeds 25 feet in height AND 15 acre-feet storage
- c) a low hazard dam that exceeds 6 feet in height AND 50 acre-feet storage

<sup>‡</sup> Note: The State Inventory of Dams includes all dams over 10 feet in height AND 9.2 acre-feet storage

## Section 4: Economic Profile

The following economic profile addresses the regional economy and its sensitivities to natural hazards. The sensitivities that are relevant to the Mid-Columbia region are a function of the types and diversity of industries and the composition of businesses that are present. To highlight key industries, this report will look at:

The largest revenue sectors, since interruptions to these industry sectors would result in significant revenue loss for the region.

The largest employment industries, since interruptions to these industry sectors would result in high unemployment in the region.

The industry sectors with the most businesses, since interruptions to these industry sectors would result in damage to the most businesses regionally.

By examining these key industry sensitivities and other economic sensitivities, such as industry diversity and the number of small businesses that exist in the Mid-Columbia region, informed decisions can be made about how to mitigate risk.

### Economic Overview

The Mid-Columbia region enjoys many economic advantages due to its location. The region's proximity to the Portland area, the Southern Pacific, Union Pacific and Burlington Northern railroad lines that run across the western edge of the region, and I-84 provide good opportunities for the transportation of manufactured and agricultural goods. In addition, the region's close proximity to the Columbia River, the Cascade Mountains, and the high desert terrain provide year-round sporting and tourism activities. Furthermore, the area's prominence as a producer of hydroelectric power represents a significant asset in the form of cheap electricity.

According to the Oregon Employment Department, the Mid-Columbia region experienced economic problems due to the downturn in the lumber, wood products and aluminum industries during the 1990's. However, the region has been able to offset the loss of jobs in these industries by the addition of new manufacturing companies, especially food processing companies, in Hood River, Morrow, Umatilla, and Wasco counties. As of 2004, the region employed 73,600 people with a combined payroll of over one and a half billion dollars. Table 12 displays the payroll and employee figures per county.

**Table 12. Mid-Columbia Employment and Payroll by County, 2004**

<b>County</b>	<b># of Employees</b>	<b>Annual Payroll</b>
Gilliam	1,333	\$ 24,668,000
Hood River	14,380	\$ 277,702,000
Morrow	5,244	\$ 114,515,000
Sherman	1,209	\$ 19,413,000
Umatilla	39,166	\$ 922,272,000
Wasco	12,268	\$ 267,351,000
<b>Total</b>	<b>73,600</b>	<b>\$1,625,921,000</b>

Source: Bureau of Economic Analysis

In 2004, there were 3,465 businesses in the Mid-Columbia region. Of these, 90%, or 3,121, were small businesses with less than 20 employees.<sup>27</sup> The prevalence of small businesses in the Mid-Columbia region is an indication of sensitivity to natural hazards because small businesses are more susceptible to financial uncertainty.<sup>28</sup> When 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.<sup>29</sup>

Although the Mid-Columbia region has a high percentage of small businesses, as a whole, the Mid-Columbia region has a more homogeneous economy than other Oregon regions. Many of the small businesses fall into the same categories of industry sectors. This low economic diversity means that certain industries are dominating the economic structure of the community, and are therefore extremely important to the Mid-Columbia region. Table 13 displays the diversity ranking for each county with 1 being the most diverse economic county in Oregon, 36 being the least diverse economic county in Oregon.

**Table 13. County Economic Diversity Ranking, 1999**

<b>County</b>	<b>Economic Diversity Index Ranking</b>
Gilliam	35
Hood River	24
Morrow	32
Sherman	36
Umatilla	12
Wasco	19

Source: Oregon Employment Department<sup>30</sup>

An economy that is heavily dependent upon a few key industries may have a more difficult time recovering after a natural disaster than one with a more diverse economic base. While a community with a diverse economic base may suffer from an industry sector being damaged

during a natural disaster, they have a broader base of operating industry sectors to continue to rely upon. However, a community that relies upon specific key industry sectors may have a harder time recovering their economic base if one of those key industry sectors is damaged. Recognizing that economic diversification is a long-term issue, more immediate strategies to reduce vulnerability should focus on risk management for the dominant industries.

## **Key Industries**

Key industries are those that represent major employers, major revenue generators, and for the purposes of hazard mitigation planning, industries that are represented by a high number of businesses. 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. The effect is especially great when the affected businesses belong to basic sector industries. Basic sector industries are those that are dependent on sales outside of the local community; they bring money into a local community via employment. The farm and ranch, information, and wholesale trade industries are all examples of basic industries. Non-basic sector industries are those that are dependent on local sales for their business, such as retail trade, construction, and health and social assistance.

Basic sector businesses have a multiplier effect on a local economy, whereby the jobs and income they bring to a community allow for the creation of new non-basic sector jobs. Their presence can therefore help speed the recovery process following a natural disaster. If, on the other hand, basic sector industry production is hampered by a natural hazard event, the multiplier effect could be experienced in reverse. In this case, a decrease in basic sector purchasing power results in lower profits (and potentially job losses) for the local non-basic businesses that are dependent on them.

## **High Revenue Sectors**

The Mid-Columbia region's top revenue generating industries are a mix of basic and non-basic sectors. In 2002, the three sectors in the Mid-Columbia region with the highest revenue were Retail Trade (39.2%), Wholesale Trade (21.1%), and Farm and Ranch (19.8%).<sup>31</sup>

Within the individual counties in the Mid-Columbia, however, the industries' relative contribution to revenue differs. For instance, in Gilliam, Morrow, and Sherman counties, the Farm and Ranch sector garners the highest amount of revenue. Table 14 shows the percent of total county revenue that is contributed by various sectors.

**Table 14. Percent of Revenue in Mid-Columbia Counties by Industry, 2002**

County	Industry									
	Retail Trade	Wholesale Trade	Accommodation and Food Services	Health Care/ Social Assistance	Professional, Scientific and Technology	Other (except Public Admin)	Real Estate and Rental and Leasing	Arts/ Entertainment	Administrative/ Waste Services	Farm and Ranch
Gilliam	29%	n/a	7%	n/a	n/a	n/a	n/a	n/a	n/a	63%
Hood River	39%	23%	7%	13%	4%	3%	2%	n/a	1%	10%
Morrow	10%	32%	3%	n/a	n/a	1%	1%	n/a	2%	52%
Sherman	39%	11%	6%	n/a	n/a	n/a	n/a	n/a	n/a	44%
Umatilla	46%	24%	10%	n/a	n/a	2%	1%	n/a	3%	15%
Wasco	45%	16%	6%	17%	2%	2%	1%	1%	1%	7%

Source: U.S. Census 2002, Oregon Department of Agriculture 2002

The *retail trade sector* is primarily composed of small businesses (89%) that tend to be more sensitive to hazard induced costs due to prior financial instability. Retail trade is also largely dependent on wholesale trade and the transportation network for the delivery of goods for sale. Disruption of the transportation system could have severe consequences for retail businesses. Retail trade typically relies on local residents and tourists and their discretionary spending ability. Residents' discretionary spending diminishes after a natural disaster when they must pay to repair their homes and properties. In this situation, residents will likely concentrate their spending on essential items that would benefit some types of retail (e.g. grocery) but hurt others (e.g. gift shops). The potential income from tourists also diminishes after a natural disaster as people are deterred from visiting the impacted area. In summary, depending on the type and scale a disaster could affect specific segments of retail trade, or all segments.

*Wholesale trade* is closely linked with retail trade but it has a broader client base than retail trade, with local and non-local businesses as the typical clientele. Local business spending will be likely to diminish after a natural disaster, as businesses repair their properties and wait for their own retail trades to increase. Distanced clients may have difficulty reaching local wholesalers due to transportation disruptions from a natural disaster. Both would adversely impact the profitability of this sector.

The *farm and ranch sector* is inherently dependent on the weather and is susceptible to a variety of natural hazards that afflict the Mid-Columbia region, including flood, drought, and summer and winter storms. These natural hazards have the capacity to devastate seasonal

crops, representing a significant financial loss for the year. The western part of the region is known for its high quality fruit, including pears, apples, and cherries. The eastern part of the region is the state's principal wheat producing area.

In the Mid-Columbia region, a substantial ripple effect through the economy can be anticipated following agricultural loss. This is due both to the number of people who could lose employment in the wake of crop failure and the number of supporting industries (e.g., food processing manufacturers, wholesale trade, and retail trade) that could be affected. Even if not directly impacted by a disaster, agricultural producers are also sensitive to the disruption of regional transportation networks from natural disasters; they need seasonal laborers to access the area and it is imperative that perishable products are moved to market in a timely manner.

### **Major employment sectors**

Economic resilience to natural disasters is particularly important for the major employment sectors in the region. If these sectors are negatively impacted by a natural hazard, such that employment is affected, the impact will be felt throughout the regional economy. Thus, understanding and addressing the sensitivities of these sectors is a strategic way to increase the resiliency of the entire regional economy.

The three sectors in the Mid-Columbia region with the most employees in 2004 were Government (16.4%), Farm and Ranch (14.5%), and Retail Trade (11.3%).<sup>32§</sup>

Within the six Mid-Columbia counties, the percent of county employment by various sectors differs. For example, in Morrow County, manufacturing is the second largest employer, though across the region, manufacturing accounts for a smaller percent of total employment. Table 15 shows the distribution of each county's employees across the five largest regional employment sectors.

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<sup>§</sup> Note: The Bureau of Economic Analysis did not disclose employment figures in some counties where an industry was represented by only a few businesses. These figures represent the closest estimate.

**Table 15. Percent of County Employment by the Five Largest Regional Employment Sectors, Mid-Columbia Region, 2004**

County	Industry						Accommodation and Food Services
	Government	Health Care and Social Services	Retail Trade	Farm	Manufacturing		
Gilliam	16%	6%	7%	22%	1%	n/a	
Hood River	9%	12%	12%	11%	9%	9%	
Morrow	16%	2%	7%	19%	17%	3%	
Sherman	22%	n/a	12%	23%	n/a	n/a	
Umatilla	18%	9%	11%	7%	11%	6%	
Wasco	18%	14%	14%	7%	6%	8%	

Source: Bureau of Economic Analysis 2004

Sectors that are anticipated to be major employers in the future also warrant special attention in the hazard mitigation planning process.

Between 2005 and 2014, the largest job growth in the Mid-Columbia region is expected to occur in the Information, Local Government, and Educational and Health Services sectors.<sup>33</sup>

The *information sector*, as defined by the North American Industry Classification System, includes publishing industries, motion picture and sound recording industries, broadcasting industries, telecommunications industries, internet service providers, data processing industries, and information services industries. The information sector is sensitive to a loss of power from a disaster and to disruptions of physical transmission cables (phone lines, etc.). There may also be a disruption of employees' ability to work as a result of damages/problems at home.

If prepared and organized, however, this sector has the potential to have high resilience to many disasters due to its unique characteristics. First, as a basic sector, information businesses are frequently not dependant on the local community for revenue. Many of the targeted consumers of the products are located outside the region and their purchasing power would not be impacted by a localized natural disaster. Second, the sector is more insulated from disruptions to the transportation network than others because there is a potential for many of the employees to work from home and because some products are transmitted via internet.

The *health care and social assistance sector* ranges from physicians and chiropractors to family planning and kidney dialysis centers to emergency food and housing organizations and child day care services. This sector is growing in the Mid-Columbia, partly as a result of the large retirement age population.

The demand for health care and social assistance following a severe natural disaster may increase in the short term as extra health care and housing services may be necessary. Services that are privately subsidized and sensitive to interruptions of funding may suffer following a disaster. However, the long-term economic viability of this sector should not be adversely affected by a natural disaster. The facilities' ability to withstand the physical impacts of a disaster and the services' ability to cope with a potential influx of people requiring attention after a disaster may be concerns for this sector.

### **Common Business Types**

Identifying sectors that are represented by a large number of businesses can guide the development of targeted mitigation strategies for those sectors. Approximately 40% of all businesses in the Mid-Columbia region fall into three industry sectors-

18% (573) of all businesses are engaged in Retail Trade, 12% (373) of all businesses are engaged in Construction, and 11% (365) of all businesses are engaged in Health Care and Social Assistance.<sup>34</sup>

The retail trade and health care and social assistance sectors' sensitivities to natural hazards are addressed above. The large number of businesses engaged in the *construction* industry warrants attention to its specific vulnerabilities. First, it should be noted that 96% of construction businesses in the Mid-Columbia region have fewer than 20 employees; small businesses tend to face more financial uncertainty than larger ones. These businesses may therefore be particularly sensitive to any temporary decreases in demand following a moderate natural hazard event.

However, in the event of wildfires, floods, earthquakes, or other types of destructive natural disasters, the demand for reconstruction services may be expected to increase. Business from local residents looking to rebuild their homes and businesses may boost construction revenue. If transportation routes have been affected, construction businesses may have difficulty accessing necessary supplies from outside the impacted area. Protecting infrastructure and transportation will help to enable the construction sector to continue operating and re-building communities after a natural disaster.

### **Regional Profile and Sensitivity Conclusion**

Information presented in the Community, Infrastructure, and Economic Profiles can be used to help communities identify areas of sensitivity and vulnerability to natural hazards. Once the areas of sensitivity are identified, communities should identify appropriate, corresponding action items from the ONHW Potential Action Item Report.



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# **REGION 5**

## **Mid-Columbia Region<sup>1</sup>**

### **Hazards Assessment**

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<sup>1</sup> Gilliam, Hood River, Morrow, Sherman, Umatilla and Wasco counties

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# DROUGHT

## Characteristics and Brief History

Droughts are not uncommon in the State of Oregon, nor are they just an “east of the mountains” phenomenon. They occur in all parts of the state, and in both summer and winter. They appear to be cyclic and they can have a profound effect on the state’s economy, particularly the hydro-power and agricultural sectors. The environmental consequences also are far-reaching. They include insect infestations in Oregon forests and the lack of water to support endangered fish species. Severe drought conditions preceded the four disastrous Tillamook fires (1933, 1939, 1945, 1951) and pitted farmer against fish propagation groups during the Klamath Basin drought of 2001. The minimum drought loss included about 1200 jobs and \$150 million dollars in goods and services. Local farmers maintain that the cost was considerably more. Water allocation continues to be controversial. In recent years, the state has addressed drought emergencies through the Oregon Drought Council. This interagency (state / federal) council meets to discuss forecasts and advise the Governor as the need arises. Significant Oregon droughts are listed in Table 1.

**TABLE 1. SIGNIFICANT DROUGHTS**

DATE	DESCRIPTION
1904-1905	A statewide drought period of about 18 months
1917-1931	A very dry period throughout Oregon punctuated by brief wet spells in 1920-21 and 1927
1939-1941	A three-year intense drought in Oregon
1959-1964	Primarily affected eastern Oregon
1985-1997	Generally a dry period, capped by statewide droughts in 1992 and 1994

Source: Taylor, George H., and Ray Hatton, 1999, *The Oregon Weather Book*.

## Recurrence

Oregon’s drought history reveals many short-term and a few long-term events. The average recurrence interval for severe droughts in Oregon is somewhere between 8 and 12 years. Table 1 provides an overview of some severe droughts in Oregon.

## Vulnerability

The probability that Region 5 will experience drought and the region’s vulnerability to their effects are depicted in Table 2 below. These scores are based on an analysis of risk conducted by county emergency program managers, usually with the assistance of a team of local public safety officials.

The probability scores below address the likelihood of a future major emergency or disaster within a specific period of time, as follows:

High = One incident likely within a 10 to 35 year period.

Moderate = One incident likely within a 35 to 75 year period.

Low = One incident likely within a 75 to 100 year period.

The vulnerability scores address the percentage of population or region assets likely to be affected by a major emergency or disaster, as follows:

High = More than 10% affected

Moderate = 1-10% affected

Low = Less than 1% affected

In some cases, counties either did not rank the hazard or did not find it to be a significant concern. These cases are noted with a dash (-) in the table below.

**TABLE 2. Vulnerability and Probability Assessment of Drought**

	Gilliam	Hood River	Morrow	Sherman	Umatilla	Wasco
Vulnerability	M	-	-	H	-	H
Probability	H	-	-	H	-	H

Source: Oregon Emergency Management, July 2003, County Hazard Analysis Scores.

# EARTHQUAKES

## Characteristics and History

The geographical position of this region makes it susceptible to earthquakes from four sources: (1) the off-shore Cascadia Fault Zone, (2) deep intra-plate events within the subducting Juan de Fuca plate, (3) shallow crustal events within the North America Plate, and (4) earthquakes associated with renewed volcanic activity. All have some tie to the subducting or diving of the dense, oceanic Juan de Fuca Plate under the lighter, continental North America Plate. Stresses occur because of this movement and there appears to be a link between the subducting plate and the formation of volcanoes some distance inland from the off-shore fault zone.

When crustal faults slip, they can produce earthquakes with magnitudes (M) up to 7.0 and can cause extensive damage, which tends to be localized in the vicinity of the area of slippage. Deep intraplate earthquakes occur at depths between 30 and 100 kilometers below the earth's surface. They occur in the subducting oceanic plate and can approach M7.5. Subduction zone earthquakes pose the greatest hazard. They occur at the boundary between the descending oceanic Juan de Fuca Plate and the overriding North American Plate. This area of contact, which starts off the Oregon coast, is known as the Cascadia Subduction Zone (CSZ). The CSZ could produce an earthquake up to 9.0 or greater.

This part of Oregon has experienced three historic earthquakes of significance that were centered in the region: the 1893 Umatilla (VI or VII Modified Mercalli Intensity), the 1936 Milton-Freewater (M6), 1951 Hermiston, and the 1976 Deschutes Valley (M4.8), all shallow crustal earthquakes. There are also identified faults in the region that have been active in the last 20,000 years. The region has also been shaken historically by crustal and intraplate earthquakes and prehistorically by subduction zone earthquakes centered outside the area (Table 3). Given this history, there is good reason to believe that the most devastating future earthquakes would originate along shallow crustal faults in the region.

Earthquake associated hazards include severe ground shaking, liquefaction of fine-grained soils, and landsliding. The severity of these effects depend on several factors, including the distance from the earthquake source, the ability of soil and rock to conduct seismic energy and the degree (angle) and composition of slope materials.

Earthquakes produced through volcanic activity could reach magnitudes of M5.2. However the Cascade volcanoes are some distance away from populated centers, which tends to lessen the concern.

Earthquake risk in Region 5 is reflected in the Uniform Building Code's (UBC) Earthquake Hazard maps (i.e., seismic zones 1-4). The higher the numerical designation, the more stringent the building standards become. Region 5 is within UBC Seismic Zone 2b.

**TABLE 3. SIGNIFICANT EARTHQUAKES**

DATE	LOCATION	MAGNITUDE (M)	REMARKS
Approximate Years 1400 BCE* 1050 BCE 600 BCE 400 750 900	Offshore, Cascadia Subduction Zone	Probably 8-9	Based on studies of earthquake and tsunamis at Willapa Bay, Washington. These are the mid-points of the age ranges for these six events.
January, 1700	Offshore, Cascadia Subduction Zone	Approximately 9.0	Generated a tsunami that struck Oregon, Washington, and Japan; destroyed Native American villages along the coast
March, 1893	Umatilla	VI-VII (Modified Mercalli Intensity)	Damage unknown
July, 1936	Milton-Freewater	6.1	Eastern Oregon's largest event, several aftershocks, \$100, 000 dollars in damage based on 1936 dollars, chimney damage, houses shifted off foundations, school buildings damaged
January, 1951	Hermiston	V	Damage unknown
April, 1976	Deschutes Valley	4.8	Near Maupin, cracked plaster, objects thrown

Notes: \* BCE: Before the Common Era

Source: Ivan Wong and Jacqueline D.J. Bolt, November 1995, A Look Back at Oregon's Earthquake History, 1841-1994, *Oregon Geology*, pp. 125-139.

## Probability

The Cascadia Subduction Zone generates an earthquake on average every 500-600 years. However, as with any natural process, the average time between events can be misleading. Some of the earthquakes may have been 150 years apart with some closer to 1,000 years apart (DOGAMI, 1999). Establishing a probability for crustal earthquakes is more difficult given the paucity of historic events in the region. Earthquakes generated by volcanic activity in Oregon's Cascade Range are possible, but likewise unpredictable.

## Vulnerability

Region 5 is moderately vulnerable to earthquake hazards from earthquake-induced landslides in the Cascades and ground shaking.

The Oregon Department of Geology and Mineral Industries (DOGAMI) has developed two earthquake loss models for Oregon based on the two most likely sources of seismic events: (1) the Cascadia Subduction Zone (CSZ), and (2) combined crustal events (500-year Model). Both models are based on HAZUS, a computerized program, currently used by the Federal Emergency Management Agency (FEMA) as a means of determining potential losses from earthquakes. The CSZ event is based on a potential 8.5 earthquake generated off the Oregon coast. The model does not take into account a tsunami, which probably would develop from the event. The 500-Year crustal model does not look at a single earthquake (as in the CSZ model); it encompasses many faults, each with a 10% chance of producing an earthquake in the next 50 years. The model assumes that each fault will produce a single “average” earthquake during this time. Neither model takes unreinforced masonry buildings into consideration

DOGAMI investigators caution that the models contain a high degree of uncertainty and should be used only for general planning purposes. Despite their limitations, the models do provide some approximate estimates of damage. Results are found in Tables 4 to 6.

**TABLE 4. PROJECTED DOLLAR LOSSES BASED ON A M8.5 SUBDUCTION EVENT AND A 500-YEAR MODEL**

<b>REGION 5 COUNTIES</b>	<b>ECONOMIC BASE IN THOUSANDS (1999)</b>	<b>GREATEST ABSOLUTE LOSS IN THOUSANDS (1999) FROM A M 8.5 CSZ EVENT</b>	<b>GREATEST ABSOLUTE LOSS IN THOUSANDS (1999) FROM A 500-YEAR EVENT</b>
Gilliam	\$112,000	Less than \$1,000	\$1,000
Hood River	\$1,029,000	\$3,000	\$62,000
Morrow	\$365,000	Less than \$1,000	\$10,000
Sherman	\$97,000	Less than \$1,000	\$1,000
Umatilla	\$2,998,000	Less than \$1,000	\$68,000
Wasco	\$1,260,000	Less than \$1,000	\$25,000

Source: DOGAMI, 1999, Special Publication 29: Earthquake Damage in Oregon.

**TABLE 5. ESTIMATED LOSSES ASSOCIATED WITH A M8.5 SUBDUCTION EVENT**

<b>REGION 5 COUNTIES:</b>	<b>Gilliam</b>	<b>Hood River</b>	<b>Morrow</b>	<b>Sherman</b>	<b>Umatilla</b>	<b>Wasco</b>	<b>REMARKS</b>
INJURIES	0	0	0	0	0	0	These figures have a high degree of uncertainty and should be used only for general planning purposes.
DEATHS	0	0	0	0	0	0	
DISPLACED HOUSEHOLDS	0	0	0	0	0	0	
ECONOMIC LOSSES FOR BUILDINGS	\$5,000	\$3 million	\$97,000	\$17,000	\$236,000	\$795,000	The HAZUS run that produced these figures did not account for unreinforced masonry structures.
OPERATIONAL THE DAY AFTER THE EVENT							
Fire stations	100%	99%	100%	100%	100%	99%	
Police stations	100%	100%	100%	100%	100%	100%	
Schools	100%	98%	100%	100%	100%	100%	
Bridges	100%	95%	100%	99%	100%	99%	
ECONOMIC LOSSES TO INFRASTRUCTURE							
Highways	0	\$704,000	0	\$29,000	0	\$71,000	
Airports	0	\$76,000	0	0	0	0	
Communications	0	\$17,000	0	0	0	\$6,000	
DEBRIS GENERATED (thousands of tons)	0	1	0	0	0	1	

Source: DOGAMI, 1999, Special Paper 29: Earthquake Damage in Oregon.

**TABLE 6. ESTIMATED LOSSES ASSOCIATED WITH A 500-YEAR MODEL<sup>1</sup>**

REGION 5 COUNTIES	Gilliam	Hood River	Morrow	Sherman	Umatilla	Wasco	REMARKS
INJURIES	0	30	3	0	19	6	<p>NA* : Because the 500-year model includes several earthquakes, the number of facilities operational the day after the quake can not be calculated.</p> <p>The HAZUS run that produced these figures did not account for unreinforced masonry structures.</p>
DEATHS	0	1	0	0	0	0	
DISPLACED HOUSEHOLDS	0	56	10	0	81	23	
ECONOMIC LOSSES FOR BUILDINGS	\$705,000	\$62 million	\$10 million	\$923,000	\$67,000	\$25 million	
OPERATIONAL THE DAY AFTER THE EVENT	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	
Fire stations	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	
Police stations	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	
Schools	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	
Bridges	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	
ECONOMIC LOSSES TO INFRASTRUCTURE			\$550,000	\$3 million	\$6 million	\$3 million	
Highways	\$350,000	\$12M	\$392,000	\$423,000	\$3 million	\$3 million	
Airports	\$440,000	\$3M	\$46,000	\$61,000	\$3 million	\$2 million	
Communications	\$29,000	\$1M				\$1 million	
Debris generated (thousands of tons)	0	41	8	0	45	16	

Source: DOGAMI, 1999, Special Paper 29: Earthquake Damage in Oregon.

The probability that Region 5 will experience earthquakes and the region's vulnerability to their effects are depicted in Table 7 below. These scores are based on an analysis of risk conducted by county emergency program managers, usually with the assistance of a team of local public safety officials.

The probability scores below address the likelihood of a future major emergency or disaster within a specific period of time, as follows:

High = One incident likely within a 10 to 35 year period.

Moderate = One incident likely within a 35 to 75 year period.

Low = One incident likely within a 75 to 100 year period.

The vulnerability scores address the percentage of population or region assets likely to be affected by a major emergency or disaster, as follows:

High = More than 10% affected

Moderate = 1-10% affected

Low = Less than 1% affected

**TABLE 7. Vulnerability and Probability Assessment of Windstorms**

	Gilliam	Hood River	Morrow	Sherman	Umatilla	Wasco
Vulnerability	L	M	H	L	M	H
Probability	H	M	L	L	M	L

Source: Oregon Emergency Management, July 2003, County Hazard Analysis Scores.

# FIRES IN THE URBAN/WILDLAND INTERFACE

## Characteristics and Brief History

Oregon has a very lengthy history of fire in the undeveloped wildlands and in the developing urban/wildland interface. In recent years, the cost of fire suppression has risen dramatically; a large number of homes have been threatened or burned, more fire fighters have been placed at risk, and fire protection in wildland areas has been reduced. These factors have prompted the passage of Oregon Senate Bill (SB) 360 (Forestland / Urban Interface Protection Act, 1997). This bill: (1) establishes legislative policy for fire protection, (2) defines urban/wildland interface areas for regulatory purposes, (3) establishes standards for locating homes in the urban/wildland interface, and (4) provides a means for establishing an integrated fire protection system.

This document defines wildfire as an uncontrolled burning of forest, brush, or grassland. Wildfire always has been a part of these ecosystems and sometimes with devastating effects. Table 8 provides an overview of the significant wildfires Oregon, an important indicator of the type of fires possible in the region. Wildfire results from natural causes (e.g., lightning strikes), a mechanical failure (Oxbow Fire), or human-caused (unattended campfire, debris burning, or arson). The severe fire season of 1987 resulted in a record setting mobilization of fire fighting resources. Most wildfires can be linked to human carelessness.

Region 5 contains a variety of forest and grassland ecosystems. The Cascade Mountains form the western boundaries of Hood River and Wasco counties. Morrow and Umatilla counties contain large tracts of Blue Mountain forests and all Region 5 counties have extensive grasslands. Each ecosystem is different. Consequently, the probability and management of wildfire would differ from place to place. The build-up of fuel (e.g., brush, dead or dying trees) that leads to devastating wildfires is a very important factor and is the current focus of mitigation strategies.

**TABLE 8. SIGNIFICANT WILDFIRES**

Year	Name of Fire	Location	Acres Burned	Remarks
1977		Wasco		
1979	Pine Grove/Juniper Flat			
1983	Moro	Sherman		
1985	Maupin	Wasco		
1988		Wasco		
1991	Falls		1,100	Fire along the Columbia Gorge.
1994	Smith Canyon			
1998	Rowena	Wasco	2,208	
1998	Reith Barnhart/Coombs Canyon	Umatilla	45,000	
2000	Willow Creek	Morrow and Gilliam	27,000	
2000	Antelope	Wasco		
2001	Two Rivers	Umatilla	7,011	
2001	Bridge Creek	Umatilla	9,230	
2002	Sheldon Ridge	Wasco	12,681	
2003	Herman Creek	Wasco	300	3 structures were lost in this fire that affected Cascade Locks *excerpted from the State Plan, 2006
2003		Umatilla County		\$40,000 in property damage, \$200,000 in crop damage
2003		Umatilla County		\$15,000 in property damage, \$500 in crop damage
2004		Gilliam, Morrow, Umatilla Counties		\$6,000 in property damage
2005		Sherman, Wasco Counties		\$333.33 in property damage *damage estimate includes Jefferson County

Year	Name of Fire	Location	Acres Burned	Remarks
2005		Morrow, Umatilla Counties		\$2500 in property damage and \$11,500 in crop damage
2005		Gilliam, Morrow, Umatilla Counties		\$37966.67 in crop damage

Source: Oregon Emergency Management, State Natural Hazard Mitigation Plan, 2003, Wildland/Urban Interface chapter. State Interagency Hazard Mitigation Team (2006). The state of Oregon Natural Hazards Mitigation Plan. Available from <http://www.oregonshowcase.org/index.cfm?mode=stateplan>

Source: Hazards & Vulnerability Research Institute (2007). The Spatial Hazard Events and Losses Database for the United States, Version 5.1 [Online Database]. Columbia, SC: University of South Carolina. Available from <http://www.sheldus.org>

Note: This list is representative of a lengthy wildfire history. There have been many fires, named and unnamed. Statistics differ, depending on the source.

## Probability

The probability of a wildland urban interface fire occurrence in this region has been assessed at the local level; each of the counties in this region considers the likelihood of an event to be high.

## Vulnerability

An understanding of risk begins with the knowledge that wildfire is a natural part of forest and grassland ecosystems. Past forest practices included the suppression of all forest and grassland fires. This practice, coupled with hundreds of acres of dry brush or trees weakened or killed through insect infestation, has fostered a dangerous situation. Present state and national forest practices include the reduction of understory vegetation through thinning and prescribed (controlled) burning.

Each year a significant number of people build homes within or on the edge of the forest (urban/wildland interface), thereby increasing wildfire hazards. In Oregon, there are about 240,000 homes worth around \$6.5 billion within the urban/wildland interface. Such development has greatly complicated firefighting efforts and significantly increased the cost of fire suppression. Interface communities at risk in Region 5 are listed in Table 9. A number of these communities are grassland communities rather than forest.

A detailed community inventory of factors that affect vulnerability is important in assessing risk and is beyond the scope of the statewide assessment.

When assessing the risks from natural hazards, established mitigation practices already provide benefits in reduced disaster losses. It is important for communities to understand the benefits of past mitigation practices when assessing their risks, being mindful of opportunities to further reduce losses.

Possible mitigation practices include:

- Identify and map current hazardous forest conditions such as fuel, topography, etc.;
- Identify forest / urban interface communities - List of interface communities, Federal Register, 08/17/01. V. 66, N. 160;
- Identify and map Forest Protection Districts;
- Identify and map water sources;
- Implement effective addressing system in rural forested areas;
  
- Clearly mark evacuation routes;
- Identify and locate seasonal forest users. Initiate information program through schools, summer camps, forest camping grounds, lodges, etc;
- Identify and map bridges that can (and can not) support the weight of emergency vehicles. This is a basic requirement for fire suppression;
- Form committees to implement Oregon Senate Bill 360. This is required in Oregon Senate Bill 360; and
- Create road standards in interface areas to reflect fire suppression needs. Roads must be wide enough for fire suppression vehicles to turn around. Road grades cannot be too steep for large, heavy vehicles.

**TABLE 9. WILDLAND/URBAN INTERFACE COMMUNITIES**

GILLAM COUNTY	HOOD RIVER COUNTY	MORROW COUNTY	SHERMAN COUNTY	UMATILLA COUNTY	WASCO COUNTY
Arlington	Cascade Locks	Blake's Addition	Biggs Junction	Gibbon	Antelope
Condon	Dee	Boardman	Grass Valley	Hermiston	Bear Springs
Mayville	Hood River	Cutsforth Park	Kent	Lehman Springs	Big Muddy Ranch
	Mt. Hood	Hardman	Moro	McNary	Boyd
	Oak Grove	Heppner	Rufus	Meacham	Chenoweth
	Odell	lone	Wasco	Meacham Lake	Cherry Heights
	Parkdale	Irrigon		Mill Creek	Clarno
	Pine Grove	Lexington		Milton-Freewater	Durur
	Rockford	Pentland Lake		Mission	Kahneeta Hot Springs
	Summit			Pendleton	Maupin
	Trout Creek			Pilot Rock	Mosier /7 Mill Hill
	Viento			Poverty Flats	North Junction
	Westside			Power City	Oak Springs
	Wyeth			Rieth	Pine Grove
				Stanfield	Rowena
				Thorn Hollow	Shaniko
				Tollgate	Sidwalter
				Ukiah	Simnasho
				Umatilla	Taylorville/Sportsmans Park
				Weston	The Dalles/Mill Cr/7 Mile Hill
				Weston Mountain	Tygh Valley
					Wamic/ Pine Hollow /
					Wapintia

Source: August 17, 2001, Federal Register, v.66, n.160.

The probability that Region 5 will experience interface fires and the region's vulnerability to their effects are depicted in Table 10 below. These scores are based on an analysis of risk conducted by county emergency program managers, usually with the assistance of a team of local public safety officials.

The probability scores below address the likelihood of a future major emergency or disaster within a specific period of time, as follows:

High = One incident likely within a 10 to 35 year period.

Moderate = One incident likely within a 35 to 75 year period.

Low = One incident likely within a 75 to 100 year period.

The vulnerability scores address the percentage of population or region assets likely to be affected by a major emergency or disaster, as follows:

High = More than 10% affected

Moderate = 1-10% affected

Low = Less than 1% affected

**TABLE 10. Vulnerability and Probability Assessment of Fires in Interface Areas**

	Gilliam	Hood River	Morrow	Sherman	Umatilla	Wasco
Vulnerability	L	M	M	H	M	H
Probability	H	H	H	H	H	H

Source: Oregon Emergency Management, July 2003, County Hazard Analysis Scores.

# FLOOD

## Characteristics and Brief Flood History

The Mid-Columbia region of Oregon is subject to a variety of flood conditions. The most common type of flooding is associated with unseasonably warm weather during the winter months, which quickly melts high-elevation snow. This condition has produced devastating floods throughout the region (Table 11). The warm weather events usually occur December through February, and can affect the entire state. Flash floods are almost always a summer phenomenon and are associated with intense local thunderstorms. The flash flood of June 1903 in the City of Heppner (Morrow County) is a benchmark event. No flood in Oregon has been more lethal: 247 fatalities. Heppner's vulnerability to flash flood hazards has since been reduced through the construction of the Willow Creek Dam. The region's other flood events are linked to normal seasonal snowmelt and run-off from agricultural fields.

There are several rivers in the region that produce extreme flood conditions. Surprisingly, the Columbia is not one of them, nor is the lower Deschutes or the John Day. The Columbia is so regulated by upstream dams that 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 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 and John Day (Columbia River tributaries) are confined to fairly deep canyons with small floodplains. Consequently, they do not present the flood problems associated with smaller rivers, such as the Umatilla, the Walla Walla, and their tributaries. Table 12 details the rivers causing principle flood hazards in the region.

**TABLE 11. SIGNIFICANT FLOODS**

DATE	LOCATION	DESCRIPTION	TYPE OF FLOOD
June, 1894	Main stem Columbia River (Region 5 communities)	Largest flood observed on the Columbia River (1,200,000 cfs). City of Umatilla inundated. Widespread damage.	Snow melt (SM)
June, 1903	Willow Creek (Morrow County)	Very devastating flash flood. Forty-foot wall of water in City of Heppner. 247 Fatalities; 141 homes destroyed.	Flash flood (FF)
Jan., 1923	Mid-Columbia region	Widespread flooding. Unusually warm weather, intense rain.	Rain-on-snow (ROS)
Jan., 1933	Mid-Columbia region	Widespread flooding. Heavy mountain snow pack followed by rain and mild temperatures.	ROS
Dec., 1955	Mid-Columbia region	Mild temperatures and rain. Farms, highways flooded.	ROS
Dec., 1964	Entire State	Record-breaking floods throughout state. Heavy snow in mountains followed by intense rain. Considerable flood damage	ROS
July, 1965	Lane / Spears Canyons (Umatilla Co.)	Thunderstorm. Eight to ten-foot wall of water from canyon. Considerable damage. One fatality; several people injured	FF
Dec., 1980	Polallie Creek (Hood River Co.)	Debris flow from vicinity of Mt. Hood. Debris dam formed a small lake that was later breached. Damage to highways and utilities.	Debris flow
Feb., 1985	Umatilla County	Warm rain on snow at higher elevations. Flooding throughout county.	ROS
Feb., 1986	Entire state	Warm rain on snow. Widespread flooding. Considerable damage	ROS
May, 1998	Central and eastern Oregon	Widespread flooding. Rain melting mountain snow.	ROS
Aug., 2003	Gilliam County	\$7,000 in property damage	
Aug., 2003	Sherman County	Flash Flood (Gerking Canyon) * excerpted from State Plan, 2006	
April, 2005	Morrow County	\$2,000 in property damage	
April, 2005	Umatilla County	\$170,000 in property damage	

Source: Taylor, George and Raymond Hatton, 1999, *The Oregon Weather Book*. Source: Hazards & Vulnerability Research Institute (2007). The Spatial Hazard Events and Losses Database for the United States, Version 5.1 [Online Database]. Columbia, SC: University of South Carolina. Available from <http://www.sheldus.org> Source: State Interagency Hazard Mitigation Team (2006). The state of Oregon Natural Hazards Mitigation Plan.

**TABLE 12. PRINCIPAL FLOOD SOURCES**

<b>Gilliam County</b>	<b>Hood River County</b>	<b>Morrow County</b>	<b>Sherman County</b>	<b>Umatilla County</b>	<b>Wasco County</b>
Columbia River*	Columbia River*	Columbia River*	Columbia River*	Columbia River*	Columbia River*
Thirty Mile Creek	Hood River	Hinton Creek		Birch Creek	Spanish Hollow Creek
	Indian Creek	Little Blackhorse Canyon Cr.		McKay Creek	Fifteen Mile Creek
		Shobe Creek		Mill Creek	Mosier Creek
		Willow Creek		Patawa Creek	
		Rhea Creek		Stage Gulch	
				Tutuilla Creek	
				Umatilla River	
				Walla Walla River	
				Waterman Gulch	
				Pine Creek	
				Greasewood Creek	

Source: FEMA Flood Insurance Studies for Gilliam, Hood River, Morrow, Sherman, Umatilla, and Wasco counties.

Notes: \*The Columbia River flow is controlled by a series of up-stream dams. However, it still constitutes a flood hazard. The failure to regulate properly during high water conditions could worsen flood conditions

## Probability

The probability of an occurrence has been assessed at the county level. Each of the counties in this region considers the probability to be either high or medium. More information follows below.

## Vulnerability

The probability that Region 5 will experience flooding and the region's vulnerability to their effects are depicted in Table 13 below. These scores are based on the perceptions of area emergency managers.

The probability scores below address the likelihood of a future major emergency or disaster within a specific period of time, as follows:

High = One incident likely within a 10 to 35 year period.

Moderate = One incident likely within a 35 to 75 year period.

Low = One incident likely within a 75 to 100 year period.

The vulnerability scores address the percentage of population or region assets likely to be affected by a major emergency or disaster, as follows:

High = More than 10% affected

Moderate = 1-10% affected

Low = Less than 1% affected

**TABLE 13. Vulnerability and Probability Assessment of Flood**

	Gilliam	Hood River	Morrow	Sherman	Umatilla	Wasco
Vulnerability	L	M	H	H	M	M
Probability	M	M	H	H	H	H

Source: Oregon Emergency Management, July 2003, County Hazard Analysis Scores.

# LANDSLIDES/DEBRIS FLOWS

## Characteristics and Brief History

Landslides include any detached mass of soil, rock, or debris that moves down a slope or stream channel. They are classified according to the type and rate of movement and the kind of material that is transported. Debris flows (mudslides, mudflows, debris avalanches) are a common type of rapidly moving landslide that generally occur during intense rainfall on previously saturated ground. They usually begin on steep hillsides as slumps or slides that liquefy, accelerate to speeds as great as 35 mph or more, and flow down slopes and channels onto gently sloping ground. Their consistency ranges from watery mud to thick, rocky, mud-like wet cement --- dense enough to carry boulders, trees, and automobiles. Debris flows from different sources can combine in canyons and channels, where their destructive power is greatly increased. In general, slopes over 25%, or having a history of landslides, signal a potential problem. Landslides / debris flows occur throughout Region 5, but especially in the Columbia River Gorge (i.e., Hood River and Wasco counties).

The Columbia River Gorge is known for its landslide topography, and many of the landslides are very ancient. Landslide / debris flow conditions are worsened by the same weather conditions that produce severe flooding throughout Oregon: rain-on-snow. In short, it is not uncommon in the Pacific Northwest for mild rainy conditions to follow an abundant snowfall. Such was the case in February 1996, when similar weather conditions produced over 700 landslides/ debris flows throughout the state. During that period three landslides closed Interstate Highway 84 along the Columbia River for a period of time. The weather pattern appears to be cyclic.

Landslides / debris flows in Oregon were particularly noteworthy in 1964, 1982, 1966, 1996, and 1997. Research undertaken by the Oregon Department of Forestry has linked many of these landslides to weather and forest management practices (e.g., roads and harvesting); other research efforts have associated landslides with soil types (e.g., loess in the Blue Mountain region or marine sediments in the Columbia River Gorge) and underlying structure (i.e., type and attitude of rocks, etc.). No doubt all of these things are factors. The most universal link, however, appears to be precipitation, which is the basis of Oregon's debris flow warning system.

Oregon's landslide / debris flow warning system primarily involves three state and one federal agency: the Oregon Department of Forestry (ODF), the Oregon Department of Geology and Mineral Industries (DOGAMI), the Oregon Department of Transportation (ODOT), and the National Oceanic and Atmospheric Administration (NOAA). The warning system is triggered by rainfall and monitored in areas that have been determined to be hazardous.

As the lead agency, ODF is responsible for forecasting and measuring rainfall from storms that may trigger debris flows. Advisories and warnings are issued as appropriate. Information is broadcast over NOAA weather radio and on the Law Enforcement Data System. DOGAMI provides additional information on debris flows to the media; ODOT provides information concerning the location of landslides / debris flows, alternate transportation routes, etc.

**TABLE 15. SIGNIFICANT LANDSLIDES**

DATE	LOCATION	DESCRIPTION
2005	Sherman and Wasco Counties	\$11666.67 in property damage damage estimate includes Jefferson County as well

Source: Hazards & Vulnerability Research Institute (2007). The Spatial Hazard Events and Losses Database for the United States, Version 5.1 [Online Database]. Columbia, SC: University of South Carolina. Available from <http://www.sheldus.org>

## Probability

The probability of rapidly moving landslide occurring depends on a number of factors; these include steepness of slope, slope materials, local geology, vegetative cover, human activity, and water. There is a strong correlation between intensive winter rainstorms and the occurrence of rapidly moving landslides (debris flows); consequently, the Oregon Department of Forestry tracks storms during the rainy season, monitors rain gages and snow melt, and issues warnings as conditions warrant. Given the correlation between precipitation / snow melt and rapidly moving landslides, it would be feasible to construct a probability curve. The installation of slope indicators or the use of more advanced measuring techniques could provide information on slower moving slides.

Geo-engineers with the Oregon Department of Forestry estimate widespread activity about every 20 years; In western Oregon, landslides at a local level can be expected every 2 or 3 years.<sup>2</sup>

## Vulnerability

The probability that Region 5 will experience landslides and the region's vulnerability to their effects are depicted in Table 14 below. These scores are based on an analysis of risk conducted by county emergency program managers, usually with the assistance of a team of local public safety officials.

The probability scores below address the likelihood of a future major emergency or disaster within a specific period of time, as follows:

High = One incident likely within a 10 to 35 year period.

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<sup>2</sup> Mills, 2002.

Moderate = One incident likely within a 35 to 75 year period.

Low = One incident likely within a 75 to 100 year period.

The vulnerability scores address the percentage of population or region assets likely to be affected by a major emergency or disaster, as follows:

High = More than 10% affected

Moderate = 1-10% affected

Low = Less than 1% affected

In some cases, counties either did not rank the hazard or did not find it to be a significant concern. These cases are noted with a dash (-) in the table below.

**TABLE 14. Vulnerability and Probability Assessment of Landslides**

	<b>Gilliam</b>	<b>Hood River</b>	<b>Morrow</b>	<b>Sherman</b>	<b>Umatilla</b>	<b>Wasco</b>
Vulnerability	-	-	M	-	-	L
Probability	-	-	H	-	-	L

Source: Oregon Emergency Management, July 2003, County Hazard Analysis Scores.

# VOLCANO-RELATED HAZARDS

## Characteristics and Brief History

The western boundary of Hood River and Wasco counties coincide with the Cascade Range. Several of their communities are very close to Mt. Hood, a well-known volcanic peak. In addition, both counties are less than 100 miles from Mt. St. Helens and Mt. Adams in Washington State, two prominent volcanoes. The principal risks from these mountains include air borne tephra (ash), lahars, and pyroclastic flows from a Mt. Hood eruption. The primary risks from Mt. St. Helens and Mt. Adams, separated by distance and the Columbia River, include air borne tephra and the possibility of lahars reaching the Columbia River from Mt. Adams. The remaining counties in Region 5 are at risk from air borne tephra from several Cascade volcanoes.

The history of volcanic activity in the Cascade Range is contained in its geologic record; the age of the volcanoes vary considerably. Some lava flows on Washington's Mt. Rainier are thought to be older than 840,000 years; Mt. Saint Helens erupted in May 1980, and continues to be active. In short, all of the Cascade volcanoes are characterized by long periods of quiescence and intermittent activity. And these characteristics make predictions, recurrence intervals, or probability very difficult to attain.

## Probability

Mt. St. Helens remains a probable source of air borne tephra. It has repeatedly produced voluminous amounts of this material and has erupted much more frequently in recent geologic time than any other Cascade volcano. It blanketed Yakima and Spokane, Washington during the 1980 eruption and it continues to be a concern. The location, size and shape of the area affected by tephra fall are determined by the vigor, and duration of the eruption and the wind direction. Because wind direction and velocity vary with both time and altitude, it is impossible to predict the direction and speed of tephra transport more than a few hours in advance.<sup>3</sup>

Mt. Hood's eruptive history can be traced to late Pleistocene times (15-30,000 years ago) and will no doubt continue. But the central question remains: When? The most recent series of events (1900-2000) consisted of small lahars and debris avalanches; Steam explosions and minor tephra falls occurred between 1856 and 1865. Mt. Hood's recent history also includes tephra falls, dome building, lahars, pyroclastic flows and steam explosions. These occurred about 200 years ago. 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

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<sup>3</sup> USGS Open File Report 95-247, p.6.

(1996-20026). For comparison, the 30-year probability of a house being damaged by fire in the United States is about 1 in 90.<sup>4</sup>

The probability of 1 cm or more of tephra fall-out from eruptions anywhere in the Cascade Range, include:

- **Gilliam County:** 1 in 1,000
- **Hood River County:** Between 1 in 500 and 1 in 1,000
- **Morrow County:** 1 in 1,000
- **Sherman County:** 1 in 1,000
- **Umatilla County:** Between 1 in 1,000 and 1 in 5,000
- **Wasco County:** Between 1 in 500 and 1 in 1,000<sup>5</sup>

## Vulnerability

The probability that Region 5 will experience volcano-related hazards and the region's vulnerability to them are depicted in Table 15 below. These scores are based on an analysis of risk conducted by county emergency program managers, usually with the assistance of a team of local public safety officials.

The probability scores below address the likelihood of a future major emergency or disaster within a specific period of time, as follows:

High = One incident likely within a 10 to 35 year period.

Moderate = One incident likely within a 35 to 75 year period.

Low = One incident likely within a 75 to 100 year period.

The vulnerability scores address the percentage of population or region assets likely to be affected by a major emergency or disaster, as follows:

High = More than 10% affected

Moderate = 1-10% affected

Low = Less than 1% affected

In some cases, counties either did not rank the hazard or did not find it to be a significant concern. These cases are noted with a dash (-) in the table below.

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<sup>4</sup> Scott, W.E., et al., 1997.

<sup>5</sup> Sherrod, David et al, 1997

**TABLE 16. Vulnerability and Probability Assessment of Volcano-Related Hazards**

	Gilliam	Hood River	Morrow	Sherman	Umatilla	Wasco
Vulnerability	-	M	-	L	-	H
Probability	-	L	-	L	-	M

Source: Oregon Emergency Management, July 2003, County Hazard Analysis Scores.

# WINDSTORMS

## Characteristics and Brief History

Extreme winds are experienced in all of Oregon's eight regions. The most persistent high winds occur along the Oregon Coast and the Columbia River Gorge, so much so that these areas have special building code standards. All manufactured homes in Region 5 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. The average wind speed at Hood River is 13 mph, not much less than the notoriously windy Texas and Kansas plains whose wind speeds average 15 mph.<sup>6</sup>

A historic overview of windstorms affecting Region 5 is listed in Table 16.

Though their occurrence is somewhat less frequent, Region 5 has also experienced tornadoes. For the most part, these tornadoes have not resulted in major damages. Table 17, below, describes the history of tornadoes in the region.

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<sup>6</sup> Taylor, George H. and Ray Hatton, 1999, *The Oregon Weather Book*.

**Table 17. SIGNIFICANT WINDSTORMS**

DATE	AFFECTED AREA	CHARACTERISTICS
Apr., 1931	N. Central Oregon	Unofficial wind speeds reported at 78 mph. Damage to fruit orchards and timber.
Dec., 1935	W. Columbia Gorge	Damage to automobiles. Wind gusts at 120 mph
Nov. 10-11, 1951	Statewide	Widespread damage; transmission and utility lines; Wind speed 40-60 mph; Gusts 75-80 mph
Dec., 1951	Statewide	Wind speed 60 mph in Willamette Valley. 75 mph gusts. Damage to buildings and utility lines.
Dec., 1955	Statewide	Wind speeds 55-65 mph with 69 mph gusts. Considerable damage to buildings and utility lines
Nov., 1958	Statewide	Wind speeds at 51 mph with 71 mph gusts. Every major highway blocked by fallen trees
Oct., 1962	Statewide	Columbus Day Storm; Oregon's most destructive storm to date. 116 mph winds in Willamette Valley. Estimated 84 houses destroyed, with 5,000 severely damaged. Total damage estimated at \$170 million
Mar., 1971	Most of Oregon	Greatest damage in Willamette Valley. Homes and power lines destroyed by falling trees. Destruction to timber in Lane Co.
Nov., 1981	Statewide	Severe wind storm
Dec., 1987	Umatilla County	Damaging wind storm; 2 fatalities
Mar., 1991	Mid – Columbia / NE Oregon	Severe wind storm
Dec., 1991	N. Central Oregon	Severe wind storm; Blowing dust.
Jan., 1993	Northern Oregon	Severe wind storm. Damage to utilities
Dec., 1995	Statewide	Severe wind storm. Widespread Damage
Oct., 2003	Umatilla County	\$1,000 in property damage
Jan., 2004	Morrow, Umatilla Counties	\$2,500 in property damage
Feb., 2004	Umatilla County	\$3,000 in property damage *damage estimate includes Jefferson County
April, 2004	Hood River County	\$25,000 in property damage
Apr., 2004	Wasco County	\$1,000 in property damage
Oct., 2004	Gilliam, Morrow, Umatilla Counties	\$333.33 in property damage
Dec., 2004	Gilliam, Morrow, Umatilla Counties	\$166.66 in property damage
Dec., 2004	Sherman, Wasco Counties	\$3,333.33 * damage estimate includes Jefferson County

<b>DATE</b>	<b>AFFECTED AREA</b>	<b>CHARACTERISTICS</b>
Feb., 2005	Gilliam, Morrow, Umatilla Counties	\$3,000 in property damage
Mar., 2005	Sherman, Wasco Counties	\$2,500 in property damage *damage estimate includes Jefferson County
Nov., 2005	Umatilla County	\$400
April, 2006	Umatilla County	\$10,000 in property damage in Hermiston
May, 2006	Morrow County	\$500,000 in property damage
May, 2006	Sherman County	\$50,000 in property damage in Grass Valley

Source: Taylor, George H., and Ray Hatton, 1999, The Oregon Weather Book, p.151-157; and FEMA-1405-DR-OR, February 7, 2002, Hazard Mitigation Team Survey Report, Severe Windstorm in Western Oregon. and Hazards & Vulnerability Research Institute (2007). The Spatial Hazard Events and Losses Database for the United States, Version 5.1 [Online Database]. Columbia, SC: University of South Carolina. Available from <http://www.sheldus.org> and U.S. Department of Commerce. National Climatic Data Center. Available from <http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms>

**TABLE 18. SIGNIFICANT TORNAOES**

DATE	LOCATION	RESULT
June, 1888	Morrow County (Lexington, Sand Hill, Pine City)	30 buildings, including two schools destroyed. Six people killed (including two children); 4 people injured
April , 1925	Gilliam County	Warehouse and automobiles destroyed in Condon. About \$10,000 in damages
April , 1957	Gilliam and Morrow Counties	Minor damage (rangeland)
April, 1970	Wasco County	Observed. No damage
May, 1991	Umatilla County	Some damage to wheat fields
July, 1995	Umatilla County	Some damage to wheat fields
May 2006	Morrow County	\$20,000 in property damage

Source: Taylor, George Source: Taylor, George H., and and Ray Hatton, 1999, The Oregon Weather Book, pp. 130-136. U.S. Department of Commerce. National Climatic Data Center. Available from <http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms>

## Probability

The probability of an occurrence has been assessed at the county level. Each of the counties in this region considers the probability for future windstorms to be either high or medium. More information follows below.

## Vulnerability

Many buildings, utilities, and transportation systems within Region 5 are vulnerable to wind damage. This is especially true in open areas, such as natural grasslands or farmlands. It also is true in forested areas, along tree-lined roads and electrical transmission lines, and on residential parcels where trees have been planted or left for aesthetic purposes. Structures most vulnerable to high winds include insufficiently anchored manufactured homes and older buildings in need of roof repair. The Oregon Department of Administrative Service's inventory of state-owned and operated buildings includes an assessment of roof conditions as well as the overall condition of the structure. Oregon Emergency Management has arranged this information by county.

Fallen trees are especially troublesome. They can block roads and rails for long periods, which can affect emergency operations. In addition, up-rooted or shattered trees can down power and/or utility lines and effectively bring local economic activity and other essential facilities to a standstill. Much of the problem may be attributed to a shallow or weakened root system in saturated ground. Uprooted trees growing next to a house have destroyed roofs when they fall as a result of

windstorms. In some situations, strategic pruning may be the answer. Prudent counties will work with utility companies in identifying problem areas and establishing a tree maintenance and removal program.

The probability that Region 5 will experience windstorms and the region’s vulnerability to their effects are depicted in Table 18 below. These scores are based on an analysis of risk conducted by county emergency program managers, usually with the assistance of a team of local public safety officials.

The probability scores below address the likelihood of a future major emergency or disaster within a specific period of time, as follows:

High = One incident likely within a 10 to 35 year period.

Moderate = One incident likely within a 35 to 75 year period.

Low = One incident likely within a 75 to 100 year period.

The vulnerability scores address the percentage of population or region assets likely to be affected by a major emergency or disaster, as follows:

High = More than 10% affected

Moderate = 1-10% affected

Low = Less than 1% affected

In some cases, counties either did not rank the hazard or did not find it to be a significant concern. These cases are noted with a dash (-) in the table below.

**TABLE 19. Vulnerability and Probability Assessment of Windstorms**

	Gilliam	Hood River	Morrow	Sherman	Umatilla	Wasco
Vulnerability	-	H	H	M	H	M
Probability	-	H	M	H	H	M

Source: Oregon Emergency Management, July 2003, County Hazard Analysis Scores.

# WINTERSTORMS

## Characteristics and Brief History

Within the State of Oregon, Region 5 communities 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. 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. And local residents also experience problems. 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. Table 19 provides an historic overview of severe winter conditions within Region 5.

## Probability

The recurrence interval for severe winter storms throughout Oregon is about every 13 years, however, there can be many localized storms between these periods.

**TABLE 20. SIGNIFICANT WINTERSTORMS**

DATE	LOCATION	REMARKS
Dec., 1861	Entire state	Storm produced between 1 and 3 feet of snow throughout Oregon
Dec., 1884	Columbia Basin	Heavy snowfall. The Dalles received 29.5 inches in one day.
Dec., 1885	Wasco County	Most snow ever recorded (6-10 feet). Trains had difficulty reaching Portland.
Dec., 1892	Northern counties	Between 15 and 30 inches of snow fell throughout the northern counties
Jan., 1916	Entire state	Two storms. Very heavy snowfall, especially in mountainous areas
Jan., Feb., 1937	Entire state	Deep snow drifts
Jan., 1950	Entire state	Record snow falls; Property damage throughout state.
Mar., 1960	Entire state	Many automobile accidents; Two fatalities
Jan., 1969	Entire state	Heavy snow throughout state
Jan., 1980	Entire State	Series of string storms across state. Many injuries and power outages.
Feb., 1985	Entire state	Two feet of snow in northeast mountains; Downed power lines. Fatalities
Feb., 1986	Central / Eastern Oregon	Heavy snow in Deschutes Basin. Traffic accidents; Broken power lines
Mar., 1988	Entire state	Strong winds; Heavy snow
Feb., 1990	Entire state	Heavy snow throughout state
Nov., 1993	Cascade Mountains	Heavy snow throughout region
Mar., 1994	Cascade Mountains	Heavy snow throughout region
Winter 1998-99	Entire state	One of the snowiest winters in Oregon history (Snowfall at Crater Lake: 586 inches)
Jan., 2005	Gilliam, Morrow, Umatilla Counties	33 injuries

Source: Taylor, George and Ray Hatton, 1999, The Oregon Weather Book, p.118-122.

Source: Hazards & Vulnerability Research Institute (2007). The Spatial Hazard Events and Losses Database for the United States, Version 5.1 [Online Database]. Columbia, SC: University of South Carolina. Available from <http://www.sheldus.org>

## Vulnerability

The probability that Region 5 will experience winterstorms and the region's vulnerability to their effects are depicted in Table 20 below. These scores are based on an analysis of risk conducted by county

emergency program managers, usually with the assistance of a team of local public safety officials.

The probability scores below address the likelihood of a future major emergency or disaster within a specific period of time, as follows:

High = One incident likely within a 10 to 35 year period.

Moderate = One incident likely within a 35 to 75 year period.

Low = One incident likely within a 75 to 100 year period.

The vulnerability scores address the percentage of population or region assets likely to be affected by a major emergency or disaster, as follows:

High = More than 10% affected

Moderate = 1-10% affected

Low = Less than 1% affected

**TABLE 21. Vulnerability and Probability Assessment of Winterstorms**

	Gilliam	Hood River	Morrow	Sherman	Umatilla	Wasco
Vulnerability	H	H	H	M	H	H
Probability	H	H	H	M	H	H

Source: Oregon Emergency Management, July 2003, County Hazard Analysis Scores.

# Appendix E

## Economic Analysis of Natural Hazard Mitigation Projects

This appendix was developed by the Community Service Center's Oregon Natural Hazards Workgroup at the University of Oregon. 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 provide the details of economic analysis methods that can be used 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 there 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, avoided 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 of 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 purchasers. 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**

Conducting detailed benefit/cost or cost-effectiveness analysis for every possible mitigation activity could be very time consuming and may not be practicable. 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 these methods is the STAPLE/E Approach.

Using STAPLE/E criteria, mitigation activities can be evaluated quickly by steering committees in a systematic 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.

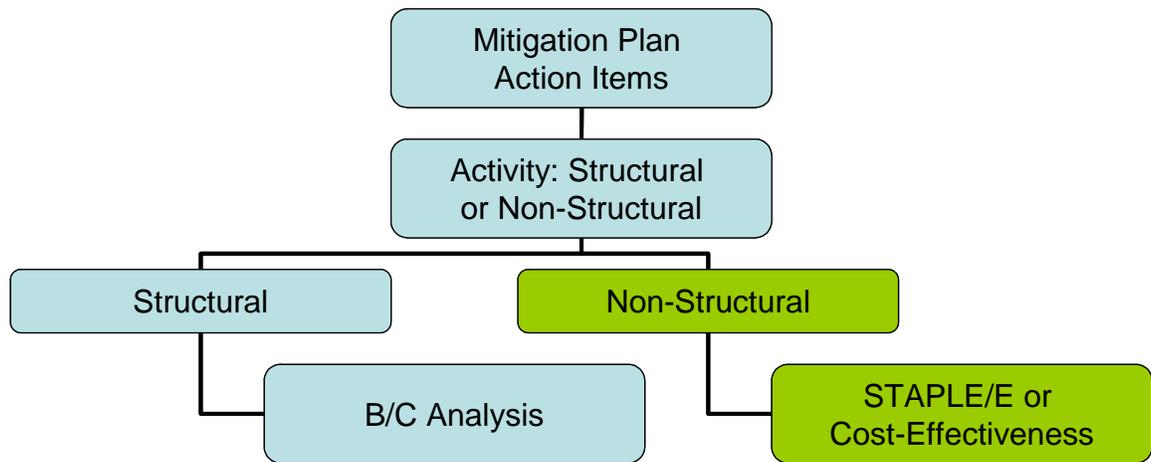
- How will the action impact the environment?
- Will the action need environmental regulatory approvals?
- Will it meet local and state regulatory requirements?
- Are endangered or threatened species likely to be affected?

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 A.1: Economic Analysis Flowchart**



Source: Community Service Center's Oregon Natural Hazards Workgroup at the University of Oregon, 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 project 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 expected future cost expressed in today's dollars. If the net present value is greater than the project 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. Many communities are looking towards developing multi-objective 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**

CUREe Kajima Project, *Methodologies For Evaluating The Socio-Economic Consequences Of Large Earthquakes*, Task 7.2 Economic Impact Analysis, Prepared by University of California, Berkeley Team, Robert A. Olson, VSP Associates, Team Leader; John M. Eidinger, G&E Engineering Systems; Kenneth A. Goettel, Goettel and Associates Inc.; and Gerald L. Horner, Hazard Mitigation Economics Inc., 1997.

Federal Emergency Management Agency, *Benefit/Cost Analysis of Hazard Mitigation Projects*, Riverine Flood, Version 1.05, Hazard Mitigation Economics Inc., 1996.

Federal Emergency Management Agency *Report on Costs and Benefits of Natural Hazard Mitigation*. Publication 331, 1996.

Goettel & Horner Inc., *Earthquake Risk Analysis Volume III: The Economic Feasibility of Seismic Rehabilitation of Buildings in The City*

*of Portland*, Submitted to the Bureau of Buildings, City of Portland, August 30, 1995.

Goettel & Horner Inc., *Benefit/Cost Analysis of Hazard Mitigation Projects* Volume V, Earthquakes, Prepared for FEMA's Hazard Mitigation Branch, October 25, 1995.

Horner, Gerald, *Benefit/Cost Methodologies for Use in Evaluating the Cost Effectiveness of Proposed Hazard Mitigation Measures*, Robert Olson Associates, Prepared for Oregon State Police, Office of Emergency Management, July 1999.

Interagency Hazards Mitigation Team, *State Hazard Mitigation Plan*, (Oregon State Police – Office of Emergency Management, 2000).

Risk Management Solutions, Inc., *Development of a Standardized Earthquake Loss Estimation Methodology*, National Institute of Building Sciences, Volume I and II, 1994.

VSP Associates, Inc., *A Benefit/Cost Model for the Seismic Rehabilitation of Buildings*, Volumes 1 & 2, Federal Emergency Management Agency, FEMA Publication Numbers 227 and 228, 1991.

VSP Associates, Inc., *Benefit/Cost Analysis of Hazard Mitigation Projects: Section 404 Hazard Mitigation Program and Section 406 Public Assistance Program, Volume 3: Seismic Hazard Mitigation Projects*, 1993.

VSP Associates, Inc., *Seismic Rehabilitation of Federal Buildings: A Benefit/Cost Model*, Volume 1, Federal Emergency Management Agency, FEMA Publication Number 255, 1994.

# Appendix F

## Existing Plans, Policies, and Programs in Sherman County

The following appendix summarizes the existing plans, policies and programs in Sherman County. The first section covers plans and policies on the books for the County and the second section covers social service providers.

### Existing Plans and Policies

The Disaster Mitigation Act of 2000 requires that communities identify a process where the requirements of the mitigation plan get incorporated into other planning mechanisms. The purpose of this appendix is to document those existing plans and policies in an effort to assist the community in identifying potential means to better integrate mitigation into the day-to-day decisions of local governments.

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.<sup>1</sup>

The 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 to remain current, and maximizes the county's resources.

Below is a table of the plans and policies that currently exist in Sherman County. For each plan or policy, the table provides information on its author, its purpose, and how it relates to natural hazard mitigation. The information provided in the table can also be used to complete action item worksheets by identifying rationale and potential ideas for implementation.

Sherman County  
Existing Plans, Policies Programs

Name	Date of Last Revision	Author/Owner	Description	Relation to Natural Hazard Mitigation
Comprehensive Land Use Plan, Sherman County, Oregon	1994	Sherman County	Provides legal authority for land use planning, development, and resource conservation and preservation. It also provides for public involvement and the consideration of short and long term implications.	<ul style="list-style-type: none"> <li>• Guides land use within the county, including natural resources and areas subject to natural hazards.</li> <li>• Goals of preserving resource and protecting life can be linked to action items that guide development to reduce the county's risk to natural hazards.</li> <li>• Can be linked to action items for how the County will implement Oregon Statewide Planning Goal 7 requirements.</li> </ul>
Sherman County Zoning, Subdivision, Partitioning, and Land Development Ordinance	1994	Sherman County Planning Commission	Provides the County with the authority to address zoning provisions within the county. Goals include the promotion of public health and safety.	<ul style="list-style-type: none"> <li>• Guides growth and development.</li> <li>• Can be linked to action items that shape growth and development so that they do not increase the county's risk to natural hazards.</li> <li>• Can be linked to action items that protect natural and historic areas and areas subject to natural hazards.</li> <li>• Can be linked to action items for how the County will implement Oregon Statewide Planning Goal 7 requirements.</li> </ul>
Sherman County: From Vision To Action: Strategic Plan for Economic Development	1995	Sherman County with Peter F. Dobert and Associates	Provides strategic goals and strategies and recommends actions that the county can take to plan and prepare for future economic development. It is intended to provide guidance for county-wide economic development.	<ul style="list-style-type: none"> <li>• Influences the development of the local economy and businesses.</li> <li>• Can be linked to action items that assist local businesses in preparing for, and being more resistant to, natural hazards.</li> </ul>

Sherman County  
Existing Plans, Policies Programs

Name	Date of Last Revision	Author/Owner	Description	Relation to Natural Hazard Mitigation
Community Shelter Plan, Sherman County, Oregon: Report II, Emergency Information Readiness	1968	University of Oregon Bureau of Governmental Research and Service	Describes policies and procedures for disseminating information to the public about the shelter plan and what to do in the event of an emergency.	<ul style="list-style-type: none"> <li>• Can be linked to action items that establish pre-disaster emergency response strategies.</li> </ul>
North Central Oregon: Gilliam, Grant, Morrow, Sherman, Wasco and Wheeler Counties; Strategic Plan for Tourism	1996	Michael Wetter and Associates	Provides recommendations for how the North Central Oregon Region can use collective resources to develop local tourism industries and local economies.	<ul style="list-style-type: none"> <li>• Can be linked to action items that help the County prepare for assisting visitors to the county in the event of a natural hazard.</li> <li>• Can be linked to action items that address tourism in areas subject to natural hazards without increasing the County's vulnerability to natural hazards.</li> </ul>

## Existing Social Service Providers

Social systems can be defined as community organizations and programs that provide social and community-based services, such as health care or housing assistance, to the public. In planning for natural hazard mitigation, it is important to know what social systems exist within the community because of their existing connections to the public. . Often times, actions identified by the plan involve communicating with the public, or specific subgroups within the population (e.g. elderly, children, low income). The County can use existing social systems as resources for implementing such communication related activities because these service providers already work directly with the public and have already established a trusted method for communicating with these subgroups. On a daily basis social service providers work and communicate directly with the public on a number of issues, one of which could be natural hazard preparedness and mitigation.

The following is a brief explanation of how the communication process works and how the community's existing social service providers could be used to provide natural hazard related messages to their clients.

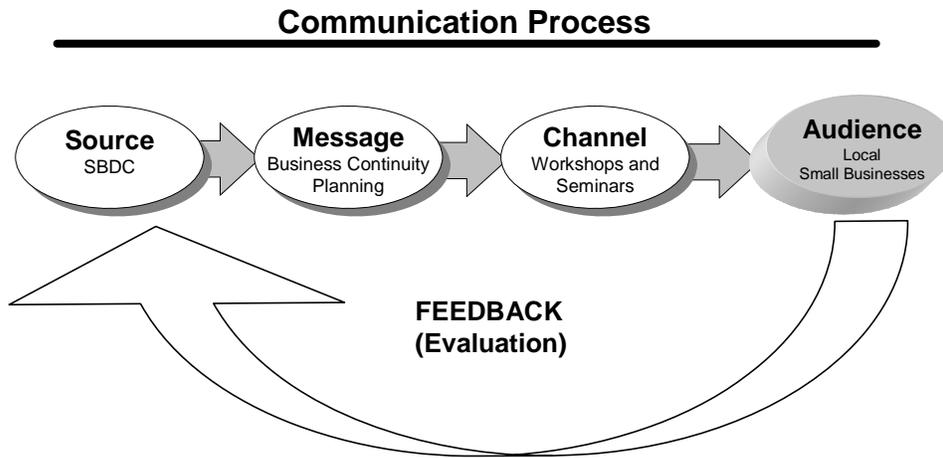
There are five essential elements for communicating effectively to a target audience:

- The **source** of the message must be credible,
- The **message** must be appropriately designed,
- The **channel** for communicating the message must be carefully selected,
- The **audience** must be clearly defined, and

The recommended action must be clearly stated and a **feedback** channel established for questions, comments and suggestions.

An example of an existing social system whose communication system can be linked to natural hazard mitigation is the Columbia Gorge Community College's Small Business Development Center (SBDC). The SBDC (the source) provides local businesses (the audience) with information on business contingency planning (the message) through workshops and seminars (the channel). To target small businesses, (insert name) County can provide the SBDC with information on developing business continuity plans and strategies for recovering from a natural hazard. When local small businesses attend the SBDC's workshops and seminars they can pick up this natural hazard mitigation information. This example communication process is graphically presented in *Figure F.1*:

**Figure F.1 Communication Process**



Source: Adapted from the U.S. Environmental Protection Agency Radon Division's outreach program

The following table provides a list of existing social systems within Sherman County. The table provides information on each organization or program's service area, types of services offered, populations served, and how the organization or program could be involved in natural hazard mitigation. The three involvement methods identified in the table are defined below:

- Education and outreach – organization could partner with the community to educate the public or provide outreach assistance on natural hazard preparedness and mitigation.
- Information dissemination – organization could partner with the community to provide hazard related information to target audiences.
- Plan/project implementation – organization may have plans and/or policies that may be used to implement mitigation activities or the organization could serve as the coordinating or partner organization to implement mitigation actions.

The information provided in the table can also be used to complete action item worksheets by identifying potential coordinating agencies and internal and external partners.

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<sup>1</sup> Burby, Raymond J., ed. 1998. *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*.

Sherman County  
Social Service Providers

Name and Contact Information	Description	Service Area	Populations Served						Potential Involvement with Natural Hazard Mitigation
			Businesses	Children	Disabled	Elders	Families	Low Income	
<b>ABC Huskies Day Care</b> Tel: 541-442-5024	Provides childcare services.	Sherman County		✓					<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>American Red Cross:</b> Oregon Mountain River Chapter 6839 SW Simpson (97701) Bend, OR 97008 Tel: 541-382-2142 Fax: 541-382-2405	Collect and provide blood and plasma to the community.	Gilliam, Hood River, Jefferson, Morrow, Sherman, Umatilla, Wheeler, Wasco Counties		✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> <li>• Plan/project implementation</li> </ul>
<b>Arc of the Mid-Columbia</b> P.O Box 521 The Dalles, Oregon, 97508 Website: <a href="http://community.gorge.net/arcofmidcolumbia">http://community.gorge.net/arcofmidcolumbia</a>	Provide educational and recreational services to children and adults with developmental disabilities.	Gilliam, Hood River, Sherman, and Wasco Counties		✓	✓		✓		<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Boy Scouts of America -</b> Mid Columbia District Tel: 541- 298-5022	Provides youth programs.	Mid-Columbia Region		✓				✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Campfire Boys and Girls -</b> Mt. Hood Council Tel: 360-816-0570 Fax: 503-656-6356 5427 Glen Echo Ave. Gladstone, OR 97027	Provide youth programs.	Hood River, Sherman, and Wasco Counties		✓					<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Columbia Gorge Center</b> 2940 Thomsen Road Hood River, Oregon, 97031 Tel: 541-386-3520 Fax: 541-386-7788 Website: <a href="http://www.cgc-direct.com">www.cgc-direct.com</a>	Provide residential and vocational services for people with disabilities.	Mid-Columbia Region			✓				<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>

Sherman County  
Social Service Providers

Name and Contact Information	Description	Service Area	Populations Served						Potential Involvement with Natural Hazard Mitigation
			Businesses	Children	Disabled	Elders	Families	Low Income	
<b>Department of Human Services</b> 700 Union Street The Dalles, Oregon, 97058 Webpage: <a href="http://egov.oregon.gov/DHS/">http://egov.oregon.gov/DHS/</a>	Provide self-sufficiency, medical, mental health, services and assistance for children, the elderly, and people with disabilities.	Mid-Columbia Region		✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> <li>• Plan/project implementation</li> </ul>
<b>Eastern Oregon Support Services Brokerage</b> P.O Box 329 Hood River, OR 97031 Tel: 541-387-3600 Fax 541-387-2999 Website: <a href="http://www.eossb.org">www.eossb.org</a>	Provides consulting and self-sufficiency services to individuals with developmental disabilities.	Umatilla, Morrow, Wallowa, Malheur, Union, Baker, and Harney Grant Counties			✓				<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Gorge Kids</b> P.O Box 1233 Hood River, Oregon, 97401 Tel: 541-386-6250 Fax: 541386-6241 Email: <a href="mailto:info@gorgekids.com">info@gorgekids.com</a> Website: <a href="http://www.gorgekids.com">www.gorgekids.com</a>	Provides child-related information, events, and activities.	Mid-Columbia Region		✓				✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Hospice of the Gorge</b> Tel: 541-296-3228 (The Dalles) 541-387-6449 (Hood River)	Provides medical services and personnel, as well as in-home medical care.	Mid-Columbia Region			✓				<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>

Sherman County  
Social Service Providers

Name and Contact Information	Description	Service Area	Populations Served						Potential Involvement with Natural Hazard Mitigation
			Businesses	Children	Disabled	Elders	Families	Low Income	
<b>Legal Aid Service - Clackamas &amp; Mid Columbia Gorge</b> 421 High Street, Suite 110, Oregon City, Oregon, 97405 Tel: 503-655-2518 Fax 503-655-2701 <a href="http://www.eoddr.com/crisis_services.html">http://www.eoddr.com/crisis_services.html</a>	Provides legal aid services to low-income residents.	Clackamas, Hood River, Wasco and Sherman Counties						✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Lifespan Respite Care Network</b> Tel: 541-565-3200 110 Main St., #2 Moro, OR 97039	Provides respite care services.	Sherman and Wheeler Counties			✓				<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Moro Medical Center</b> PO Box 186 Moro, OR 97039-0186 Tel: 541-565-3325 Fax: 541-565-3617	Provides health and rural health clinic services.	Sherman County		✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> <li>• Plan/project implementation</li> </ul>
<b>Mid-Columbia Center For Living</b> 1610 Woods Court, Hood River, Oregon, 97031	Provides assistance for mental, health, alcohol, drug abuse, and gambling addiction treatment.	Gilliam, Hood River, Sherman, and Wasco Counties			✓				<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>

Sherman County  
Social Service Providers

Name and Contact Information	Description	Service Area	Populations Served						Potential Involvement with Natural Hazard Mitigation
			Businesses	Children	Disabled	Elders	Families	Low Income	
<b>Mid-Columbia Community Action Council, Inc</b> 312 East 4th Street, The Dalles, Oregon, 97508 Tel: 541-298-5131 Fax: 541-298-5141 Website: www.mccac.com	Evaluates the programs aimed at reducing poverty, fosters community partnerships, and provides resources to reduce poverty.	Hood River, Sherman, and Wasco Counties						✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Mid-Columbia Council of Governments</b> 1102 Twelfth Street Hood River, OR 97031 Tel: 541-386-6300 Fax: 541-386-2189	Provides services to businesses and families.	Gilliam, Hood River, Sherman, Wasco, and Wheeler Counties	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Mid-Columbia Economic Development District</b> 515 E. 2nd Street The Dalles, OR 97058 Tel: 541-296-2266 Website: <a href="http://www.mcedd.org/">http://www.mcedd.org/</a>	Provides economic development services to communities	Hood River, Sherman, and Wasco Counties	✓						<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> <li>• Plan/project implementation</li> </ul>
<b>Mid-Columbia Housing</b> 312 Court Street, Ste. 419 The Dalles, OR 97058 Tel: 541-296-5462 TTY: 800-735-1232 Fax: 541-296-8570	Provides Section 8 Housing Choice vouchers and services to low-income and developmentally disabled residents	Hood River, Sherman, and Wasco Counties			✓			✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>

Sherman County  
Social Service Providers

Name and Contact Information	Description	Service Area	Populations Served						Potential Involvement with Natural Hazard Mitigation
			Businesses	Children	Disabled	Elders	Families	Low Income	
<b>Mid-Columbia Senior and Disabled Services</b> 1113 Kelly Ave. The Dalles, OR 97058 Tel: 541-386-9080		Mid-Columbia Region			✓	✓			<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Mid-Columbia Senior Center</b> 1112 W 9th St The Dalles, OR 97058 Tel: 541-296-4788		Mid-Columbia Region				✓			<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Next Door, Inc - Residential Services</b> P.O Box 661, Hood River, Oregon, 97031 Tel: 541-386-6665 Fax: 541-386-5440 Website: www.nextdoorinc.org	Provides services for children			✓					<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Senior Health Services, Sunshine Club Adult Daycare</b> Hood River Memorial Hospital Tel: 541-387-6246	Provides health services for senior citizens.					✓			<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Sherman County Ambulance</b> Tel: 541-565-3100	Provides ambulance service for the county	Sherman County		✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> <li>• Plan/project implementation</li> </ul>
<b>Sherman Pre-School</b> Tel: 541-565-3320	Provides childcare services.	Sherman County		✓					<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>

Sherman County  
Social Service Providers

Name and Contact Information	Description	Service Area	Populations Served						Potential Involvement with Natural Hazard Mitigation
			Businesses	Children	Disabled	Elders	Families	Low Income	
<b>Special Olympics</b> 922 East 2nd Street The Dalles, Oregon, 97508 Website: <a href="http://www.specialolympics.com">www.specialolympics.com</a>	Provides sports programs for people with developmental disabilities.	Gilliam, Hood River, Sherman, and Wasco Counties		✓	✓			✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>The Gorge Translink - Public Transportation</b> 201 Federal Street The Dalles, Oregon, 97058 Tel: 541-298-5345 Fax: 541-296-5674 Website: <a href="http://www.gorgetranslink.org">www.gorgetranslink.org</a>	Provides public transportation for people in the Mid-Columbia region to travel within the are or between counties.	Skamania, Klickitat, Hood River, Wasco, and Sherman Counties	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> <li>• Plan/project implementation</li> </ul>
<b>Transportation Network</b> Tel: 541-296-7595 877-875-4657	Provide transportation services to and from medical appointments for people without transportation	Mid-Columbia Region			✓	✓		✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Wasco Sherman Public Health Department</b> 419 East 7th Street The Dalles, Oregon, 97058 Tel: 541-506-2600 Website: <a href="http://www.wshd.org">www.wshd.org</a>	Provide public health services.	Sherman and Wasco Counties.		✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>
<b>Women, Infants, and Children's Program (WIC)</b> Tel: 541-387-6882 Fax: 541-386-9181	Provides health and nutrition assistance and programs.	Mid-Columbia Region		✓				✓	<ul style="list-style-type: none"> <li>• Education and outreach</li> <li>• Information dissemination</li> </ul>

# Appendix G: Open for Business

The purpose of this section is to document the Open for Business training that took place in conjunction with the development of this natural hazard mitigation plan.

# Open for Business Workshop Summary

ONHW, with commitment from the Institute for Business & Home Safety (IBHS), provided individuals in the Mid-Columbia region with access to, and use of, the IBHS interactive, web-based *Open for Business* property protection and disaster recovery planning tool. The access was provided in two classes, one located in Hermiston, Oregon on May 24<sup>th</sup>, 2006 and the second in The Dalles, Oregon on May 25<sup>th</sup>, 2006. The following agencies and organizations were invited to attend: agencies providing start-up and ongoing counseling services to micro- and small businesses in low-income areas, such as the Statewide Small Business Development Center; agencies providing housing services to hundreds of low-income residents, such as County Housing Authorities, which also employs low-income people; and disaster assistance agencies serving at-risk populations, such as food banks and the American Red Cross. Any remaining spaces were made available to: micro- or small business start-up companies; and established micro- or small businesses.

The classes were organized as train-the-trainer classes, so that the agency personnel and the business people could: 1. Understand the importance of disaster planning; 2. Learn how to navigate the interactive, web-based *Open for Business* property protection and disaster recovery planning tool; 3. Start to develop their own plans during the training; 4. Learn how to communicate the importance of developing and utilizing plans for property protection and recovery from business interruption to their constituencies and/or colleagues, in order to institutionalize disaster safety into every day decision making.

## Recruitment Process

The Oregon Natural Hazards Workgroup assembled a list of social service providers from basic internet searches and representative small businesses from Chamber of Commerce Membership databases for the seven counties in the region. E-mail and/or mailed invitations were sent to over 200 agencies, organizations and businesses in the region. Recruitment materials can be found on the following page. The following agencies and organizations attended the workshop:

- Umatilla/Morrow County Housing Authority
- Irrigon Chamber of Commerce
- Pendleton Chamber of Commerce
- Small Business Development Center – Blue Mountain Community College
- Small Business Development Center – Columbia Gorge Community College
- Wasco County Human Services Department

April 26, 2006

Greetings!

You are invited to attend the *Open for Business Toolkit* Training, co-hosted by the Oregon Natural Hazards Workgroup (ONHW) and the Institute for Business and Home Safety (IBHS).

The Open for Business Toolkit is an interactive, web-based program that businesses can follow to develop customized property protection and recovery plans (also known as contingency plans), which are then stored securely on-line for future reference and updating.

Why should your business attend the *Open for Business Toolkit* Training?

- To learn how to use the toolkit to develop disaster preparedness and recovery plans (also known as business continuity plans) to make your business better prepared for disasters;
- By preparing your business, you are helping to make the regional economy more disaster resistant; and
- It's free, the interactive toolkit is valued at \$2,000).



Who should attend the *Open for Business Toolkit* Training:

- Owners and managers;
- Risk managers; and/or
- Payroll and financial staff.

Two dates and locations are being offered for the *Open for Business Toolkit* training.

**Wednesday, May 24, 2006**

1:30 pm – 5:00 pm  
Blue Mountain Community College  
980 SE Columbia Drive  
Hermiston, OR 97838

**Thursday, May 25, 2006**

1:30 pm – 5:00 pm  
Columbia Gorge Community College  
400 E. Scenic Drive  
The Dalles, OR 97058

Space is limited in each session, so please RSVP as soon as possible. If you are interested in attending the training, please contact Linda White at (541) 346-3889 or [lindaw@uoregon.edu](mailto:lindaw@uoregon.edu) and indicate which training date you would prefer to attend.

# Even if the worst happens -



## ***Open for Business<sup>sm</sup>* -**

A Disaster Planning Toolkit  
for the Small Business Owner

## **PLAN NOW TO STAY...**

### **DISASTER READINESS SELF-ASSESSMENT QUESTIONS**

1. Are you concerned that your normal business operations might be interrupted by a natural or human-caused disaster?
2. Have you determined what parts of your business need to be operational as soon as possible following a disaster, and planned how to resume those operations?
3. Do you and your employees have a disaster response plan in place to help assure your safety and to take care of yourselves until help can arrive?
4. Could you communicate with your employees if a disaster happened during work hours or after work hours?
5. Can your building withstand the impact of a natural disaster, and are your contents and inventory sufficiently protected so they will not be damaged?
6. Are your vital records protected from the harm that could be caused by a disaster?
7. Are you prepared to stay open for business if your suppliers cannot deliver, your markets are inaccessible, or basic needs (e.g. water, sewer, electricity, transportation) are unavailable?
8. Do you have plans to stay open for business, even if you cannot stay in or reach your place of business?
9. Have you worked with your community — public officials and other businesses — to promote disaster preparedness and plan for community recovery?
10. Have you consulted with an insurance professional to determine if your insurance coverage is adequate to help you get back in business following a disaster?



May 2, 2006

Greetings!

You are invited to attend the *Open for Business Toolkit* Training, co-hosted by the Oregon Natural Hazards Workgroup (ONHW) and the Institute for Business and Home Safety (IBHS).

The Open for Business Toolkit is an interactive, web-based program that organizations can follow to develop customized property protection and recovery plans (also known as contingency plans), which are then stored securely on-line for future reference and updating.

Why should your organization attend the *Open for Business Toolkit* Training?

- To learn how to use the toolkit to develop disaster preparedness and recovery plans (also known as business continuity plans) to make your organization better prepared for disasters;
- To use the training's information to help other businesses and organizations in your community develop their own preparedness and recovery plans; and
- There is no training fee, (the interactive toolkit is valued at \$2,000).



Who should attend the *Open for Business Toolkit* Training:

- Administrators and managers;
- Staff that provide direct assistance to businesses;
- Risk managers; and/or
- Payroll and financial staff.

Two dates and locations are being offered for the *Open for Business Toolkit* training.

**Wednesday, May 24, 2006**

1:30 pm – 5:00 pm  
Blue Mountain Community College  
980 SE Columbia Drive  
Hermiston, OR 97838

**Thursday, May 25, 2006**

1:30 pm – 5:00 pm  
Columbia Gorge Community College  
400 E. Scenic Drive  
The Dalles, OR 97058

The opportunity to participate in the training is being offered on a first-come-first serve basis. As a local service provider, you have been given the first opportunity to attend. If you are interested in attending the training, please contact Linda White at (541) 346-3889 or [lindaw@uoregon.edu](mailto:lindaw@uoregon.edu) and indicate which training date you would prefer to attend. Please reserve your place as soon as possible. Remaining spaces will be offered to local business owners on May 5th.

# Even if the worst happens -



## ***Open for Business<sup>sm</sup>* -**

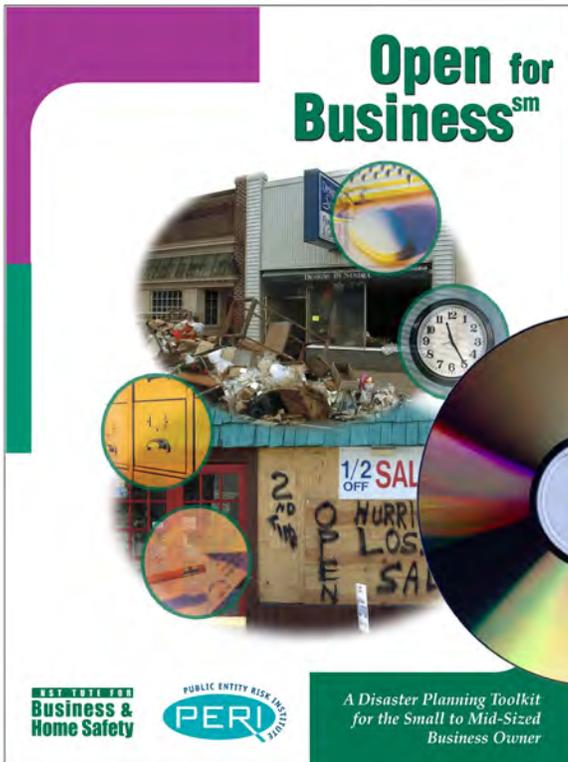
A Disaster Planning Toolkit  
for the Small Business Owner

## **PLAN NOW TO STAY...**

### **DISASTER READINESS SELF-ASSESSMENT QUESTIONS**

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9. Have you worked with your community — public officials and other businesses — to promote disaster preparedness and plan for community recovery?
10. Have you consulted with an insurance professional to determine if your insurance coverage is adequate to help you get back in business following a disaster?





## *Open for Business<sup>sm</sup> Toolkit*

(includes CD-ROM)

***Wildfires, floods, hurricanes/  
high winds/tornadoes, earth-  
quakes and freezing weather.***

Loss of power, waterline breaks,  
and computer crashes.

Disasters come in many sizes, but they can  
often mean big trouble for businesses, large  
and small. In fact, when disasters force busi-  
nesses to shut down, 25% will never reopen.

But you can stay ***Open for Business<sup>sm</sup>***,  
with advanced planning and the right tools.

That's why the Institute for Business & Home Safety (IBHS) created ***Open for Business<sup>sm</sup>***, a comprehensive disaster planning toolkit in booklet and CD-ROM formats. The easy-to-use guide helps you reduce the potential for loss, should disaster strike, and reopen quickly should you be forced to close. This creates savings for your business and also benefits your employees and customers who rely on it.

The kit includes valuable worksheets to help you develop a property protection and business continuity plan, and gives you tips on disaster protection and recovery. This information can help you identify the hazards your business faces, plan for and reduce the impact of disaster, keep your doors open after a disaster hits, advise you on disaster supplies, and help make your business disaster resilient.

Single copies of the toolkit are available free! You can download ***Open for Business<sup>sm</sup>*** from [www.ibhs.org](http://www.ibhs.org), or you can email [info@ibhs.org](mailto:info@ibhs.org) or call 1-866-657-IBHS (4247) to request a single copy without charge. Multiple copies can be ordered from the Public Entity Risk Institute, [www.riskinstitute.org](http://www.riskinstitute.org).



[www.riskinstitute.org](http://www.riskinstitute.org)

**INSTITUTE FOR  
Business &  
Home Safety<sup>®</sup>**  
[www.ibhs.org](http://www.ibhs.org)

*Taking the Lead in Property Loss Reduction<sup>sm</sup>*

The Institute for Business & Home Safety's mission is to reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters.