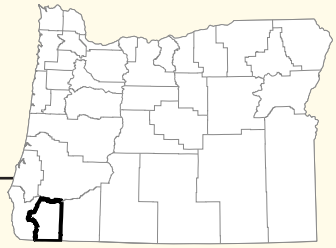
Josephine County

Multi-Jurisdictional Natural Hazards Mitigation Plan

Prepared for: Josephine County and the city of Grants Pass



Photos: Gary Halvorson, Oregon State Archives

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Special Thanks & Acknowledgements

This natural hazards mitigation plan was developed through a regional partnership funded by the Federal Emergency Management Agency's Pre-Disaster Mitigation Competitive Grant Program. The Mid-Willamette Valley grant was awarded to update the natural hazard mitigation plans for the region. This regional effort used a plan update process, plan templates, and plan development support provided by the Oregon Partnership for Disaster Resilience.

Regional partners included:

- Oregon Partnership for Disaster Resilience at the University of Oregon's Community Service Center
- Oregon Emergency Management
- Federal Emergency Management Agency, Region X
- Josephine County

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Josephine County
Natural Hazards Mitigation Plan

Table of Contents

Volume I: Natural Hazard Mitigation Plan

Executive Summary……..i
Section 1: Introduction……1-1
Section 2: Community Overview…….. 2-1
Section 3: Mission, Goals, and Action Items……3-1
Section 4: Hazard Identification and Risk Assessment …..……4-1
Section 5: Plan Implementation and Maintenance…….. 5-1

Volume II: Grants Pass Addendum

Section 1: Community Overview and Risk Assessment ……...1-1
Section 2: Mitigation Plan Action Items…..…….. 2-1

Volume III: Mitigation Resources

Appendix A: Josephine County Action Item Forms……...A-1
Appendix B: Planning and Public Process……...B-1
Appendix C: Economic Analysis
of Natural Hazard Mitigation Projects…...……...C-1
Appendix D: Regional Profile……..……. D-1
Appendix E: Grant Programs……..……..E-1

Volume 1
Executive Summary

What is Natural Hazard Mitigation?

Natural hazard mitigation is defined as 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; education and outreach to targeted audiences, such as Spanish speaking residents, or the elderly. Mitigation is the responsibility of individuals, private businesses and industries, state and local governments, and the federal government.

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

Why Develop a Mitigation Plan?

Josephine County updated this Natural Hazards Mitigation Plan and added multijurisdictional components in an effort to reduce future loss of life and damage to property resulting from natural hazards. This plan was developed with and for the following jurisdictions: Josephine County (including Cave Junction), and through an addendum, the City of Grants Pass. 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 hazards.

A natural hazard mitigation plan can assist the community in understanding what puts the community at risk. By identifying and understanding the relationship between natural hazards, vulnerable systems, and existing capabilities, communities in Josephine County become better equipped to identify and implement actions aimed at reducing the overall risk of hazards.

This plan focuses on the primary natural hazards that could *affect Josephine County,* Oregon, which include wildfire, flood, earthquake, severe weather, landslide, drought, and volcanic activity. The dramatic increase in the costs associated with natural disasters over the past decades has fostered interest

in identifying and implementing effective means of reducing vulnerability. A report submitted to Congress by the National Institute of Building Science's Multi-hazard Mitigation Council (MMC) highlights that for every dollar spent on mitigation, society can expect an average savings of $4.[i] This multi-jurisdictional Natural Hazards Mitigation Plan is intended to assist all participating jurisdictions in reducing its risk from natural hazards by identifying resources, information, and strategies for risk reduction.

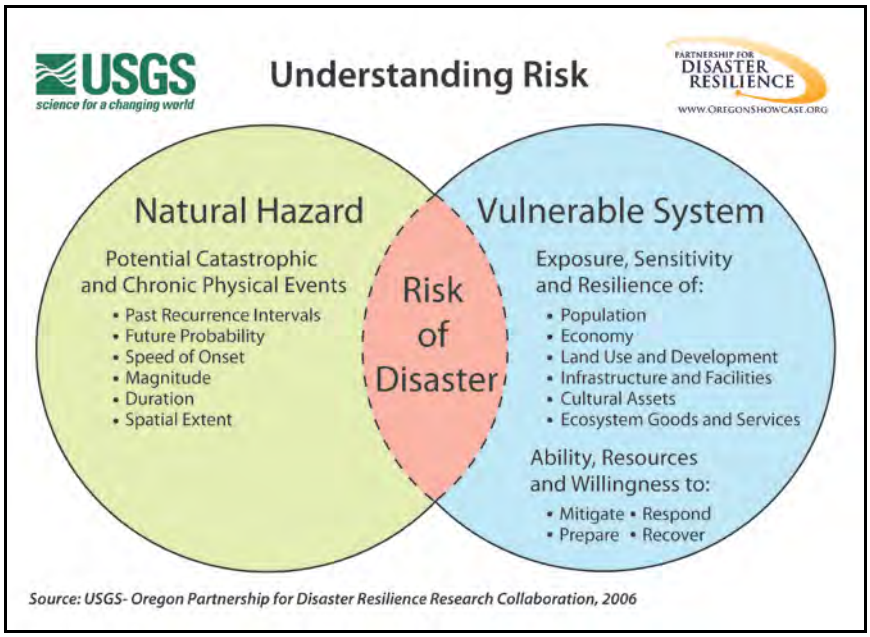
The plan is strategic and non-regulatory in nature, meaning that it does not necessarily set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public in the County; (2) identification and prioritization of future mitigation activities; and (3) aid in meeting federal planning requirements and qualifying for assistance programs. The mitigation plan works in conjunction with other County and City plans and programs including Josephine County Comprehensive Plan, Josephine County Rural Land Development Code, Josephine County Integrated Fire Plan, the Josephine County Rural Transportation System Plan, the Grants Pass Community Development Plan, Grants Pass Storm Water Master Plan, Grants Pass Development Code, and the Cave Junction Municipal Code 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, and the implementation of preventative activities such as fuels reduction and code updates. The actions described in the plan are intended to be implemented through existing plans and programs within the County and/or city.

Risk Assessment

A risk assessment consists of three phases: hazard identification, vulnerability assessment, and risk analysis, as illustrated in the following graphic.

Figure i.1: Understanding Risk



The first phase of the risk assessment, hazard identification, involves identifying relevant hazards and determining their geographic extent, intensity, and probability of occurrence (left side of the diagram above). This level of assessment typically involves the most current scientific assessment of the hazard. The outputs from this phase can also be used for land use planning, management, and regulation; public awareness; defining areas for further study; and identifying properties or structures appropriate for acquisition or relocation.[1]

The second phase, vulnerability assessment, involves the identification of key community assets such as existing (or planned) property and population centers, critical infrastructure, economic interests, community resources, etc. (right side of the diagram above). The community profile, above, provides this context.

The third phase, risk analysis, combines the hazard and vulnerability assessments to establish key points of intersection. Specifically, the risk analysis involves estimating the damage, injuries, and costs likely to be incurred in a geographic area over a period of time (middle, overlap area depicted above). Risk has two measurable components: (1) the magnitude

[1] Burby, R. 1998. Cooperating with Nature. Washington, DC: Joseph Henry Press. Pg. 126

of the harm that may result, defined through the vulnerability assessment, and (2) the likelihood or probability of the harm occurring.

What is the County's Overall Risk to Hazards?

The Josephine County Steering Committee conducted a risk assessment to evaluate the probability of each hazard as well as the vulnerability of the community to that hazard. The Grants Pass Steering Committee used the results of the County process to compare risk and vulnerability. Table i.1 below shows the relative risk as determined by each steering committee.

The relative rankings were determined by assigning the value (1) to Low; (2) to Medium; and (3) to High probability or vulnerability.

Table i.1: City and County Comparative Risk Assessment Summary, 2011

	Josephine County			Grants Pass		
	Probability	*Vulnerability*	*Relative Rank*	*Probability*	*Vulnerability*	*Relative Rank*
Wildfire	H	H	6	H	H	6
Flood	H	M	5	H	H	6
Earthquake	M	H	5	M	H	5
Severe Weather	H	H	6	H	H	6
Landslide	M	L	3	L	L	2
Volcanic	L	L	2	L	L	2
Drought	H	M	5	H	M	5

Who Participated in Developing the Plan?

Josephine County

Representatives from the following organizations served as steering committee members for the Josephine County natural hazard mitigation planning process.

Table i.2: Josephine County NHMP Steering Committee

Name	Association
Allen Mitchell	Bureau of Land Management
Austin Prince	Rural Metro Fire Department
Bob Hamblin	City of Grants Pass
Charlie Phenix	Josephine County Emergency Management Board
Derek Davenport	USFS Wildrivers District Ranger
Jeff Wheaton	Josephine County Public Works
Jenny Hall	Josephine County Emergency
John Jenson	Wolf Creek Fire
John O' Conner	Oregon Department of Forestry
Jim Wolf	Josephine County Integrated Fire Plan Coordinator
Lang Johnson	Grants Pass Fire Rescue and Fire Safety
Neil Benson	Josephine County Integrated Fire Plan Board
Paul Galloway	Rogue River - Siskiyou National Forest
Phil Turnbull	Rural Metro Fire Department

Rick Dryer	Oregon Department of Forestry
Sara Rubrecht	Josephine County Emergency Management
Steve Scrivner	City of Grants Pass
Tanya Phillips	Josephine County Public Health
Terry Haugen	City of Grants Pass
Tim Gonzales	(Medford) Bureau of Land Management
Travis Robbins	City of Cave Junction

Grants Pass

Representatives from the following organizations served as steering committee members for the City of Grants Pass natural hazard mitigation planning process.

Table i.3: Grants Pass NHMP Steering Committee

Name	Association
Alicia Robe	Stream Restoration Alliance of Middle Rogue
Bob Hamblin	City of Grants Pass – Distribution and Collection
Carla Angeli	City of Grants Pass - Planning
Dan Shepard	Grants Pass Irrigation District
David Reeves	City of Grants Pass - Finance
James Lowe	Grants Pass School District
Jenny Hall	Josephine County Emergency
Ken Sandlin	City of Grants Pass - Building
Kurt Bolser	Picket Mountain Construction
Lance Holder	Holder Homes Construction
Lang Johnson	City of Grants Pass – Public Safety
Lily Morgan	City of Grants Pass Council
Robert Callaway	Asante/Three Rivers
Steve Dahl	City of Grants Pass – Economic Development
Steve Scrivner	City of Grants Pass – Streets/Stormdrains
Terry Haugen	City of Grants Pass – Public Works

What is the Plan's Mission?

The mission of the Josephine County Natural Hazard Mitigation Plan is to create a disaster resilient county.

What are the Plan Goals?

1. Prevent or reduce losses to life, private property and natural resources resulting from natural hazards.

2. Prevent or reduce the disruption to essential public infrastructure and services resulting from natural hazards.

3. Increase public awareness for the importance and benefits of preparing for and mitigating natural hazard impacts.

4. Increase the level of personal responsibility and accountability among Josephine County citizens to mitigate the impacts of natural hazards.

5. Support the diversification, expansion and stabilization of local and regional economies by preventing or reducing business losses resulting from natural hazards.

6. Increase the amount of federal, state and local funding sources dedicated to implementing affordable multi-objective natural hazard mitigation strategies.

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[i] National Institute of Building Science's Multi-hazard Mitigation Council. "Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities" 2005.

Volume 1

Section1

Introduction

What is Natural Hazard Mitigation?

Natural hazard mitigation is defined as 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; education and outreach to targeted audiences, such as Spanish speaking residents, or the elderly. Mitigation is the responsibility of individuals, private businesses and industries, state and local governments, and the federal government.

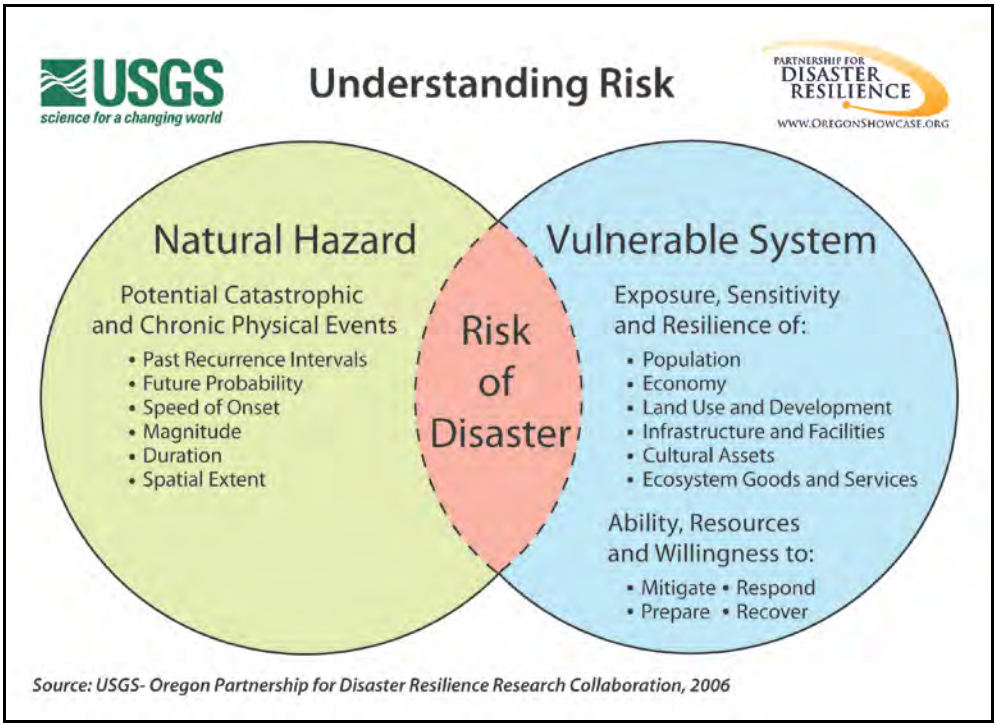
Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within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

Why Develop a Mitigation Plan?

Josephine County updated this Natural Hazards Mitigation Plan and added multijurisdictional components in an effort to reduce future loss of life and damage to property resulting from natural hazards. This plan was developed with and for the following jurisdictions: Josephine County (including Cave Junction), and through an addendum, the City of Grants Pass. 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 hazards.

The figure below is utilized throughout the plan to illustrate the concepts of risk reduction.

Figure 1.1 Understanding Risk



A natural hazard mitigation plan can assist the community in understanding what puts the community at risk. By identifying and understanding the relationship between natural hazards, vulnerable systems, and existing capabilities, communities in Josephine County become better equipped to identify and implement actions aimed at reducing the overall risk of hazards.

This plan focuses on the primary natural hazards that could *affect Josephine County,* Oregon, which include wildfire, flood, earthquake, severe weather, landslide, drought, and volcanic activity. The dramatic increase in the costs associated with natural disasters over the past decades has fostered interest in identifying and implementing effective means of reducing vulnerability. A report submitted to Congress by the National Institute of Building Science's Multi-hazard Mitigation Council (MMC) highlights that for every dollar spent on mitigation, society can expect an average savings of $4[1]. This multi-jurisdictional Natural Hazards Mitigation Plan is intended to assist all participating jurisdictions in reducing its risk from natural hazards by identifying resources, information, and strategies for risk reduction.

[1] National Institute of Building Science's Multi-hazard Mitigation Council. "Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities" 2005.

The plan is strategic and non-regulatory in nature, meaning that it does not necessarily 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) aid in meeting federal planning requirements and qualifying for assistance programs. The mitigation plan works in conjunction with other County and City plans and programs including Josephine County Comprehensive Plan, Josephine County Rural Land Development Code, Josephine County Integrated Fire Plan, the Josephine County Rural Transportation System Plan, the Grants Pass Community Development Plan, Grants Pass Storm Water Master Plan, Grants Pass Development Code, and the Cave Junction Municipal Code 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, and the implementation of preventative activities such as fuels reduction and code updates. The actions described in the plan are intended to be implemented through existing plans and programs within the County and/or city.

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 or away from hazard areas. Goal 7, along with other land use planning goals, has helped to reduce losses from natural hazards. Through risk identification and the recommendation of risk-reduction actions, this plan aligns with the goals of the jurisdiction's Comprehensive Plan, and helps each jurisdiction meet the requirements of statewide land use planning Goal 7.

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

Plan Development

In the fall of 2008, the Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Community Service Center developed a Pre-Disaster Mitigation Planning Grant proposal in partnership with Oregon Emergency Management (OEM) and communities in the Willamette Valley to update local mitigation plans. FEMA awarded the grant in the summer of 2009, and the Josephine County and Grants Pass plan update process began in January, 2011. OPDR staff, with support from graduate interns at the University of Oregon, oversaw the planning process and completed final edits to the plan.

Additional details about the planning process are included in Volume III, Appendix B: Planning and Public Process.

Methodology

The Natural Hazard Mitigation Plan development process implemented by OPDR was designed to: (1) result in a plan that is DMA 2000 compliant; (2) coordinate with the State's plan and activities of The Partnership; and (3) build a network of jurisdictions and organizations that can play an active role in plan implementation.

The Josephine County Integrated Fire Plan Board / Emergency Management Board was designated as the Steering Committee for the NHMP update process.

Representatives from the following organizations served as steering committee members for the Josephine County natural hazard mitigation planning process.

Table 1.1: Josephine County NHMP Steering Committee

Name	Association
Allen Mitchell	Bureau of Land Management
Austin Prince	Rural Metro Fire Department
Bob Hamblin	City of Grants Pass
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Jeff Wheaton	Josephine County Public Works
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Steve Scrivner	City of Grants Pass
Tanya Phillips	Josephine County Public Health
Terry Haugen	City of Grants Pass
Tim Gonzales	(Medford) Bureau of Land Management
Travis Robbins	City of Cave Junction

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

- **Meeting 1: Preliminary Strategy Meeting, 9/9/10**
  As part of the Josephine County Emergency Management Board Meeting, Partnership staff presented an overview of the NHMP planning process, identified role and responsibilities and facilitated a discussion of possible outreach strategies.

- **Meeting 2: Risk Assessment Review, 11/23/10**
  This meeting served to introduce the Josephine County Steering Committee to the concepts of a Risk Assessment. Partnership staff reviewed the CFR and other regulations that guide NHMP development. The Steering Committee then conducted the Risk Assessment exercise and identified the probability and vulnerability for the hazards.

- **Meeting 3:PreliminaryAction Item Discussion, Review of Goals and NHMP Mission 2/09/11**
  Partnership staff presented the Josephine County Steering Committee with a preliminary list of actions based on the 2004 Josephine County NHMP and suggestions. Steering Committee members provided revisions and additions to the action item list. The Steering Committee also adopted the NHMP mission.

- **Meeting 4: Action Item Finalization, Implementation and Maintenance, and Funding Overview, 4/13/11**
  The Steering Committee conducted a final review of the action items. The committee also identified the convener, coordinating body, and determined a maintenance schedule for the plan.

Partnership staff presented the Steering Committee with information about funding strategies and sources with specific emphasis on implementation of mitigation actions through existing plans and mechanisms.

- **Outreach**
  A draft of the Risk Assessment and Action Items was presented to the public via the web. The Partnership website hosted the documents and the County website and newsletters announced the public comment period. No comments were submitted.

The process for development of the Grants Pass Addendum can be found in Volume II. Meeting Agendas, attendance, and presentations can be found in Volume III, Appendix B: Planning and Public Process

The Josephine County Board of County Commissioners adopted the updated NHMP via resolution on *INSTERT DATE, YEAR*

How is the Plan Organized?

Each volume of the mitigation plan provides specific information and resources to assist readers in understanding the hazard-specific issues facing County citizens, businesses, and the environment. Combined, the sections create a mitigation plan that furthers the community's mission to create a disaster resilient county. This plan structure enables stakeholders to use the section(s) of interest to them.

Volume I: Josephine County Natural Hazard Mitigation Plan

Section 1: Introduction

The Introduction briefly describes the countywide mitigation planning efforts and the methodology used to develop the plan. City specific planning efforts are documented in Volume II: City Addendums.

Section 2: Community Overview

This section provides an overall description of Josephine County. The section includes a brief community profile, discussion of the government structure, listing of existing plans, policies, and programs, listing of community organizations, summary of existing mitigation actions, and an overview of the hazards addressed in the plan. This section allows readers to gain an understanding of the County's sensitivities – those community assets and characteristics that may be impacted by natural hazards, as well as the County's resilience – the ability to manage risk and adapt to hazard event impacts. A Community Overview for each participating city and special district is located in Volume II: City Addendums.

Section 3: Mission, Goals and Action Items

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

mitigation strategies. Actions are based on community sensitivity and resilience factors and the hazard assessments in Volume II City specific action items are located in Volume III: City Addendum.

Section 4: Hazard Identification and Risk Assessment

This section describes the risk assessment process and summarize the best available local hazard data. A hazard summary is provided for each of the hazards addressed in the plan. The summary includes hazard history, location, extent, vulnerability, impacts, and probability.

The hazard specific annexes included with this plan are the following:

- Wildfire;
- Flood;
- Earthquake;
- Severe Weather
- Landslide/Debris Flow;
- Drought;
- Volcanic Event;

Section 5: Plan Implementation and Maintenance

This section provides information on the implementation and maintenance of the plan. It describes the process for prioritizing projects, and includes a suggested list of tasks for updating the plan to be completed at the semi-annual and 5-year review meetings. The participating cities and special districts will utilize this implementation and maintenance process as well.

Volume II: City/Special District Addendums

Volume III of the plan is reserved for any city or special district addendums developed through this multi-jurisdictional planning process.

Volume IV: Resource Appendices

The resource appendices are designed to provide the users of the Josephine County multi-jurisdictional Natural Hazards Mitigation Plan with additional information to assist them in understanding the contents of the mitigation plan, and provide them with potential resources to assist with plan implementation.

Appendix A: Action Item Forms

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

Appendix B: Planning and Public Process

This appendix includes documentation of the planning process utilized to develop the plan. It includes invitation lists, agendas, sign-in sheets, and

summaries of Steering Committee meetings as well as documentation of public involvement methods.

Appendix C: Economic Analysis of Natural Hazards Mitigation Projects

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

Appendix D: Regional Profile and Risk Assessment

This report was developed by *The Partnership* and it 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 transportation and power transmission systems, 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 2009 by *The Partnership* as part of the State Natural Hazards Mitigation Plan.

Appendix E: Resource Directory

This appendix lists state and federal resources and programs available as sources for funding or mitigation implementation guidance.

Section 2
Community Overview

This Community Overview describes Josephine County from a systems perspective, that is, the social, economic, political, and physical components of the community. While each aspect of the County can be addressed separately, it is important to consider how they are inherently interconnected. For example, ensuring the resilience of the physical infrastructure like roads, utilities, or telecommunications from a natural hazard incident will support a speedy recovery of businesses. In turn, businesses such as grocery stores or shops provide for the daily well being of the community. This community profile will describe if and how some aspects of the County's systems may be exposed to natural hazards or have increased sensitivity to natural hazards. Additionally, community resilience factors will be defined as the community's ability to manage risk and adapt to hazard event impacts (e.g., governmental structure, agency missions and directives, and plans, policies, and programs).

The information in this section represents a snapshot in time of the current sensitivity and resilience factors in the county when the plan was developed. The information documented below, along with the hazard risk assessments should be used as the local level rationale for the risk reduction actions identified in the action items. The identification of actions that reduce the county's sensitivity, and increase its resilience, assist in reducing overall risk,

Geography and Climate

Josephine County is located in southwestern Oregon and covers 1,639 square miles.[1] The county is bordered in the south by California, the west by Curry County, the north by Douglas County and the east by Jackson County.

Josephine County is mountainous and has two major valleys and three rivers; the Rogue, the Applegate and the Illinois. The topography of the county can range from 7,013 feet above sea level at the summit of Greyback Mountain to roughly 500 feet at Black Bar Falls.

The Southern Oregon region boasts more than 210 days of sunshine annually. The rainy season is November - March / April. The information below includes precipitation and temperature information for areas around Josephine County. The information in Figure 2.1 and 2.2 show a variable climate across Josephine County.

Table 2.1: Annual Average Precipitation

	Josephine County	Cave Junction	Grants Pass
Annual	31 in^	63 in*	31 in*

Source: *The Oregon Climate Service, George Taylor, State Climatologist "Climate of Josephine County." ^Southern Oregon Area Profile, Southern Oregon Regional Economic Development, Inc.

Table 2.2: Monthly and Annual Average Temperatures (deg F), Grants Pass, 1971-2000

Month	Mean max	Mean min	Mean temp	Extreme max	Extreme min
Jan	47.4	31.1	39.3	69	13
Feb	54.1	32.7	43.4	76	12
Mar	59.8	34.1	47	81	22
Apr	65.6	35.8	50.7	93	24
May	73.1	40.5	56.8	102	26
Jun	80.8	45.4	63.1	106	33
Jul	88.8	49.5	69.2	109	39
Aug	89	48.9	69	110	36
Sep	82.7	43	62.9	108	29
Oct	70.4	37.4	53.9	98	20
Nov	53.3	34.6	44	77	12
Dec	45.7	31.3	38.5	67	-1
Annual	**67.6**	**38.7**	**53.2**	**110**	**-1**

Source: The Oregon Climate Service, George Taylor, State Climatologist "Climate of Josephine County."
http://ocs.oregonstate.edu/county_climate/Josephine_files/Josephine.html

[1] U.S. Census Bureau, Josephine County Quickfacts, 2011

Population and Demographics

Not every rain storm is a flood. It is the way in which hazards interact with the built environment and social aspects of communities that can turn an incident, like a rain storm, into a flood disaster. The characteristics of the population are important factors in determining the overall impact of a hazard event. Social-science research has demonstrated that demographic factors like age, race, gender, and socioeconomic status effect vulnerability.[2]

Table 2.3: Josephine County Population, 2000 and 2009

			Change 2000-2009		
	2000	2009	Number	Percent	AAGR
Josephine County*	75,726	81,026	5,300	7%	0.8%
Grants Pass^	23,003	33,225	10,222	44%	4.2%
Cave Junction^	1,363	1,750	387	28%	2.8%
Unincorporated^	51,360	48,690	-2,670	-5%	-0.6%
3-County Area*	357,394	385,517	28,123	8%	0.8%
Oregon*	3,421,399	3,825,657	404,258	12%	1.2%

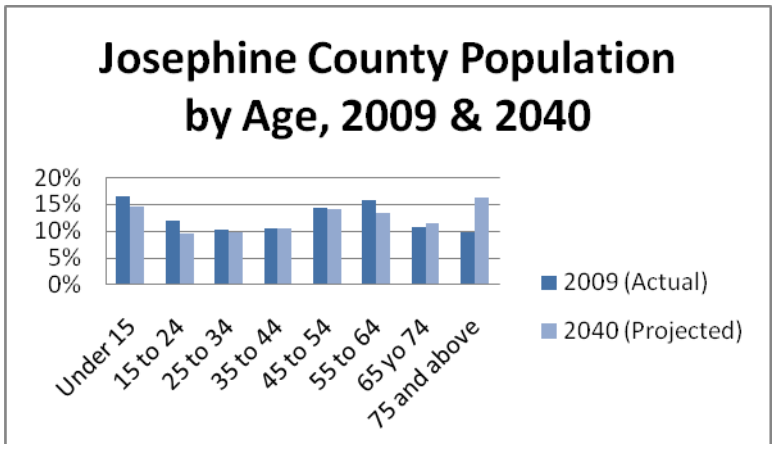
*Source: U.S. Census Bureau, 2009 Population Estimates, Census 2000

^Source: Population Research Center, PSU, March 2010

Between 2000 and 2009, the population of Josephine County grew 7%. This is approximately the same growth rate experienced in the three county region overall. In the same time period, Grants Pass grew faster than Cave junction or the County as a whole. Likewise, Grants Pass experienced more population growth than the three county area or the state. The overall growth trend in urban areas is due in small part to a decrease in the percent of people who live in unincorporated Josephine County, though not entirely.

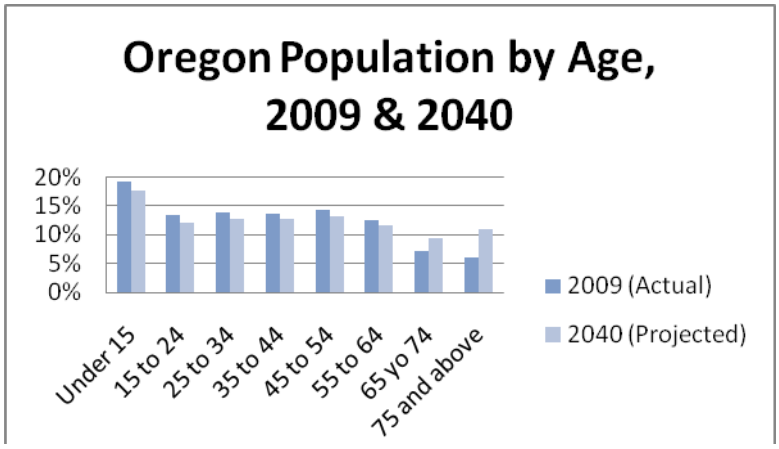
[2] Wood, Nathan. *Variations in City Exposure and Sensitivity to Tsunami Hazards in Oregon*. U.S. Geological Survey, Reston, VA, 2007.

Figure 2.1: Josephine County Population by Age, 2009 and 2040



Source: Oregon Office of Economic Analysis, Department of Administrative Services, Population Research Center at Portland State University, 2010

Figure 2.2: Oregon Population by Age, 2009 and 2040



Source: Oregon Office of Economic Analysis, Department of Administrative Services, Population Research Center at Portland State University, 2010

In 2009, the population of Josephine was proportionally older than the overall state population. 51% of the residents of Josephine County were 45 years of age or older while across Oregon as a whole, only 40% were older than 45. Figure 2.5 above shows trend towards an aging population in both Josephine County and in Oregon as whole. If current trends continue, Josephine County's population will continue to proportionally be older than the state population. Additionally, Josephine County has a smaller workforce-age population that the state overall, with only about 35% of the population between the ages of 25-54 as compared to the state's 42%.

The age profile of an area has a direct impact both on what actions are prioritized for mitigation and how response to hazard incidents is carried out. For example, school age children rarely make decisions about preparedness. Therefore, a larger youth population in an area will increase the importance of outreach to schools and parents on effective ways to

teach children about fire safety, earthquake response, and evacuation plans. Older populations may also have special needs during and/or after a natural disaster. Older populations may require assistance in evacuation due to limited mobility or health issues. Additionally, older populations may require special medical equipment at shelters, and can lack the social and economic resources needed for post-disaster recovery.[3]

Additionally, studies have shown that racial and ethnic minorities can be more vulnerable to natural disaster events. This is not reflective of individual characteristics; instead, historic patterns of inequality along racial or ethnic divides have often resulted in minority communities that are more likely to have inferior building stock, degraded infrastructure, or less access to public services. Figure 2.6 describes Josephine County's population by race and ethnicity.

Table 2.4: Josephine County Population by Race, 2000 & 2008

Race/Ethnicity	2000	2008	Change in Share
White	94%	94%	0%
Black	0%	0%	0%
AIAN	1%	1%	0%
Asian	1%	1%	0%
NHPI	0%	0%	0%
Other or multiple	4%	4%	0%
Hispanic or Latino	4%	5%	1%
Not Hispanic or Latino	96%	95%	-1%
Total	**100%**	**100%**	**0%**

Source: U.S. Census Bureau 2006-2008 American Community Survey, 2000 Census

Though the minority population in Josephine County is not large, it will be important for the County to identify specific ways to support all portions of the community through hazard preparedness and response. According to 2008 Census estimates, 4.2% of the population in Josephine County primarily speaks something other than English at home.[4] Culturally appropriate, and effective, outreach can include both methods and messaging targeted to this diverse audience. For example, connecting to historically disenfranchised populations through already trusted sources or providing preparedness handouts and presentations in the languages spoken by the population will go a long way to increasing overall community resilience.

[3] Ibid.

[4] U.S. Census Bureau, 2006-2008 American Community Survey http://factfinder.census.gov/servlet/ADPTable?_bm=y&-qr_name=ACS_2008_3YR_G00_DP3YR2&-geo_id=05000US41033&-ds_name=&-_lang=en

Employment and the Economy

Economic resilience to natural disasters more complex than just restoring employment positions or ensuring income for residents. Building a resilient economy requires understanding how the component parts of employers, workers, inputs, resources, and infrastructure are connected in the existing economic picture. Once any inherent strengths or systematic vulnerabilities become apparent, both the public and private sectors can take action to increase the resilience of the local economy.

Median income can be used as an indicator of the strength of the region's economic stability. Between 2000 and 2008 the median household income in Josephine County has risen but not quite as fast as the State or country overall.

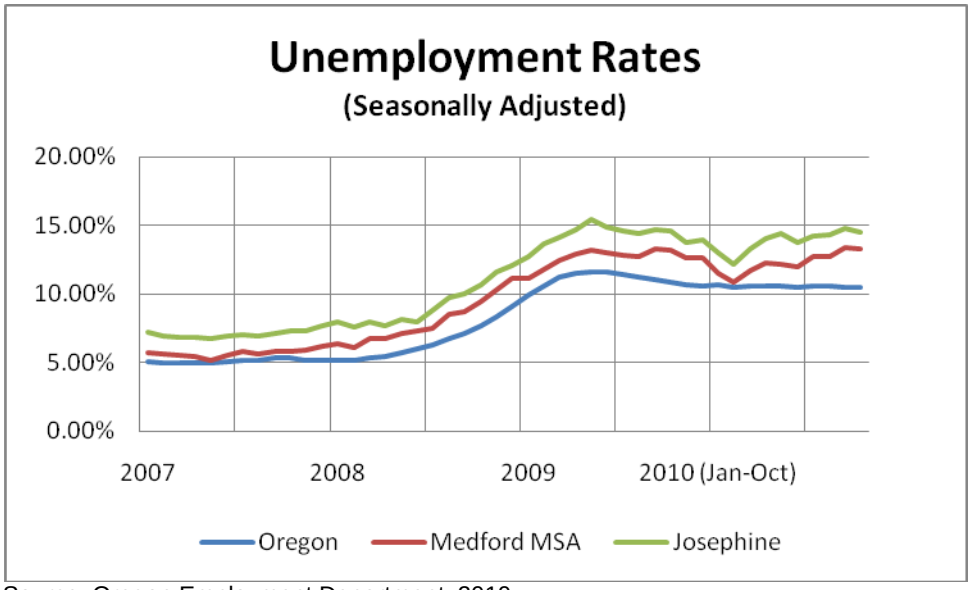
Table 2.5: Median Household Income, 2000 and 2008

	2000	2008	Change	AAGR
Josephine County	$31,229	$37,373	$6,144	2%
Oregon	$40,916	$49,863	$8,947	3%
United States	$41,994	$52,175	$10,181	3%

Source: U.S. Census Bureau 2006-2008 American Community Survey, 2000 Census

The Oregon Employment Department describes a cyclical employment pattern in the Josephine and Jackson County region with a seasonal peak in the fall (October). Tourist attractions along the Rogue River as well as construction trades typically slow between October and February.

Figure 2.3: Seasonally adjusted unemployment rates, 2007-2010



Source: Oregon Employment Department, 2010

In Josephine County there is no one industry that employs the majority of workers. In 2009, several industries did account for a large percentage of employment: government (15%), retail (16%), health and social assistance (18%), manufacturing (11%) and the accommodations and food services (10%). Between 2001 and 2009 there were employment trends within those industries that may signal a shift in the overall economic picture in Josephine County.

Several sectors contracted between 2001 and 2009 including manufacturing and government. Manufacturing cut 19% of its workforce representing a loss of 550 jobs. 831 government jobs were also lost in the same time period. This represents a 20% decrease in government employment however government jobs still make up 15% of overall employment in Josephine County.

Health and social assistance grew both in sheer number of people employed (increased by 1,020) and the percent that the sector represents of total employment (13% in 2001 and 18% in 2009). More jobs became available in the accommodations / food services sector. An additional 207 jobs were added, representing a 10% sector growth.

Overall, there was a 2% loss of jobs in Josephine County between 2001 and 2009.

Table 2.6: Total Employment by Industry, 2001 & 2009

Industry	2001	2009	Change 2001-2009		
			Number	Percent	AAGR
Natural Resources and Mining	582	398	-184	-32%	-4.64%
Construction	918	858	-60	-7%	-0.84%
Manufacturing	2,901	2,351	-550	-19%	-2.59%
Wholesale	630	982	352	56%	5.71%
Retail	3,508	3,550	42	1%	0.15%
Transportation, Warehousing, and Utils.	495	380	-115	-23%	-3.25%
Information	415	150	-265	-64%	-11.94%
Finance and Insurance	634	477	-157	-25%	-3.49%
Real Estate Rental and Leasing	335	233	-102	-30%	-4.44%
Professional, Scientific, and Tech Serv	445	520	75	17%	1.97%
Management of Companies	111	116	5	5%	0.55%
Admin, Support, Waste Mgmt and Remed.	777	835	58	7%	0.90%
Education	184	167	-17	-9%	-1.20%
Health and Social Assistance	3,017	4,037	1,020	34%	3.71%
Arts, Entertainment, and Recreation	242	271	29	12%	1.42%
Accommodations and Food Services	2,084	2,291	207	10%	1.19%
Other Services	979	1,008	29	3%	0.37%
Government	4,173	3,342	-831	-20%	-2.74%
Total Covered Employment	**22,430**	**21,966**	**-464**	**-2%**	**-0.26%**

Source: Oregon Labor Market Information System, accessed December 2010

Labor and Commute Shed

Most hazards can happen at any time during the day or night. It may be possible to give advance warning to residents and first responders who can take immediate preparedness and protection measures, but the variability of hazards it one part of why they can have such varied impact. A snow storm during the work day will have different impacts than one that comes during the night. During the day, a hazard has the potential to segregate the population by ask or type of employment (e.g., school children at school, office workers in downtown areas). This may complicate some aspects of initial response such as transportation or the identification of wounded or missing. Conversely, a hazard at midnight may occur when most people are asleep and unable to receive an advance warning through typical communication channels. This labor shed and commute shed analysis is intended to document where County residents work and where people live who work in Josephine County. Overall, the workforce is highly mobile between Josephine and Jackson County.

Table 2.7: Commute Shed (Where workers are employed who live In Josephine County), 2010

Location	Number	Percent
Josephine County	**16,045**	**60%**
Grants Pass	12,210	46%
Cave Junction	234	1%
Redwood	180	1%
Jackson County	**5,147**	**19%**
Medford	3,259	12%
Central Point	255	1%
Douglas County	**1,081**	**4%**
Roseburg	465	2%
Multnomah County	**715**	**3%**
All Other Locations	**3,605**	**14%**
Total	**26,593**	**100%**

While the majority of Josephine County residents are employed within the County (60%), there is also a significant number of workers who commute to locations outside the County to work. Nearly 20% of workers who live in Josephine County travel eastward to Jackson County for their job. Interestingly, a significant number (14%) of County residents are employed much further afield in locations including Salem, Eugene, in communities along the Oregon coast, and even as far away as Portland. It is possible that these workers do not physically commute every day or on a regular basis and instead telecommute or otherwise have remote locations. The graduated dots on Figure 2.2 represent where the County residents are employed.

Figure 2.4 Commute Shed Map (Where workers are employed who live In Josephine County), 2010

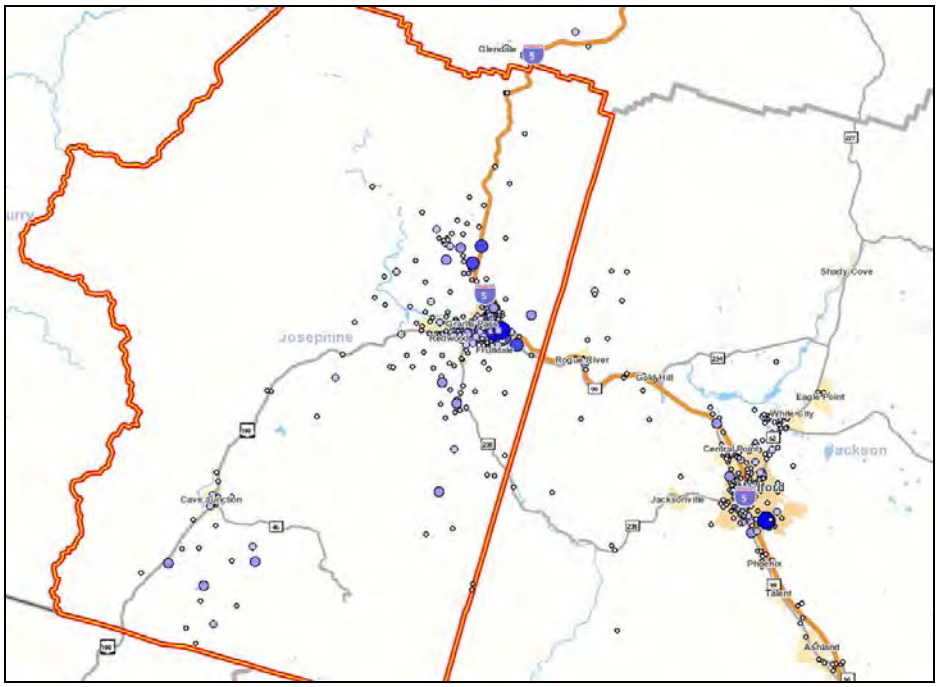
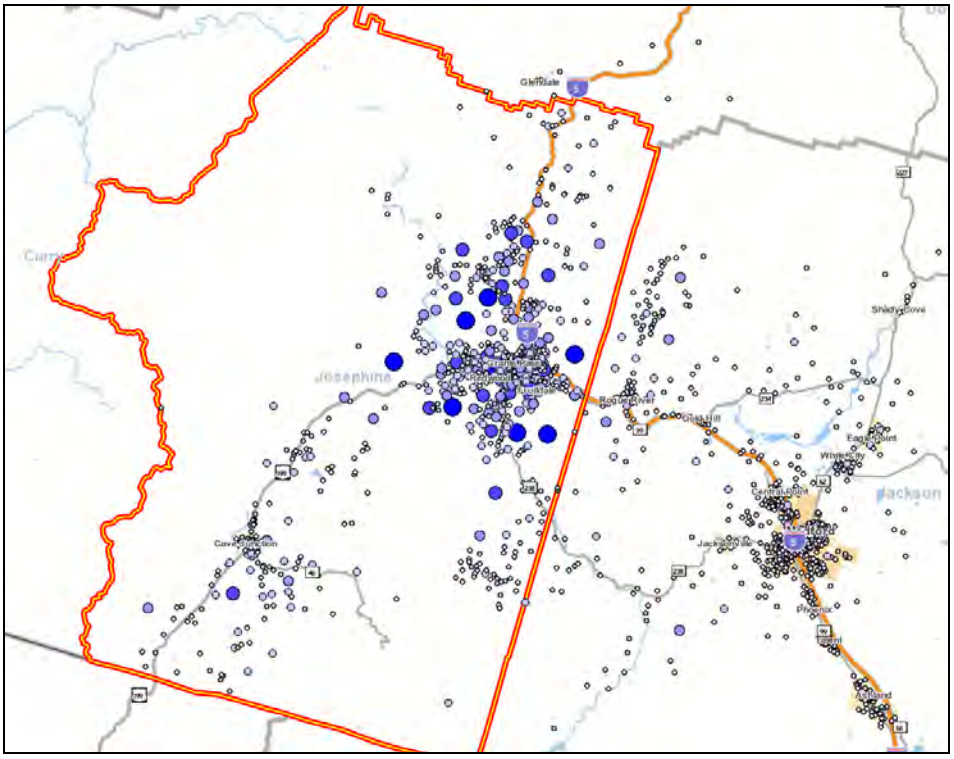


Figure 2.12 and 2.13 below, together tell the spatial and statistical story about where workers live who are employed in Josephine County. The majority of workers employed in the County are also residents (72%). The location outside of the County where to most number of workers come from is Jackson County. However it is not necessarily the urban areas of Jackson County. Figure 2.13 shows this with the numerous dots along the county border representing the homes of workers who are employed in Josephine County but live in Jackson County.

Table 2.8: Labor Shed (Where workers live who are employed in Josephine County), 2010

Location	Number	Percent
Josephine County	**16,045**	**72%**
Grants Pass	7,802	35%
Cave Junction	150	1%
Redwood	762	3%
Fruitdale	218	1%
Jackson County	3,524	**16%**
Medford	1,133	5%
Central Point	276	1%
Ashland	218	1%
Douglas County	685	**3%**
Roseburg	155	1%
All Other Locations	2,044	**9%**
Total	**22,298**	**100%**

Figure 2.5: Labor Shed Map (Where workers live who are employed in Josephine County), 2010



In summary, the Labor Shed analysis and Commute Shed analysis reveal that there are more workers in the County than jobs available; workers are more likely to live in Josephine County and travel outside the County for work than to work in Josephine County and live in another County.

Housing

Housing characteristics are an important factor in hazard 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 wood-frame construction. Generally the older the home is, the greater the risk of damage from natural disasters. This is because stricter building codes have only been implemented in recent years, following improved scientific understanding of plate tectonics and earthquake risk. In Oregon, for example, the building code was only recently upgraded to include earthquake loading in the building design.[5] Figure 2.14 shows that nearly 30% of the housing stock in Josephine County was built after 1990 when more stringent building codes were put in place, leaving about 70% with questionable seismic stability.

Table 2.9: Housing Stock by Age, 2009 County Housing

Year Structure Built	Number	Percent
Built 2005 or later	1,575	4.3%
Built 2000 to 2004	3,145	8.5%
Built 1990 to 1999	6,231	16.9%
Built 1980 to 1989	5,210	14.1%
Built 1970 to 1979	9,422	25.5%
Built 1960 to 1969	3,660	9.9%
Built 1950 to 1959	2,859	7.7%
Built 1940 to 1949	2,671	7.2%
Built 1939 or earlier	2,142	5.8%
Total housing units	**36,915**	**100%**

Source: U.S. Census, 2005-2009 American Community Survey

Additionally, multiunit structures are more vulnerable to impact from natural disasters due to the increased number of people living in closer proximity. In short, a structural weakness in a multiunit structure will have an amplified impact on the population.

[5] Wang Yumei and Bill Burns. "Case History on the Oregon GO Bond Task Force: Promoting Earthquake Safety in Public Schools and Emergency Facilities." National Earthquake Conference. January 2006.

Table 2.10: Housing Types, 2009

Housing Type Summary		
1 unit	26,533	72%
2 to 10 units	2,520	6.8%
10 to 19 units	227	0.6%
20 or more units	992	2.7%
Mobile home	6,336	17.2%
Boat, RV, van, etc.	307	0.8%

Source: U.S. Census, 2005-2009 American Community Survey

Mitigation and preparedness planning should also consider type of occupancy when developing outreach project or educational campaigns. Residents who own their own home are more likely to want to take steps to reduce the impact of natural hazards through mitigation or insurance methods. Renters may be less invested in physical improvements to the unit, but outreach around personal preparedness or renters insurance would benefit this population. Approximately 30% of the housing units in Josephine County are renter-occupied.

Tbale2.11: Housing Unit Occupancy Summary, 2009

Housing Occupancy Summary		
Occupied housing units	33,844	91.7%
Owner-occupied	*23,530*	*69.5%*
Renter-occupied	*10,314*	*30.5%*
Vacant housing units	3,071	8.3%
Total housing units	**36,915**	

Source: U.S. Census, 2005-2009 American Community Survey

Land Use and Development

Historically, the County, region and state economy are based on timber, tourism and agriculture. This, along with the large portions of the county that are public lands, impacted the land use and development patterns in the county.

The Board of County Commissioners began adopting land use regulations in 1956. Then, in 1973, the Oregon Legislature adopted mandatory requirement for local jurisdictions commonly referred to as Oregon's 19 Statewide Planning Goals. The Goals express the state's policies on land use and related topics, such as citizen involvement, housing, and natural resources. Local jurisdictions including Counties and incorporated cities must prepare and adopt comprehensive plans, zoning regulations, land use permitting regulations.[6] As part of the 19 Goals, Urban Growth Boundaries (UGBs) were established to separate areas planned for urban use as opposed to rural uses. Urban Growth boundaries are not necessarily city boundaries and, unlike a city boundary, must contain land enough land to meet estimated 20 year employment and population growth. Additionally, the UGB must be regularly periodically to assess the land capacity.

Much of Josephine County is publically owned including the Rogue River National Forest, the Grants Pass District State Forest and the Wolf Creek County Park. Josephine County has two incorporated cities, Cave Junction and Grants Pass. In July of 2009, it was estimated that there were 34,975 people living in these two cities with another 48,690 in the unincorporated areas of the county. The Urban Growth Boundaries (UGBs) were established around Grants Pass and Cave Junction in 1979. In the early 1980's the City of Grants Pass and the County established a joint Urban Area Planning Commission to review and approve land use decisions and an Intergovernmental Agreement for joint management of the Grants Pass UGB. The current and existing comprehensive plan was completed in 2005 and

In 2006 the City of Grants Pass identified the need for future residential, commercial, employment and other land within the UGB and initiated a UGB expansion process that, at the time of writing is currently underway.

[6] Oregon Department of Land Conservation and Development, Statewide Planning Goals. << http://www.lcd.state.or.us/LCD/goals.shtml>> Accessed December, 2010.

Critical Infrastructure and Facilities

The Department of Homeland Security defines Critical Infrastructure as "the assets, systems, and networks, whether physical or virtual, so vital to … that their incapacitation or destruction would have a debilitating effect on security, … economic security, public health or safety, or any combination thereof."

Many things can be counted as critical infrastructure and facilities depending on the social, environmental, economic, and physical makup of the area under consideration. Some examples include: Agriculture and food systems; communications facilities; critical manufacturing; dams; emergency services; energy generation and transmission; government facilities; healthcare and public health; information technology; transportation systems; and water.

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 documented in this section of the profile can provide the basis for informed decisions about the infrastructure and facilities already in place that can be used to reduce the vulnerability of Josephine County to natural hazards. Figure 2.17 provides a list of some of Josephine County's critical facilities and structures.

Table 2.12: Critical Facilities in Josephine County

	County Total
Hospitals (# of beds)	**1 (103)**
Police / Sheriff's Offices	**11**
Fire & Rescue Stations	**33**
Dams	**7**
Bridges	**225**
State Highway	*101*
County Highway	*122*
City/Municipal Highway	*2*
School Districts &Colleges	**2 districts, 1 Com.College**
Airports	**9**
Public Airport	*2*
Private Airport	*4*
Private Helipad	*3*

Source: Region 4 Southwest Oregon Regional Profile,
State of Oregon NHMP, 2009

Transportation

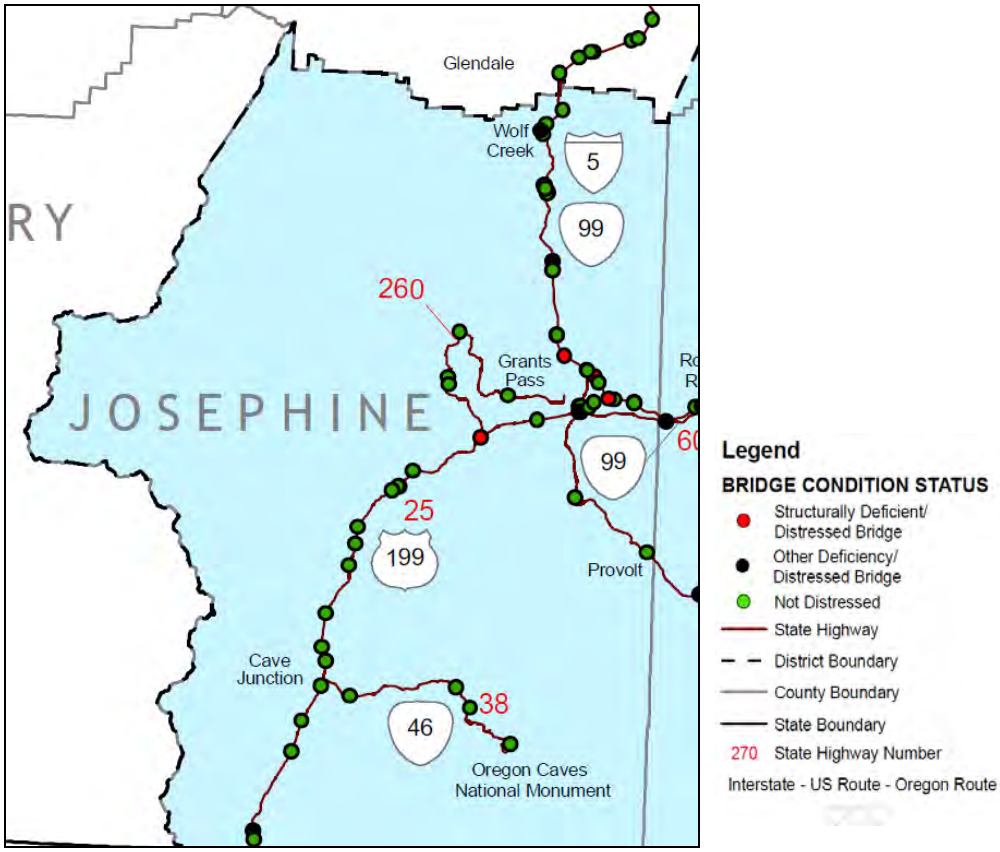
There are four major transportation routes in Josephine County. The first, Interstate 5 (I-5) serves as the primary north and south through route for traffic traveling through the northeast quadrant of the County, which includes the bulk of the County's populated area.

The second, US 199 (Redwood Highway), runs from the City of Grants Pass into northern California, connecting the I-5 corridor with US 101. It is the primary transportation corridor for the Illinois Valley area.

OR 99 runs concurrent with I-5 until it reaches the City of Grants Pass. In Grants Pass, OR 99 becomes a north/south one way couplet through downtown, converting into a four-lane east/west highway after crossing the Rogue River. It continues along the south side of the river into Jackson County, rejoining I-5 east of the City of Rogue River.

OR 238 (Jacksonville Highway), runs from the City of Grants Pass south and east along the Applegate River into Jackson County, where it intersects I-5 in the City of Medford.

Figure 2.6: County Bridge Inventory, ODOT



Source: 2010 Bridge Condition Report, Oregon Department of Transportation

First Responders: Fire Districts and Police

There are six fire response districts in Josephine County. They regularly work together in planning and response efforts. The districts are: The Applegate Valley RFPD, Grants Pass Public Safety, Illinois Valley RFPD, Rural/Metro FD, Williams RFPD and the Wolf Creek RFPD

Public Health

Josephine County Public Health (JCPH) provides programs that meet the five essential public health services of epidemiology and control of preventable diseases, maternal and child health services, family planning, collection and reporting of health statistics, health information and referral services, per ORS 431. Other services provided include emergency preparedness, tobacco prevention and education, travel immunizations, Animal Protection and Regulation, Juvenile Shelter and Retention and Adult Jail Health. [7]

Utility Providers

Pacific Power

Pacific Power serves customers in Southern Washington, Oregon, Northern California, Eastern Idaho, Utah and Wyoming. In Southern Oregon, Pacific Power serves communities in Douglas, Jackson and Josephine counties.

Qwest Communications / Century Link

CenturyLink is the third largest telecommunications company in the United States. The company provides broadband, voice and wireless services to consumers and businesses across the country.

Avista Utilities

Avista engages in energy production, transmission and distribution. Avista provides electric and natural gas service to about 481,000 customers in a service territory of more than 30,000 square miles. In the Avista Southern Oregon service area (from Roseburg to Medford along I-5, then east to Klamath Falls), Avista provides natural gas services

Ferrellgas

Ferrellgas is a propane services provider. Ferrellgas operates in all 50 states

[7] Josephine County Public Health Comprehensive Plan, 2010-2013,

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.

Josephine County was first settled in 1852 as prospectors and pioneers came to the region in search of gold. The area was originally part of Jackson County but was separated from its neighbor on January 22, 1856 and named after the daughter of one of the prominent gold prospectors. The original County seat was Sailor Diggings (now the "ghost town" Waldo). In 1885 the County seat was moved to Kerby but shortly thereafter the voters chose Grants Pass as the permanent center of County government.

National Register of Historic Places

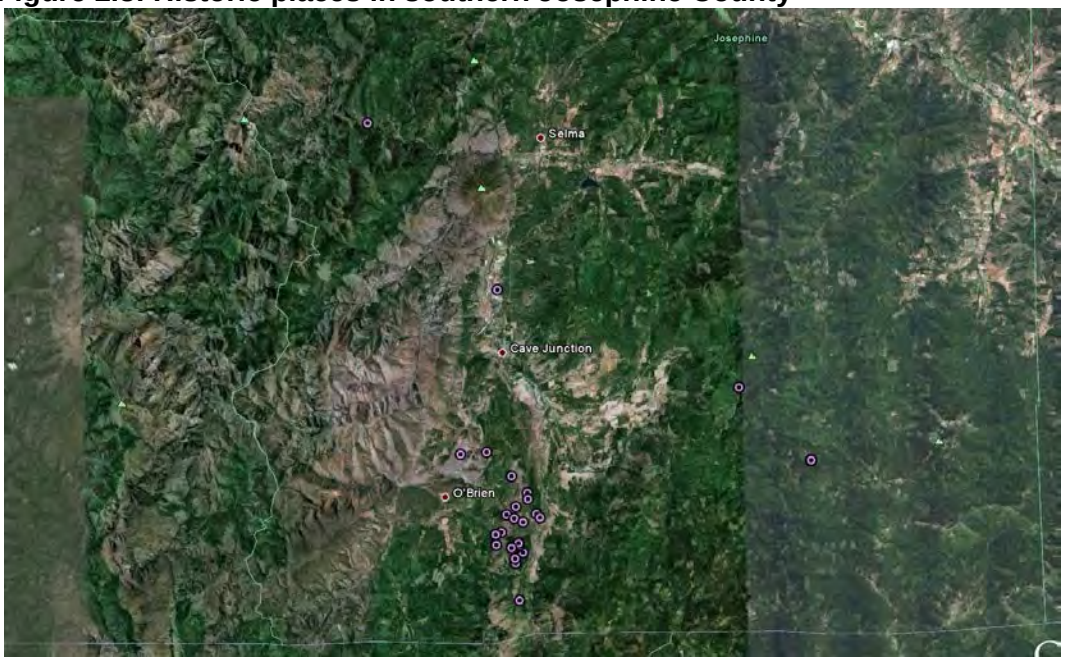
The following structures, and/or places within Josephine County are listed on the National Register of Historic Places:[8]

Figure 2.7: Historic places in northern Josephine County

Source: National Register of Historic Places, 2011

[8] National Park Service, National Register of Historic Places database (accessed April 2011)

Figure 2.8: Historic places in southern Josephine County



Source: National Register of Historic Places, 2011

- Ahlf, John and Susanna, House
- Allen Gulch
- Allen Gulch Townsite
- Calhoun, George, House
- Cameron Mine
- Cedar Guard Station No. 1019
- Christie-Eismann House
- Clark-McConnell House
- Clark-Norton House
- Clemens, Michael, House
- Cornell, Albert B. and Mary, House
- Croxton, Thomas, House
- Deep Gravel Mine
- Dimmick-Judson House
- Esterly Pit No. 2--Llano De Oro Mine
- Fetzner, Joseph, House
- Flanagan, Dr. William H., House
- Fry Gulch Mine
- Golden Historic District
- Grant Pass City Hall and Fire Station
- Grants Pass G Street Historic District
- Grants Pass Supervisor's Warehouse
- Grave Creek Bridge
- High Gravel Mine
- Hotel Josephine Annex
- Hugo Community Baptist Church
- Kienlen-Harbeck Building
- Logan Cut
- Logan Drain Ditches
- Logan Wash Ditch
- Lundburg, George H., House
- McLean, Robert and Lucy, House
- Middle Ditch
- Nauke, William and

Nannie, House
- Newell, Edwin, House
- Newman United Methodist Church
- Oregon Caves Chateau
- Oregon Caves Chateau
- Oregon Caves Historic District
- Osgood Ditch
- Plataurica Mine
- Rand Ranger Station
- Redwoods Hotel
- Rogue River Valley Grange No. 469
- Rogue Theatre
- Schmidt, Claus and Hannchen, House
- Siskiyou Smokejumper Base
- Smith, Herbert and Katherine, House
- Speed's Place on the Rogue
- St. Patrick's Roman Catholic Cemetery
- Store Gulch Guard Station No. 1020
- Upper Ditch
- Voorhies, Amos E., House
- Waldo Cemetery
- Waldo Chinese Cemetery
- Waldo Mine
- Whisky Creek Cabin
- Wimer Ditch [Image]
- Wolf Creek Tavern

Government Structure

Josephine County is governed by a three member Board of Commissioners. The Commissioners are non-partisan and serve four year terms. The Board is empowered to adopt ordinances, establish programs, levy taxes, appropriate funds, make appointments, and zone property in the unincorporated area of Josephine County.

All the departments within the County governance structure have some degree of responsibility in building overall community resilience. Department with an Obvious role to improve the life safety would be first responders such as Emergency Medical Service and public health, and public works focuses on hardening physical infrastructure. But beyond the obvious responsibility, all the department play a role in ensuring that County functions and normal operations resume after an incident, and the needs of the population are met.

Some divisions and departments of Josephine County government that have a role in hazard mitigation are:

DMA2K Requirement §201.6(c)(4)(ii):

*The plan **shall** include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

- **Building Safety:** Assists citizens with permitting and build code applications. This department could collaborate to do outreach to the owners of structures that were not built up to modern, resilient code. Professionals from this department could even be called on to help survey buildings after an incident.

- **Commission for Children and Families:** Plans, advocates, and engages the community around issues on behalf of families and children, often thought of as vulnerable populations due to increased sensitivity to the impacts of hazard incidents. This department also manages state and federal grant funds. Because this department is in frequent contact with a vulnerable population, it would be a natural partner in mitigation actions for outreach efforts and to build the County's awareness of the needs of children and families.

- **Fairgrounds:** Serves as an entertainment venue but can be considered a staging site for response efforts. Mitigation could include specific actions to ensure the facilities could be used during response, such as extra power should it need to be used as a shelter.

- **Forestry**: Manages the County's 30,000 acres of forest land for timber productions, minerals, watershed enhancement and protection, wildlife, and recreation. This involves reforestation, wetland reclamation, mine site reclamation, timber harvest, and other

related activities. This department has specific knowledge of areas that are geologically or environmentally sensitive that can inform mitigation against natural hazard such as flood, wildfire, or debris flows.

- **Geographic Information Systems**: Develops and maintains a Geographic Information System (GIS) for Josephine County. The GIS is composed of computer maps and associated databases. Examples of the maps include soils, flood hazard areas, and streams. In all phases of the disaster cycle, information is key. Building robust data that catalogues not only the County's risk and vulnerability, but also resources and response capability can ensure that efficient and effective mitigation activities.

- **Information Technology:** focuses on providing the various other County departments with the information systems and telecommunications technology to conduct daily business. Without this critical component, the County could not effectively serve the residents. Mitigation efforts from this department would not likely involve citizens at all, but would go a long way to ensuring uninterrupted services during hazard incidents.

- **Planning:** conducts both short and long range plans that determine much of the built, physical community. Through the County Comprehensive Plan and subsequent policies, this department guides decisions about growth, development, and conservation of natural resources. The Planning Department can be partners in mitigation by developing, implementing, and monitoring policies that incorporate hazard mitigation principles such as ensuring homes, businesses, and other buildings are built to current seismic code and out of the flood zones.

- **Public Health**: Josephine County Divisions of Health, Environmental Health, and Animal Protection & Regulation provides quality public health services consistent with laws, available resources, and community support through, the prevention of disease, health education and promotion and protection of the community and the environment. As an inherently mitigation focused department, Public Health can be an ally in preparing the community for natural hazards. Public Health likely has a distribution network established for information and supplies and these connection to the community will be to encourage personal preparedness and also during incident response.

- **Public Works**: The Public Works Department develops and implements the Josephine County Rural Transportation System Plan that assure the roads, bridges, traffic signs, and rights-of-way are designed, built, and maintained to provide users with the best-possible, safest transportation system. The Public Works

department will have important information about the resilience of the physical aspects of the community. This department can help to prioritize projects for mitigation and will be a key partner in implementation as well.

- **Sheriff's Office**: The mission of the Josephine County Sheriff's Office is to provide quality public safety services, in a professional, ethical and fiscally responsible manner. Life safety is the first goal of mitigation and response. Public Safety interacts with the vulnerable aspects of the community on a day-to-day basis and can help identify areas for focused mitigation.

Section 3: Mission, Goals, and Action Items

This section describes the components that guide implementation of the identified mitigation strategies and is based on strategic planning principles. This section provides information on the process used to develop the plan mission, goals and action items. This section also includes an explanation of how Josephine County intends to incorporate the mitigation strategies outlined in the plan into existing planning mechanisms and programs such as the County comprehensive land use planning process, capital improvement planning process, and building codes enforcement and implementation. City or special district specific documentation of how actions will be implemented through existing plans and policies is located in Volume III: City/Special District Addendums.

- **Mission—** The mission statement is a philosophical or value statement that answers the question "Why develop a plan?" In short, the mission states the purpose and defines the primary function of the County's multi-jurisdictional Natural Hazards Mitigation Plan. The mission is an action-oriented statement of the plan's reason to exist. It is broad enough that it need not change unless the community environment changes.

- **Goals—** Goals are designed to drive actions and they are intended to represent the general end toward which the County effort is directed. Goals identify how the County intends to work toward mitigating risk from natural hazards. The goals are guiding principles for the specific recommendations that are outlined in the action items.

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

Mitigation Plan Mission

The mission of the Josephine County Natural Hazard Mitigation Plan is to: Create a disaster resilient county.

Mitigation Plan Goals

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

DMA2K Requirement §201.6(c)(3)(i):

*The hazard mitigation strategy **shall** include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

On February 9, 2011, the Josephine County NHMP Steering Committee met to review the current NHMP goals and to suggest potential changes thereto. In amending and updating the goals, the Josephine County Steering committee considered (1) the need for alignment with goals contained in the Oregon Enhanced NHMP, (2) goals contained in the Josephine County Comprehensive and Community Wildfire Protection plans, and (3) community based information contained in Section 2 – Community Profile. At the request of the Steering Committee, OPDR revised the existing plan goals to better reflect the goals contained in the State plan as well as the goals and principles contained in the Josephine County Community Wildfire Protection Plan.

On April 9, 2011, the Josephine County NHMP Steering Committee met again to review, edit and approve the plan goals. The County solicited further input from the public in May and June 2011.

In accordance with the requirements contained in §201.6(c)(3)(i), the Josephine County NHMP goals are:

Plan Goal 1: Prevent or reduce losses to life, private property and natural resources resulting from natural hazards.

Plan Goal 2: Prevent or reduce the disruption to essential public infrastructure and services resulting from natural hazards.

Plan Goal 3: Increase public awareness for the importance and benefits of preparing for and mitigating natural hazard impacts.

Plan Goal 4: Increase the level of personal responsibility and accountability among Josephine County citizens to mitigate the impacts of natural hazards.

Plan Goal 5: Support the diversification, expansion and stabilization of local and regional economies by preventing or reducing business losses resulting from natural hazards.

Plan Goal 6: Increase the amount of federal, state and local funding sources dedicated to implementing affordable multi-objective natural hazard mitigation strategies.

Mitigation Plan Action Items

Short and long-term action items identified through the planning process are an important part of the mitigation plan. Action items are detailed recommendations for activities that local departments, citizens and others could engage in to reduce risk. They address both multi-hazard and hazard-specific issues. Action items can be developed through a number of sources and are primarily based in needs or issues identified in the county Risk Assessment.

The Josephine County NHMP Steering Committee met twice to discuss potential action items.

- February 9, 2011: This meeting included a review of previous action items, description of implementation, and a discussion of the need and feasibility of new actions.
- April 13, 2011: The Steering Committee reviewed the list of updated and new actions to ensure implementation ideas were appropriate and feasible and that effective partners were identified.

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

Rationale or Key Issues Addressed

Action items are tied directly to issues or needs identified during the NHMP update process. Actions were identified throughout the update process and came from various sources including participants in the planning process, noted deficiencies in local capability, or issues identified through the risk assessment. The rationale for proposed action items is based on the information documented in Section 2 and the Hazard Annexes.

Ideas for Implementation:

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

Implementation through Existing Programs

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

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

Coordinating Organization:

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

Internal and External Partners:

The internal and external partner organizations listed in the Action Item Worksheets are potential partners recommended by the project Steering Committee but not necessarily contacted during the development of the plan. The coordinating organization should contact the identified partner organizations to see if they are capable of and interested in participation. This initial contact is also to gain a commitment of time and/or resources toward completion of the action items.

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

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

Plan Goals Addressed:

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

Timeline:

Action items include 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.

Summary of Action Items:

Multi-Hazard

1.1. Improve and sustain County-wide public information and education programs about potential hazards in the county, the need for personal preparedness, and mitigation actions possible.

1.2. Develop a mapped inventory of hazards, vulnerable locations, and critical facilities

1.3. Continue to participate on the Regional Vulnerable Populations Committee as a way to support the resilience of vulnerable and special needs populations in Josephine County.

1.4. Develop an economic impact assessment and strategy to better understand how high-risk hazards may impact the county economy.

1.5. In coordination with the City of Grants Pass and Cave Junction, identify and apply for applicable mitigation grants

Flood

2.1. Provide a link on the county website to current National Flood Insurance Program rate maps.

2.2. Annually assess the county's interest in and ability to participate in the National Flood Insurance Program's Community Rating System.

2.3. Identify and apply for federal and state grant funds to acquire, elevate/retrofit, or relocate properties and facilities within the 100-year floodplain.

2.4. Collaborate with the City of Grants Pass to identify sources of funding to retrofit the Wastewater Treatment Plant to protect against flood damage.

2.5. Review and update county code to enhance flood risk management

2.6. Include needed culvert upgrades in the County Capital Improvements Plan

2.7. Collaborate with the City of Grants Pass and Cave Junction to develop outreach materials for property owners and tenants along stream and riverbanks to share information about how to minimize erosion of soils and banks during flood events of varying magnitudes.

Earthquake

3.1. Identify existing critical facilities needing structural retrofits; prioritize projects and develop funding strategy

3.2. Ensure all new critical facilities are built to highest earthquake building code standards; consider Institute for Business and Home Safety (IBHS) "Fortified for Safer Business" standards.

3.3. Promote non-structural retrofit strategies to property owners, renters and contractors

3.4. Promote non-structural retrofit strategies in county-owned facilities.

3.5. Develop Catastrophic Recovery Plan / Framework.

3.6. Promote the reduction of non-structural hazards in K-12 Schools

Landslide

4.1. Mitigate landslide hazards in previous landslide area of Wolf Creek

4.2. Collaborate with the Oregon Department of Geology and Mineral Industries (DOGAMI) on future acquisition of LIDAR data and creation of updated landslide maps for the county.

Severe Weather

5.1. Collaborate with electrical utilities to develop criteria for when to use underground construction methods based on local risk.

5.2. Promote wind-mitigation strategies in both building location and construction practices among property owners, renters and contractors.

5.3. Collaborate with Grants Pass and Cave Junction to assess the feasibility of a policy and procedures for opening heating and cooling shelter sites

5.4. Establish designated parking areas within the county proximate to major transportation corridors (I-5, OR-199) for stranded motorists during severe weather events

Wildfire

6.1. Coordinate fire mitigation actions through the Josephine County Integrated Fire Plan

Drought

7.1. Support the City of Grants Pass' efforts to address localized drought management strategies.

Volcanic

8.1. Provide information about the risk and vulnerability to the impact due to volcanic ash fall vulnerable facilities from impact due to ash fall.

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[i] Burby, Raymond J., ed. 1998. *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities.*

VOLUME I

SECTION 4:

HAZARD IDENTIFICATION, HISTORY AND RISK ASSESSMENT

TABLE OF CONTENTS

Introduction 4-3

What is a Risk Assessment? 4-3

Wildfire 4-5

Flood 4-11

Earthquake 4-17

Severe Weather 4-22

Landslide 4-26

Drought 4-30

Volcanic Incident 4-33

INTRODUCTION

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.

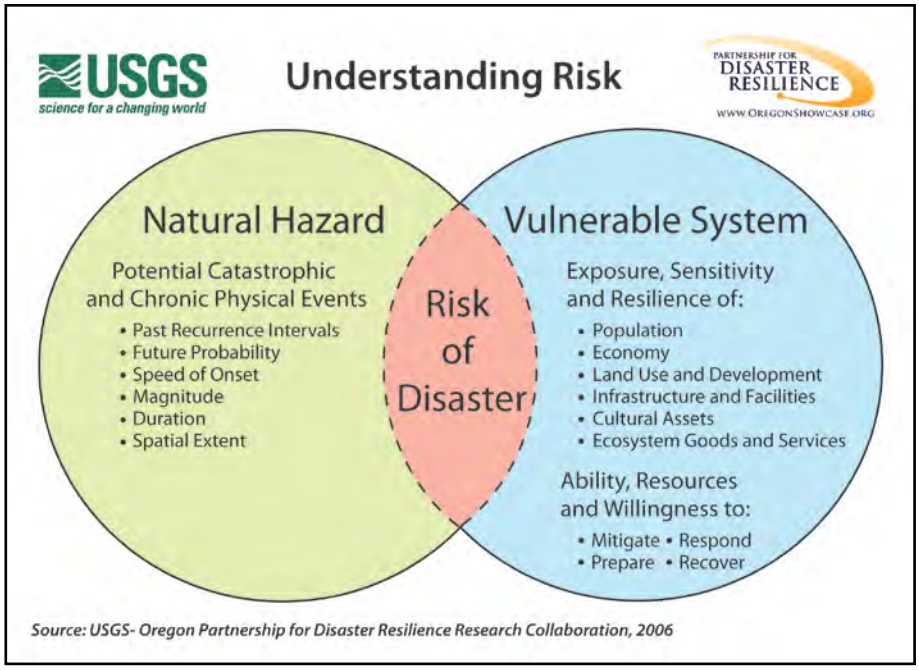
This section identifies and profiles the location, extent, previous occurrences, and future probability of natural hazards that can impact the participating jurisdictions, as highlighted in Figure 3.1 below. The information in this section was paired with the information in Section 2 – Community Overview during the planning process in order to identify issues and develop actions aimed at reducing overall risk, or the area of overlap in the figure below.

This section focuses on local level information and results in an understanding of the risks the communities face. In addition to local data, the information here relies upon the Regional Risk Assessment in the State of Oregon Natural Hazard Mitigation Plan.

WHAT IS A RISK ASSESSMENT?

A risk assessment consists of three phases: hazard identification, vulnerability assessment, and risk analysis, as illustrated in the following graphic.

FIGURE 3.1: OVERVIEW OF A RISK ASSESSMENT



The first phase of the risk assessment, hazard identification, involves identifying relevant hazards and determining their geographic extent, intensity, and probability of occurrence (left side of the diagram above). This level of assessment typically involves the most current scientific assessment of the hazard. The outputs from this phase can also be used for land use planning, management, and

regulation; public awareness; defining areas for further study; and identifying properties or structures appropriate for acquisition or relocation.[1]

The second phase, vulnerability assessment, involves the identification of key community assets such as existing (or planned) property and population centers, critical infrastructure, economic interests, community resources, etc. (right side of the diagram above). This step can assist in justifying changes to building codes or development regulations, property acquisition programs, policies concerning critical and public facilities, taxation strategies for mitigating risk, and informational programs for members of the public who are at risk.[2]

The third phase, risk analysis, combines the hazard and vulnerability assessments to establish key points of intersection. Specifically, the risk analysis involves estimating the damage, injuries, and costs likely to be incurred in a geographic area over a period of time (middle, overlap area depicted in Figure 3.1 above). Risk has two measurable components: (1) the magnitude of the harm that may result, defined through the vulnerability assessment, and (2) the likelihood or probability of the harm occurring. An example of a product that can assist communities in completing the risk analysis phase is HAZUS, a risk assessment software program for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH current scientific and engineering knowledge is coupled with the latest geographic information systems (GIS) technology to produce estimates of hazard-related damage before, or after a disaster occurs.

To assess relative risk, the Josephine County Steering Committee evaluated the probability of each hazard as well as the vulnerability of the community to that hazard.[3] The scoring and assessment parameters used have been established by Oregon Emergency Management and are described below.

Probability

- High = One incident likely within 10 to 35 years.
- Moderate = One incident likely within 35 to 75 years.
- Low = One incident likely within 75 to 100 years.

Vulnerability

- High = More than 10% of the population is affected
- Moderate = 1-10% of the population is affected
- Low = Less than 1% of the population is affected

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[1] Burby, R. 1998. Cooperating with Nature. Washington, DC: Joseph Henry Press. Pg. 126

[2] Burby, R. 1998. Cooperating with Nature. Washington DC: Joseph Henry Press. Pg. 133.

[3] In 2008, Josephine County conducted a Hazard Analysis. That process was completed as part of compliance requirements for the State of Oregon Emergency Management Preparedness Grant Program (EMPG). The EMPG update cycle was established by the state Office of Emergency Management prior to the introduction of Federal NHMP requirements. The update cycle and method of analysis for EMPG and NHMP are not required to be the same and for Josephine County, the 5-year review cycle requirements do not align.

WILDFIRE

Fire is an essential part of Oregon's ecosystem, but it is also a serious threat to life and property particularly in the state's growing rural communities. Wildfires are fires occurring in areas having large amounts of flammable vegetation that require a suppression response. Areas of wildfire risk exist throughout the state with areas in central, southwest and northeast Oregon having the highest risk.

Ignition of a wildfire may occur naturally from lightning or from human causes such as debris burns, arson, careless smoking, recreational activities or industrial accident. Once started, four main conditions affect the fire's behavior: fuel, topography, weather and development.

- Fuel is the material that feeds a fire. Fuel is classified by volume and type. As a western state, Oregon is prone to wildfires due to its prevalent conifer, brush and rangeland fuel types.
- Topography influences the movement of air and directs a fire's course. Slope and hillsides are key factors in fire behavior. Unfortunately, hillsides with steep topographic characteristics are also desirable areas for residential development.
- Weather is the most variable factor affecting wildfire behavior. High risk areas in Oregon share a hot, dry season in late summer and early fall with high temperatures and low humidity.
- The increase in residential development in interface areas has resulted in greater wildfire risk. Fire has historically been a natural wildland element and can sweep through vegetation that is adjacent to a combustible home. New residents in remote locations are often surprised to learn that in moving away from built-up urban areas, they have also left behind readily available fire services providing structural protection.[4]

Wildfire can be divided into three categories: interface, wildland, and firestorms.

INTERFACE FIRES

An interface fire occurs where wildland and developed areas come together with both vegetation and structural development combining to provide fuel. The wildland-urban interface (sometimes called rural interface in small communities or outlying areas) can be divided into three categories.

- The classic wildland-urban interface exists where well-defined urban and suburban development presses up against open expanses of wildland areas.
- The mixed wildland-urban interface is more typical of the problems in areas of suburban or rural development: isolated homes, subdivisions, resorts and small communities situated in predominantly in wildland settings.
- The occluded wildland-urban interface where islands of wildland vegetation exist within a largely urbanized area.

[4] Oregon Natural Hazard Technical Resource Guide, Wildfire / Chapter 7, 2000

WILDLAND FIRES

A wildland fire's main fuel source is natural vegetation. Often referred to as forest or rangeland fires, these fires occur in national forests and parks, private timberland, and on public and private rangeland. A wildland fire can become an interface fire if it encroaches on developed areas.

FIRESTORMS

Firestorms are events of such extreme intensity that effective suppression is virtually impossible. Firestorms often occur during dry, windy weather and generally burn until conditions change or the available fuel is consumed. The disastrous 1991 East Bay Fire in Oakland, California is an example of an interface fire that developed into a firestorm.

WILDFIRE HAZARD HISTORY

Josephine County has a long history of wildfires in the county. From 2005 to 2009 there were 517 incidents of fire in Josephine County, 97 of which were caused by lightning[5] (the remainder were human caused). Table 3.1 summarizes the characteristics of some of the larger fires that occurred in recent years.

TABLE 3.1: RECENT JOSEPHINE COUNTY FIRE HISTORY

Year	Name	Extent	Ignition Source	Location	Cost	Impact
2001	Biscuit	499,965 acres. Lasted four months (Ignition July 13th, control date, November 8th)	Lightning	Southern Oregon and northern California	More than $153million	No loss of life; four homes, nine outbuildings, one lookout and numerous accessory structures were lost
2003	Powell Creek	262 acres (140 BLM, 122 private)	Equipment Use	Upper Powell Creek Road, near Williams	More than $800,000.	No loss of life, property or livestock
2004	Redwood Highway *(Presidentially*	210 acres, 8/4/04	Downed power line	Near Cave Junction	$468,312.	180 homes and Forest Service's Illinois Valley Ranger District evacuated
2005	Deer Creek^	1,548 acres burned, 8/25/10 – 8/30/10	Equipment use	2 miles west of Selma, OR	$4,700,000.	Wildland-urban interface fire; burned grass, brush, timber, five homes destroyed, several others damaged
2007	Bailey Creek	274 acres, 7/1/2007	Equipment use	4 miles north of Galice, OR	$240,097.	
2008	Kerby Mainline	69 acres, 7/19/2008	Misc.,	2 miles north of Kerby, OR		U.S. Forest Service
2009	Horse	1,062 acres, 8/17/2009	Lightning,			U.S. Forest Service
2010	Oak Flat	7,494 acres, 8/13/2010	Recreationist,	10 miles NW of Selma, OR	$18,675,417	No loss of life or property

Source: Josephine County Emergency Management, 2011 ; Disaster Information Web Search, FEMA. Accessed 2/17/10. (http://www.fema.gov/hazard/). Note: ^ indicates a wildfire that was a presidentially declared disaster.

[5] Protecting Communities – Making a Difference, 2009 Highlights: A joint report of the Josephine County and Jackson County Integrated Fire Plans.2009

WILDFIRE VULNERABILITY ASSESSMENT

In Southern Oregon, large costly fires have become regular events, disrupted communities, cost millions of dollars in suppression and recovery costs, and increased the risk to private property owners. According to the Oregon Department of Forestry, "large fires that threaten dwellings are 48% more expensive to fight, and the likelihood of human-caused fires exponentially increases with the addition of each new home. Throughout Oregon's wildland-urban interfaces historically normal fires have become economically and socially unacceptable due to the scale of damage they cause.[6]

In November 2004, the Josephine County Board of County Commissioners adopted the Josephine County Integrated Fire Plan. The plan was developed as a collaborative effort among the County Fire Defense Board, Oregon Department of Forestry, county departments, state and federal agencies, rural fire protection districts and community organizations throughout the county. The County initiated this effort to reduce wildfire risk to citizens, the environment, and quality of life within Josephine County.

The Josephine County Integrated Fire Plan is multi-jurisdictional and addresses wildfire risk and mitigation actions for the two municipalities of Grants Pass and Cave Junction, the four rural fire protection districts (Applegate Valley, Illinois Valley, Williams, and Wolf Creek), as well as the unprotected areas of Josephine County, largely served by the Rural/Metro Fire Department.[7] The Josephine County plan is coordinated with the Jackson County plan via the Rogue Valley Fire Chiefs Association. This body also facilitates coordination with the Office of the State Fire Marshal.

The Josephine County Integrated Fire Plan mission is to reduce the risk from wildfire to life, property and natural resources in the County. The plan goals are:

- Protect against potential losses to life, property and natural resources from wildfire
- Build and maintain active participation from each Fire Protection District;
- Set realistic expectations for reducing wildfire risk;
- Identify and prioritize actions for fire protection;
- Access and utilize federal and other grant dollars;
- Identify incentives for fire protection and community participation;
- Promote visible projects and program successes;
- Monitor the changing conditions of wildfire risk and citizen action over time; and
- Institutionalize fire-related programs and sustain community efforts for fire protection.

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[6] Oregon Department of Forestry, Oregon Forests Report, 2007-2009

[7] Josephine County Integrated Fire Plan, 2004

For the intent of this fire plan, we define communities at risk to fire by looking at the common service boundaries for fire protection and population centers.[8]

While a number of Josephine County's communities are listed as "unprotected," it is important to note that these communities are NOT without fire service. Three private companies, Rural/Metro Fire Department, Grants Pass Rural and Inland Fire, provide contract structural fire protection services in the unprotected areas of Josephine County. "Communities at Risk" are defined in the Fire Plan by common service boundaries for fire protection and population centers.

COMMUNITIES AT RISK IN JOSEPHINE COUNTY

- Applegate Valley (Provolt, Murphy)
- Grants Pass
- Josephine County Unprotected (Galice, Hugo, Merlin, North Valley, Colonial Valley, Wilderville, Wonder, Sunny Valley, Murphy, etc.)
- Illinois Valley
- Williams
- Wolf Creek
- Oregon Caves[9]

WILDLAND-URBAN INTERFACE

The Southwest Oregon Fire Management Plan[10] identifies the wildland-urban interface on the basis of proximity between private and federal lands, topography, and 6th field watersheds. The Josephine County Integrated Fire Plan adopts this methodology and the Federal Fire Management definition and boundaries for the wildland-urban interface.

TABLE 3.2: ACRES IN THE WILDLAND-URBAN INTERFACE BY LAND OWNERSHIP, 2004

Ownership	Acres	Percent
Private	268,196	50.4%
BLM	156,333	29.4%
Forest Service	57,127	10.7%
County	26,167	4.9%
Federal (Other)	16,203	3.0%
State	6,671	1.3%
School Districts	1,120	.2%
City	739	.1%
Total	**532,555**	**100%**

Source: Josephine County Integrated Fire Plan, 2004

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[8] Josephine County Integrated Fire Plan, 2004

[9] Josephine County Integrated Fire Plan, 2004

[10] Southwest Oregon State Forest Management Plan, Oregon Department of Forestry, 2001

WILDFIRE RISK ASSESSMENT

The JCIFP Risk Assessment Committee approaches the yearly wildfire risk assessment with a comprehensive review of risk assessment methods and examples from communities throughout the United States. The committee also conducts an inventory of existing data for risk, hazard, values, structural vulnerability and protection capability. These efforts resulted in a standard methodology for wildfire risk assessment to be adopted by the Oregon Department of Forestry for use in a statewide assessment of communities at risk.

The analysis takes into consideration a combination of factors that we define below:

- Risk : Potential and frequency for wildfire ignitions (based on past occurrences)
- Hazard : Conditions that may contribute to wildfire (fuels, slope, aspect, elevation, weather)
- Values : People, property, natural and other resources that could suffer losses in a wildfire event.
- Protection Capability : Ability to mitigate losses, prepare for, respond to and suppress wildland and structural fires.
- Structural Vulnerability : Characteristics influencing the vulnerability of structures during a wildfire event (roof type and building materials, access to the structure, and whether or not there is defensible space or fuels reduction around the structure.)[11]

In 2009, Josephine and Jackson Counties collaborated on developing an updated wildfire risk assessment[12]:

- **Two-County Risk Assessment.** In 2009, Jackson and Josephine County wildfire partners collaborated on an update of the joint risk assessment using the two-county fuel-mapping project data completed in 2008. With support from Jackson County GIS staff and Title III funds, updates of all the key data sets (ignition risk, hazard, protection capability, and values at risk) were completed for both Jackson and Josephine Counties. Both county risk/fuels committees reviewed the data and model parameters. The primary goals of the assessment update that were accomplished in 2009 included incorporation of the new calibrated LANDFIRE data and advanced fire modeling tools, and consistent use of the assessment methodology across the two-county area. The two counties also share a Mutual Aid Agreement for fire response.

The Integrated Fire plan is updated annually, and contains extensive analysis. Therefore, the current Josephine County Integrated Fire plan risk assessment is incorporated herein by reference. In accordance with CFR 401.6 and as part of the 2010/20111 NHMP update process, the NHMP Steering Committee considered fire risk using the same evaluation method as other hazards included in the NHMP to allow for a comparative analysis of hazard risk.

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[11] Josephine County Integrated Fire Plan, 2004

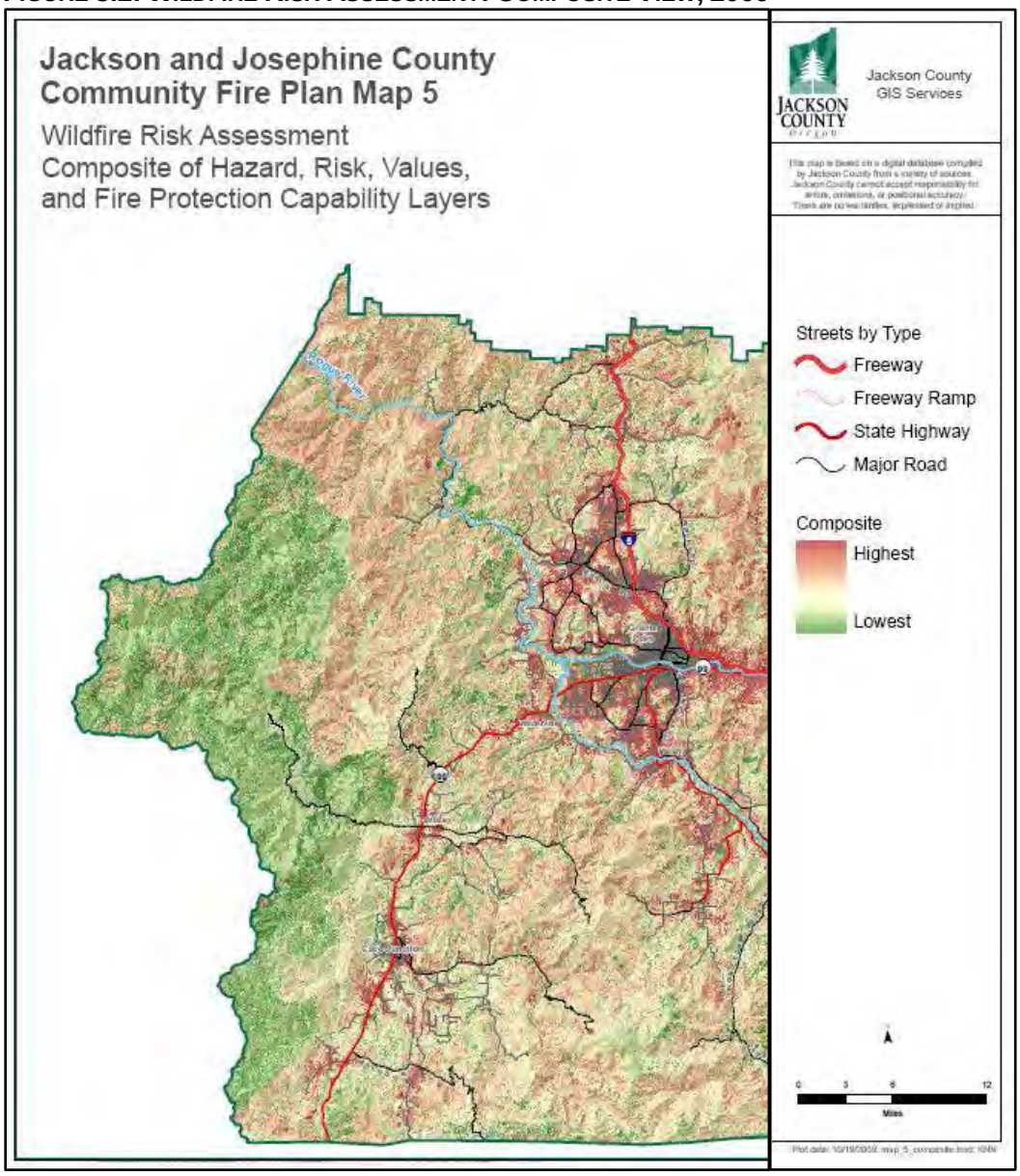
[12] Protecting Communities – Making a Difference, 2009 Highlights: A joint report of the Josephine County and Jackson County Integrated Fire Plans.2009

The Steering Committee assessed risk associated with the fire hazard in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The Steering Committee determined the following level of risk of fire in Josephine County:

- **Probability**: High (One incident likely within a 10 to 35 year period)
- **Vulnerability**: Moderate (1-10% affected)

Figure 3.2, below, shows the overall, compost risk score according to the 2009 update to the Integrated Fire Plan. To access additional wildfire risk assessment maps and the current Integrated Fire Plan, visit the Josephine County website: (www.co.josephine.or.us)

FIGURE 3.2: WILDFIRE RISK ASSESSMENT: COMPOSITE VIEW, 2009



Source: Protecting Communities – Making a Difference, 2009 Highlights: A joint report of the Josephine County and Jackson County Integrated Fire Plans.2009(zoom in on Josephine County)

FLOOD

Oregon has a detailed history of flooding with flood records dating back to the 1860s. There are over 250 flood-prone communities in Oregon. The principal types of flood that occur in the community include:

RIVERINE FLOODS

Riverine floods occur when water levels in rivers and streams overflow their banks. Most communities located along such water bodies have the potential to experience this type of flooding after spring rains, heavy thunderstorms or rapid runoff from snow melt. Riverine floods can be slow or fast-rising, but usually develop over a period of days.

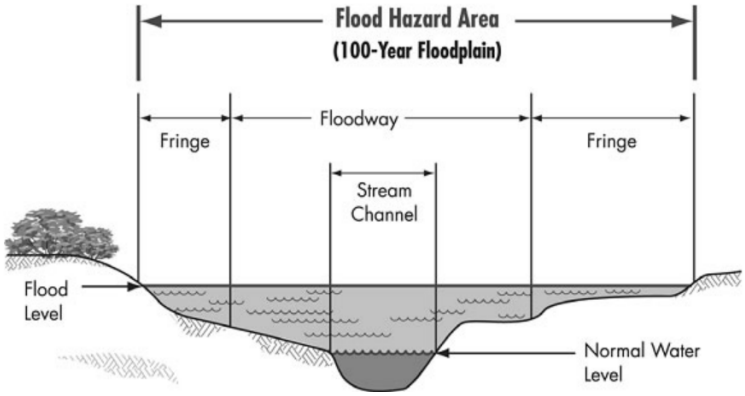
The danger of riverine flooding occurs mainly during the winter months, with the onset of persistent, heavy rainfall, and during the spring, with melting of snow in the Cascade and Coast Ranges.

FLASH FLOODS

Flash floods usually result from intense storms dropping large amounts of rain within a brief period. Flash floods usually occur in the summer during thunderstorm season, appear with little or no warning and can reach full peak in only a few minutes. They are most common in the arid and semi-arid central and eastern areas of the state where there is steep topography, little vegetation and intense but short-duration rainfall. Flash floods can occur in both urban and rural settings, often along smaller rivers and drainage ways.

In flash flood situations, waters not only rise rapidly, but also generally move at high velocities and often carry large amounts of debris. In these instances a flash flood may arrive as a fast moving wall of debris, mud, water or ice. Such material can accumulate at a natural or man-made obstruction and restrict the flow of water. Water held back in such a manner can cause flooding both upstream and then later downstream if the obstruction is removed or breaks free.

FIGURE 3.3: CROSS-SECTION OF A FLOODPLAIN



Source: New Hampshire Office of Energy and Planning, 2007

SHALLOW AREA FLOODS

These floods are a special type of riverine flooding. FEMA defines a shallow area flood hazard as an area that is inundated by a 100-year flood with a flood depth between one to three feet. Such areas are generally flooded by low velocity sheet flows of water.

URBAN FLOODS

Urban flooding occurs where land has been converted from fields or woodlands to developed areas consisting of homes, parking lots, and commercial, industrial and public buildings and structures. In such areas the previous ability of water to filter into the ground is often prevented by the extensive impervious surfaces associated with urban development. This in turn results in more water quickly running off into watercourses which causes water levels to rise above pre-development levels. During periods of urban flooding streets can rapidly become swift moving rivers and basements and backyards can quickly fill with water. Storm drains often may back up with yard waste or other flood debris leading to further localized flooding. Another source of urban flooding is grading associated with development. In some cases, such grading can alter changes in drainage direction of water from one property to another.

FLOOD HAZARD HISTORY[13]

The Southwest Oregon Regional Profile (compiled for the 2009 Oregon Enhanced NHMP) lists the following flood events as impacting Josephine County:

HISTORIC:

- **1861** Rogue River Crests at 43 feet at Grants Pass (175,000 cfs)
- **1890** Rogue River Crests at 36 feet at Grants Pass.
- **1927** Rogue River Crests at 32 feet at Grants Pass.
- **October 1950 -** Severe flooding in Region 4. Six fatalities. Bridges and roads destroyed.
- **1955** Rogue River Crests at 32.6 feet at Grants Pass.
- **December 1964 –** Statewide flooding event; benchmark event with record flows on the Rogue and Umpqua rivers. Rogue River Crests at 35.15 feet at Grants Pass; flood stage is 24.5 feet. $90 million in damages (2004 dollars) Rogue and Illinois Valleys isolated with roads (including I-5) temporarily closed; 10 inches of rain over a six day period.

RECENT:

- **1996**: Wolf Creek small stream flooding. A series of storms dumped several inches of rain within a four day period, Dec. 7 through Dec. 10; caused mudslides andflooding

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[13] Sourced from: 1) Southwest Oregon Regional Profile, 2009 Oregon Enhanced Natural Hazard Mitigation Plan and 2) NCDC Climate Radar Data Inventories.

- **January, 1997 –** 4 inches of rain over 48 hours; 90,100 cfs in Grants Pass; $10 million in damages. Governor Kitzhaber declared a state of emergency.
- **1999**: Wilderville/ Selma, February 28, 1999. Small stream Flood Warning issued in County; Shade Creek reported out of banks and threatening nearby road; Deer Creek above bank
- **2002:** Numerous reports of flooding with rainfall between 2 and 4 inches countywide; December 27, 2002
- **April 2005:** 3.6 inches of rain fell in one hour in Grants Pass Warning Area (2.0 inches in 45 minutes in Merlin) flooding city streets; mud and debris on county roads.
- **December 2005:** $2,840,000 in flood damage centered in Douglas, Jackson and Josephine counties.

FLOOD VULNERABILITY ASSESSMENT[14]

COUNTY FLOODPLAIN DESCRIPTION

The following information is from the 2009 FEMA Flood Insurance Study done in Josephine County. The study drew on data from the Josephine County National Flood Insurance Program flood hazard data repository. Josephine County collects and maintains this data as a compliance measure for the National Flood Insurance Program.

Josephine County is drained almost entirely by the Rogue River and its two principal tributaries, the Applegate and Illinois Rivers. Steep, mountainous terrain lends to rapid runoff when mild temperatures and heavy rainfall melt snow at the higher elevations.

The Rogue River originates in the Cascade Range where the highest elevations exceed 8,000 feet. As the river flows westerly through the county, flood flows are fairly well contained by both banks until reaching the City of Grants Pass. From Grants Pass to Finely Bend (9.9 miles west of the city), vast areas of lowlying terrain are subject to severe flooding. From Finley Bend, the river meanders north of Jumpoff Joe Creek (8.5 miles downstream). In these reaches, flood flows are subject to natural bank constrictions which result in sizable ponding of water. Beyond Jumpoff Joe Creek, the Rogue River flows northwesterly toward the resort community of Galice. In this reach, flood flows are totally contained by steep canyon walls, especially at Hellgate Canyon and at an unnamed canyon ending at Taylor Creek. In these canyons, flood flows become constricted to a few hundred feet in width. Beyond Galice, the river continues its westward passage through the Klamath Mountain Range until it eventually reaches the Pacific Ocean.

The Applegate River originates in the Siskiyou Mountains which form all but the northern boundary of the basin. The river enters Josephine County from the southeast at a point 7.5 miles upstream from the small community of Murphy. Flood flows in a sharply meandering channel inundate wide portions of the floodplain that lie upstream from natural constrictions. Five miles downstream from Murphy, the river passes through a short, narrow canyon. After leaving the canyon, overbank

[14] For additional information on flood hazards, review the State of Oregon Natural Hazard Mitigation Plan, Flood chapter or the Oregon Technical Resource Guide.

flooding is moderate until the river becomes affected by backwater from the Redwood Highway (U.S. Highway 199) bridge near Wilderville. Here, extensive flooding occurs.

The headwaters of Illinois River consist of two principal tributaries, the East and West Forks Illinois River. The East Fork Illinois River enters Josephine County from the south at a point 3.9 miles upstream from the community of Takilma. General flooding occurs in most areas near Takilma except in a gorge east of the community. Farther north, extensive flooding occurs in the wide, flat floodplain downstream from the Redwood Highway Bridge near Cave Junction.

The West Fork Illinois River also flows northerly into Josephine County at a point 7.1 miles upstream from the community of O'Brien. The most significant flooding in O'Brien occurs at the Redwood Highway Bridge. Overflow inundates portions of the community before re-entering the channel downstream from the bridge. Farther north, near Cave Junction, flooding can be much more severe.

Below the confluence of its East and West Forks, the Illinois River flows northerly through fertile agricultural areas. Wide floodplains between Cave Junction and Kerby (2 miles to the north) become completely flooded. The flooding north of Kerby is equally severe, caused in part by a sharp bend in the river as it enters a narrow canyon.

Deer Creek, a tributary of the Illinois River, is located entirely within Josephine County. The creek originates in the Siskiyou Mountain foothills, south of Grants Pass, and flows westerly toward the community of Selma. The drainage area of the stream at a point 3.5 miles upstream from its mouth is 101 square miles. Flood plains in the Selma area are low and flat. Extensive flooding occurs in this agricultural area.[15]

POTENTIAL FLOOD IMPACT

The extent of the damage and risk to people caused by flood events is primarily dependent on the depth and velocity of floodwaters. Fast moving floodwaters can wash buildings off their foundations and sweep vehicles downstream. Roads, bridges, other infrastructure and lifelines (pipelines, utility, water, sewer, communications systems, etc.) can be seriously damaged when high water combines with flood debris, mud and ice. Extensive flood damage to residences and other structures also results from basement flooding and landslide damage related to soil saturation. Surface water entering into crawlspaces, basements and daylight basements is common during flood events not only in or near flooded areas but also on hillsides and other areas far removed from floodplains. Most damage is caused by water saturating materials susceptible to loss (e.g., wood, insulation, wallboard, fabric, furnishings, floor coverings and appliances.)

Homes in frequently flooded areas can also experience blocked sewer lines and damage to septic systems and drain fields. This is particularly the case of residences in rural flood prone areas who commonly utilize private individual sewage treatment systems. Inundation of these systems can result in the leakage of wastewater into surrounding areas creating the risk of serious water pollution and public health threats. This kind damage can render homes unlivable.

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[15] Josephine County Flood Insurance Study, FEMA, 2009

As was seen in Oregon's 1996 floods, many housing units that were damaged or lost were mobile homes and trailers. Many older manufactured home parks are located in floodplain areas. Manufactured homes have a lower level of structural stability than "stick-built" (standard wood frame construction) homes. Manufactured homes in floodplain zones must be anchored to provide additional structural stability during flood events. Lack of community enforcement of manufactured home construction and anchoring standards in floodplains can contribute to severe damages from flood events.

Flood events impact businesses by damaging property and interrupting commerce. Flood events can cut off customer access and close businesses for repairs. A quick response to the needs of businesses affected by flood events can help a community maintain economic viability in the face of flood damage.

Bridges are a major concern during flood events as they provide critical links in road networks by crossing water courses and other significant natural features. However bridges and their supporting structures can also be obstructions in flood-swollen watercourses and can inhibit the rapid flow of water during flood events.

THE NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

The Flood Insurance and Mitigation Administration, a component of the Federal Emergency Management Agency (FEMA), manages the National Flood Insurance Program (NFIP). The three components of the NFIP are:

- Flood Insurance
- Floodplain Management
- Flood Hazard Mapping[16]

Josephine County participates in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities. Preliminary Flood Insurance Study (FIS) Flood Insurance and Rate Maps (FIRM) are current and effective as of December 3, 2009.

As of October 2009, unincorporated Josephine County has the following NFIP profile:

- Flood insurance policies in force: 661
- Total insurance in force: $135 million
- Number of paid flood insurance losses (since NFIP entry): 32
- Total claims paid (since NFIP entry): $422,000
- Repetitive Loss Properties: 4

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[16] FEMA, National Flood Insurance Program hompage, (www.fema.gov/about/programs/nfip), accessed May 2011.

Josephine County does not participate in the Community Rating System (CRS). Grants Pass does participate in the CRS. More information about the Grants Pass participation, see the Grants Pass City Addendum, Volume II, Section 1.

More About Flood Insurance

Flood insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods. Flood damage is reduced by nearly $1 billion a year through communities implementing sound floodplain management requirements and property owners purchasing of flood insurance. Additionally, buildings constructed in compliance with NFIP building standards suffer approximately 80 percent less damage annually than those not built in compliance. Community participation in the NFIP is voluntary.

In addition to providing flood insurance and reducing flood damages through floodplain management regulations, the NFIP identifies and maps the Nation's floodplains. Mapping flood hazards creates broad-based awareness of the flood hazards and provides the data needed for floodplain management programs and to actuarially rate new construction for flood insurance.

FLOOD RISK ASSESSMENT

As part of the 2010/20111 NHMP update process, the NHMP Steering Committee reviewed the risk associated with the flood hazard in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The Steering Committee determined the following level of risk of flood in Josephine County:

- **Probability**: High (One incident likely within a 10 to 35 year period)
- **Vulnerability**: Moderate (1-10% affected)

Additional data and analysis is needed to determine specific areas or structures at risk in unincorporated Josephine County.

EARTHQUAKE

Seismic events were once thought to pose little or no threat to Oregon communities. However, recent earthquakes and scientific evidence indicate that the risk to people and property is much greater than previously thought. Oregon and the Pacific Northwest in general are susceptible to earthquakes from three sources: 1) the off-shore Cascadian Subduction Zone; 2) deep intra-plate events within the subducting Juan de Fuca Plate; and 3) shallow crustal events within the North American Plate.

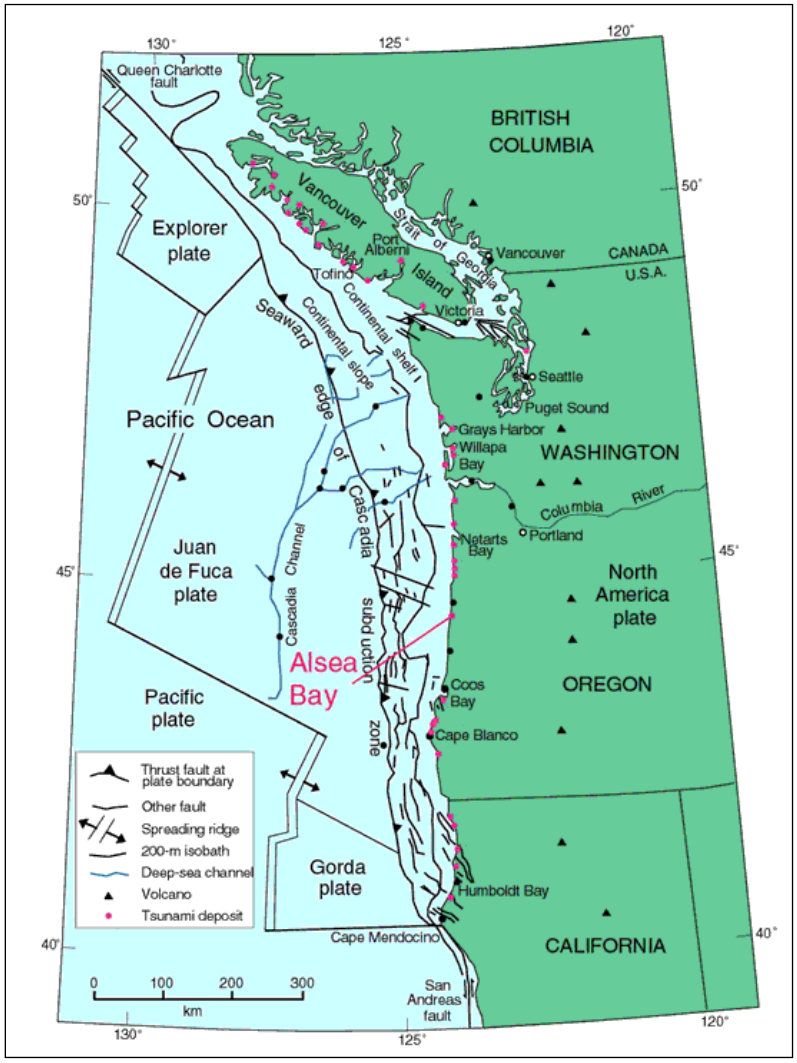
While all three types of quakes possess the potential to cause major damage, Subduction zone earthquakes pose the greatest danger. The source for such events lies off the Oregon coast and is known as the Cascadia Subduction Zone (CSZ). A major CSZ event could generate an earthquake with a magnitude of 9.0 or greater resulting in devastating damage and loss of life.

The specific hazards associated with an earthquake include the following:

- **Ground Shaking:**
  Ground shaking is defined as the motion or seismic waves felt on the Earth's surface caused by an earthquake. Ground shaking is the primary cause of earthquake damage.
- **Ground Shaking Amplification**
  Ground shaking amplification refers to the soils and soft sedimentary rocks near the surface that can modify ground shaking from an earthquake. Such factors can increase or decrease the amplification (i.e., strength) as well as the frequency of the shaking.
- **Surface Faulting**
  Surface faulting are planes or surfaces in Earth materials along which failure occurs. Such faults can be found deep within the earth or on the surface. Earthquakes occurring from deep lying faults usually create only ground shaking.
- **Earthquake-Induced Landslides**
  These landslides are secondary hazards that occur from ground shaking.
- **Liquefaction**
  Liquefaction takes place when ground shaking causes granular soils to turn from a solid into a liquid state. This in turn causes soils to lose their strength and their ability to support weight.[17]

[17] Oregon Natural Hazard Technical Resource Guide, Seismic/Chapter 8, 2000

FIGURE 3.4: CASCADIA SUBDUCTION ZONE



Source: USGS, Atwater et al., 1995 and Clague, 1997

EARTHQUAKE HAZARD HISTORY

Historically, major Cascadia subduction zone events have occurred roughly every 250-500 years with likely impacts in Josephine County. There have been no earthquakes over M4.0 centered in Josephine County in modern times. The following earthquakes located in or near southern Oregon have been felt in Josephine County:

- **January 26, 1700 Offshore quake Approximately 9:** Cascadia Subduction Zone 9.0 Generated a tsunami that struck Oregon, Washington, and Japan; destroyed Native American villages along the coast.
- **November 23, 1873:** 6.75 quake near California Boarder. Damage was reported along the coast and in Josephine and Jackson Counties.
- **April 14, 1920**: Quake centered near Crater Lake – No record of reported damage.

- **September 20-mid December 1983** : Series of quakes M5.1 – 6.0. No record of reported damage in Josephine County.
- **September 20, 1993**: Klamath Falls Earthquakes, Two (2) magnitude 6.0 earthquakes that caused $7.5 million in damages and killed two (2; one heart attack, one crushed by a boulder while driving); felt in Southern Oregon.
- **January 16, 2003**: 6.3 offshore quake at that Blanco Fracture Zone, Oregon

EARTHQUAKE VULNERABILITY ASSESSMENT[18]

Oregon is rated third highest in the nation for potential losses due to earthquakes. Until recently Oregon was not considered to be an area of high seismicity, and consequently the majority of buildings and infrastructure were not designed to withstand the magnitude of ground shaking that would occur in conjunction with a major seismic occurrence. Experts predict that a magnitude 8.5 Cascadia Subduction Zone earthquake could result in 7,700 injuries, 100 deaths, $12 billion in economic losses for buildings, and $370 million in losses for highways. The estimate for the 500-year earthquake resulted in 24,000 injuries, 500 deaths, $32 billion in economic losses for buildings, and $1.3 billion in losses for highways.[19]

The degree of damage to structures and injury and death to people will depend upon the type of earthquake, proximity to the epicenter and the magnitude and duration of the event. Buildings, ports, dams, levees and lifelines including water, sewer, storm water and gas lines, transportation systems, and utility and communication networks are particularly at risk. Also, damage to roads and water systems will make it difficult to respond to post-earthquake fires.

Earthquake damage to roads and bridges can be particularly serious by hampering or cutting off the movement of people and goods and disrupting the provision of emergency response services. Such effects in turn can produce serious impacts on the local and regional economy by disconnecting people from work, home, food, school and needed commercial, medical and social services. A major earthquake can separate businesses and other employers from their employees, customers, and suppliers thereby further hurting the economy. Finally, following an earthquake event, the cleanup of debris can be a huge challenge for the community.

As Figure 3.5 shows, there is one small fault line within Josephine County. When the Cascadia Subduction Fault ruptures, it will likely be felt in Josephine County. The location of the epicenter of the earthquake will determine the duration intensity of the earthquake in Josephine County and subsequently the damage to buildings and infrastructure. Many other communities throughout Oregon will likely face catastrophic damage, and may turn to Josephine County for assistance with response and recovery.

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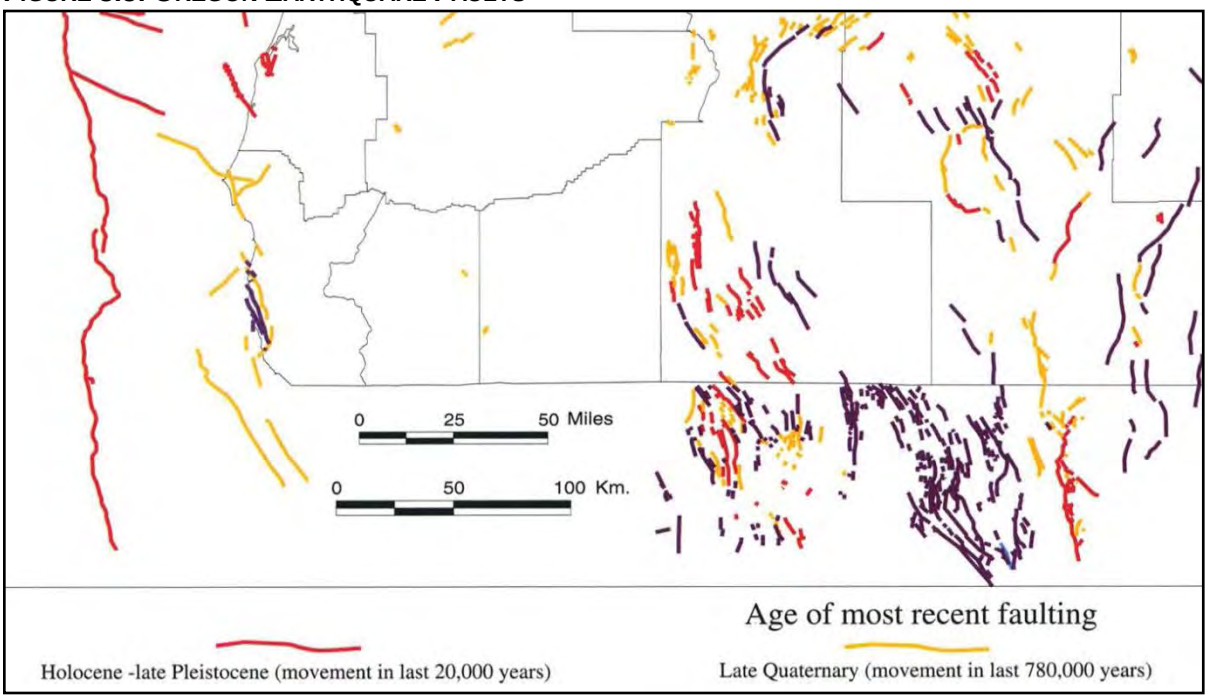
[18] For additional information on flood hazards, review the State of Oregon Natural Hazard Mitigation Plan, earthquake chapter or the Oregon Technical Resource Guide

[19] State of Oregon Natural Hazard Mitigation Plan, 2007

FIGURE 3.5: OREGON EARTHQUAKE FAULTS



Source: DOGAMI, 1996

RAPID VISUAL SCREENING

The following information is from the DOGAMI homepage for the Statewide Seismic Needs ASSESSMENT Using Rapid Visual Screening.[20]

In 2005, Oregon Senate Bill 2 directed the Department of Geology and Mineral Industries (DOGAMI) to develop a statewide seismic needs assessment that included seismic safety surveys of K-12 public school buildings and community college buildings that have a capacity of 250 or more persons, hospital buildings with acute inpatient care facilities, fire stations, police stations, sheriffs' offices and other law enforcement agency buildings.

An interactive website containing the complete report, building scores, and background information is now online at http://www.oregongeology.com. The five key parameters that determine the relative seismic risk of a building are the:

- Seismic Zone (how hard the ground is expected to shake in a given area)
- Building Structural Type (wood frame, reinforced masonry, steel frame, etc.)
- Building Irregularities (the shape of the building)
- Original Construction Date
- Soil Type (softer soils amplify the severity of ground motion)

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[20] DOGAMI, Statewide Seismic Needs Assessment Using Rapid Visual Screening (RVS), (www.oregongeology.org/sub/projects/rvs), accessed May 2011

It is important to note that these probability of collapse estimates are based upon limited observed and analytical data, and the probability of collapse ranking is therefore approximate. The score and ranking in this report – Very High, High, Moderate, and Low – is related to the likelihood or probability of a building sustaining major life threatening damage, given the occurrence of an earthquake. Different building construction types react in different ways to earthquake shaking, and this does not necessarily mean the complete collapse of a building. More detailed structural investigation by qualified and experienced engineers is required to fully assess the seismic risks and rehabilitation issues of any one building.

TABLE 3.3: COLLAPSE POTENTIAL IN JOSEPHINE COUNTY

	Very High	High	Moderate	Low
Community College	2	1	2	1
Sheriff Public Safety		1		2*
Fire - City		1		
Fire - RFPD			1	5
Hospital				1
School		13	12	27

Source: Oregon Department of Geology and Mineral Industries, 2010
Note: * Confidential locations

EARTHQUAKE RISK ASSESSMENT

As part of the 2010/20111 NHMP update process, the NHMP Steering Committee reviewed the risk associated with the earthquake hazard in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The Steering Committee determined the following level of risk of damage from earthquake in Josephine County:

- **Probability**: Moderate (one incident likely within a 35 to 75 year period)
- **Vulnerability**: High (more than 10% affected)

Additional data and analysis is needed to determine specific areas or structures at risk from earthquake as well as the economic impacts to unincorporated Josephine County.

Collapse Potential Score

The score relates to the probability that the building will collapse if ground motions occur that are equal to or exceed the maximum considered earthquake at that location. The maximum considered earthquake is defined as the maximum event considered likely in a reasonable amount of time. The maximum considered earthquake for any location is determined by the United States Geological Survey's (USGS) work, most recently updated in 2002. This information can be found online at: http://earthquake.usgs.gov/research/hazmaps/

SEVERE WEATHER

WINDSTORM

Extreme winds occur throughout Oregon. The most persistent high winds take place along the Oregon Coast and in the Columbia River Gorge. High winds in the Columbia Gorge are well documented. The Gorge is the most significant east-west gap in the Cascade Mountains between California and Canada. Wind conditions in southeast Oregon are not as dramatic as those along the coast or in the Gorge yet can cause dust storms or be associated with severe winter conditions such as blizzards. A majority of the destructive surface winds striking Oregon are from the southwest. Some winds blow from the east but most often do not carry the same destructive force as those from the Pacific Ocean.

Although rare, tornados can and do occur in Oregon. In December 2010, an EF 2 tornado touched down in Aumsville Marion County. Though damage was extensive, no serious injuries occurred. According to the weather service, Oregon typically experiences two tornadoes annually but the December incident was the fourth since 2000..[21]

WINTER STORM

Destructive winter storms that produce heavy snow, ice, rain and freezing rain, and high winds have a long history in Oregon and Josephine County. Severe storms with snow and ice typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from October through March.

- **Ice storms** are comprised of cold temperatures and moisture, but subtle changes can result in varying types of ice formation which may include freezing rain, sleet and hail. Of these, freezing rain can be the most damaging of ice formations.
- **Sleet** is rain that freezes into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects; however, it can accumulate like snow and cause roads and walkways to become hazardous. Freezing rain (also known as an ice storm) is rain that falls onto a surface with a temperature below freezing. The cold surface causes the rain to freeze so the surfaces, such as trees, utilities, and roads, become glazed with ice. Even small accumulations of ice can cause a significant hazard to property, pedestrians, and motorists.
- **Black ice** can fool drivers into thinking water is on the road. What they may not realize is that condensation, such as dew, freezes when temperatures reach 32 degrees F or below, forming a thin layer of ice. This shiny ice surface is one of the most dangerous road conditions. Black ice is likely to form under bridges and overpasses, in shady spots and at intersections.

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[21] National Oceanic and Atmospheric Administration, National Climatic Data Center, *State of the Climate, Tornadoes, December 2010. (www.ncdc.noaa.gov/sotc/tornadoes/2010/12).*

SEVERE WEATHER HAZARD HISTORY

As currently described in the Josephine County NHMP, Severe weather is comprised of winter storms (including heavy snows, ice storms, and extreme cold) and non-winter events (thunder and lightning storms, high winds, and heavy rains). The plan currently describes the following severe weather events in Josephine County:

- **December 1929**: Significant snowfall event; 27.5 inches recorded in Grants Pass for the month.
- **January 1969**: Significant snowfall event; 30.6 inches recorded in Cave Junction and 106.7 inches at Sexton Summit.
- **December 1972**: Extreme cold event with lowest temperatures on record recorded in Grants Pass (one-degree) and Cave Junction (six-degrees).
- **October 1962:** Known as the "Columbus Day Storm" this storm produced wind speeds of up to 179 mph and wind gusts of 58 mph, the National weather service minimum for "High Wind Criteria," or higher were reported from California to British Columbia. Damage from this event was the greatest in the Willamette Valley. The storm killed 38 people and left over $200 million in damage. More than 50,000 homes suffered some damage and nearly 100 were destroyed. Entire fruit and nut orchards were destroyed and livestock killed as barns collapsed and trees blew over.
- **February 24 1961**: Southwest Oregon Windstorm. Severe winds. 30'x55' chunk of roof was ripped off of Union High School in Grants Pass, carried by 70 mph winds, no injuries, school closed for several weeks.
- **November 1981**: Two windstorms struck Oregon and Washington over the course of three days. At Sexton Pass, the first storm on November 13 produced 73mph wind speeds while the second, on November 15, produced 43mph wind speeds.
- **December 1995:** This extreme wind produced by this storm impacted Oregon and Washington. Already wet soil condition left many trees vulnerable and they were toppled. Cave Junction reported gusts of 64mph. wind
- **Various occurrences**: Numerous reports of large hail between 1995 and 2003 ranging from ¾ to 1.5 inches in diameter;
- **September. 10 1997:** ¾ inch hail knocked out power to 75 residences in Grants Pass;
- **April 29 1998:** ¾ inch hail knocked out power to 44,000 residents between Rogue River, OR and Crescent City, CA;
- **December 2006**: High winds up to 90 mph caused $150,000 in damages in Douglas and Josephine. The storm also impacted Coos and Curry Counties for a storm damage total of $300,000.
- **July 2007**: Severe thunderstorms with winds up to 60 mph down numerous trees damaging vehicles and trailers. Lightening struck the steeple of a church in Josephine County, causing $60,000 in damages.
- **June 2009**: A thunderstorm accompanied by nickel sized hail and strong winds affected the town of Williams. The town experienced some local, urban flooding and three large trees were toppled.

- **March 2011**: A severe wind storm took down numerous large trees in Grants Pass doing significant damage at Riverside Park and in several housing developments in and around the community.

SEVERE WEATHER VULNERABILITY ASSESSMENT

WINDSTORM

A majority of the destructive surface winds in Oregon come out of the southwest. Under certain conditions, very strong east winds may occur, but these are usually limited to small areas in the vicinity of the mountain passes. Even so, the damaging effects of windstorms may extend for distances of 100 to 300 miles from the center of storm activity.

Thunderstorm activity, which can include high winds, hail, and excessive rain, can cause serious damage and even loss of life. Positive wind pressure is a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Negative pressure also affects the sides and roof: passing currents create lift and suction forces that act to pull building components and surfaces outward. Additionally, debris carried along by extreme winds can directly contribute to loss of life and indirectly to the failure of protective building envelope components.

When severe windstorms strike a community, downed trees, powerlines, and damaged property are major hindrances to response and recovery. Not only are the lifelines themselves damaged (e.g. downed powerlines) but the ability of first responders is hampered by the other debris (e.g. trees or other debris).

WINTER STORM

A major winter storm can last for days and can include high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. People can become marooned at home without utilities or other services. Severe cold can cause much harm. It can damage crops and other vegetation and freeze pipes, causing them to burst.

Heavy snowfall and blizzards can trap motorists in their vehicles and make walking to find help a deadly mistake. Heavy snow can immobilize a region by stopping the flow of supplies and disrupting emergency and medical services. Some remote areas may be isolated for days. In rural areas, unprotected livestock can be lost. In urban areas, the cost of snow removal, damage repair, and lost business can have severe economic impacts.

Heavy accumulations of ice can bring down trees and topple utility poles and communication towers. Ice can disrupt power and communication for days while utility companies repair extensive damage. Even small accumulations of ice can be dangerous to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces.

Winter storms are considered deceptive killers because most winter storm deaths are related only indirectly to the storms. Overall, most winter storm deaths result from vehicle or other transportation accidents caused by ice and snow. Exhaustion and heart attacks brought on by overexertion are two other common causes of deaths related to winter storms. Tasks such as shoveling snow, pushing a vehicle, or even walking in heavy snow can cause a heart attack, particularly in people who are older or who are not used to high levels of physical activity. Home fires occur more frequently in the winter because people do not take the proper safety precautions

when using alternative heat sources. Fires during winter storms present a great danger because water supplies may freeze and it may be difficult for firefighting equipment to get to the fire. In addition, people can be killed by carbon monoxide emitted by fuels such as charcoal briquettes improperly used to heat homes.[22]

SEVERE WEATHER RISK ASSESSMENT

As part of the 2010/20111 NHMP update process, the NHMP Steering Committee reviewed the risk associated with severe weather hazards in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The Steering Committee determined the following level of risk of severe weather in Josephine County:

- **Probability**: High (One incident likely within a 10 to 35 year period)
- **Vulnerability**: High (more than 10% affected)

Additional data and analysis is needed to determine specific areas or structures at risk from severe weather in unincorporated Josephine County.

[22] *Talking About Disasters: Guide for Standard Messages*, National Disaster Education Coalition,2004

LANDSLIDE

Landslides are fairly common, naturally occurring events in various parts of Oregon. While not all landslides result in property damage, many landslides do pose serious risk to people and property. Increasing population in Oregon and the resultant growth in home ownership has caused the siting of more development in or near landslide areas. Often these areas are highly desirable owing to their location along the coast, rivers and on hillsides.

In simplest terms, a landslide is any detached mass of soil, rock, or debris that falls, slides or flows down a slope or a stream channel. Landslides are classified according to the type and rate of movement and the type of materials that are transported.

In understanding a landslide, two forces are at work: 1) the driving forces that cause the material to move down slope, and 2) the friction forces and strength of materials that act to retard the movement and stabilize the slope. When the driving forces exceed the resisting forces, a landslide occurs.

As described in the Oregon Natural Hazard Technical Resource Guide, landslides are classified based on causal factors and conditions and exist in three basic categories:

- **Falls:** This type of landslide involves the movement of rock and soil which detaches from a steep slope or cliff and falls through the air and/or bounces or rolls down slope. This type of slide is termed a rock fall and is very common along Oregon highways where they have been cut through bedrock in steep canyons and along the coast.
- **Slides:** This kind of landslide exists where the slide material moves in contact with the underlying surface. Here the slide moves along a plane and either slumps by moving along a curved surface (called a rotational slide) or along a flat surface (called a translational slide). While slow-moving slides can occur on relatively gentle slopes are less likely to cause serious injuries or fatalities, they can result in very significant property damage.
- **Flows**: In this case the landslide is characterized as plastic or liquid in nature in which the slide material breaks up and flows during movement. This type of landslide occurs when a landslide moves down slope as a semi-fluid mass scouring or partially scouring rock and soils from the slope along its path. A flow landslide is typically rapid moving and tends to increase in volume as it moves down slope and scours out its channel.

  Rapidly moving flow landslides are often referred to a debris flows. Other terms given to debris flows are mudslides, mudflows, or debris avalanches. Debris flows frequently take place during or following an intense rainfall on previously saturated soil. Debris flows usually start on steep hillsides as slumps or slides that liquefy, accelerate to speeds as high as 35 miles per hour or more, and travel down slopes and channels onto gentle sloping or flat ground. Most slopes steeper than 70 percent are risk from debris flows.[23]

[23] Oregon Natural Hazard Technical Resource Guide, Landslide / Chapter 5, 2000

CONDITIONS AFFECTING LANDSLIDES

Natural conditions and human activities can both play a role in causing landslides. Certain geologic formations are more susceptible to landslides than others. Locations with steep slopes are at the greatest risk of slides. However, the incidence of landslides and their impact on people and property can be accelerated by development. Developers who are uninformed about geologic conditions and processes may create conditions that can increase the risk of or even trigger landslides.

There are four principal factors that affect or increase the likelihood of landslides:

- Natural conditions and processes including the geology of the site, rainfall, wave and water action, seismic tremors and earthquakes and volcanic activity.
- Excavation and grading on sloping ground for homes, roads and other structures.
- Drainage and groundwater alterations that are natural or human-caused can trigger landslides. Human activities that may cause slides include broken or leaking water or sewer lines, water retention facilities, irrigation and stream alterations, ineffective storm water management and excess runoff due to increased impervious surfaces.
- Change or removal of vegetation on very steep slopes due to timber harvesting, land clearing and wildfire.[24]

LANDSLIDE HAZARD HISTORY

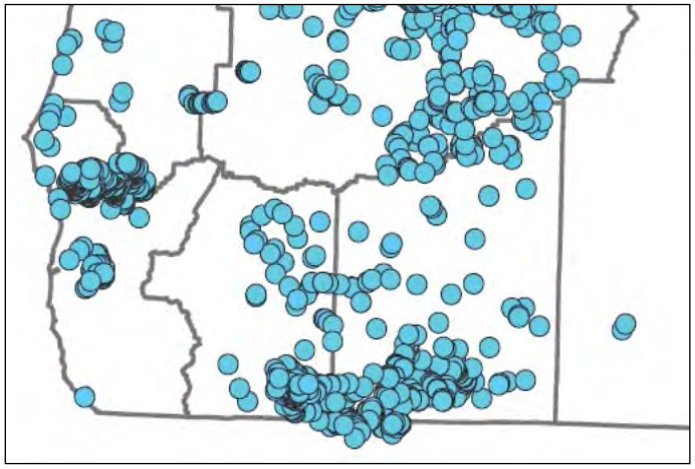
Josephine County has regular occurrences of landslides. There are 28 areas where roads within the jurisdiction of the county have been closed at least once due to landslide or subsidence[25]. Some recent landslide activity in the county includes:

- **1974 event**: Canyon Creek near Canyonville in Douglas County. Nine people were killed.
- **1996/1997:** Severe storms caused damage across the state. Josephine County experienced many slope failures.
- **February 2002**: Slide on Galice Access Road at milepost 4.6;
- **December 2005 – January 2006:** Josephine County was one of 19 counties that included in a presidentially declared disaster for severe storms, flooding, landslides and mudslides. Direct damage in Josephine County is not known .
- **May 2010**: Landslide on Southside Road caused by erosion related with the Applegate River

[24] Oregon Natural Hazard Technical Resource Guide, Landslide / Chapter 5, 2000

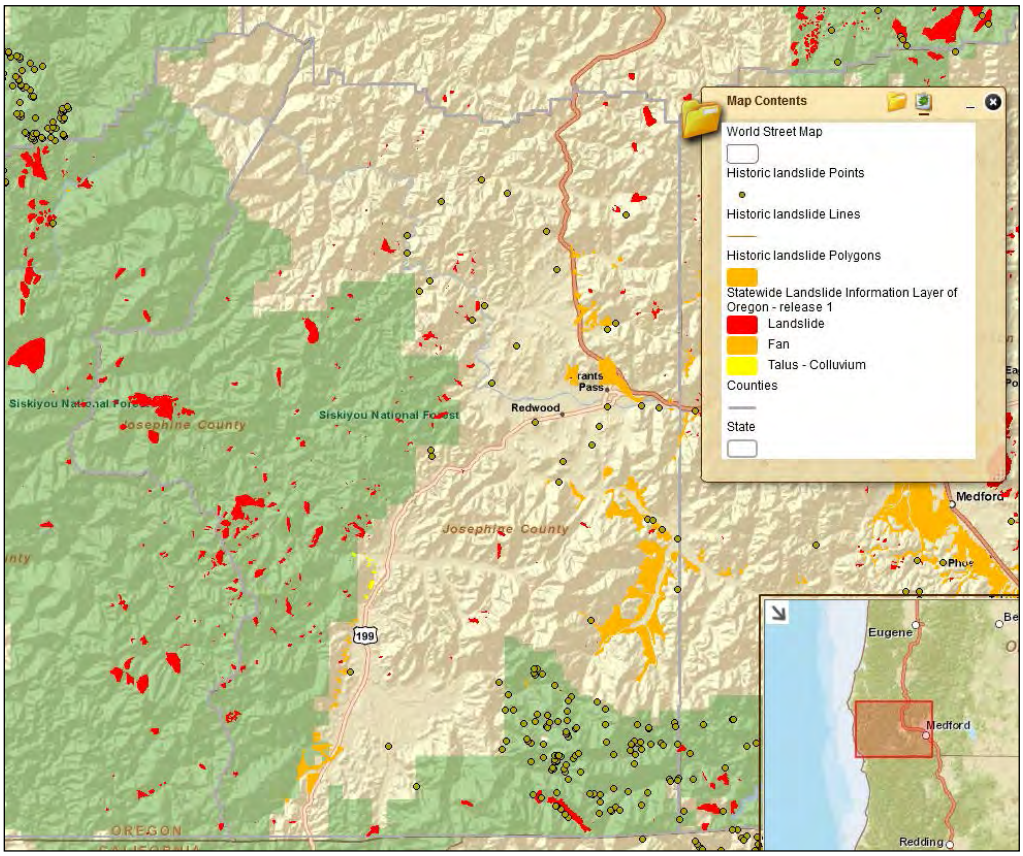
[25] Josephine County Public Works Department, 2004

FIGURE 3.6: 1996-1997 LANDSLIDES



Source: DOGAMI, Special Paper 34, Slope Failures in Oregon GIS Inventory for three 1996/1997 Storm Events, 2000

FIGURE 3.7: JOSEPHINE COUNTY LANDSLIDE INFORMATION, 2011



Source: Statewide Landslide Information Database for Oregon (SLIDO), DOGAMI, ACCESSED May 2011

LANDSLIDE VULNERABILITY ASSESSMENT[26]

Depending upon the type, location, severity and area affected, severe property damage, injuries and loss of life can be caused by landslide hazards. Landslides can damage or temporarily disrupt utility services, roads and other transportation systems and critical lifeline services such as police, fire, medical, utility and communication systems, and emergency response. In additional to the immediate damage and loss of services, serious disruption of roads, infrastructure and critical facilities and services may also have longer term impacts on the economy of the community and surrounding area.

Increasing the risk to people and property from the effects of landslides are the following three factors:

- Improper excavation practices, sometimes aggravated by drainage issues, can reduce the stability of otherwise stable slopes.
- Allowing development on or adjacent to existing landslides or known landslide-prone areas raises the risk of future slides regardless of excavation and drainage practices. Homeowners and developers should understand that in many potential landslide settings that there are no development practices that can completely assure slope stability from future slide events
- Building on fairly gentle slopes can still be subject to landslides that begin a long distance away from the development. Sites at greatest risk are those situated against the base of very steep slopes, in confined stream channels (small canyons), and on fans (rises) at the mouth of these confined channels. Home siting practices do not cause these landslides, but rather put residents and property at risk of landslide impacts. In these cases, the simplest way to avoid such potential effects is to locate development out of the impact area, or construct debris flow diversions for the structures that are at risk.

LANDSLIDE RISK ASSESSMENT

As part of the 2010/2011 NHMP update process, the NHMP Steering Committee reviewed the risk associated with landslide hazards in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The Steering Committee determined the following level of risk of landslides in Josephine County:

- **Probability**: Moderate (one incident likely within a 35 to 75 year period)
- **Vulnerability**: Low (less than 1% affected)

Additional data and analysis is needed to determine specific areas or structures at risk in unincorporated Josephine County. DOGAMI plans to collect additional LIDAR data for the Grants Pass area later in 2011. This information could be used to enhance county and city understanding of landslide vulnerability and risk.

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[26] For more information on the landslide hazard, please visit the state plan's Landslide chapter or the Oregon Technical Resource Guide.

DROUGHT

The State of Oregon is confronted with continuing challenges associated with drought and water scarcity. The challenges are exacerbated because of a rapidly growing population and the demands placed on a renewable, yet finite resource - water. The terms "drought" and "water scarcity" are not necessarily synonymous. Water scarcity implies that demand is exceeding the supply. The combined effects of drought and water scarcity are far-reaching and merit special consideration.

The State of Oregon Natural Hazard Mitigation plan defines drought in several ways:

- Meteorological or climatological droughts usually are defined in terms of the departure from a normal precipitation pattern and the duration of the event. Drought is a slow-onset phenomenon that usually takes at least three months to develop and may last for several seasons or years.
- Agricultural droughts link the various characteristics of meteorological drought to agricultural impacts. The focus is on precipitation shortages and soil-water deficits. Agricultural drought is largely the result of a deficit of soil moisture. A plant's demand for water is dependent on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil.
- Hydrological droughts refer to deficiencies in surface water and sub-surface water supplies. It is measured as stream flow, and as lake, reservoir, and ground water levels. Hydrological measurements are not the earliest indicators of drought. When precipitation is reduced or deficient over an extended period of time, the shortage will be reflected in declining surface and sub-surface water levels.
- Socioeconomic droughts occur when physical water shortage begins to affect people, individually and collectively. Most socioeconomic definitions of drought associate it with supply, demand, and economic good. One could argue that a physical water shortage with no socio-economic impacts is a policy success.[27]

Planning For Drought In Oregon

"From the beginning of our effort in developing a state drought plan it was evident that we needed to concentrate on three things:

- Close coordination among state and federal agencies
- Procedures for obtaining the best data available on statewide conditions
- Establish a strong network and public information program to make data on existing conditions available"

Source: Barry Norris, Administrator, Technical Services Division, Oregon Water Resources Department Planning for Drought 2001

[27] Oregon Natural Hazard Mitigation Plan, 2009

DROUGHT HAZARD HISTORY

- **April 1977**: Josephine County was one of many Oregon counties that were included in a presidential disaster declaration for public assistance related to drought conditions.

- **July 2001**: Governor Kitzhaber declared an emergency in Josephine and Jackson Counties due to conditions caused by droughts, low water conditions, and energy shortages. The Oregon Department of Agriculture was directed to coordinate assistance for agricultural recovery, and the Department of State Police Office of Emergency Management was directed to coordinate and assist as needed with assessment and mitigation activities to address current and projected conditions.

DROUGHT VULNERABILITY ASSESSMENT

Droughts are not just a summer-time phenomenon; winter droughts can have a profound impact on the agricultural sector. Also, below average snowfall in Oregon's higher elevations has far-reaching effects on the entire state, especially in terms of hydroelectric power, irrigation, recreational opportunities and a variety of industrial uses.

There also are environmental consequences. A prolonged drought promotes an increase of insect pests, which in turn, damage trees already weakened by a lack of water. A moisture-deficient forest constitutes a significant fire hazard. In addition, drought and water scarcity add another dimension of stress to species listed pursuant to the Endangered Species Act (ESA) of 1973.

The following information provided by the Oregon Natural Hazard Mitigation Plan addresses the impact of a severe or prolonged drought on the population, infrastructure, facilities, economy, and environment:

- **Population**: Drought can affect all segments of the population, particularly those employed in water-dependent activities (e.g., agriculture, hydroelectric generation, recreation, etc.). Also, domestic water-users may be subject to stringent conservation measures (e.g., rationing) and could be faced with significant increases in electricity rates.
- **Infrastructure**: In general, infrastructure such as highways, bridges, energy conveyance systems, etc., are unaffected by drought, which can, but seldom does, produce structural damage. An exception would include areas of severe soil shrinkage. In these uncommon situations, soil shrinkage would affect the foundation upon which the infrastructure was built.
- **Critical/Essential Facilities:** Facilities affected by drought conditions include communications facilities, hospitals, and correctional facilities that are subject to power failures. Storage systems for potable water, sewage treatment facilities, and water storage for firefighting are vulnerable.
- **Public Facilities:** There are a variety of public facilities that could be affected by a prolonged drought. The most obvious include schools, office buildings, health-care facilities, etc. Power outages always are a concern. Maintenance activities (e.g., grounds, parks, etc.) may be curtailed during periods of drought.
- **Economy:** Drought has an impact on a variety of economic sectors. These include water-dependent activities and economic activities requiring significant amounts of hydroelectric

power. The agricultural sector is especially vulnerable as are some recreation-based economies (e.g., boating, fishing, water or snow skiing). Whole communities can be affected. This was particularly evident during 2000-2001 when one-half (18) of Oregon's counties, including Josephine County, sought relief through state and federal drought assistance programs. The years 2000 and 2001 were the second driest years in Oregon's climate history.

- **Environment:** Oregon has several fish species listed as threatened or endangered pursuant to the Endangered Species Act (ESA) of 1973. Some of these species have habitat requirements that often conflict with the needs or desires of the human environment. For example, in times of scarcity, the amount of water necessary to maintain certain fish species may conflict with the needs of the local agricultural community.[28]

More About Drought

- Drought is often associated with water scarcity, which usually is perceived as a "human-caused" hazard, rather than a "natural" hazard.
- Drought is frequently an "incremental" hazard, the onset and end are often difficult to determine. Also, its effects may accumulate slowly over a considerable period of time and may linger for years after the termination of the event.
- Quantifying impacts and provisions for disaster relief is a less clear task than it is for other natural hazards.
- The lack of a precise and universally accepted definition adds to the confusion about whether or not a drought actually exists.
- Droughts are often defined by growing seasons, the water year, and livestock impacts.

DROUGHT RISK ASSESSMENT

As part of the 2010/20111 NHMP update process, the NHMP Steering Committee reviewed the risk associated with the drought hazard in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The Steering Committee determined the following level of risk of drought in Josephine County:

- **Probability**: High = One incident likely within a 10 to 35 year period.
- **Vulnerability**: Moderate = 1-10% affected

Additional data and analysis is needed to determine specific areas or economic or social sectors at risk in unincorporated Josephine County.

[28] Oregon Natural Hazard Mitigation Plan, 2009

VOLCANIC INCIDENT

The volcanic Cascade Range extends southward from British Columbia into northern California. The volcanoes are a result of the complex interaction of tectonic plates along the Cascadia Subduction Zone. Subduction is the process that results in the Juan de Fuca seafloor plate subducting, or sinking, underneath the North American plate on which we live. As the subducted plate descends, it heats up and begins to melt. This provides the reservoir of heat and molten rock needed to create the magma chambers that lie kilometers deep underneath the Cascades.[29]

As described in the Oregon Natural Hazard Mitigation Plan, there are a number of hazards associated with volcanoes. Some occur only during an eruption, but there are secondary hazards that can happen without an eruption. Each eruption will be a unique combination of hazards; not all of them will be present in all eruptions and the degree of damage will vary.

Due to the location of Josephine County the proximity of active and potentially active volcanoes, the primary hazard risk facing the county resulting from a volcanic eruption is ash fall. During an eruption that emits ash, the ashfall deposition is controlled by the prevailing wind direction. The predominant wind pattern over the Cascades is from the west, and previous eruptions seen in the geologic record have resulted in most ashfall drifting to the east of the volcanoes.

FIGURE 3.8: POTENTIALLY ACTIVE VOLCANOES IN THE WESTERN UNITED STATES

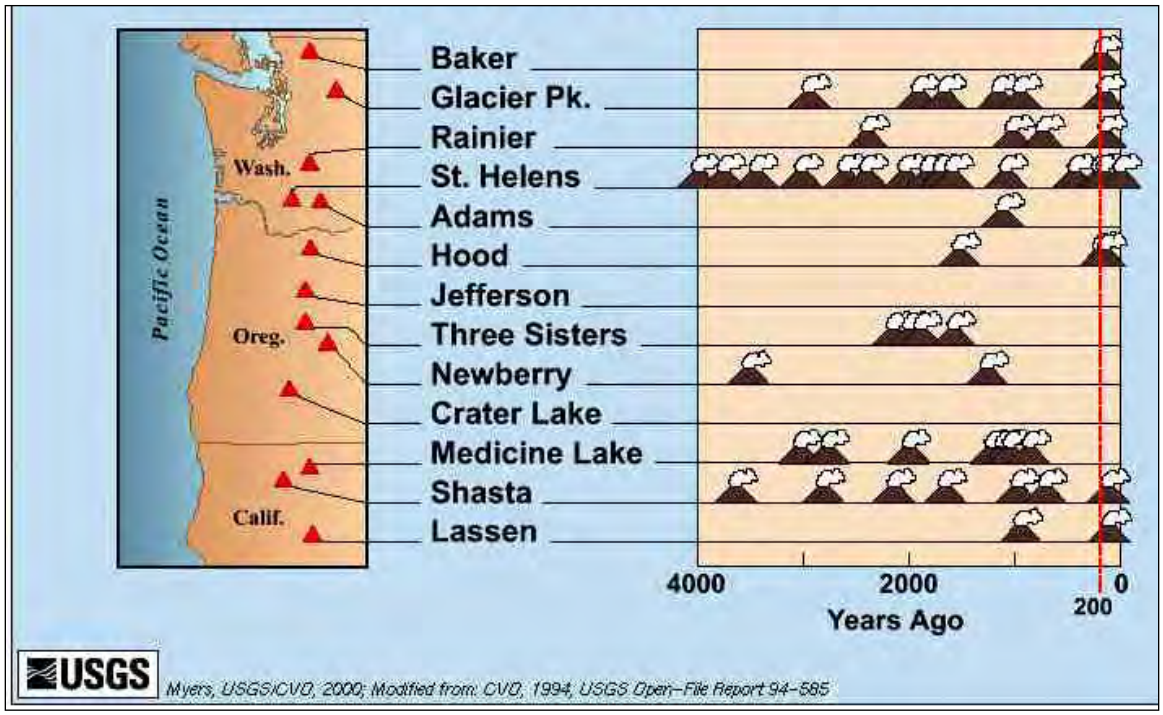
Source: USGS, 1999

[29] Oregon Natural Hazard Mitigation Plan, 2009

VOLCANIC HAZARD HISTORY

The volcanoes of the Cascade Range have a long history of eruption and intermittent quiescence. Note that in the diagram to the right, each volcano has a different frequency of eruptions. Not all Cascade volcanoes have been active in the recent past. This is typical of a volcanic range and is one of the reasons forecasting eruptions can be difficult.

FIGURE 3.9: CASCADE ERUPTIONS DURING THE PAST 4,000 YEARS



Source: USGS and the State of Oregon Natural Hazards Mitigation Plan, 2009

VOLCANIC HAZARD VULNERABILITY

Due to the location of Josephine County the proximity of active and potentially active volcanoes, the primary hazard risk facing the county resulting from a volcanic eruption is ash fall. Ashfall is one of the most serious hazards from an eruption: the rock (bombs) and dust-sized ash particles - called tephra - blown into the air. The dust-sized ash particles can travel enormous distances and are a serious by-product of volcanic eruptions.

The USGS documents the potential effects of volcanic ash as highly disruptive to economic activity because it covers just about everything, infiltrates most openings, and is highly abrasive. Airborne ash can obscure sunlight to cause temporary darkness and reduce visibility to zero. Ash is slippery, especially when wet; roads, highways, and airport runways may become impassable. Automobile

and jet engines may stall from ash-clogged air filters and moving parts can be damaged from abrasion, including bearings, brakes, and transmissions.[30]

Structural damage can also result from the weight of ash, especially if it is wet. Four inches of wet ash may cause buildings to collapse. A half- inch of ash can impede the movement of most vehicles and disrupt transportation, communication, and utility systems, and cause problems for human and animal respiratory systems.[31]

During an eruption that emits ash, the ashfall deposition is controlled by the prevailing wind direction. The predominant wind pattern over the Cascades is from the west, and previous eruptions seen in the geologic record have resulted in most ash fall drifting to the east of the volcanoes. This results in low vulnerability of significant ash fall impact for Josephine County.

VOLCANIC HAZARD RISK ASSESSMENT

As part of the 2010/20111 NHMP update process, the NHMP Steering Committee reviewed the risk associated with volcanic hazards in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The Steering Committee determined the following level of risk of volcanic (ash) in Josephine County:

- **Probability**: Low = One incident likely within a 75 to 100 year period.
- **Vulnerability**: Low = Less than 1% affected

Additional data and analysis is needed to determine specific areas or structures at risk in unincorporated Josephine County.

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[30] USGS, *Volcanic Hazard: Tephra, including volcanic ash* (volcanoes.usgs.gov/hazards/tephra) accessed May2011.

[31] State of Oregon Natural Hazard Mitigation Plan, 2009

Section 5: Plan Implementation and Maintenance

This section details the formal process that will ensure that the Josephine County Natural Hazards Mitigation Plan (NHMP) remains an active and relevant document. The plan implementation and maintenance process includes a schedule for monitoring and evaluating the Plan annually, as well as producing an updated plan every five years. Finally, this section describes how the County and participating jurisdictions will integrate public participation throughout the plan maintenance and implementation process.

Implementing the Plan

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

Convener

Josephine County Emergency Management is responsible for the maintenance of the plan. This includes:

- Yearly annual reports
- Convening the NHMP Update Steering Committee for a 5-year update.

Coordinating Body

The Josephine County Emergency Management Board will serve as the coordinating body for the mitigation plan. The roles and responsibilities of the coordinating body include:

- Serving as the local evaluation committee for funding programs such as the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds, and Flood Mitigation Assistance program funds;

- Prioritizing and recommending funding for natural hazard risk reduction projects;
- Documenting mitigation successes and lessons learned;
- Evaluating and updating the Natural Hazards Mitigation Plan following a disaster;
- Evaluating and updating the Natural Hazards Mitigation Plan in accordance with the prescribed maintenance schedule; and
- Developing and coordinating ad hoc and/or standing subcommittees as needed.

Members

The following organizations were represented and served on the 2010/2011 NHMP Update Steering Committee during the development of the Josephine County NHMP:

Table 5.1: Josephine County NHMP Steering Committee

Name	Association
Allen Mitchell	Bureau of Land Management
Austin Prince	Rural Metro Fire Department
Bob Hamblin	City of Grants Pass
Charlie Phenix	Josephine County Emergency Management Board
Derek Davenport	USFS Wildrivers District Ranger
Jeff Wheaton	Josephine County Public Works
Jenny Hall	Josephine County Emergency
John Jenson	Wolf Creek Fire
John O' Conner	Oregon Department of Forestry
Jim Wolf	Josephine County Integrated Fire Plan Coordinator
Lang Johnson	Grants Pass Fire Rescue and Fire Safety
Neil Benson	Josephine County Integrated Fire Plan Board
Paul Galloway	Rogue River - Siskiyou National Forest
Phil Turnbull	Rural Metro Fire Department
Rick Dryer	Oregon Department of Forestry
Sara Rubrecht	Josephine County Emergency Management
Steve Scrivner	City of Grants Pass
Tanya Phillips	Josephine County Public Health
Terry Haugen	City of Grants Pass
Tim Gonzales	(Medford) Bureau of Land Management
Travis Robbins	City of Cave Junction

To make the coordination and review of Josephine County's NHMP as effective and efficient as possible, the Emergency Management Board will invite additional stakeholder to meetings where the NHMP will be on the agenda.

Plan Maintenance

Plan maintenance is a critical component of the natural hazard mitigation plan. Proper maintenance of the plan ensures that this plan will maximize efforts to reduce the risks posed by natural hazards. The NHMP Steering Committee / Emergency Management Board and other local staff are responsible for implementing this process, in addition to maintaining and updating the plan through a series of meetings outlined in the maintenance schedule below.

Meetings

The Josephine County Emergency Management Board meets monthly. On a Semi-Annual basis, or more frequently if needed, the Board will include the NHMP as an agenda item for discussion. At those meetings, additional stakeholders will be invited to participate, including jurisdictions or agencies that lead implementation for mitigation actions and potential mitigation partners.

In coordination with these meetings, Josephine County Emergency Management will develop an annual Mitigation Report that documents successes and any updated information.

Agenda topics could include:

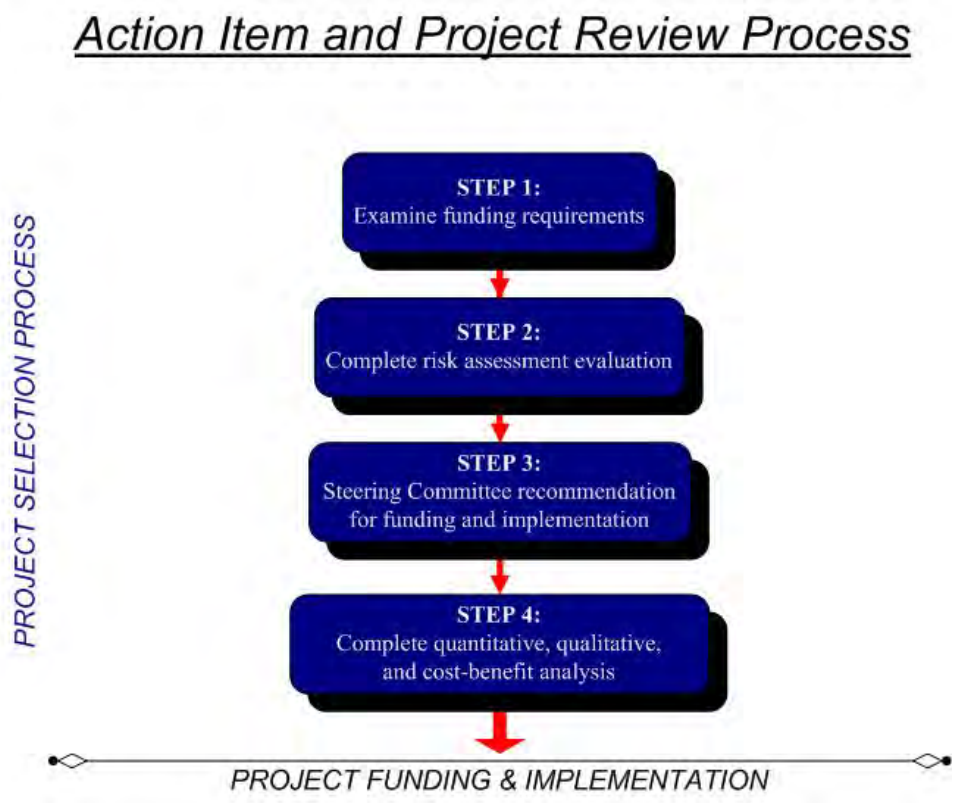
- Identify issues that may not have been identified when the plan was developed;
- Prioritize potential mitigation projects;
- Discuss opportunities to collaborate for mitigation;
- Identify or evaluate funding sources;
- Review existing and new risk assessment data;
- Discuss methods for continued public involvement; and
- Document successes and lessons learned during the year.

The convener will be responsible for documenting the outcome of these meetings. The plan's format allows the county and participating jurisdictions to review and update sections when new data becomes available. New data can be easily incorporated, resulting in a NHMP that remains current and relevant.

Project Prioritization Process

The Disaster Mitigation Act of 2000 requires that jurisdictions identify a process for prioritizing potential actions. Potential mitigation activities often come from a variety of sources; therefore the project prioritization process needs to be flexible. Projects may be identified by committee members, local government staff, other planning documents, or the risk assessment. Figure 4.1 illustrates the project development and prioritization process.

Figure 4.1: Project Prioritization Process



Source: Community Service Center's Partnership for Disaster Resilience at the University of Oregon, 2008.

Step 1: Examine funding requirements

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

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

Step 2: Complete risk assessment evaluation

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

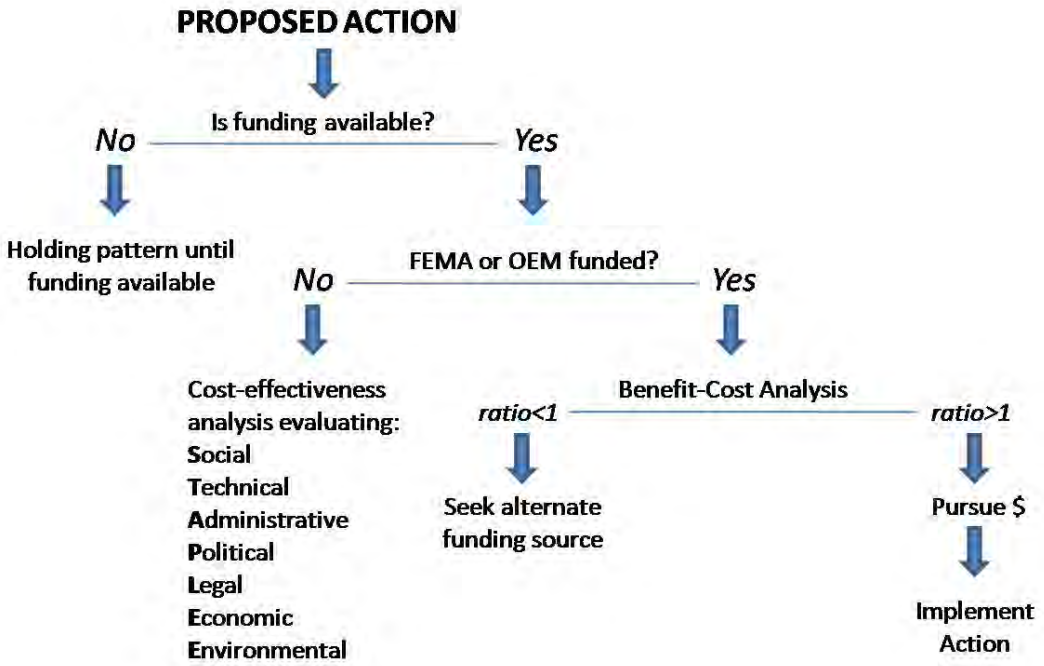
Step 3: Committee Recommendation

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

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

The fourth step is to identify the costs and benefits associated with the selected natural hazard mitigation strategies, measures or projects. Two categories of analysis that are used in this step are: (1) benefit/cost analysis, and (2) cost-effectiveness analysis. Conducting benefit/cost analysis for a mitigation activity assists in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards provides decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects. Figure 4.2 shows decision criteria for selecting the appropriate method of analysis.

Figure 4.2: Benefit Cost Decision Criteria



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

If the activity requires federal funding for a structural project, the Committee will use a Federal Emergency Management Agency-approved cost-benefit analysis tool to evaluate the appropriateness of the activity. A project must have a benefit/cost ratio of greater than one in order to be eligible for FEMA grant funding.

For non-federally funded or nonstructural projects, a qualitative assessment will be completed to determine the project's cost effectiveness. The committee will use a multivariable assessment technique called STAPLE/E to prioritize these actions. STAPLE/E stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental. Assessing projects based upon these seven variables can help define a project's qualitative cost effectiveness. The STAPLE/E technique has been tailored for use in natural hazard action item prioritization by the Partnership for Disaster Resilience at the University of Oregon's Community Service Center. See Appendix C for a description of the STAPLE/E evaluation methodology.

Continued Public Involvement & Participation

Josephine County is dedicated to involving the public in the continual reshaping and updating of the NHMP. Although members of the Steering Committee represent the public to some extent, the public will also have the opportunity to continue to provide feedback about the Plan.

To ensure that these opportunities will continue, the County and participating jurisdictions will incorporate information about the NHMP

into existing communications strategies (e.g. into yearly information that gets publicized about fuels reduction and fire safety, winter weather, and driving safety)

Additionally, continued public outreach is included as an explicit mitigation action. Topics for public outreach could include:

- Air quality issues (from fires, ash fall, or seasonal changes), the impact of extreme heat or cold (especially to vulnerable groups) and existing resources available to county residents, and opportunities to volunteer on mitigation projects.

Ideas for Implementation include:

- Josephine County Emergency Management should attend and / or host opportunities to disseminate personal preparedness information (e.g. fairs, outreach events, Preparedness Fairs, festivals, town meetings, etc)
- Schedule seasonal Public Service Announcements that provide relevant information to the hazard of the season (e.g. fire in the summer or earthquakes during April (earthquake awareness month))
- Declare additional "County Emergency Preparedness Months" or "Awareness Weeks"
- Update and enhance the hazard and preparedness information on the county website
- Public meetings to introduce important issues
- Update and distribute the Josephine County Emergency Preparedness Handbook

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

Five-Year Review of Plan

This plan will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. The convener will be responsible for organizing the coordinating body to address plan update needs. The coordinating body will be responsible for updating any deficiencies found in the plan, and for ultimately meeting the Disaster Mitigation Act of 2000's plan update requirements.

The following 'toolkit' can assist the convener in determining which plan update activities can be discussed during regularly-scheduled plan maintenance meetings, and which activities require additional meeting time and/or the formation of sub-committees.

Mitigation Plan Update Toolkit			
Question	*Yes*	*No*	*Plan Update Action*
Is the planning process description still relevant?			Modify this section to include a description of the plan update process. Document how the planning team reviewed and analyzed each section of the plan, and whether each section was revised as part of the update process. (This toolkit will help you do that).
Do you have a public involvement strategy for the plan update process?			Decide how the public will be involved in the plan update process. Allow the public an opportunity to comment on the plan process and prior to plan approval.
Have public involvement activities taken place since the plan was adopted?			Document activities in the "planning process" section of the plan update
Are there new hazards that should be addressed?			Add new hazards to the risk assessment section
Have there been hazard events in the community since the plan was adopted?			Document hazard history in the risk assessment section
Have new studies or previous events identified changes in any hazard's location or extent?			Document changes in location and extent in the risk assessment section
Has vulnerability to any hazard changed?			Document changes in vulnerability in the risk assessment section
Have development patterns changed? Is there more development in hazard prone areas?			
Do future annexations include hazard prone areas?			
Are there new high risk populations?			
Are there completed mitigation actions that have decreased overall vulnerability?			

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Mitigation Plan Update Toolkit			
Question	*Yes*	*No*	*Plan Update Action*
Did the plan document and/or address National Flood Insurance Program repetitive flood loss properties?			Document any changes to flood loss property status
Did the plan identify the number and type of existing and future buildings, infrastructure, and critical facilities in hazards areas?			1) Update existing data in risk assessment section or 2) determine whether adequate data exists. If so, add information to plan. If not, describe why this could not be done at the time of the plan update
Did the plan identify data limitations?			If yes, the plan update must address them: either state how deficiencies were overcome or why they couldn't be addressed
Did the plan identify potential dollar losses for vulnerable structures?			1) Update existing data in risk assessment section or 2) determine whether adequate data exists. If so, add information to plan. If not, describe why this could not be done at the time of the plan update
Are the plan goals still relevant?			Document any updates in the plan goal section
What is the status of each mitigation action?			Document whether each action is completed or pending. For those that remain pending explain why. For completed actions, provide a 'success' story.
Are there new actions that should be added?			Add new actions to the plan. Make sure that the mitigation plan includes actions that reduce the effects of hazards on both new and existing buildings.
Is there an action dealing with continued compliance with the National Flood Insurance Program?			If not, add this action to meet minimum NFIP planning requirements
Are changes to the action item prioritization, implementation, and/or administration processes needed?			Document these changes in the plan implementation and maintenance section
Do you need to make any changes to the plan maintenance schedule?			Document these changes in the plan implementation and maintenance section
Is mitigation being implemented through existing planning mechanisms (such as comprehensive plans, or capital improvement plans)?			If the community has not made progress on process of implementing mitigation into existing mechanisms, further refine the process and document in the plan.

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City Addendum
Grants Pass

Overview

Grants Pass developed this addendum to the Josephine County Natural Hazards Mitigation Plan in an effort to increase the community's resilience to natural hazards. The addendum focuses on the natural hazards that could affect Grants Pass, Oregon, which include: Wildfire, flood, earthquake, severe weather, landslide, volcanic hazards, and drought.

It is impossible to predict exactly when disasters may occur, or the extent to which they will affect the City. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from natural hazards.

The addendum provides a set of actions that aim to reduce the risks posed by natural hazards. Areas of focus include education and outreach programs, the development of partnerships, and the implementation of preventative activities such as fire fuel mitigation, development code revisions and land use or watershed management programs. The actions address a range of risk and identify many partners that will be critical for successful implementation. Therefore, the actions described in the addendum are intended to be implemented not only through existing plans and programs within the City, but also through partnerships, multi-objective projects, or with the support of outside grant programs (e.g. Federal Emergency Management Agency (FEMA), or state based grants)

The addendum is comprised of the following sections: 1) Addendum Development Process; 2) Community Profile; 3) Risk Assessment; 4) Mission, Goals, and Actions; and 5) Plan Implementation and Maintenance.

Addendum Development Process

In the fall of 2008, the Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Community Service Center developed a Pre-Disaster Mitigation Planning Grant proposal in partnership with Oregon Emergency Management (OEM) and communities in the Willamette Valley to update local mitigation plans. FEMA awarded the grant in the summer of 2009, and the Josephine County and Grants Pass plan update process began in January, 2011. OPDR staff, with support from graduate interns at the University of Oregon, oversaw the planning process and completed final edits to the plan.

Representatives from the following organizations served as steering committee members for the City of Grants Pass natural hazard mitigation planning process.

Table 1.1: Grants Pass NHMP Steering Committee

Name	Association
Alicia Robe	Stream Restoration Alliance of Middle Rogue
Bob Hamblin	City of Grants Pass – Distribution and Collection
Carla Angeli	City of Grants Pass - Planning
Dan Shepard	Grants Pass Irrigation District
David Reeves	City of Grants Pass - Finance
James Lowe	Grants Pass School District
Jenny Hall	Josephine County Emergency
Ken Sandlin	City of Grants Pass - Building
Kurt Bolser	Picket Mountain Construction
Lance Holder	Holder Homes Construction
Lang Johnson	City of Grants Pass – Public Safety
Lily Morgan	City of Grants Pass Council
Robert Callaway	Asante/Three Rivers
Steve Dahl	City of Grants Pass – Economic Development
Steve Scrivner	City of Grants Pass – Streets/Stormdrains
Terry Haugen	City of Grants Pass – Public Works

The Partnership designed the NHMP planning process to: (1) result in an addendum that is Disaster Mitigation Act 2000 compliant; (2) coordinate with the state's plan and activities of the Partnership; and (3) build a network of local organizations that can play an active role in plan implementation. The following is a summary of major activities included in the planning process.

- Preliminary City Strategy Meeting, 1/11/11

  This meeting included the City representatives who participated in the Josephine County NHMP Steering Committee. The purpose of this meeting was to confirm the interest from Grants Pass in

developing a NHMP addendum and to identify the Grants Pass Steering Committee members.

- Meeting 1: Risk Assessment Review, 2/9/11

  This meeting served to introduce the Grants Pass Steering Committee to the NHMP planning process. Partnership staff reviewed the CFR and other regulations that guide NHMP development. The Steering Committee then reviewed the Josephine County Risk Assessment and identified the hazards for which Grants Pass experiences greater or lesser risk.

- Meeting 2:Action Item Development, 3/16/11

  Via conference call, Partnership staff presented the Grants Pass Steering Committee with a preliminary list of actions based on the Josephine County actions. Steering Committee members provided revisions and additions to the action item list. The Steering Committee also adopted the NHMP mission.

- Meeting 3: Action Item Review and Funding Overview, 4/13/11

  Partnership staff presenting the Steering Committee with information about funding strategies and sources with specific emphasis on implementation of mitigation actions through existing plans and mechanisms. The Steering Committee also discussed implementation ideas for specific actions.

- Meeting 4: Action Item Finalization and Maintenance, 7/28/11

  The Steering Committee met to review the draft Grants Pass NHMP Addendum and to finalize the action items. The committee also identified the convener, coordinating body, and determined a maintenance schedule for the plan.

- Outreach:

  On March 1, the City of Grants Pass published a press release that informed the community about the NHMP planning process and about upcoming ways to participate, including viewing a presentation to City Council and providing comments on the Risk Assessment.

  On March 16, the Grants Pass Public Works Director and Deputy Fire Chief presented an overview of the NHMP planning process to the Grants Pass City Council. This meeting was open to the public and broadcast live on local television channel 14. It was re-broadcast as well.

  Josephine County's project webpage located on the OPDR website (http://csc.uoregon.edu/opdr) served as an outreach tool. Participating jurisdictions invited community members to review

the Josephine County risk assessment and submit comments via e-mail. The final adopted and approved addendum will be posted on the University of Oregon Libraries' Scholar's Bank Digital Archive.

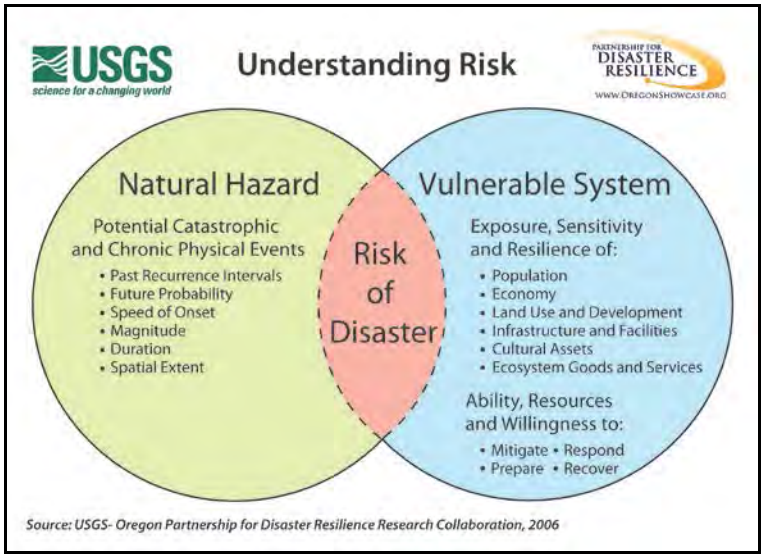
The City of Grants Pass adopted the Josephine County Natural Hazard Mitigation Plan, and the Grants Pass Addendum via resolution on Insert Date, Year

Community Profile

The following section describes the City of Grants Pass from a number of perspectives in order to help define and understand the City's vulnerability and resilience to natural hazards. Vulnerability factors can be defined as those community assets and characteristics that may be impacted by natural hazards, (e.g., special populations, economic factors, and historic and cultural resources). Community resilience factors can be defined as the community's ability to manage risk and adapt to hazard event impacts (e.g., governmental structure, agency missions and directives, and plans, policies, and programs).

The information in this section represents a snapshot in time of the current vulnerability and resilience factors in Grants Pass when the NHMP was developed. The information documented here, along with the risk assessments located below, are used as the local level rationale for the risk reduction actions identified at the end of this addendum. The identification of actions that reduce the City's vulnerability and increase its resilience assist in reducing overall risk (refer to the area of overlap in Figure 1 below).

Figure 1.1: Understanding Risk



Geography & Climate

Grants Pass is located in the Rogue Valley in South-West Oregon. The Rogue River runs through the City. The region experiences hot, short summers and generally mild winters, though severe winter storms are not uncommon. This area differs from the rest of South-West Oregon in that there is less ocean influence, cooler winters, and warmer drier summers. The town is at an elevation of approximately 950 feet.

Population & Demographics

Disaster impacts (in terms of loss and 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, especially children, the elderly, the disabled, minorities, and low income persons. In Grants Pass, 18.2% of the population is 65 years of age or older and approximately 24.2% are 18 years of age or younger. Elderly individuals require special consideration due to their sensitivities to heat and cold, their reliance upon public transportation for medications, and their comparative difficulty in making home modifications that reduce risk to hazards. About 19.5% of individuals in Grants Pass were living below the federal poverty level in 2009. This population is more sensitive to even small scale or short term hazards or the secondary impact of hazards due to fewer resources to mitigation or respond to the impact of hazards.

Nearly 6% of the population speaks a language other than English in the home, with 3.6% of that represented by Spanish speaking households.

Employment & Economics

Median income can be used as an indicator of the strength of the region's economic stability. In 2009, the median household income in Grants Pass was $33,789. This is $3,661 below the 2009 median household income for Josephine County of $37,456, and $17,636 below the national average of $51,425.[1] Although it can be used to compare areas as a whole, this number does not reflect how income is divided among area residents.

The overall largest employment sectors include educational services, and health care and social assistance, which employs more than 20% of the work force; retail trade which employs more than 16% of the work force; and manufacturing which employs almost 11% of the work force. The Census Bureau reported an 8.3% unemployment rate in Grants Pass in 2009.[2]

In the 2011-2012 Recommended Operating and Capital Budget for Grants Pass, the combined total of Transient Room Tax revenues is nearly3% higher than the previous year's forecast but still below the total actual revenues transferred in FY'09.[3]

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[1] United States Census Bureau. 2009. Fact Sheet: Josephine County, Oregon. www.census.gov.

[2] United States Census Bureau. 2009. Fact Sheet: Grants Pass, Oregon. www.census.gov.

[3] City of Grants Pass Oregon, Recommended Operating and Capity Busget, Fiscal Year 2011-2012

Housing

Housing type 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. In Grants Pass, the housing stock has mostly been built since 1960.

Generally the older the home is, 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, 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.

Table 1.2: Year of Housing Unit Construction

Year Structure Built	Percent
2000 or later	17.8
1980-1999	28.4
1960-1979	27.5%
1940-1959	18.3%
1939 or earlier	8.1%

Source: American Community Survey, 2009

In 2009, the housing mix was predominantly single family housing units. The American Community Survey reported that approximately 55% of all units were owner-occupied. Owners, renters, and landlords may take different approaches to structural mitigation action which can affect the resilience of the community.

Table 1.3: Housing Type, 2009

Housing type	Percent
1 unit	71.4%
2-4 units	11.3%
5-20 units	5.1%
20+ units	6.2%
Mobile Home	5.7%

Source: American Community Survey, 2009

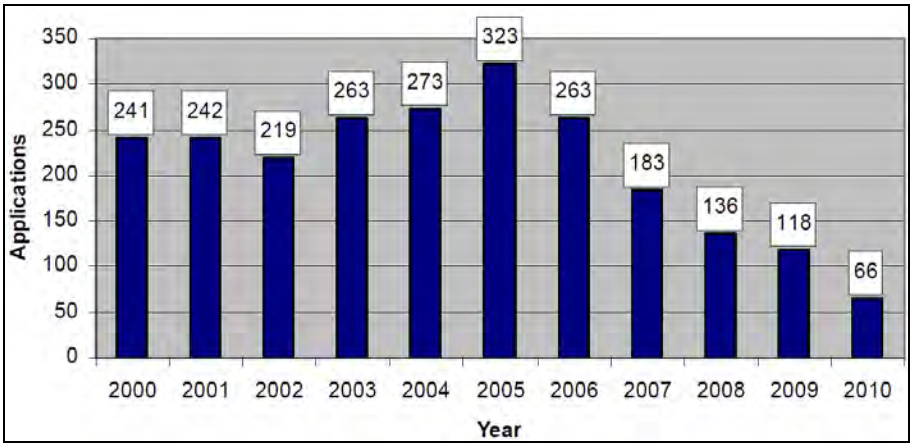
Land Use & Development

Overall, there is a downward trend in the pace of development – both applications and actual construction since mid-decade. In 2010, all development permit applications were down 45% from the previous year.[4]

[4] Communtiy Development Statistics Report, Grants Pass 2010

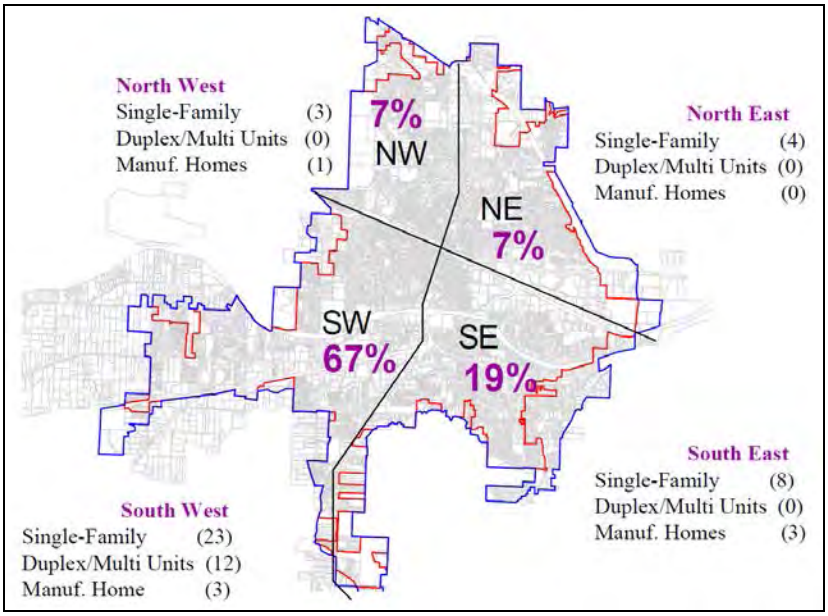
Engineering projects including water, sewer & storm drain lines, pedestrian paths, roadway improvement and sidewalk infill projects were also down. Even so, the Community Development Department reported that 2010 saw an increase in the valuation of duplex / multifamily units as well as commercial / industrial development over the previous year. Additionally, the Community Development Department estimates that new building construction valuation was up in 2010 over 2009 figures by 7.5%, with the largest increase in value for commercial / industrial and multi-family construction. In 2010, the majority of housing building permits were issued for construction in the southwestern part of town.

Figure 1.2: Development Permit Applications, 2000-2010



Source: Communtiy Development Statistics Report, Grants Pass 2010

Figure 1.3: Location of New Home Permits, 2010



Source: Communtiy Development Statistics Report, Grants Pass 2010

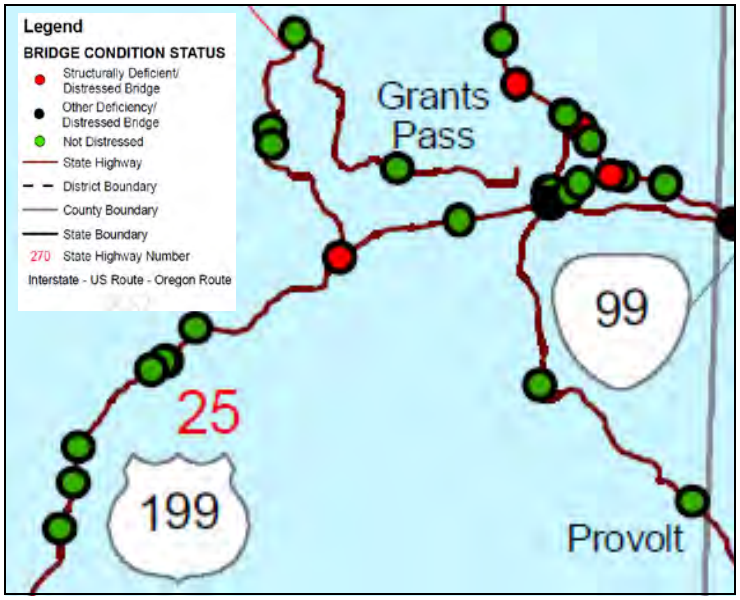
Critical Facilities, Infrastructure, and transportation

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. Critical facilities in Grants Pass include:

- Elementary and High Schools
- Fire and police stations
- Water Restoration Plant
- Water Restoration Plant
- 13 remote pumping stations
- 8 reservoirs
- Power substations
- Grants Pass Airport
- Hospital
- Rail line
- Williams gas transmission line
- Interstate Highway 5
- State Highway 199 and 99
-

Grants Pass is also bisected by Interstate 5 and National Highway 199. Highway 199 crosses the Rogue River in Grants Pass.

Figure 1.4: Oregon State Highway System, 2010 Bridge Condition



Source: 2010 Bridge Condition Report, Oregon Department of Transportation

Historical & Cultural Resources

Historical 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.

Figure 1.5: Historic Place in Grants Pass

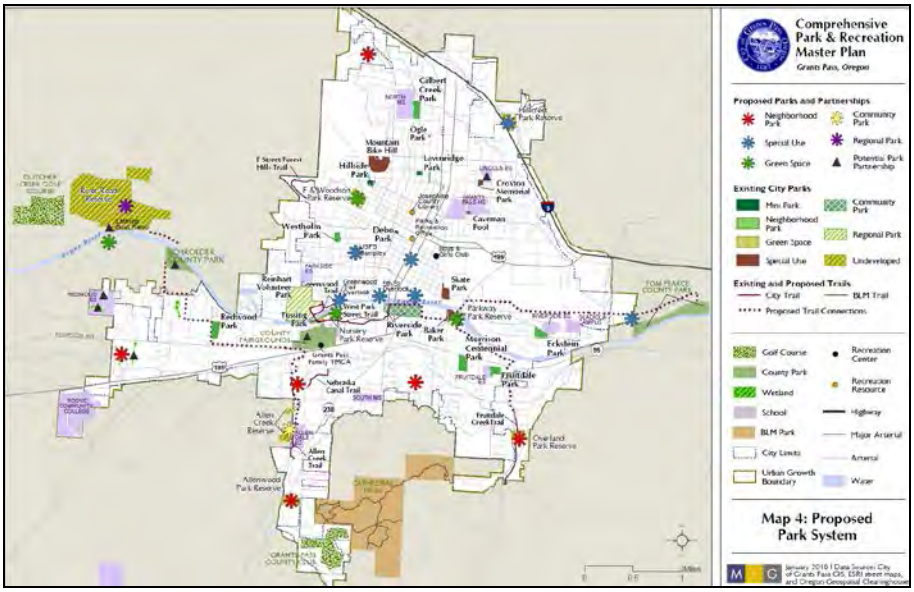
Source: National Register of Historic Places, 2011

- Ahlf, John and Susanna, House
- Calhoun, George, House
- Clark-McConnell House
- Clark-Norton House
- Clemens, Michael, House
- Cornell, Albert B. and Mary, House
- Croxton, Thomas, House
- Dimmick-Judson House
- Fetzner, Joseph, House
- Flanagan, Dr. William H., House
- Grant Pass City Hall and Fire Station
- Grants Pass G Street Historic District
- Grants Pass Supervisor's Warehouse
- Hotel Josephine Annex
- Hugo Community Baptist Church
- Kienlen-Harbeck Building
- Lundburg, George H., House
- McLean, Robert and Lucy, House
- Newell, Edwin, House
- Newman United Methodist Church
- Redwoods Hotel
- Rogue River Valley Grange No. 469
- Rogue Theatre
- Schmidt, Claus and Hannchen, House
- Smith, Herbert and Katherine, House
- Voorhies, Amos E., House

Additionally, there are twenty-one City parks and green spaces. These include special recreation sites such as pools, boat launches, and a skate park.

- Baker Park
- Croxton Park
- Debo Park
- Eckstein Park
- Fruitdale Park
- Gilbert Creek Park
- Grants Pass Skate Park
- Hillside Park
- Lawnridge Park
- Lawnridge Park
- Morrison Centennial Park
- Ogle Park
- Redwood Park
- Reinhart Park
- Riverside Park
- Tussing Park
- Westholm Park
- Caveman Pool

Figure 1.7: Current and General Future Park Locations, 2010



Source: Grants Pass Comprehensive Park & Recreation Master Plan, 2011

Government Structure

The City is governed by an elected City Council and Mayor who serve as volunteers. City staff includes the City Manager and the employees of the following departments:

- Administration (City Manager and Administrative Staff)
  The City Manager will be a key player in developing the political capital to facilitate mitigation projects and building partnerships with public and private partners to further the goals of mitigation.

- Community Development (Community Planning, Building and Engineering services)
  Mitigation goals and actions can be integrated into the daily and cyclical review and permitting processes managed by the Community Development department.

- Economic Development (Business relocations, incentives, funding programs) and Finance (Finance, Utility Billing, Business licenses, permits).
  A report submitted to Congress by the National Institute of Building Science's Multi-hazard Mitigation Council highlights that for every dollar spent on mitigation, society can expect an average savings of $4[5]. In this way mitigation that fosters resiliency is supporting economic recovery from disasters.

- Human Resources (Employment Opportunities, Bargaining Unit Contracts, Salary Schedules)

- Parks and Community Services (Parks and Recreation, tourism, downtown, internal services)
  Public space and parks help define the character of a community. These parks and open areas can also serve as buffers between the urban areas and high areas, such as flood plains. Dual use parks are just one way to integration mitigation principles into parks and community space.

- Public Safety (Police, Fire/Rescue, Prevention, 9-1-1 Emergency Communications and Records)
  First responders benefit when the population is better prepared for a disaster. If individuals take mitigation into their own home and businesses, the need to respond will be decreased.

- Public Works (Water Treatment, Waste Management, Streets and Drainage)
  The restoration of essential services is one central measure of community resiliency. Public Works can protect the health and safety of the community by integrating mitigation principles into long term planning and daily operations.

- Visitors and Convention Bureau (Community marketing and public relations, community promotions, and cooperative advertising with local businesses).
  Building a diverse economic base in the community, through multiple tourist attractions can build economic resilience.

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[5] National Institute of Buildings Science's Multi-hazard Mitigation Council. "Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities" 2005.

Existing Plan & Policies

Communities often have existing plans and policies that guide and influence land use, land development, and population growth. Such existing plans and policies can include comprehensive plans, zoning ordinances, and technical reports or studies. Plans and policies already in existence have support from local residents, businesses and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, and can adapt easily to changing conditions and needs.[6]

Why connect the NHMP to existing plans?

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

This Grants Pass Addendum to the Josephine County Natural Hazard Mitigation Plan includes a range of recommended action items that, when implemented, will reduce the City's vulnerability to natural hazards. Many of these recommendations are consistent with the goals and objectives of the City's existing plans and policies identified in the plan. Implementing the natural hazards mitigation plan's action items through existing plans and policies increases their likelihood of being supported and getting updated, and maximizes the City's resources.

The following are some of the plans and policies already in place in Grants Pass.

Guides for Development

- Development code
- Municipal Code
- Comprehensive Community Development Plan
- Comprehensive Parks and Recreation Plan
- Grants Pass Department of Public Safety Strategic Plan
- Grants Pass School District 7 Emergency Response Guidelines

Emergency Management Related Plans

- Josephine County Fire Plan
- Grants Pass Emergency Operations Plan
- Water Plant Emergency Operations Plan
- Grants Pass School District #7 Emergency Management Plan

[6] Burby, Raymond J., ed. 1998. *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities.*

Public Works Plans

- Water Distribution Master Plan
- Water Conservation and Management Plan
- Water Treatment Plant Facility Plan
- Wastewater Collection System Master Plan
- Water Restoration Plant Wastewater Facilities Plan Update
- Redwood Sanitary Sewer Service District Engineering Report
- Water and Sewer SDC Rate Study
- Master Transportation Plan
- Total Maximum Daily Load Implementation Plan
- Storm Water Master Plan

Community Organizations and Programs

Social systems can be defined as community organizations and programs that provide social and community-based services, such as health care or housing assistance, to the public. In planning for natural hazard mitigation, it is important to know what social systems exist within the community because of their existing connections to the public. Often, actions identified by the plan involve communicating with the public or specific subgroups within the population (e.g. elderly, children, low income). The City can use existing social systems as resources for implementing such communication-related activities because these service providers already work directly with the public on a number of issues, one of which could be natural hazard preparedness and mitigation. Three involvement methods 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 following organizations are actively engaging with the community on issues related to natural hazards and mitigation and may be potential partners for implementing mitigation actions.

- Rogue Valley Fire Prevention Co-op
  The co-op is an interagency nonprofit fire service organization with the goals of: 1) uniting agencies engaged in fire prevention and

public education; 2) Promoting an interagency exchange of ideas, programs and resources in the area of fire prevention and public education; 3) Promoting, coordinating and actively supporting interagency participation in fire prevention activities; 4) Acting as a central agency for the exchange of professional information among its members; and 5) Obtaining a reduction in the number of preventable fires within the jurisdiction of the cooperative. Members of the cooperative help spread the fire prevention message by: 1) Taking Smokey Bear and his helpers to first-grade classrooms every spring to talk about wildfire prevention; 2) Teaching children about home fire safety in the co-op's mobile Fire Safety House; 3) Organizing and supporting a local wildfire prevention and education team; 4) Making its members available for speaking engagements to groups of kids or adults

- Community-Emergency Response Team (C-ERT)
  CERT is a community training program about readiness, people helping people, rescuer safety, and doing the greatest good for the greatest number. CERT is a positive and realistic approach to emergency and disaster situations where citizens will be initially on their own and their actions can make a difference. Through training, citizens can manage utilities and put out small fires; treat the three killers by opening airways, controlling bleeding, and treating for shock; provide basic medical aid; search for and rescue victims safely; and organize themselves and spontaneous volunteers to be effective.[7]

- Stream Restoration Alliance of the Middle Rogue / Middle Rogue Watershed Council
  The MRWC is a voluntary group of citizens working together to protect and enhance the watershed. It is not a regulatory, political, or single issue organization. It is comprised of landowners, businesses, scientists, students and educators, as well as City, state and federal agency personnel. The group is actively involved in the community by promoting watershed restoration projects, community service, landowner education, and youth empowerment through environmental education.[8]

- Three Rivers School District
  The Three Rivers School District and the Grants Pass Risk Department have developed a partnership to ensure the safety of students and school employees. Quarterly inspections of school facilities by the Department of Public Safety include a non-structural hazards assessment and revisions to the Three Rivers School District Emergency Operations Plan

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[7] About CERT. (www.citizencorps.gov/cert/about.shtm) Accessed July, 2011

[8] About the Middle Rogue Watershed Council. (www.roguebasinwatersheds.org). Accessed July 2010

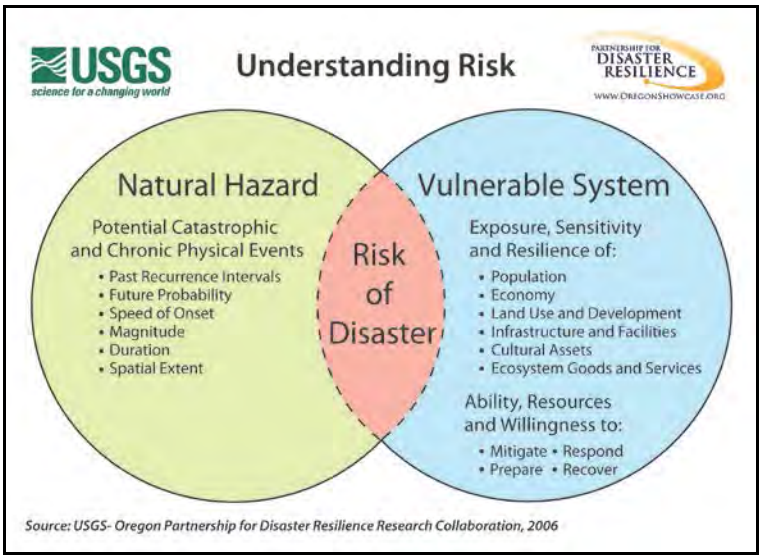
- Grants Pass School District #7
  Grants Pass School District #7 has established Emergency Response Guides for each facility and conducts outreach to parents, faculty and staff about inclement weather and school closures.
  The district also trains high school students basic emergency response skills through the Student Emergency Response Team (S-ERT) program.
- Grants Pass Irrigation District
  The Grants Pass Irrigation District, located in Oregon's Josephine and Jackson Counties, was organized in 1916 to provide adequate irrigation water for lands in the Rogue Valley. The district is dedicated to operate and maintain a distribution system that economically and environmentally enhances the community.[9]

[9] Grants Pass Irrigation District, Mission Statement. (http://www.gpid.com/). Accessed July 2011

Risk Assessment

A risk assessment consists of three phases: hazard identification, vulnerability assessment, and risk analysis, as illustrated in the following graphic.

Figure 1.8: Understanding Risk



The first phase of the risk assessment, hazard identification, involves identifying relevant hazards and determining their geographic extent, intensity, and probability of occurrence (left side of the diagram above). This level of assessment typically involves the most current scientific assessment of the hazard. The outputs from this phase can also be used for land use planning, management, and regulation; public awareness; defining areas for further study; and identifying properties or structures appropriate for acquisition or relocation.[10]

The second phase, vulnerability assessment, involves the identification of key community assets such as existing (or planned) property and population centers, critical infrastructure, economic interests, community resources, etc. (right side of the diagram above). The community profile, above, provides this context.

The third phase, risk analysis, combines the hazard and vulnerability assessments to establish key points of intersection. Specifically, the risk analysis involves estimating the damage, injuries, and costs likely to be incurred in a geographic area over a period of time (middle, overlap area depicted above). Risk has two measurable components: (1) the magnitude

[10] Burby, R. 1998. Cooperating with Nature. Washington, DC: Joseph Henry Press. Pg. 126

of the harm that may result, defined through the vulnerability assessment, and (2) the likelihood or probability of the harm occurring.

The Josephine County Steering Committee conducted a risk assessment that the Grants Pass Steering Committee used to evaluate the probability of each hazard as well as the vulnerability of the community to that hazard. Table 4 below shows the relative risk as determined by each steering committee.

The relative rankings were determined by assigning the value (1) to Low; (2) to Medium; and (3) to High probability or vulnerability.

Table 1.4: City and County Comparative Risk Assessment Summary, 2011

	Josephine County			Grants Pass		
	Probability	***Vulnerability***	***Relative Rank***	***Probability***	***Vulnerability***	***Relative Rank***
Wildfire	H	H	6	H	H	6
Flood	H	M	5	H	H	6
Earthquake	M	H	5	M	H	5
Severe Weather	H	H	6	H	H	6
Landslide	M	L	3	L	L	2
Volcanic	L	L	2	L	L	2
Drought	H	M	5	H	M	5

Wildfire

Comment [kd1]: There is an opportunity to thin out some of the background since the County plan defines the different types already. Though, they city may prefer to have this level of detail? Same comment for all hazards

Fire is an essential part of Oregon's ecosystem, but it is also a serious threat to life and property. Wildfires are fires occurring in areas having large amounts of flammable vegetation that require a suppression response. Areas of wildfire risk exist throughout the state with areas in central, southwest and northeast Oregon having the highest risk.

Ignition of a wildfire may occur naturally from lightning or from human causes such as debris burns, arson, careless smoking, recreational activities or industrial accident. Once started, four main conditions affect the fire's behavior: fuel, topography, weather and development.

- Fuel is the material that feeds a fire. Fuel is classified by volume and type. As a western state, Oregon is prone to wildfires due to its prevalent conifer, brush and rangeland fuel types.
- Topography influences the movement of air and directs a fire's course. Slope and hillsides are key factors in fire behavior. Unfortunately, hillsides with steep topographic characteristics are also desirable areas for residential development.
- Weather is the most variable factor affecting wildfire behavior. High risk areas in Oregon share a hot, dry season in late summer and early fall with high temperatures and low humidity.
- The increase in residential development in interface areas has resulted in greater wildfire risk. Fire has historically been a natural wildland element and can sweep through vegetation that is adjacent to a combustible home. New residents in remote locations are often surprised to learn that in moving away from built-up urban areas, they have also left behind readily available fire services providing structural protection.[11]

Wildfire can be divided into three categories: interface, wildland, and firestorms. Due to its urban development, Grants Pass is primarily exposed to interface fires. An interface fire occurs where wildland and developed areas come together with both vegetation and structural development combining to provide fuel. The wildland-urban interface (sometimes called rural interface in small communities or outlying areas) can be divided into three categories.

- The classic wildland-urban interface exists where well-defined urban and suburban development presses up against open expanses of wildland areas.
- The mixed wildland-urban interface is more typical of the problems in areas of suburban or rural development: isolated homes,

[11] Oregon Natural Hazard Technical Resource Guide, Wildfire / Chapter 7, 2000

subdivisions, resorts and small communities situated in predominantly in wildland settings.

- The occluded wildland-urban interface where islands of wildland vegetation exist within a largely urbanized area.

History

Fire events that have directly impacted Grants Pass include:

- Scenic Drive Fire, August 15, 2007. 25-30 acres burned right at the City limits and moved into the County. This area is one of the 18 designated high hazard areas. No homes were lost but one private fire department brush truck was destroyed
- College Heights Fire, September 2002. 50+ acres burned into the City Urban Growth Boundary. A sizable portion of this area is included as one of the 18 high hazard areas. One (1) house was destroyed by the fire.

Regional fires of significance for Grants Pass include:

- Oak Knoll Fire in Ashland, August 24, 2010. 11 houses were lost in a fire adjacent to I-5. This is a prime example of the same potential fire Grants Pass could experience in several of the high hazard area.
- Deer Creek Fire, August 25, 2005. Several Hundred acres burned and several houses were destroyed. The fire is a perfect representation of the type of fire that threatens both City and County residents.

Risk Assessment

In November 2004, the Josephine County Board of County Commissioners adopted the Josephine County Integrated Fire Plan. The plan was develop as a collaborative effort among the County Fire Defense Board, Oregon Department of Forestry, County departments, state and federal agencies, rural fire protection districts and community organizations throughout the County. The County initiated this effort to reduce wildfire risk to citizens, the environment, and quality of life within Josephine County. The plan mission is to reduce the risk from wildfire to life, property and natural resources in the County

The Josephine County Integrated Fire Plan is multi-jurisdictional and addresses wildfire risk and mitigation actions for the two municipalities of Grants Pass and Cave Junction, the four rural fire protection districts (Applegate Valley, Illinois Valley, Williams, and Wolf Creek), as well as the unprotected areas of Josephine County, largely served by the Rural/Metro Fire Department.

The Integrated Fire Plan is reviewed annually and contains an extensive risk assessment along with mitigation actions. As such, it is complementary to this NHMP and together they present a complete risk profile.

As part of this NHMP, the Josephine County Steering Committee assessed risk associated with the fire hazard in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The NHMP states following level of risk of fire in Josephine County:

- Probability: High (One incident likely within a 10 to 35 year period)
- Vulnerability: Moderate (1-10% affected)

The Grants Pass NHMP Steering Committee assessed risk associated with the fire hazard using the same metrics and determined

- Probability: High (One incident likely within a 10 to 35 year period)
- Vulnerability: High (more than 10% affected)

Grants Pass experiences greater vulnerability to wildfire than the County overall due to the larger population that would be affected. The City of Grants Pass has conducted wildfire risk mapping and identified 18 high hazard areas. In an effort to enhance the risk mapping, in 2011 Grants Pass applied for and was awarded a grant to support a *Firewise* Coordinator position. This coordinator will lead the project to validate the existing maps for each hazard area by verifying the number and type of resident, access and egress, and other potential hazards that exist. Additionally, the City would like to build area plans for each of the 18 high fire hazard areas with specific mitigation actions for each. These projects are significant steps in achieving *Firewise Communities.*

The City also has developed several ordinances to address the increased fire vulnerability. Ordinances exist that include: grass lot, fireworks, and open burning.

Flood

Oregon has a detailed history of flooding with flood records dating back to the 1860s. There are over 250 flood-prone communities in Oregon. The principal types of flood that occur in the community include:

- *Riverine floods*: Riverine floods occur when water levels in rivers and streams overflow their banks. Most communities located along such water bodies have the potential to experience this type of flooding after spring rains, heavy thunderstorms or rapid runoff from snow melt. Riverine floods can be slow or fast-rising, but usually develop over a period of days. The danger of riverine flooding occurs mainly during the winter months, with the onset of persistent, heavy rainfall, and during the spring, with melting of snow in the Cascade and Coast Ranges.

- *Flash floods*: Flash floods usually result from intense storms dropping large amounts of rain within a brief period. Flash floods usually occur in the summer during thunderstorm season, appear with little or no warning and can reach full peak in only a few minutes. In flash flood situations, waters not only rise rapidly, but also generally move at high velocities and often carry large amounts of debris, obstructing the water way and inducing flooding both upstream and then later downstream if the obstruction is removed or breaks free.

- *Urban floods*: Urban flooding occurs where land has been converted from fields or woodlands to developed areas consisting of homes, parking lots, and commercial, industrial and public buildings and structures. In such areas the pervious ability of water to infiltrate into the ground is often prevented by the extensive impervious surfaces associated with urban development. This in turn results in more water quickly running off into watercourses which causes water levels to rise quickly. During periods of urban flooding streets, basements and backyards can quickly fill with water. Storm drains often may back up with debris, inducing further localized flooding.

History

Flood events that have directly impacted Grants Pass include[12]:

- 1955 Rogue River Crests at 32.6 feet at Grants Pass.
- December 1964 – Statewide flooding event; benchmark event with record flows on the Rogue and Umpqua rivers. Rogue River Crests at 35.15 feet at Grants Pass; flood stage is 24.5 feet. $90 million in

[12] Sourced from: 1) Southwest Oregon Regional Profile, 2009 Oregon Enhanced Natural Hazard Mitigation Plan and 2) NCDC Climate Radar Data Inventories.

damages (2004 dollars) Rogue and Illinois Valleys isolated with roads (including I-5) temporarily closed; 10 inches of rain over a six day period.

- January, 1997 – 4 inches of rain over 48 hours; 90,100 cfs in Grants Pass; $10 million in damages. Governor Kitzhaber declared a state of emergency.
- April 2005: 3.6 inches of rain fell in one hour in Grants Pass Warning Area (2.0 inches in 45 minutes in Merlin) flooding City streets; the blockage of Hunt Lane was an issue for first responders.

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Grants pass already participates in CRS and currently holds a class rating of 8.

Risk Assessment

The Josephine County NHMP assessed risk associated with the flood hazard in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The NHMP states following level of risk of flood in Josephine County:

- Probability: High (One incident likely within a 10 to 35 year period)
- Vulnerability: Moderate (1-10% affected)

The Grants Pass NHMP Steering Committee assessed risk associated with the flood hazard using the same metrics and determined

- Probability: High (One incident likely within a 10 to 35 year period)
- Vulnerability: High (more than 10% affected)

Grants Pass experiences greater vulnerability than the County overall due to the location of several key pieces of infrastructure in the floodplain. The Water Filtration plant's intake structure lies in the floodway. Relatedly, the increasing turbidity of the river has stressed the water intake system. Turbidity, and the presences of general debris in the river, can be exacerbated by flood.

Additionally, because the City is bisected by the river, connectivity of the community is vulnerable to floods that might damage the main transportation routes. There is only one hospital and one predetermined Emergency Operations Facility and significant riverine or urban flooding can restrict access to those critical facilities.

Flood mitigation actions include NFIP compliant elevation requirements and a recent evaluation prioritized pipes and culverts for replacement and repair. Even so, recent development may still outpace the monitoring of flood hazard vulnerability.

Earthquake

Oregon and the Pacific Northwest in general are susceptible to earthquakes from three sources: 1) the off-shore Cascadian Subduction Zone; 2) deep intra-plate events within the subducting Juan de Fuca Plate; and 3) shallow crustal events within the North American Plate.

While all three types of quakes possess the potential to cause major damage, Subduction zone earthquakes pose the greatest danger. The source for such events lies off the Oregon coast and is known as the Cascadia Subduction Zone (CSZ). A major CSZ event could generate an earthquake with a magnitude of 9.0 or greater resulting in devastating damage and loss of life. The specific hazards associated with an earthquake include the following:

- Ground Shaking: Ground shaking is defined as the motion or seismic waves felt on the Earth's surface caused by an earthquake. Ground shaking is the primary cause of earthquake damage.
- Ground Shaking Amplification: Ground shaking amplification refers to the soils and soft sedimentary rocks near the surface that can modify ground shaking from an earthquake. Such factors can increase or decrease the amplification (i.e., strength) as well as the frequency of the shaking.
- Surface Faulting: Surface faulting are planes or surfaces in Earth materials along which failure occurs. Such faults can be found deep within the earth or on the surface. Earthquakes occurring from deep lying faults usually create only ground shaking.
- Earthquake-Induced Landslides: These landslides are secondary hazards that occur from ground shaking.
- Liquefaction: Liquefaction takes place when ground shaking causes granular soils to turn from a solid into a liquid state. This in turn causes soils to lose their strength and their ability to support weight.[13]

History

The Josephine County NHMP adequately documents the earthquake history for Grants Pass.

[13] Oregon Natural Hazard Technical Resource Guide, Seismic/Chapter 8, 2000

Risk Assessment

The Josephine County NHMP assessed risk associated with the earthquake hazard in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The NHMP states following level of risk of earthquake in Josephine County:

- Probability: Moderate (one incident likely within a 35 to 75 year period)
- Vulnerability: High (more than 10% affected)

The Grants Pass NHMP Steering Committee assessed risk associated with the earthquakes using the same metrics and determined the same levels of probability and vulnerability as the County NHMP. Therefore, the County risk assessment adequately addresses risk to the City of Grants Pass.

Mitigation Success: Structural Retrofit of Critical Facilities

In 2011, Grants Pass was awarded grant funding from the State of Oregon to retrofit the Hillcrest Fire Station. The target completion date is summer 2013.

Severe Weather

Windstorm

Extreme winds occur throughout Oregon. Wind conditions in southwest Oregon are not as dramatic as those along the coast or in the Gorge yet destructive surface winds strike Oregon most often from the southwest. Some winds blow from the east but most often do not carry the same destructive force as those from the Pacific Ocean.

Although rare, tornados can and do occur in Oregon. In December 2010, an EF 2 tornado touched down in Aumsville, Marion County. Though damage was extensive, no serious injuries occurred. According to the weather service, the December incident was the fourth since 2000.[14]

Winter Storm

Destructive winter storms that produce heavy snow, ice, rain and freezing rain, and high winds have a long history in Oregon and Josephine County. Severe storms with snow and ice typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from October through March.

- Ice storms are comprised of cold temperatures and moisture, but subtle changes can result in varying types of ice formation which may include freezing rain, sleet and hail. Of these, freezing rain can be the most damaging of ice formations.
- Sleet is rain that freezes into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects; however, it can accumulate like snow and cause roads and walkways to become hazardous. Freezing rain (also known as an ice storm) is rain that falls onto a surface with a temperature below freezing. The cold surface causes the rain to freeze so the surfaces, such as trees, utilities, and roads, become glazed with ice. Even small accumulations of ice can cause a significant hazard to property, pedestrians, and motorists.
- Black ice can fool drivers into thinking water is on the road. What they may not realize is that condensation, such as dew, freezes when temperatures reach 32 degrees F or below, forming a thin layer of ice. This shiny ice surface is one of the most dangerous road conditions. Black ice is likely to form under bridges and overpasses, in shady spots and at intersections.

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[14] National Oceanic and Atmospheric Administration, National Climatic Data Center, *State of the Climate*, *Tornadoes*, *December 2010. (www.ncdc.noaa.gov/sotc/tornadoes/2010/12).*

History

Severe weather events that have directly impacted Grants Pass in recent years include:

- December 2006: High winds up to 90 mph caused $150,000 in damages in Douglas and Josephine.
- July 2007: Severe thunderstorms with winds up to 60 mph down numerous trees damaging vehicles and trailers. Lightning struck the steeple of a church, causing $60,000 in damages.
- June 2009: A thunderstorm accompanied by nickel sized hail and strong winds affected the town of Williams. The town experienced some local, urban flooding and three large trees were toppled.
- March 2011: A severe wind storm took down numerous large trees in Grants Pass doing significant damage at Riverside Park and in several housing developments in and around the community.

Risk Assessment

The Josephine County NHMP assessed risk associated with severe weather in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The NHMP states following level of risk of severe weather in Josephine County:

- Probability: High (One incident likely within a 10 to 35 year period)
- Vulnerability: High (more than 10% affected)

The Grants Pass NHMP Steering Committee assessed risk associated with the severe weather using the same metrics and determined the same levels of probability and vulnerability as the County NHMP. Therefore, the County risk assessment adequately addresses risk to the City of Grants Pass.

Landslide

Landslides are a common, naturally occurring events in various parts of Oregon. While not all landslides result in property damage, many landslides do pose serious risk to people and property. Increasing population and development in Oregon has induced the siting of more development in or near landslide areas. Often these areas are highly desirable owing to their location along the coast, rivers and on hillsides.

In the simplest terms, a landslide is any detached mass of soil, rock, or debris that falls, slides or flows down a slope or a stream channel. Landslides are classified according to the type and rate of movement and the type of materials that are transported. In understanding a landslide, two forces are at work: 1) the driving forces that cause the material to move down slope, and 2) the friction forces and strength of materials that act to retard the movement and stabilize the slope. When the driving forces exceed the resisting forces, a landslide occurs.

Conditions Affecting Landslides

Natural conditions and human activities can both play a role in causing landslides. Certain geologic formations are more susceptible to landslides than others. Locations with steep slopes are at the greatest risk of slides. However, the incidence of landslides and their impact on people and property can be accelerated by development. Developers who are uninformed about geologic conditions and processes may create conditions that can increase the risk of or even trigger landslides. There are four principal factors that affect or increase the likelihood of landslides:

- Natural conditions and processes including the geology of the site, rainfall, wave and water action, seismic tremors and earthquakes and volcanic activity.
- Excavation and grading on sloping ground for homes, roads and other structures.
- Drainage and groundwater alterations that are natural or human-caused can trigger landslides. Human activities that may cause slides include broken or leaking water or sewer lines, water retention facilities, irrigation and stream alterations, ineffective storm water management and excess runoff due to increased impervious surfaces.
- Change or removal of vegetation on very steep slopes due to timber harvesting, land clearing and wildfire.[15]

History

Landslide events that directly impacted Grants Pass include:

[15] Oregon Natural Hazard Technical Resource Guide, Landslide / Chapter 5, 2000

- **1996/1997:** Severe storms caused damage across the state. Josephine County experienced many slope failures.

Risk Assessment

The Josephine County NHMP assessed risk associated with landslide hazards in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The NHMP states following level of risk of landslide in Josephine County:

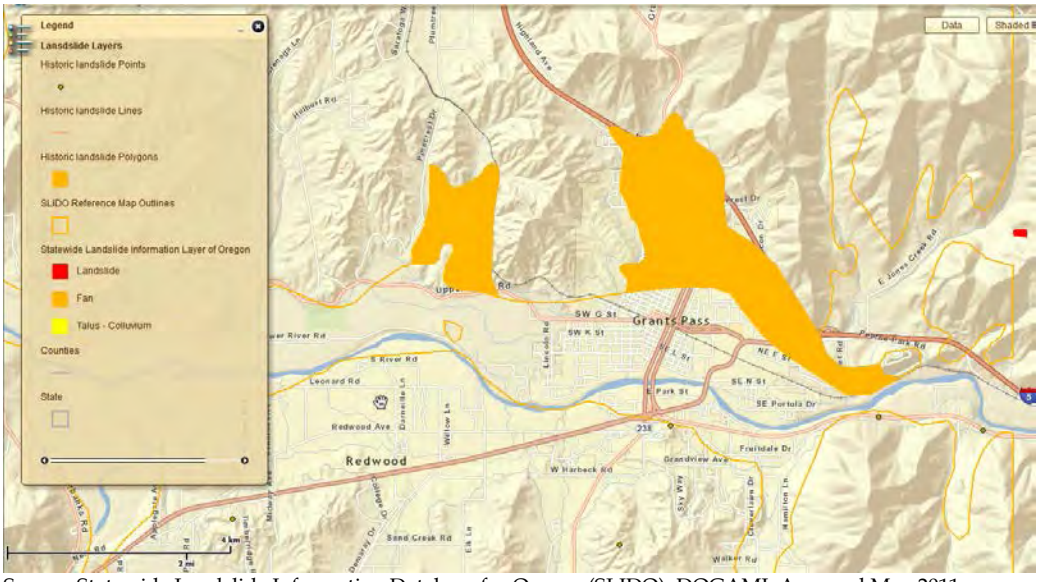
- Probability: Moderate (one incident likely within a 35 to 75 year period)
- Vulnerability: Low (less than 1% affected)

The Grants Pass NHMP Steering Committee assessed risk associated with the landslide hazard using the same metrics and determined that the City incurs less risk than the County because the City experiences a lower probability of landslides than the County (which experience medium probability), and also a low level of vulnerability. Figure 9 depicts historical landslide areas in and near Grants Pass.

- Probability: Low = One incident likely within a 75 to 100 year period.
- Vulnerability: Low (less than 1% affected)

Therefore, the County risk assessment adequately addresses risk to the City of Grants Pass.

Figure 1.9: Grants Pass Landslide Information, 2011



Source: Statewide Landslide Information Database for Oregon (SLIDO), DOGAMI, Accessed May 2011

Drought

Drought can be defined in several ways, depending on who is doing the defining and for what reason. The American Heritage Dictionary defines drought as "a long period with no rain, especially during a planting season." While straight forward, this definition falls far short of the benchmark needed to assess the extent or severity of the hazard and how it might be mitigated. The following list is a general categorization of the types of drought.

- **Meteorological or climatological** droughts usually are defined in terms of the departure from a normal precipitation pattern (Figure D-1) and the duration of the event. Drought is a slow-onset phenomenon that usually takes at least three months to develop and may last for several seasons or years.
- **Agricultural droughts** link the various characteristics of meteorological drought to agricultural impacts. The focus is on precipitation shortages and soil-water deficits. Agricultural drought is largely the result of a deficit of soil moisture. A plant's demand for water is dependent on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil.
- **Hydrological droughts** refer to deficiencies in surface water and sub-surface water supplies. It is measured as stream flow, and as lake, reservoir, and ground water levels. Hydrological measurements are not the earliest indicators of drought. When precipitation is reduced or deficient over an extended period of time, the shortage will be reflected in declining surface and sub-surface water levels.
- **Socioeconomic droughts** occur when physical water shortage begins to affect people, individually and collectively. Most socioeconomic definitions of drought associate it with supply, demand, and economic good. One could argue that a physical water shortage with no socio-economic impacts is a policy success.

History

The Josephine County NHMP adequately documents the drought history for Grants Pass.

Risk Assessment

The Josephine County NHMP assessed risk associated with drought in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The NHMP states following level of risk of drought in Josephine County:

- Probability: High = One incident likely within a 10 to 35 year period.
- Vulnerability: Moderate = 1-10% affected

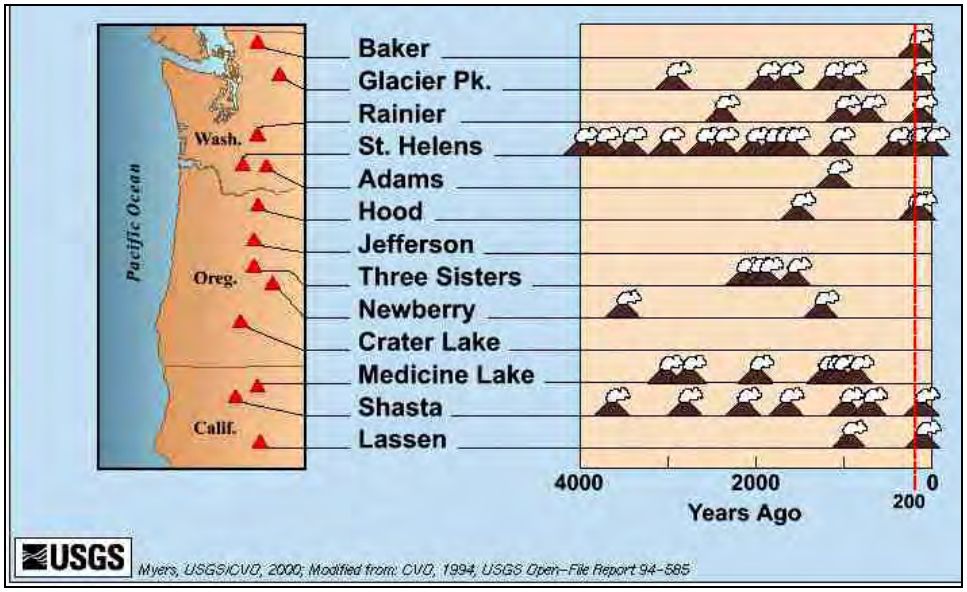
The Grants Pass NHMP Steering Committee assessed risk associated with the drought using the same metrics and determined the same levels of probability and vulnerability as the County NHMP. Therefore, the County risk assessment adequately addresses risk to the City of Grants Pass.

Volcano

History

There is no direct history of the impact of volcanic hazard on Grants Pass. Even so, the volcanoes of the Cascade Range have a long history of eruption and intermittent quiescence. Figure 10 below shows that each of the cascade volcanoes has a different frequency of eruptions. Not all Cascade volcanoes have been active in the recent past. This is typical of a volcanic range and is one of the reasons forecasting eruptions can be difficult.

Figure 1.10: Cascade Eruptions during the past 4,000 years



Source: USGS and the State of Oregon Natural Hazards Mitigation Plan, 2009

Risk Assessment

The Josephine County NHMP assessed risk associated with the volcanic hazards in two ways: vulnerability (e.g., exposure, sensitivity, and resilience) and the probability, or likelihood, of a hazard incident. The NHMP states following level of risk of a volcanic incident in Josephine County:

- Probability: Low = One incident likely within a 75 to 100 year period.
- Vulnerability: Low = Less than 1% affected

The Grants Pass NHMP Steering Committee assessed risk associated with the earthquakes using the same metrics and determined the same levels of probability and vulnerability as the County NHMP. Therefore, the County risk assessment adequately addresses risk to the City of Grants Pass.

Mission, Goals, and Action Items

Mission

The mission of the Grants Pass Natural Hazard Mitigation Plan is to create a disaster resilient City.

The Grants Pass NHMP Steering Committee chose to adopt the mission of the County's natural hazard mitigation plan. This connection will facilitate cross-jurisdictional collaboration to meet mitigation goals.

Goals

The plan goals help guide the direction of future activities aimed at reducing risk and preventing loss from natural hazards. Goals are aspirational in nature and are intended to guide implementation of the plan. The goals listed here serve as checkpoints as agencies and organizations begin implementing mitigation action items. The Grants Pass NHMP steering committee determined that it would enhance opportunities for collaboration with the County to incorporate the County NHMP goals.

In accordance with the requirements contained in §201.6(c)(3)(i), the Grants Pass County NHMP goals are:

Plan Goal 1: Prevent or reduce losses to life, private property and natural resources resulting from natural hazards.

Plan Goal 2: Prevent or reduce the disruption to essential public infrastructure and services resulting from natural hazards.

Plan Goal 3: Increase public awareness for the importance and benefits of preparing for and mitigating natural hazard impacts.

Plan Goal 4: Increase the level of personal responsibility and accountability among Josephine County citizens to mitigate the impacts of natural hazards.

Plan Goal 5: Support the diversification, expansion and stabilization of local and regional economies by preventing or reducing business losses resulting from natural hazards.

Plan Goal 6: Increase the amount of federal, state and local funding sources dedicated to implementing affordable multi-objective natural hazard mitigation strategies.

Mitigation Action Items

The Disaster Mitigation Act of 2000 (DMA 2000) is the latest federal legislation addressing mitigation planning. It reinforces the importance of mitigation planning and emphasizes planning for natural hazards before they occur. As such, this Act established the Pre-Disaster Mitigation (PDM) grant program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). Section 322 of the Act specifically addresses mitigation planning at the state and local levels. State and local jurisdictions must have approved mitigation plans in place in order to qualify to receive post-disaster HMGP funds. Short and long-term action items identified through the planning process are an important part of the mitigation plan.

Multihazard Requirement §201.6(c)(3)(iv):

*For multi-jurisdictional plans, there **must** be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

Mitigation plans must identify specific actions to reduce risk and demonstrate that their proposed mitigation measures are based on a sound planning process that accounts for the risk to the individual and their capabilities. Additionally, in multijurisdictional planning, if the City's risk to a hazard is greater than the County's, then the City must create at least one action item to mitigate that hazard's effects.

Action items are detailed recommendations for activities that local departments, citizens and others could engage in to reduce risk. 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.

Full action item worksheets are located at the end of the addendum. Below is an overview of the mitigation actions identified by the Grants Pass Steering Committee:

MultiHazard

1.1. Establish a forum to monitor the success of the Natural Hazard Mitigation Plan

1.2. Improve and sustain public information and education programs to City residents about potential hazards, the need for personal preparedness, and mitigation actions possible.

1.3. Collaborate with the County to maintain a GIS inventory of vulnerable locations and critical facilities

1.4. Using 2011 aerial digital imaging, produce new GIS based hazard maps

1.5. Collaborate with the County and Cave Junction to develop an economic impact assessment and strategy to better understand how high-risk hazards may impact the local economy.

1.6. Collaborate with local partners to identify and apply for applicable mitigation grants

1.7. Contribute project information to the County-wide inventory of "mitigation successes"

1.8. Revise the Grants Pass Comprehensive plan to include hazards based on the updated City Risk Assessment

Flood

2.1. Continue annual review of CRS rating and activities

2.2. Identify and apply for federal and state grant funds to acquire, elevate/retrofit, or relocate properties and facilities within the 100-year floodplain.

2.3. Collaborate with Josephine County to identify sources of funding to retrofit the Water Restoration Plant to protect against flood damage.

2.4. Update the Grants Pass Stormwater Master Plan

2.5. Collaborate with the County to identify and reach out to property owners along stream and riverbanks to share information about how to minimize erosion of soils and banks during flood events of varying magnitudes.

Earthquake

3.1. Publicize and facilitate the implementation of both structural and non-structural seismic mitigation measures for home owners, business owners, renters, and contractors

3.2. Collaborate with Josephine County to develop a post-catastrophic recovery plan.

Landslide

4.1. Obtain LIDAR maps from DOGAMI to determine historic landslide areas that require development restrictions or physical landslide mitigation

Severe Weather

5.1. Work with electrical utilities to develop a policy to underground lines when opportunities arise.

5.2. In coordination with the County, assess the feasibility of a policy and procedures for opening heating and cooling shelter sites

5.3. Enhance communication between City first responders (e.g., Public Safety, Public Works) and public utilities to ensure common understanding of priorities in response and recovery.

Wildfire

6.1. Develop a fuels reduction strategy for public property

6.2. Establish a public outreach strategy through the Firewise Community program

6.3. Conduct site specific map verification and develop specific mitigation actions for the 18 identified high fire risk areas

Drought

7.1. Promote water conservation measures among City residents focusing on domestic use

7.2. Assess progress on actions recommended by existing water management plans to reaffirm or redefine priority projects

Volcanic

8.1. Disseminate volcanic impact educational materials

Plan Implementation and Maintenance

This section details the formal process that will ensure that the Grant Pass Addendum 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. Because this addendum lives within the Josephine County Natural Hazard Mitigation Plan, the City will coordinate with the County's five-year plan update schedule.

Finally, this section describes how the City will integrate public participation throughout the plan maintenance and implementation process.

Plan Adoption

After the addendum is locally reviewed and deemed complete, Josephine County Emergency Management submits it to the State Hazard Mitigation Officer at Oregon Emergency Management. Oregon Emergency Management submits the plan to the Federal Emergency Management Agency (FEMA--Region X) for review. This review addresses the federal criteria outlined in the FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, the City will adopt the plan via resolution. At that point the City will gain eligibility for the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds, and Flood Mitigation Assistance program funds.

The City Council will be responsible for adopting the Grants Pass Natural Hazard Mitigation Plan Addendum. This governing body has the authority to promote sound public policy regarding natural hazards.

Convener

The City Emergency Management Coordinator is designated as the responsible party for the implementation and maintenance of the City addendum.

Roles and responsibilities for the convener include the following:

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

Coordinating Body

The Grants Pass NHMP Steering Committee serves as the coordinating body for the City's addendum. Describe the authority and roles of the coordinating body. Examples of potential roles and responsibilities of the coordinating body include:

- Serving as the local evaluation committee for funding programs such as the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds, and Flood Mitigation Assistance program funds;
- Prioritizing and recommending funding for natural hazard risk reduction projects;
- Documenting successes and lessons learned;
- Evaluating and updating the natural hazards mitigation plan following a disaster;
- Evaluating and updating the natural hazards mitigation plan in accordance with the prescribed maintenance schedule; and
- Developing and coordinating ad hoc and/or standing subcommittees as needed.

The City can use the examples provided above, or can change them to fit the needs and situation of the community.

Members

The membership of the Steering Committee for the Grants Pass Addendum is listed in Table 1 of this report: Grants Pass NHMP Steering Committee

To make the coordination and review of the Grants Pass Addendum 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. Specific organizations have been identified as either internal or external partners on the individual action item forms.

Plan Maintenance

Plan maintenance is a critical component of the natural hazard mitigation plan. Proper maintenance of the plan ensures that this plan will maximize the City's efforts to reduce the risks posed by natural hazards. This section includes a process to ensure that a regular review and update of the plan occurs. The steering committee and local staff are responsible for implementing this process, in addition to maintaining and updating the plan through a series of meetings outlined in the maintenance schedule below.

Annual Meetings

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

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

During the second meeting of the year the committee will:

- Review existing and new risk assessment data;
- Discuss methods for continued public involvement; and
- Document successes and lessons learned during the year.

The 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. The plan's format allows the City to review and update sections when new data becomes available. New data can be easily incorporated, resulting in a natural hazards mitigation plan that remains current and relevant to the participating jurisdictions.

Project Prioritization Process

The Disaster Mitigation Act of 2000 (via the Pre-Disaster Mitigation Program) requires that jurisdictions identify a process for prioritizing potential actions. Potential mitigation activities often come from a variety of sources; therefore the project prioritization process needs to be flexible. Projects may be identified by committee members, local government staff, other planning documents, or by the risk assessment. For additional information on action item prioritization methods, refer to the Josephine County NHMP.

Continued Public Involvement & Participation

The City of Grants Pass is dedicated to involving the public directly in the continual reshaping and updating of the Natural Hazard Mitigation Plan Addendum. Although members of the steering committee represent the public to some extent, the public will also have the opportunity to continue to provide feedback about the plan.

To ensure continued public involvement and participation in the City's plan update processes, the City of Grants Pass will conduct regular outreach such as:

- Collaborate on NHMP annual review with the School Districts
- Include information about the NHMP on the City website
- Produce an annual report of progress on the NHMP goals and actions
- Discuss the NHMP at the annual Emergency Preparedness City Council meeting
- In addition to the involvement activities listed above, the City's natural hazard mitigation plan addendum has been archived and posted on the Partnership website via the University of Oregon Libraries' Scholar's Bank Digital Archive.

Five-Year Review of Plan

This plan will be updated every five years in conjunction with the Josephine County Natural Hazard Mitigation Plan. During this plan update, the following questions will be asked to determine what actions are necessary to update the plan. The convener will be responsible for convening the City's steering committee to address the questions outlined below.

- Are the plan's 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?
- 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.

Introduction

The Mitigation Action form should include critical information on the rationale or fact base for the proposed action, ideas for implementation, coordinating and partner organizations, timeline, and plan goals addressed. This approach, developed by the Oregon Partnership for Disaster Resilience at the University of Oregon provides evidence-based documentation of the proposed action and keeps together all of the essential information needed to implement the action. Community stakeholders are able to introduce action items both during and after the planning process by simply filling out the form and submitting it to the coordinating body for review and inclusion into the plan.

Form Definitions

Proposed Action Title:

Include a brief description of the proposed action.

Alignment with Plan Goals:

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.

Rationale or Key Issues Addressed:

The rationale describes the critical issues that the action item will address. It presents the logic and the fact base behind the action item: why is it important that this action item be implemented?

Ideas for Implementation:

For each action item, the form asks for some ideas for implementation, which serve as the starting point for taking action. This information offers a transition from theory to practice. Ideas for implementation could include: (1) collaboration with relevant organizations, (2) alignment with the community priority areas, and (3) applications to new grant programs.

The ideas for implementation are just that: ideas. They do not necessarily prescribe the exact steps that the County or its partners should take to implement a particular action item. When an action is implemented, more work will probably be needed to determine the exact course of action. (For more information on how this plan will be implemented and evaluated, see Section 5).

Coordinating Organization:

The coordinating organization is the public agency with authority to implement the identified action. It can also be an agency 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 County that may be able to assist in the implementation of an action item by providing relevant resources (time, budget, staff, data, etc.) to the coordinating organization.

External Partners:

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

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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 County departments may implement with existing resources and authorities within one to two years. *Long-term action items* (LT) may require new or additional resources and/or authorities, and may take more than two years to implement.

Action Summary:

MultiHazard

1.1. Establish a forum to monitor the success of the Natural Hazard Mitigation Plan

1.2. Improve and sustain public information and education programs to City residents about potential hazards, the need for personal preparedness, and mitigation actions possible.

1.3. Collaborate with the County to maintain a GIS inventory of vulnerable locations and critical facilities

1.4. Using 2011 aerial digital imaging, produce new GIS based hazard maps

1.5. Collaborate with the County and Cave Junction to develop an economic impact assessment and strategy to better understand how high-risk hazards may impact the local economy.

1.6. Collaborate with local partners to identify and apply for applicable mitigation grants

1.7. Contribute project information to the County-wide inventory of "mitigation successes"

1.8. Revise the Grants Pass Comprehensive plan to include hazards based on the updated City Risk Assessment

Flood

2.1. Continue annual review of CRS rating and activities

2.2. Identify and apply for federal and state grant funds to acquire, elevate/retrofit, or relocate properties and facilities within the 100-year floodplain.

2.3. Collaborate with Josephine County to identify sources of funding to retrofit the Water Restoration Plant to protect against flood damage.

2.4. Update the Grants Pass Stormwater Master Plan

2.5. Collaborate with the county to identify and reach out to property owners along stream and riverbanks to share information about how to minimize erosion of soils and banks during flood events of varying magnitudes.

Earthquake

3.1. Publicize and facilitate the implementation of both structural and non-structural seismic mitigation measures for home owners, business owners, renters, and contractors

3.2. Collaborate with Josephine County to develop a post-catastrophic recovery plan.

Landslide

4.1. Obtain LIDAR maps from DOGAMI to determine historic landslide areas that require development restrictions or physical landslide mitigation

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Severe Weather

5.1. Work with electrical utilities to develop a policy to underground lines when opportunities arise.

5.2. In coordination with the County, assess the feasibility of a policy and procedures for opening heating and cooling shelter sites

5.3. Enhance communication between City first responders (e.g., Public Safety, Public Works) and public utilities to ensure common understanding of priorities in response and recovery.

Wildfire

6.1. Develop a fuels reduction strategy for public property

6.2. Establish a public outreach strategy through the *Firewise Community* program

6.3. Conduct site specific map verification and develop specific mitigation actions for the 18 identified high fire risk areas

Drought

7.1. Promote water conservation measures among city residents focusing on domestic use

7.2. Assess progress on actions recommended by existing water management plans to reaffirm or redefine priority projects

Volcanic

8.1. Disseminate volcanic impact educational materials

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1. MultiHazard

1.1. Establish a forum to monitor the success of the Natural Hazard Mitigation Plan

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☒
Action development: 2011 Addendum ☒ 2016 Update ☐	
Rationale for Proposed Action Item:	
While there are groups that exist in the county and region that focus on hazard mitigation such as the Josephine County Emergency Management Board and Rogue Valley Fire Chiefs Association, there is a need to address the specific hazards, risk and vulnerabilities present in Grants Pass.	
Ideas for Implementation:	
• The County will utilize the JOCO emergency management board as the primary committee to focus on mitigation. • The City of Grants Pass will convene a group that will meet once a year, or more frequently as needed to discuss mitigation actions and needs. • Two or three members of the Grants Pass Committee will also participate in the County Committee.	
Coordinating Organization:	Grants Pass Emergency Management Coordinator
Internal Partners:	**External Partners:**
Grants Pass City Manager, Community Development, Public Works, Public Safety	Josephine County Emergency Management and Emergency Management Board
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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1.2. Improve and sustain public information and education programs to City residents about potential hazards, the need for personal preparedness, and mitigation actions possible.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☒ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐
Action development: 2011 Addendum ☒ 2016 Update ☐	
Rationale for Proposed Action Item:	
Although there is increased interest in reducing losses during and immediately after hazard incidents and disasters, there is an ongoing need to provide resident and key stakeholder groups (such as infrastructure operators) with hazard mitigation information. There are mitigation actions appropriate at all levels of the community: individual, business, neighborhood, community, and county level. Promoting mitigation throughout Josephine County achieves both more resilient population but also may uncover or inspire new partnerships around mitigation. Also, continued public information and education is a state NHMP action.(Multi-Hazard, Long-Term #3).	
Ideas for Implementation:	
The awareness program could consist of: 1. Preparedness Fairs 2. Public Service Announcements (Plans are under way for PSA's in the Grants Pass Daily Courier and KAJO/KLDR radio as a part of County Emergency Preparedness Month which has been declared by Board of County Commissioners for September). 3. Hazard Information website which would include facts about hazards, building code information, insurance information about specific hazards, and other safety and security measures. This particular approach may require longer than two years and additional funding beyond current county budget capacity. 4. Public meetings to introduce important issues (Recent public hearings and participation in public forums and on local radio shows are being planned at this time and will continue to broadcast efforts of the committee and other emergency services and programs. 5. Efforts to encourage all residents and businesses to have 72 hour kits 6. The Josephine County Emergency Preparedness Handbook will continue to be disseminated to individuals and families throughout the county.	
Coordinating Organization:	Grants Pass Emergency Management Coordinator
Internal Partners:	**External Partners:**
Community Development, Public Safety, City Manager	County groups, Community organizations (e.g., civic and religious groups), media, Three Rivers School District, utility providers
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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1.3. Collaborate with the County to maintain a GIS inventory of vulnerable locations and critical facilities

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐
Action development: 2011 Addendum ☒ 2016 Update ☐	
Rationale for Proposed Action Item:	
The CFR 201.6(c.)(2)(ii) requires that the NHMP include a summary of how each hazard would impact the community, that the NHMP should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in hazard areas. While the vulnerability analysis and risk assessment in the 2011 NHMP was based on best available data, developing an inventory of the extent of vulnerability would allow for a more in-depth vulnerability analysis and risk assessment, at the sub-area or facility level, during the next NHMP update. An inventory in a Geographic Information System (GIS) database provides a quick and easy way to understand how the physical and community aspects of the County overlap and intersect with hazards. It would improve the county's understanding of risk and vulnerability and lead to more specific mitigation actions. Additionally, this database can also be used to catalogue and geo-reference mitigation success stories.	
Ideas for Implementation:	
• Expand the existing wildfire database to include additional hazards for which data exists and continue to develop mapping of hazard areas, vulnerable locations, and critical facilities. • Obtain additional data on natural hazards from state and federal sources as it is available (Army Corps, DOGAMI) • Include mapping layer to track mitigation projects • Include in a work program for future projects • Utilize schools and students to conduct neighborhood level asset inventories (e.g., "Map Your Neighborhood, (http://www.nehrp.gov/pdf/SeismicWavesMay08.pdf)) • Connect with adjacent or other Oregon counties for input on their mapping strategies	
Coordinating Organization:	Grants Pass Community Development
Internal Partners:	**External Partners:**
Grants Pass Community Development, Public Works	Josephine County Emergency Management, Emergency Management Board and GIS Departments
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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1.4. Using 2011 aerial digital imaging, produce new GIS based hazard maps

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: 2011 Addendum ☒ 2016 Update ☐

Rationale for Proposed Action Item:

The CFR 201.6(c.)(2)(ii) requires that the NHMP include a summary of how each hazard would impact the community, that the NHMP should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in hazard areas.

The City of Grants Pass has LIDAR data from 2004 that provide a view at 1 foot contours of the city area. Additionally, the City has aerial photos that were taken in 2007. The development of commercial and residential areas since those years will be captured in new aerial imaging in 2011.

Combining this new images with the hazard information will create the most current risk assessment information and inform future updates of the NHMP

Ideas for Implementation:

- Ensure the photographed area covers all hazard areas
- Inform NHMP partners when new overlays are available

Coordinating Organization:	Grants Pass Community Development

Internal Partners:	**External Partners:**
NA	DOGAMI, Josephine County

Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Grants Pass NHMP Steering Committee

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1.5. Collaborate with the County and Cave Junction to develop an economic impact assessment and strategy to better understand how high-risk hazards may impact the local economy.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☒ Goal 6 ☐

Action development: 2011 Addendum ☒ 2016 Update ☐

Rationale for Proposed Action Item:

Each disaster or emergency event leaves its economic impacts long after the physical issues have been resolved. Due to the lack of information available, it becomes the task to identify those impacts, determine which of them can be mitigated, and inform the public while encouraging them to prepare for an emergency through the use of insurance programs and other economic preparation.

Additionally, developing this assessment and strategy will support recovery planning and recovery efforts by cataloguing the sensitivity of the economy to natural hazards. Those areas that cannot be mitigated are then natural priorities for the recovery plan and efforts.

The 2008 Business retention and expansion survey determined that new job growth, expansions, and new projects come from existing businesses.

Ideas for Implementation:

- Utilize the results of the 2008 Business Retention and Expansion Survey and the networks developed during that survey process to provide guidance or input on the topic of business and economic diversity.
- Identify partners in this analysis to provide both content and development support
- Identify capacity and capability within the county for plan development
- Survey recovery plans developed by other cities, counties, and regions across the country, especially those with similar characteristics to Josephine County
- Gather information from diverse sources about the business, employment, and labor sectors and how their inputs and outputs would be affected by interruption from natural hazards (e.g., Host public meetings where businesses are invited to attend; present potential natural hazards; gather ideas from the businesses about how the county might direct resources towards actions that could help minimize risk.)

Coordinating Organization:	Grants Pass Economic Development

Internal Partners:	**External Partners:**
Grants Pass City Manager, Grants Pass Emergency Management	County Chamber of Commerce, Business associations, large employers; City of Grants Pass; Southern Oregon Regional Economic Development Incorporated (SOREDI), United Community Action Network, Oregon Bureau of Labor and Industries, Oregon Partnership for Disaster Resilience, State of Oregon Emergency Management, Oregon Business Development Department,

Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	

Submitted by:	Grants Pass NHMP Steering Committee

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1.6. Collaborate with local partners to identify and apply for applicable mitigation grants

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☒
Action development: 2011 Addendum ☒ 2016 Update ☐	

Rationale for Proposed Action Item:

A constant concern of the Steering Committee is the lack of funding and personnel available to accomplish many of the action items listed in this plan. There will need to be a concerted effort over time to identify and apply for funding to accomplish the goals of this plan. Specific projects in need of funding include many of those mentioned in the mitigation actions such as:

- Economic Impact Assessment
- Wastewater Treatment Plant Retrofit
- Catastrophic Recovery Plan
- Non-Structural Retrofit projects
- Site specific seismic assessment of downtown / economic core

Ideas for Implementation:

- Partner with the county or special districts to develop collaborative grant submittals
- Continue to participate in state and regional meetings to keep abreast of funding opportunities.
- The Josephine County Integrated Fire Program website will continue to include a comprehensive list of fire related grant programs
- As appropriate, identify and seek foundation or other private funding / partners to support mitigation projects, especially those that impact the private sector (e.g., businesses)
- Develop a local list (e-mail list serve, website, etc.) of key grant and funding source partners within the county. Share funding information between local partners to ensure potential recipients are aware of funding opportunities.
- Attend a training workshop with The Grantsmanship Center: www.tgci.com.

Coordinating Organization:	Grants Pass, Grants Specialist
Internal Partners:	**External Partners:**
Grants Pass emergency management Coordinator, Public Works, City Manager	Oregon Emergency Management, Federal Emergency Management Agency, Josephine County Emergency Management, City of Cave Junction, Oregon Partnership for Disaster Resilience, Stream Restoration Alliance, Josephine County Public Health, County Planning, County Public Works
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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1.7. Contribute project information to the County-wide inventory of "mitigation successes"

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☐ Goal 3 ☒ Goal 4 ☐ Goal 5 ☐ Goal 6 ☒
Action development: 2011 Addendum ☒ 2016 Update ☐	
Rationale for Proposed Action Item:	
The city intends to develop a " mitigation successes" database as part of a comprehensive GIS database related to hazards. Developing this list will record progress between 5-year updates of the NHMP as well as serve as support and justification for future grant applications by showing the capability of the city to implement mitigation.	
Ideas for Implementation:	
• Hold yearly "mitigation review" meetings with the NHMP Steering Committee and central mitigation partners to discuss and list programs and activities that may have served county mitigation goals. • The Grants Pass Emergency Management Coordinator Manager will solicit information from the NHMP Steering Committee to contribute to an annual report • Assess departmental work plans and annual reports for applicable projects and programs	
Coordinating Organization:	Grants Pass Emergency Management Coordinator
Internal Partners:	**External Partners:**
Grants Pass Community Development, Public Works, NHMP Steering Committee	Josephine County Emergency Management, Planning Department, and Public Works; Oregon Emergency Management
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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1.8. Revise the Grants Pass Comprehensive plan to include hazards based on the updated City Risk Assessment

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐
Action development: 2011 Addendum ☒ 2016 Update ☐	
Rationale for Proposed Action Item:	
The Comprehensive Plan guides development and should reflect the prioritization of hazard concerns as reflected in this NHMP. The 2011 Risk Assessment process identified ways in which the comprehensive plan does not fully address the full extent of the natural hazard present in the community including • Potential impacts of earthquakes. • Cause and impacts of impacts of drought including water conservation and development practices. Drought was ranked highly in the 2011 Risk Assessment but it is not mentioned as a hazard in the current Comprehensive plan that guides development • Landslide, slope development, erosion, and hillside development ordinance review. • Building material, building construction and construction siting in wildfire hazard areas. Currently, ordinances exist for building on grass lots, fireworks and open burning but there may be an opportunity for enhancement. Goal 7 of Oregon's Land Use Planning Goals requires that local governments "adopt or amend, as necessary, based on the evaluation of risk, plan policies and implementing measures…[that avoid] development in hazard areas where the risk to people and property cannot be mitigated." Including mitigation measure in subdivision and partition ordinances can reduce the impact of wildfires on new development and help to prevent future wildfire losses. Additionally, 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)]. Incorporating mitigation actions into development code and ordinances can help to reduce the impact of hazards on new development.	
Ideas for Implementation:	
• It is an option for cities to complete a "customized" periodic review is provided in ORS 197.629(4) and OAR 660-025-0035(3). This would allow for a focused review of specific sections, in this case, the natural hazard component of the comprehensive plan.	
Coordinating Organization:	Grants Pass Community Development
Internal Partners:	**External Partners:**
Grants Pass Emergency Management Coordinator, Grants Pass Public works, Grants Pass Public Safety Fire Division	Oregon Department of Land Conservation and Development, Oregon Emergency Management, Josephine County, Homebuilders Association, Conservation groups
Timeline:	**If available, estimated cost:**
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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2. Flood

2.1. Continue annual review of CRS rating and activities

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☒ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☒
Action development: 2011 Addendum ☒ 2016 Update ☐	
Rationale for Proposed Action Item:	
In the 2011 NHMP process, the city identified a high level of flood vulnerability (more than 10% affected and high probability (one event likely within a 10-35 year period), which is a greater vulnerability than the county overall. The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Grants pass already participates in CRS and currently holds a class rating of 8. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: • Reduce flood losses; • Facilitate accurate insurance rating; and • Promote the awareness of flood insurance.	
Ideas for Implementation:	
• Conduct annual cost benefit analysis to determine the benefit to individual property owners and the city to improving the Grants Pass class rating.	
Coordinating Organization:	Grants Pass Community Development
Internal Partners:	**External Partners:**
Grants Pass Public Works	Josephine County, Oregon Emergency Management, Oregon Partnership for Disaster Resilience, Grants Pass Irrigation District
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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2.2. Identify and apply for federal and state grant funds to acquire, elevate/retrofit, or relocate properties and facilities within the 100-year floodplain.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☒ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☒
Action development: 2011 Addendum ☒ 2016 Update ☐	
Rationale for Proposed Action Item:	
Structures within the 100 year floodplain are most likely to experience damage as a result of flooding. Moving these structures out of the floodplain will reduce community vulnerability and ease the demand on response functions should an extreme flood event occur. In the 2011 NHMP process, the city identified a high level of flood vulnerability (more than 10% affected and high probability (one event likely within a 10-35 year period), which is a greater vulnerability than the county overall.	
Ideas for Implementation:	
• Community Development Department to review specific hazard areas for code and ordinance opportunities • Conduct a needs assessment for the City Water Restoration Plant • Conduct a needs assessment for the 2 lift stations and1 pump station in the flood hazard area	
Coordinating Organization:	Grants Pass Public Works
Internal Partners:	**External Partners:**
Grants Pass Community Development, City Manager	Oregon Department of Land Conservation and Development, Oregon Emergency Management, Josephine County
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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2.3. Collaborate with Josephine County to identify sources of funding to retrofit the Water Restoration Plant to protect against flood damage.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☒ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☒

Action development: 2011 Addendum ☒ 2016 Update ☐

Rationale for Proposed Action Item:

In the 2010 NHMP update process, the county identified a medium level of flood vulnerability (between 1% and 10% of the population affected) and high probability (one event likely within a 10-35 year period). While the City of Grant Pass Risk Assessment process ranked probability of flood as high also, the Grant Pass Steering Committee ranked vulnerability as High (more than 10% of the population affected) This is in part due to the fact that the city-owned wastewater treatment plant is within the flood plain.

As a critical infrastructure facility, it is in the interest of the county to assist the city in protecting the wastewater plant as the availability of clean water is a matter of life-safety. The City of Grants Pass will identify specific risk and vulnerability of the facility through operational assessment and physical assessments, and the pending master planning process for the facility.

Ideas for Implementation:

- Identify specific risk and vulnerability through the facility master planning process and risk assessment
- Assess the need for a specific, focused Task Force to guide the planning and assessment process
- Identify state and federal resources that may be available to support assessment and capital costs
- Conduct Benefit-Cost Analysis evaluating hardening the facility against flood hazards and relocation

Coordinating Organization:	Grants Pass Public Works
Internal Partners:	**External Partners:**
Grants Pass Community Development, City Manager, Emergency Management Coordinator, Grants Specialist	Josephine County, Oregon Department of Environmental Quality, Oregon Emergency Management
Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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2.4. Update the Grants Pass Stormwater Master Plan

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☒ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: 2011 Addendum ☒ 2016 Update ☐

Rationale for Proposed Action Item:

Standard urban stormwater systems contribute significantly to the volume and rate of water entering the floodway during storm events. Updating the SMP to reflect alternative, multi-objective stormwater management strategies can contribute significant community enhancement benefits while reducing the amount of stormwater being directed to the floodway during storm events.

The existing Storm Water Mater Plan was developed in 1982. Projects deemed as high priority at the time those plans were written may have been accomplished and new needs may have been identified as the community has grown significantly since that time. More recent changes such as population growth, changes in the pace, type and location of development, climate change, revisions to the development codes and System Development Charges, and the growing uncertainty about how infrastructure projects will be funded at the federal and state levels all warrant a thorough evaluation of how to prioritize future improvements to the system.

Ideas for Implementation:

- The 2011-2012 City Council Workplan identifies the Stormwater Master Plan and other infrastructure plans as high priority for revisions based on pending (2011) changes to the Urban Growth Boundary
- Integrate mitigation goals into the master planning process

Coordinating Organization:	Grants Pass Public Works

Internal Partners:	**External Partners:**
Grants Pass Emergency Management Coordinator, Community Development	Grants PassIrrigation District, Josephine County
Timeline:	**If available, estimated cost:**
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Grants Pass NHMP Steering Committee

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2.5. Collaborate with the county to identify and reach out to property owners along stream and riverbanks to share information about how to minimize erosion of soils and banks during flood events of varying magnitudes.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☒ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☒ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐
Action development: 2011 Addendum ☒ 2016 Update ☐	
Rationale for Proposed Action Item:	
In the 2011 NHMP development process, the city identified a high level of flood vulnerability (more than 10% of the population affected) and high probability (one event likely within a 10-35 year period). Additionally, the semi-rural landscape provides habitat that attracts eco-tourism and recreation. There is a need to promote effective erosion control techniques, including bioengineering of stream banks and planting of riparian vegetation, to help preserve soils, riparian zones, and habitats. This action is also a statewide flood mitigation action (Flood Hazard, Long-term #4). The City currently offers information to residents about historic flooding, flood mitigation and flood response activities. A next step is to actively connect with property owners in and near the floodplain to ensure homeowners, business owners, renters, and those that work in the flood hazard zone know their risk and steps they can take to protect themselves and their property.	
Ideas for Implementation:	
• Identify state and federal resources that may be available • Enhance city regulatory support of pervious paving surfaces and other Low Impact Development (LID) practices • Adopt strategies contained in the Association of State Flood Plain Managers No Adverse Impact program (note that many of these strategies contribute directly to points through the CRS program). • Encourage on-site storage, infiltration, surface conveyance, etc. • Collaborate with restoration and conservation groups on outreach and education	
Coordinating Organization:	Grants Pass Community Development
Internal Partners:	**External Partners:**
Grants Pass Public Works	Oregon Department of Environmental Quality, Oregon Department of Fish and Wildlife, Oregon State University Extension Service, Middle Rogue Steelheaders, School Districts
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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3. Earthquake

3.1. Publicize and facilitate the implementation of both structural and non-structural seismic mitigation measures for home owners, business owners, renters, and contractors

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☒ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☒ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐

Action development: 2011 Addendum ☒ 2016 Update ☐

Rationale for Proposed Action Item:

A 1999 study by DOGAMI identifies Josephine County's, and thus Grants Pass', risk of significant damage as "high" (http://www.oregongeology.org/sub/earthquakes/EQs.htm). Based on a combination of absolute loss and relative loss, Josephine County's Loss ratio is among the top 10 highest in the state. Additionally, in the 2011 NHMP update process the county ranked the probability of earthquake as medium (one event likely within a 35-75 year period) and the vulnerability as high (more than 10% of the population affected).

Ideas for Implementation:

- Establish working relationship with the City Safety Committee to identify ways to share information about simple non-structural retrofit in city offices (include as part of quarterly inspections?)
- Include non-structural retrofit information in the family earthquake preparedness information available to city residents.
- Provide information to schools, public facility managers, businesses, and residents explaining how to secure bookcases, filing cabinets, light fixtures, and other objects that can cause injuries or block exits.
- Supply local businesses with information on workplace seismic hazards and retrofit solutions
- Work with local building supply outlets to encourage the supply of retrofit kits.
- Use community events such as home shows to promote non-structural strategies and other hazard mitigation information.
- Work with school-age children through the schools to teach them how to identify non-structural retrofit needs and with older students (middle and high school age) to implement the retrofit

Coordinating Organization:	Grants Pass Community Development

Internal Partners:	**External Partners:**
Grants Pass Emergency Management Coordinator	Oregon Emergency Management, Oregon Department of Geology and Mineral Industries, Chamber of Commerce, Business associations, construction companies and homebuilders, School Districts, Josephine County, Grants Pass Safety Committee
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Grants Pass NHMP Steering Committee

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3.2. Collaborate with Josephine County to develop a post-catastrophic recovery plan.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☒ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☒ Goal 6 ☐
Action development: 2011 Addendum ☒ 2016 Update ☐	

Rationale for Proposed Action Item:

The National Response Plan describes a catastrophic event as likely to "almost immediately exceed resources normally available to state, local, tribal, and private-sector authorities in the impacted area". Long Term Catastrophic Recovery is the re-establishment of a healthy, functioning community that will sustain itself over time. Post-Disaster Recovery Planning can help:

- Local governments make decisions in advance of an emergency reducing potential losses
- Retain local control of decision making process
- Organize a more efficient redevelopment effort
- Preserve taxable property values and protect local economic resources

Planning for recovery before a catastrophic event impacts the community will ensure that the local community has the capability to manage:

- Recovery and redevelopment decisions;
- Multiple financial resources to achieve broad-based community support;
- Reconstruction and redevelopment opportunities to enhance economic and community vitality;
- Environmental and natural resource opportunities to enhance natural functions and maximize benefits;
- Exposure to risk to a level that is less than what it was before the disaster; and
- Integration of recovery efforts with existing plans and policies

Additionally, in the 2011 NHMP update process the County and City ranked the probability of earthquake as medium (one event likely within a 35-75 year period) and the vulnerability as high (more than 10% of the population affected).

Ideas for Implementation:

- Identify capacity and capability within the county for plan development
- Assess applicability of current recovery plan/framework models (e.g., ESF 14)
- Utilize the DOGAMI Rapid Visual Assessment method to inventory and categorize the risk of damage to and collapse of buildings downtown, historic districts, and economic core
- Identify permit programs that will need 'fast-track' permitting to assure that new structures are built properly, in a timely fashion, and to code, so that post-disaster recovery does not create another potential problem with substandard replacement structures and/or capital improvements.

Coordinating Organization:	Grants Pass Emergency Management Coordinator
Internal Partners:	**External Partners:**
Grants Pass Public Works, Community Development	Josephine County Emergency Management, Special Needs Committee, State Office of Emergency Management , DOGAMI, Chamber of Commerce, Business associations, Oregon Partnership for Disaster Resilience, School Districts, Oregon Seismic Safety Policy Advisory Commission
Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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4. Landslide

4.1. Obtain LIDAR maps from DOGAMI to determine historic landslide areas that require development restrictions or physical landslide mitigation

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☒ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: 2011 Addendum ☒ 2016 Update ☐

Rationale for Proposed Action Item:

The current city development code sets policies for areas with a 15%-25% slope and for areas with more than 25% slope. The Oregon Department of Geology and Mineral Industries (DOGAMI), in following the direction given in Oregon Senate Bill 12, is in the process of determining areas that require further review. The City can communicate priority areas to DOGAMI.

Additionally, The City of Grants Pass has LIDAR data from 2004 that provide a view at 1 foot contours of the city area. The City also has aerial photos that were taken in 2007. The development of commercial and residential areas since those years will be captured in new aerial imaging in 2011.

Combining this new images with the hazard information will create the most current risk assessment information and inform future updates of the NHMP

Ideas for Implementation:

- Work with the County to obtain data from DOGAMI,
- Prioritize additional areas for LIDAR

Coordinating Organization:	Grants Pass Community Development

Internal Partners:	**External Partners:**
Grants Pass Emergency Management Coordinator	Oregon Department of Geology and Mineral Industries

Timeline:	**If available, estimated cost:**
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Grants Pass NHMP Steering Committee

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5. Severe Weather

5.1. Work with electrical utilities to develop a policy to underground lines when opportunities arise.

Hazard Type Addressed	Alignment with Plan Goals:
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☒ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: 2011 Addendum ☒ 2016 Update ☐

Rationale for Proposed Action Item:

In the 2011 NHMP development process the city ranked the probability of severe weather as high (one event likely within a 10-35 year period and the vulnerability as high (more than 10% of the population affected). Underground lines are not vulnerable to damage from wind or winter storms.

Each site should be reviewed for the appropriate construction mentioned. But, because underground lines are not vulnerable to damage from wind or winter storms, it is a preferred construction method. Additionally, as streets and sidewalks are repaired, there may be an opportunity to underground the corresponding utility lines.

Ideas for Implementation:

- Identify areas of chronic utility failure during severe weather
- Review code with the intent to update it to encourage or require undergrounding of utilities
- Encourage that street repairs include an opportunity for burying utilities.

Coordinating Organization:	Grants Pass Community Development

Internal Partners:	External Partners:
Grants Pass Public Works, Community Development, Public Safety	Local utility and service providers including: Pacific Power, Qwest Communications, Avista Utilities

Timeline:	If available, estimated cost:
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Grants Pass NHMP Steering Committee

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5.2. In coordination with the County, assess the feasibility of a policy and procedures for opening heating and cooling shelter sites

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☒ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: 2011 Addendum ☒ 2016 Update ☐

Rationale for Proposed Action Item:

In the 2011 NHMP update process the county ranked the probability of severe weather as high (one event likely within a 10-35 year period and the vulnerability as high (more than 10% of the population affected). Summertime high temperatures can reach and exceed 100 degrees (F), and in the wintertime can drop below 0 degrees (F). While extreme temperatures are not typical, they can occur.

When temperatures soar or fall to the extremes, many people face life or health safety risks. Heating stations open to those vulnerable populations protect people from hypothermia, frost bite, exhaustion, and heart attacks caused by overexertion. Additionally, residents with burst pipes or damaged roofs due to heavy snow or wind will need shelter and temporary assistance such as water or a place to sleep. Cooling stations that provide water and regulated temperatures assist those without access to air conditioning and who may be already more vulnerable to heat related health concerns, such as the elderly, children, or pregnant women.

Ideas for Implementation:

- Evaluate state, regional, and national best practices for establishing and operating heating and cooling shelters
- Develop a list of shelter sites that already are operational throughout the county
- Determine the conditions under which shelters would need to be made available and what services need to be provided by shelter sites
- Determine potential costs and funding solutions
- With partner organizations, assign responsibilities for shelter operations
- Develop Memorandums of Understanding / Agreement (MOU / MOA) with heating and cooling site owners to establish the terms and conditions for use.

Coordinating Organization:	Grants Pass Emergency Management Coordinator

Internal Partners:	**External Partners:**
Grants Pass Community Development, Property Management	Red Cross, School district, community organizations, churches, Josephine County Public Health; Josephine County Special Needs Committee, Josephine County Emergency Management
Timeline:	**If available, estimated cost:**
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Grants Pass NHMP Steering Committee

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5.3. Enhance communication between City first responders (e.g., Public Safety, Public Works) and public utilities to ensure common understanding of priorities in response and recovery.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☒ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐
Action development: 2011 Addendum ☒ 2016 Update ☐	
Rationale for Proposed Action Item:	
Lifelines routes include primary access / egress routes to the critical facilities such as hospitals, clinics, fire and police stations. The availability of these routes following a disaster will ensure that first responder can assist the damaged parts of the community. Severe weather is a chronic risk in Grants Pass which can often create vegetation debris or failed power lines. These obstacles can prevent first responders from reaching individuals in need of assistance.	
Ideas for Implementation:	
- Create a work group with responders, public works, and utility providers to discuss current response protocol - Identify lifeline routes for priority restoration and debris management - Map lifeline routes with access to critical facilities - Identify actions needed to remove risks to those lifeline routes (e.g. powerline relocation or tree pruning	
Coordinating Organization:	Grants Pass Public Safety
Internal Partners:	**External Partners:**
Grants Pass Emergency Management Coordinator, Public Works, Community Development	Local utility and service providers including: Pacific Power, Qwest Communications, Avista Utilities
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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6. Fire

6.1. Develop a fuels reduction strategy for public property

Hazard Type Addressed	Alignment with Plan Goals:
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☒	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: 2011 Addendum ☒ 2016 Update ☐

Rationale for Proposed Action Item:

Public Property and designated wildfire hazard areas, such as green space around buildings as well as parks and open areas are the responsibility of the City to maintain. Addressing fuels reduction on this land will protect public resources as well as serve as an example for individuals to use on private property.

The Grants Pass NHMP Steering Committee assessed risk associated with the fire hazard using the same metrics and determined 1) Probability: High (One incident likely within a 10 to 35 year period); and 2) Vulnerability: High (more than 10% affected). Grants Pass experiences greater vulnerability to wildfire than the county overall due to the larger population that would be affected.

Ideas for Implementation:

- As part of the Firewise Communities program, coordinate with internal partners
- Develop a working list / work plan that identifies critical properties and prioritizes them
- Coordinate maintenance work to align with fuels reduction needs in the short term to accomplish the work and in the long term to ensure maintenance.
- Revise the vegetation management plan(s) for county-owned property to reduce the amount of flammable vegetation on these lands; and propose similar actions on private property, in cooperation with private property owners; and
- Conduct public property fuels reduction as demonstration projects for individuals in the community to learn from.

Coordinating Organization:	Grants Pass Parks and Community Services, Property Management

Internal Partners:	External Partners:
Grants Pass Community Development, Public Works, Public Safety – Fire Division	Josephine County Emergency Management Board, Oregon Department of Forestry, Josephine County Fire Plan

Timeline:	If available, estimated cost:
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Grants Pass NHMP Steering Committee

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6.2. Establish a public outreach strategy through the *Firewise Community* program

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☒	Goal 1 ☐ Goal 2 ☐ Goal 3 ☒ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐

Action development: 2011 Addendum ☒ 2016 Update ☐

Rationale for Proposed Action Item:

The National Fire Protection Association's (NFPA) Firewise Communities program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks.

The program is co-sponsored by the USDA Forest Service, the US Department of the Interior, and the National Association of State Foresters.

To save lives and property from wildfire, NFPA's Firewise Communities program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses.

In 2011 the City of Grants Pass was awarded a *Firewise Community* grant that will fund a coordinator position for two years. This position will be charged with conducting outreach and enhancing public awareness.

Ideas for Implementation:

Utilize Firewise resources to educate citizens of Grants Pass about fire safety and mitigation. Tools include:

- Vidoes
- Photos
- Newsletters
- Brochures and booklets
- Interactive seminars

Coordinating Organization:	Grants Pass Public Safety – Fire Division, *Firewise* Coordinator

Internal Partners:	**External Partners:**
Grants Pass Community Development, Public Works, Property Management, Parks and Community Services	Homeowners, renters, landlords, homebuilders, business owners, churches, schools, community service organizations, volunteer groups, Josephine County Fire Plan, Oregon Department of Forestry, Rouge Valley Fire Prevention Co-Op
Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	

Submitted by:	Grants Pass NHMP Steering Committee

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6.3. Conduct site specific map verification and develop specific mitigation actions for the 18 identified high fire risk areas

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☒	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐
Action development: 2011 Addendum ☒ 2016 Update ☐	
Rationale for Proposed Action Item:	
The Josephine County Integrated Fire Plan developed and extensive risk assessment and identified mitigation actions. Grants Pass is included under the jurisdiction of the plan and is designated as community at risk. Additionally, the Grants Pass NHMP Steering Committee assessed risk associated with the fire hazard using the same metrics and determined 1) Probability: High (One incident likely within a 10 to 35 year period); and 2) Vulnerability: High (more than 10% affected). Grants Pass experiences greater vulnerability to wildfire than the county overall due to the larger population that would be affected. Additionally, the City of Grants Pass has conducted wildfire risk mapping and identified 18 high hazard areas. The wildfire Hazard Assessment includes maps of risk areas. The Fire Division has identified target, high risk hazards areas and is conducting detailed verification of the maps of those areas and the inclusion of additional data. The *Firewise* grant, awarded in summer 2011, will support the additional mapping.	
Ideas for Implementation:	
For each high risk area, validate or update the following information: • Number and type of residences • Access and egress • Other hazards Develop target hazard plans that include specific mitigation actions for emergency responders to implement	
Coordinating Organization:	Grants Pass Public Safety Fire prevention Bureau
Internal Partners:	**External Partners:**
Grants Pass Community Development, Public Works, Property Management, Parks and Community Services	Oregon Department of forestry, jOSEPHINE county fire pLAN
Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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7. Drought

7.1. Promote water conservation measures among city residents focusing on domestic use

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☒ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☐ Goal 3 ☒ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐

Action development: 2011 Addendum ☒ 2016 Update ☐

Rationale for Proposed Action Item:

In the 2011 NHMP addendum development process the city ranked the probability of drought as high (one event likely within a 10-35 year period) and the vulnerability as medium (between 1% and 10% of the population affected). Specific negative impacts would include all river based industries, most dramatically tourism.

Additionally, competing water needs and limited resources may hamper future development efforts. Drought has a profound effect on the State's economy, particularly the hydropower and agricultural sectors. Similarly, drought can lead to insect infestations, loss of topsoil through wind erosion, flash floods, fire, and reduced stream flows to support endangered fish species.

Ideas for Implementation:

- Include information about drought management techniques (e.g. native plantings) with distribution of wildfire material and / or utility mailings
- Include drought-impacted businesses or business sectors in any studies of the impact of hazards in the county.
- Encourage water-dependent businesses such as river tourism to develop diverse offerings.
- Adoption of stricter water conservation policies such as:
  - Establish stronger economic incentives for private investment in water conservation
  - Encourage voluntary water conservation
  - Improve water use and conveyance efficiencies
  - Implement water metering and leak detection programs
  - Imposing excess-use charges during times of water shortage
  - Imposing mandatory water-use restrictions during times of water shortage
- Conduct water-conservation education of the public and of school children, including special emphasis during times of water shortage

Coordinating Organization:	Grants Pass Public Works

Internal Partners:	**External Partners:**
City Manager and City Council, Grants Pass Community Development	Homebuilders, Construction firms, local conservations groups, OSU Extension Service, Oregon Department of Environmental Quality, Department of Fish and Wildlife, Department Of Land Conservation and Development.
Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	

Submitted by:	Grants Pass NHMP Steering Committee

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7.2. Assess progress on actions recommended by existing water management plans to reaffirm or redefine priority projects

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☒ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: 2011 Addendum ☒ 2016 Update ☐

Rationale for Proposed Action Item:

Nearly all of the plans relating to the water systems in Grants Pass are more than 5 years old, with the majority being 7-11 years or older. Projects deemed as high priority at the time those plans were written may have been accomplished. More recent changes such as population growth, changes in the pace, type and location of development, climate change, revisions to the development codes and System Development Charges, and the growing uncertainty about how infrastructure projects will be funded at the federal; and state levels all warrant a thorough evaluation of how to prioritize future improvements to the system.

Ideas for Implementation:

- The 2011-2012 City Council Work plan identifies several Master Plans that will be revised based upon the UGB expansion
- The water system related plans scheduled for revision after the Urban Growth Boundary revision process is finalized include: water filtration plant, water management and conservation, water distribution.

Coordinating Organization:	Grants Pass Public Works

Internal Partners:	**External Partners:**
Grants Pass Community Development, Emergency Management Coordinator	Homebuilders, Construction firms, local conservations groups, OSU Extension Service, Oregon Department of Environmental Quality, Department of Fish and Wildlife, Department Of Land Conservation and Development.

Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	

Submitted by:	Grants Pass NHMP Steering Committee

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8. Volcanic

8.1. Disseminate volcanic impact educational materials

Hazard Type Addressed	Alignment with Plan Goals:
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☒ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☐ Goal 3 ☒ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐
Action development: 2011 Addendum ☒ 2016 Update ☐	
Rationale for Proposed Action Item:	
Indirect impacts of a nearby volcanic eruption could include ash fall and significant deterioration of air quality. Ash can clog storm drains or even clog the drain if ash mixes with water. Air intake systems on buildings can be strained and overloaded by ash in the air and sensitive electronic equipment can be permanently damaged if affected by ash. Also, similarly to a high pollen count or smoke from nearby fires, volcanic ash can pose a health risk to vulnerable and sensitive populations such as the elderly, children, and people with weakened respiratory systems	
Ideas for Implementation:	
• Identify facilities most vulnerable to ash fall (e.g. buildings with sensitive equipment). Assess public buildings for vulnerable HVAC systems or air intake points. • Educate City personnel on how to protect buildings and equipment from ash fall. • For private facilities, educate building owners about how to protect HVAC intake points from disruption by ash • Update the City website with information about health risks from reduced air quality and particulate matter in the air.	
Coordinating Organization:	Grants Pass Public Works
Internal Partners:	**External Partners:**
Grants Pass Community Development, Emergency Management Coordinator	Josephine County Public Works, Building Safety, Public Health
Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	
Submitted by:	Grants Pass NHMP Steering Committee

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Introduction

The Mitigation Action form should include critical information on the rationale or fact base for the proposed action, ideas for implementation, coordinating and partner organizations, timeline, and plan goals addressed. This approach, developed by the Oregon Partnership for Disaster Resilience at the University of Oregon provides evidence-based documentation of the proposed action and keeps together all of the essential information needed to implement the action. Community stakeholders are able to introduce action items both during and after the planning process by simply filling out the form and submitting it to the coordinating body for review and inclusion into the plan.

Form Definitions

Proposed Action Title:

Include a brief description of the proposed action.

Alignment with Plan Goals:

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.

- Plan Goal 1: Prevent or reduce losses to life, private property and natural resources resulting from natural hazards.
- Plan Goal 2: Prevent or reduce the disruption to essential public infrastructure and services resulting from natural hazards.
- Plan Goal 3: Increase public awareness for the importance and benefits of preparing for and mitigating natural hazard impacts.
- Plan Goal 4: Increase the level of personal responsibility and accountability among Josephine County citizens to mitigate the impacts of natural hazards.
- Plan Goal 5: Support the diversification, expansion and stabilization of local and regional economies by preventing or reducing business losses resulting from natural hazards.
- Plan Goal 6: Increase the amount of federal, state and local funding sources dedicated to implementing affordable multi-objective natural hazard mitigation strategies.

Rationale or Key Issues Addressed:

The rationale describes the critical issues that the action item will address. It presents the logic and the fact base behind the action item: why is it important that this action item be implemented?

Ideas for Implementation:

For each action item, the form asks for some ideas for implementation, which serve as the starting point for taking action. This information offers a transition from theory to practice. Ideas for implementation could include: (1) collaboration with relevant organizations, (2) alignment with the community priority areas, and (3) applications to new grant programs.

The ideas for implementation are just that: ideas. They do not necessarily prescribe the exact steps that the County or its partners should take to implement a particular action item. When an action is implemented, more work will probably be needed to determine the exact course of action. (For more information on how this plan will be implemented and evaluated, see Section 5).

Coordinating Organization:

The coordinating organization is the public agency with authority to implement the identified action. It can also be an agency that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation.

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Internal Partners:

Internal partner organizations are departments within the County that may be able to assist in the implementation of an action item by providing relevant resources (time, budget, staff, data, etc.) to the coordinating organization.

External Partners:

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

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 County departments may implement with existing resources and authorities within one to two years. *Long-term action items* (LT) may require new or additional resources and/or authorities, and may take more than two years to implement.

Action Summary:

Multi-Hazard

1.1. Improve and sustain County-wide public information and education programs about potential hazards in the county, the need for personal preparedness, and mitigation actions possible.

1.2. Develop a mapped inventory of hazards, vulnerable locations, and critical facilities

1.3. Continue to participate on the Regional Vulnerable Populations Committee as a way to support the resilience of vulnerable and special needs populations in Josephine County.

1.4. Develop an economic impact assessment and strategy to better understand how high-risk hazards may impact the county economy.

1.5. In coordination with the City of Grants Pass and Cave Junction, identify and apply for applicable mitigation grants

Flood

2.1. Provide a link on the county website to current National Flood Insurance Program rate maps.

2.2. Annually assess the county's interest in and ability to participate in the National Flood Insurance Program's Community Rating System.

2.3. Identify and apply for federal and state grant funds to acquire, elevate/retrofit, or relocate properties and facilities within the 100-year floodplain.

2.4. Collaborate with the City of Grants Pass to identify sources of funding to retrofit the Wastewater Treatment Plant to protect against flood damage.

2.5. Review and update county code to enhance flood risk management

2.6. Include needed culvert upgrades in the County Capital Improvements Plan

2.7. Collaborate with the City of Grants Pass and Cave Junction to develop outreach materials for property owners and tenants along stream and riverbanks to share information about how to minimize erosion of soils and banks during flood events of varying magnitudes.

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Earthquake

3.1. Identify existing critical facilities needing structural retrofits; prioritize projects and develop funding strategy

3.2. Ensure all new critical facilities are built to highest earthquake building code standards; consider Institute for Business and Home Safety (IBHS) "Fortified for Safer Business" standards.

3.3. Promote non-structural retrofit strategies to property owners, renters and contractors

3.4. Promote non-structural retrofit strategies in county-owned facilities.

3.5. Develop Catastrophic Recovery Plan / Framework.

3.6. Promote the reduction of non-structural hazards in K-12 Schools

Landslide

4.1. Mitigate landslide hazards in previous landslide area of Wolf Creek

4.2. Collaborate with the Oregon Department of Geology and Mineral Industries (DOGAMI) on future acquisition of LIDAR data and creation of updated landslide maps for the county.

Severe Weather

5.1. Collaborate with electrical utilities to develop criteria for when to use underground construction methods based on local risk.

5.2. Promote wind-mitigation strategies in both building location and construction practices among property owners, renters and contractors.

5.3. Collaborate with Grants Pass and Cave Junction to assess the feasibility of a policy and procedures for opening heating and cooling shelter sites

5.4. Establish designated parking areas within the county proximate to major transportation corridors (I-5, OR-199) for stranded motorists during severe weather events

Wildfire

6.1. Coordinate fire mitigation actions through the Josephine County Integrated Fire Plan

Drought

7.1. Support the City of Grants Pass' efforts to address localized drought management strategies.

Volcanic

8.1. Provide information about the risk and vulnerability to the impact due to volcanic ash fall vulnerable facilities from impact due to ash fall.

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1. Multi-Hazard

1.1. Improve and sustain County-wide public information and education programs about potential hazards in the county, the need for personal preparedness, and mitigation actions possible.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☐ Goal 3 ☒ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒

Rationale for Proposed Action Item:

Although there is increased interest in reducing losses during and immediately after hazard incidents and disasters, there is an ongoing need to provide resident and key stakeholder groups (such as infrastructure operators) with hazard mitigation information. There are mitigation actions appropriate at all levels of the community: individual, business, neighborhood, community, and county level. In addition, the Josephine County Integrated Fire Plan includes specific actions and strategies related to education and outreach; coordination of efforts will provide mutual reinforcement and will result in more efficient use of county resources. Promoting mitigation can increase personal preparedness but also may uncover or inspire new partnerships around mitigation. Also, continued public information and education is a state NHMP action.(Multi-Hazard, Long-Term #3).

Topics for public outreach could include: Air quality issues (from fires, ash fall, or seasonal changes), the impact of extreme heat or cold (especially to vulnerable groups) and existing resources available to county residents, opportunities to volunteer on mitigation projects,

Ideas for Implementation:

- Josephine County Emergency Management should attend and / or host opportunities to disseminate personal preparedness information (e.g. fairs, outreach events, Preparedness Fairs, festivals, town meetings, etc)
- Schedule seasonal Public Service Announcements that provide relevant information to the hazard of the season (e.g. fire in the summer or earthquakes during April (earthquake awareness month))
- Declare additional “County Emergency Preparedness Months” or “Awareness Weeks”
- Update and enhance the hazard and preparedness information on the county website
- Public meetings to introduce important issues
- Update and distribute the Josephine County Emergency Preparedness Handbook
- Improve training programs for volunteers

Coordinating Organization:	Josephine County Emergency Management Board, Emergency Management Department

Internal Partners:	**External Partners:**
Josephine County Public Health, Public Works, Planning Department, Board of County Commissioners, Sheriff, Assessor	Community organizations (e.g., civic and religious groups), media, Three Rivers School District

Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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1.2. Develop a mapped inventory of hazards, vulnerable locations, and critical facilities

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒

Rationale for Proposed Action Item:

The CFR 201.6(c.)(2)(ii) requires that the NHMP include a summary of how each hazard would impact the community, that the NHMP should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in hazard areas. While the vulnerability analysis and risk assessment in the 2011 NHMP was based on best available data, developing an inventory of the extent of vulnerability would allow for a more in-depth vulnerability analysis and risk assessment, at the sub-area or facility level, during the next NHMP update.

An inventory in a Geographic Information System (GIS) database provides a quick and easy way to understand how the physical and community aspects of the County overlap and intersect with hazards. It would improve the county's understanding of risk and vulnerability and lead to more specific mitigation actions.

Additionally, this database can also be used to catalogue and geo-reference mitigation success stories.

Ideas for Implementation:

- Expand the existing wildfire database to include additional hazards for which data exists and continue to develop mapping of hazard areas, vulnerable locations, critical facilities and emergency events.
- Obtain additional data on natural hazards from state and federal sources as it is available (FEMA, Army Corps, DOGAMI)
- Collaborate with Grants Pass Planning and Development Department for technical expertise and mapping support. The City of Grants Pass is currently engaged in an update of their hazards maps as part of a larger, comprehensive planning effort.
- Utilize schools and students to conduct neighborhood level asset inventories (e.g., "Map Your Neighborhood, (http://www.nehrp.gov/pdf/SeismicWavesMay08.pdf))
- Connect with adjacent or other Oregon counties for input on their mapping strategies

Coordinating Organization:	Josephine County and Grants Pass GIS Departments

Internal Partners:	**External Partners:**
Josephine County Emergency Management Board, Planning Department, Public Works, GIS	Schools, Oregon Emergency Management, Oregon counties,
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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1.3. Continue to participate on the Regional Vulnerable Populations Committee as a way to support the resilience of vulnerable and special needs populations in Josephine County.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐
Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒	
Rationale for Proposed Action Item:	
As a result of actions in the 2004 NHMP, a Special Needs Committee was developed. In 2008, the committee expanded it focus to be region wide by integrating with efforts in in Jackson County. It continues to meet on a regular basis. Successes between 2004 and 2011 include: • Development and implementation of the "Disaster Registry" that identifies special needs residents around the county • Development of multiple population-specific emergency planning templates • Long Term communication & outreach strategy developed	
Ideas for Implementation:	
• The Public Health Preparedness Coordinator sits on both the Regional Vulnerable Populations Committee and the Emergency Management Board and ensure information flows between the two groups. As the committee functions as a sub-committee of both County Fire Plans, activities and action items are detailed in each Annual Report. • Planning maintains a database of Medical Hardship Land Use permits that are granted to properties for an extra residence when these residences are needed to enable family care for people in need. This database could be shared with Public Health or E-Services.	
Coordinating Organization:	Josephine County Public Health participates in this committee, which is coordinated by Jackson County
Internal Partners:	**External Partners:**
Josephine County Emergency Management Emergency Management Board,Planning Department	Jackson County Health & Human Services, Jackson County Emergency Management, Rogue Valley Council of Governments, Grants Pass Senior & Disability Services
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

1.4. Develop an economic impact assessment and strategy to better understand how high-risk hazards may impact the county economy.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☒ Goal 6 ☐

Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒

Rationale for Proposed Action Item:

Each disaster or emergency event leaves its economic impacts long after the physical issues have been resolved. The CFR 201.6(c.)(2)(ii) requires that the NHMP include a summary of how each hazard would impact the community, that the NHMP should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in hazard areas, and that the NHMP should describe vulnerability in terms of an estimate of the potential dollar loses to vulnerable structure, as well as include a description of the methodology used to prepare the estimate. At the time of the 2011 NHMP update, there is not a clear understanding of how hazards incidents would impact the county economy.

The largest impact to the county economy would be from two hazards: Flood and Fire. A catastrophic fire that would decimate our forests would impact the local economy (though salvage logging could increase); and a major flood would harm the local businesses dependent on river recreation, fishing, etc. The ultimate goal of this kind of study would be to quantify losses or potential losses due to a natural hazard event. If developed, this plan could uncover needed mitigation actions to address vulnerabilities identified in the assessment, minimize economic losses due to a disaster and overall enhance the economic resiliency of Josephine County. Additionally, developing this assessment and strategy would support recovery planning and recovery efforts by cataloguing the sensitivity of the economy to natural hazards. Those areas that could not be mitigated are then natural priorities for recovery planning efforts.

This study would also support future any cost-benefit analyses conducted to prioritize mitigation actions included in this 2011 NHMP and future NHMP updates, which is emphasized in the CFR requirements for NHMP compliance.

Ideas for Implementation:

- Identify partners in this analysis to provide both content and development support
- Identify capacity and capability within the county for plan development
- Survey recovery plans developed by other cities, counties, and regions across the country, especially those with similar characteristics to Josephine County
- Gather information from diverse sources about the business, employment, and labor sectors and how their inputs and outputs would be affected by interruption from natural hazards (e.g., Host public meetings where businesses are invited to attend; present potential natural hazards; gather ideas from the businesses about how the county might direct resources towards actions that could help minimize risk.)

Coordinating Organization:	Josephine County Planning Department
Internal Partners:	**External Partners:**
Josephine County Emergency Management, Board of County Commissioners, GIS, Finance, Assessor, Public Works, Treasurer and Tax Collector	County and City Chambers of Commerce, Business associations, large employers; City of Grants Pass; Southern Oregon Regional Economic Development Incorporated (SOREDI), United Community Action Network, Oregon Bureau of Labor and Industries, Oregon Partnership for Disaster Resilience, State of Oregon Emergency Management, Oregon Business Development Department,
Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	
Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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1.5. In coordination with the City of Grants Pass and Cave Junction, identify and apply for applicable mitigation grants

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☒ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☒

Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒

Rationale for Proposed Action Item:

A constant concern of the Steering Committee is the lack of funding and personnel available to accomplish many of the action items listed in this plan. There will need to be a concerted effort over time to identify and apply for funding to accomplish the goals of this plan.

Ideas for Implementation:

- Partner with the City of Grants Pass and their grants writer to develop collaborative grant submittals.
- Continue to participate in state and regional meetings to stay informed about funding opportunities.
- As appropriate, identify and seek foundation or other private funding / partners to support mitigation projects, especially those that impact the private sector (e.g., businesses)
- The county Integrated Fire Plan website should also include a comprehensive list of fire related grant programs as a resource to the Emergency Management Board
- Develop a local list (e-mail list serve, website, etc.) of key grant and funding source partners within the county. Share funding information between local partners to ensure potential recipients are aware of funding opportunities.
- Host a training workshop with The Grantsmanship Center: www.tgci.com

Coordinating Organization:	Josephine County Emergency Management

Internal Partners:	**External Partners:**
Josephine County Emergency Management Board	State Office of Emergency Management, FEMA, City of Grants Pass, City of Cave Junction, OPDR, Water conservation districts, Regional Vulnerable Populations Committee

Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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2. Flood

2.1. Provide a link on the county website to current National Flood Insurance Program rate maps.

Hazard Type Addressed	Alignment with Plan Goals:
1. Multihazard ☐ 2. Flood ☒ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☐ Goal 3 ☒ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒

Rationale for Proposed Action Item:

Between 2004 and 2010, FEMA and the Oregon Department of Land Conservation and Development partnered to develop new NFIP Rate Maps for Josephine County as part of FEMA's Map Modernization effort. All FIRM's in Josephine County have a December 3, 2009 effective date.

If county residents have access to these current maps they can make more informed decisions about how they interact with the river and waterways and be clear on their individual risk of flood

Ideas for Implementation:

- Update the county website with a link to the FEMA Map Services website.
- Conduct public outreach to let resident know of the new information available and how it impacts new and existing development

Coordinating Organization:	Josephine County Planning Department

Internal Partners:	External Partners:
Josephine County Emergency Management, GIS, IT	FEMA

Timeline:	If available, estimated cost:
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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2.2. Annually assess the county's interest in and ability to participate in the National Flood Insurance Program's Community Rating System.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☒ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☒

Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒

Rationale for Proposed Action Item:

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result of the advanced floodplain management activities, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: Reduce flood losses; Facilitate accurate insurance rating; and Promote the awareness of flood insurance.

For CRS participating communities, flood insurance premium rates are discounted in increments of 5%; i.e., a Class 1 community would receive a 45% premium discount, while a Class 9 community would receive a 5% discount (a Class 10 is not participating in the CRS and receives no discount). The CRS classes for local communities are based on 18 creditable activities, organized under four categories:

- Public Information,
- Mapping and Regulations,
- Flood Damage Reduction, and
- Flood Preparedness.

Josephine County is currently ranked a Class 9 community which results in a 5% reduction in flood insurance premiums for policy holders. As mapping is updated and available from the County GIS, the Planning Department regulates to applicable FEMA standards.

Updated information about eligibility and process is available from FEMA at (http://www.fema.gov/business/nfip/crs.shtm)

Ideas for Implementation:

- On an annual basis, evaluate CRS participation to determine the benefit of continued or enhanced participation.
- As necessary to increase public awareness or complement outreach efforts, present information about the CRS program to the Board of County Commissioners.

Coordinating Organization:	Josephine County Emergency Management

Internal Partners:	**External Partners:**
Josephine County Planning Department, Public Works, Board of County Commissioners	Josephine Stream Restoration Alliance, land trusts

Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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2.3. Identify and apply for federal and state grant funds to acquire, elevate/retrofit, or relocate properties and facilities within the 100-year floodplain.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☒ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☒

Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒

Rationale for Proposed Action Item:

In the 2010 NHMP update process, the county identified a medium level of flood vulnerability (between 1% and 10% of the population affected) and high probability (one event likely within a 10-35 year period).

Structures within the 100 year floodplain are most likely to experience damage as a result of flooding. Mitigating the flood risk to those structures will reduce community vulnerability and lessen the demand for response functions if an extreme flood event does occur.

Ideas for Implementation:

- Work with the City of Grants Pass grant writer to identify appropriate granting agencies and opportunities
  - Grants sources could include the Hazard Mitigation Grant Program, Pre-disaster Mitigation grant program, Flood Mitigation Assistance, Repetitive Flood Claims program, or the Severe Repetitive Loss program
- Collaborate with property owners to identify amenable flood mitigation strategies such as erosion control, grading, or drainage, elevated foundation construction, demolition, or relocation.
- Code amendments to prohibit residential development in the floodway, currently allowed by County Code.

Coordinating Organization:	Josephine County Planning Department

Internal Partners:	**External Partners:**
Josephine County Emergency Management, Public Works, Planning Department	State Office of Emergency Management, Oregon Department of Land Conservation and Development, Grant Pass Planning Department (grant writer), Property Owners, State Office of Emergency Management

Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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2.4. Collaborate with the City of Grants Pass to identify sources of funding to retrofit the Wastewater Treatment Plant to protect against flood damage.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☒ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☒

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

In the 2010 NHMP update process, the county identified a medium level of flood vulnerability (between 1% and 10% of the population affected) and high probability (one event likely within a 10-35 year period). While the City of Grant Pass Risk Assessment process ranked probability of flood as high also, the Grant Pass Steering Committee ranked vulnerability as High (more than 10% of the population affected) This is in part due to the fact that the city-owned wastewater treatment plant is within the flood plain. As a critical infrastructure facility, it is in the interest of the county to assist the city in protecting the wastewater plant as the availability of clean water is a matter of life-safety. The City of Grants Pass will identify specific risk and vulnerability of the facility through operational assessment and physical assessments. The county can strategically support the assessment and mitigation assessments of the wastewater treatment plant.

Ideas for Implementation:

- Collaborate with the City to advocate to elected representatives for support for the retrofit of the facility.
- Participate in identifying state and federal resources that may be available
  - Hazard Mitigation Grant Program
  - Pre Disaster Mitigation Program
  - Flood Mitigation Assistance Program

Coordinating Organization:	Grants Pass Public Works

Internal Partners:	**External Partners:**
Josephine County Public Works, Josephine County Emergency Management	State Office of Emergency Management, Elected officials and the local and state level, Department of Land Conservation and Development,
Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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2.5. Review and update county code to enhance flood risk management

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☒ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

In 2009 the county amended the Josephine County Rural Land Development Code regarding flood hazard areas to implement updates to the JC Flood Insurance study, rate maps, and map index and adding a new section for administration in floodway fringe areas without mapped floodway. Additionally, in the 2010 NHMP update process, the county identified a medium level of flood vulnerability (between 1% and 10% of the population affected) and high probability (one event likely within a 10-35 year period).

While these measures ensure compliance with the Oregon Statewide Planning Goals (7) that focuses on natural hazards, there are additional considerations and policies that could protect existing and new property from flood risk (riverine, urban, flash, etc) and enhance the health of local waterways. Integrating the principles and methods of "No Adverse Impact" and "Low Impact Development (LID) into county policy can encourage development that is less at risk from flood.

Rain runs off hard surfaces like streets, patios and driveways and picks up chemicals, litter, bacteria, oil and other pollutants. When polluted rainwater (also called stormwater runoff) drains into the sewer system, streams and rivers it creates a health hazard for people, wildlife, salmon and the rest of the environment. Using pervious surfacesor material for patios, walkways, driveways and parking areas allows rainwater to soak into the ground before it becomes polluted stormwater runoff and flows into sewers and storm drains. The result is healthier urban waterways and less flood risk to property.

Ideas for Implementation:

- Review National Association of State Flood Plain Managers "No Adverse Impact" program for implementation strategies or policy measure
- Revise county development code to ensure support for the use of pervious paving and other Low Impact Development techniques
- Revise RLDC to prohibit residential development in the floodway, currently allowed by County Code.

Coordinating Organization:	Josephine County Planning Department

Internal Partners:	**External Partners:**
Josephine County Public Works, Emergency Management, Board of County Commissioners	Josephine Stream Restoration Alliance, Oregon Department of Land Conservation and Development, State Office of Emergency Management

Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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2.6. Include needed culvert upgrades in the County Capital Improvements Plan

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☒ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

In the 2010 NHMP update process, the county identified a medium level of flood vulnerability (between 1% and 10% of the population affected) and high probability (one event likely within a 10-35 year period). Culverts that are undersized or in disrepair can restrict the flow of water and increase the risk of flood. The County maintains a database of the maintenance and upgrade schedule for culverts, including ones that continually are responsible for localized flooding. Including the list and prioritization of culverts in the Capital Improvement Plan will ensure funding allocation for upgrades and retrofits.

Ideas for Implementation:

- Identify outside funding opportunities (such as OWEB grants)
  - Predisaster Mitigation Grants, Hazard Mitigation Grant Program, Flood Mitigation Assistance
- Work with stream restoration and fish conservation groups to complete multi-objective projects.

Coordinating Organization:	Josephine County Public Works

Internal Partners:	**External Partners:**
Josephine County Emergency Management	Josephine Stream Restoration Alliance

Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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2.7. Collaborate with the City of Grants Pass and Cave Junction to develop outreach materials for property owners and tenants along stream and riverbanks to share information about how to minimize erosion of soils and banks during flood events of varying magnitudes.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☒ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

In 2006 the county updated the county code such that if development requires an erosion control plan and or storm drainage facility, a pre-application review of the site plan is also required.

In the 2010 NHMP update process, the county identified a medium level of flood vulnerability (between 1% and 10% of the population affected) and high probability (one event likely within a 10-35 year period). Additionally, the rural landscape provides habitat that attracts eco-tourism and recreation. There is a need to promote effective erosion control techniques, including bioengineering of streambanks and planting of riparian vegetation, to help preserve soils, riparian zones, and habitats. This action is also a statewide flood mitigation action (Flood Hazard, Long-term #4).

Ideas for Implementation:

- Identify state and federal resources that may be available to support this action
- Review material currently distributed regarding streambank erosion and flood hazard for accuracy, continued relevance, and effectiveness.
- Collect new or updated information from sources such as the National Association of State Flood Plain Managers "No Adverse Impact" program, Institute for Business and Home Safety "Fortified" Programs, and FEMA, to identify mitigation measure and mitigation measures that could be disseminated to property owners and tenants.
-

Coordinating Organization:	Josephine County Planning Department

Internal Partners:	**External Partners:**
Josephine County Emergency Management, Forestry, Surveyor, Assessor;	DSL, DEQ, ODFW, OSU Extension Service; Josephine Stream Restoration Alliance

Timeline:	**If available, estimated cost:**
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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3. Earthquake

3.1. Identify existing critical facilities needing structural retrofits; prioritize projects and develop funding strategy

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☒ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒

Rationale for Proposed Action Item:

Critical facilities, and the functions they perform, are the most significant components of the system that protects the health, safety, and well-being of communities at risk. One of the most important determinants of the sustainability of a community is the reliability of physical and social infrastructure. The communities that cannot rely on their own critical infrastructure are extremely vulnerable to disasters. This is why the design of critical facilities to improve their resistance to damage, and their ability to function without interruption during and in the aftermath of hazard events, deserves special attention. A 1999 study by DOGAMI identifies Josephine County's risk of significant damage as "high" (http://www.oregongeology.org/sub/earthquakes/EQs.htm). Based on a combination of absolute loss and relative loss, Josephine County's Loss ratio is among the top 10 highest in the state. Additionally, in the 2011 NHMP update process the county ranked the probability of earthquake as medium (one event likely within a 35-75 year period) and the vulnerability as high (more than 10% of the population affected).

To ensure safe and uninterrupted operation of critical facilities, which is vital in the post-disaster period, the county and other owners of critical facilities must incorporate a comprehensive approach to identify hazards and avoid them when feasible. In cases when exposure to hazards is unavoidable, it is recommended that existing facilities are rehabilitated or new facilities are built so that they incur lower risk. The fundamental goal is to resist the forces and conditions associated with natural hazards.

Ideas for Implementation:

- Oregon Emergency Management provides funding for seismic retrofitting through the Oregon Seismic Grants Program (OSGP). OSGP provides funding for structural improvements, architecture and engineering, and project management for seismic retrofitting. To be eligible, buildings should have preliminary engineering report/assessment, cost estimate for retrofit, benefit cost analysis, and photos. Additional funding sources could be Pre-disaster Mitigation Grants or through the Hazard Mitigation Grant Program
- Include a schedule for facility retrofitting in the county Capital Improvement Plan.
- Incorporate information on code-plus construction, retrofit, and risk reduction strategies developed by the Institute for Business and Home Safety (IBHS) "Fortified" programs into county code and policy for facility maintenance, upgrades, and retrofit projects. (http://www.ibhs.org/fortified)

Coordinating Organization:	Josephine County Emergency Management,

Internal Partners:	**External Partners:**
Josephine County ,	Oregon Emergency Management , DOGAMI, Chamber of Commerce, business associations, construction companies and homebuilders.

Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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3.2. Ensure all new critical facilities are built to highest earthquake building code standards; consider Institute for Business and Home Safety (IBHS) "Fortified for Safer Business" standards.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☒ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒

Rationale for Proposed Action Item:

Critical facilities, and the functions they perform, are the most significant components of the system that protects the health, safety, and well-being of communities at risk. One of the most important determinants of the sustainability of a community is the reliability of physical and social infrastructure. The communities that cannot rely on their own critical infrastructure are extremely vulnerable to disasters. This is why the design of critical facilities to improve their resistance to damage, and their ability to function without interruption during and in the aftermath of hazard events, deserves special attention. A 1999 study by DOGAMI identifies Josephine County's risk of significant damage as "high". Based on a combination of absolute loss and relative loss, Josephine County's Loss ratio is among the top 10 highest in the state. Additionally, in the 2011 NHMP update process the county ranked the probability of earthquake as medium (one event likely within a 35-75 year period) and the vulnerability as high (more than 10% of the population affected).

To ensure safe and uninterrupted operation of critical facilities, which is vital in the post-disaster period, the county and other owners of critical facilities must incorporate a comprehensive approach to identify hazards and avoid them when feasible. In cases when exposure to hazards is unavoidable, it is recommended that new facilities are built to incur less risk or, as addressed in other NHMP actions, existing facilities are rehabilitated. The fundamental goal is to resist the forces and conditions associated with natural hazards.

"Fortified for Safer Business" is a code-plus new construction program offering a package of improvements that greatly increase a new light commercial building's durability and resilience to natural hazards prevalent in the area where it's being built. Achieving a "Fortified for Safer Business" designation gives the facility the advantage of remaining open or re-opening faster during a time of need for county residents, customers, employees, and the county's partners. This level of dependability and service following a major catastrophe will add value to the response and recovery process overall

Ideas for Implementation:

- Identify the schedule for new construction of critical facilities, both public and private (e.g. hospitals)
- Provide private owners of those critical facilities with information on code-plus construction, retrofit, and risk reduction strategies developed by the Institute for Business and Home Safety (IBHS) "Fortified" programs into county code and policy for facility maintenance, upgrades, and retrofit projects. (http://www.ibhs.org/fortified).

Coordinating Organization:	Josephine County Building Safety

Internal Partners:	**External Partners:**
Josephine County Emergency Management, Board of County Commissioners, Planning	State Office of Emergency Management, DOGAMI, Chamber of Commerce, Business associations, construction companies, Three River Community Hospital, Red Cross, school districts
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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3.3. Promote non-structural retrofit strategies to property owners, renters and contractors

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☒ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒

Rationale for Proposed Action Item:

In the past, seismic events were thought to pose little or no threat to Oregon communities. However, recent earthquakes and scientific evidence indicate that the risk to people and property is much greater than previously thought. Oregon and the Pacific Northwest in general are susceptible to earthquakes from three sources: 1) the off-shore Cascadian Subduction Zone; 2) deep intraplate events within the subducting Juan de Fuca Plate; and 3) shallow crustal events within the North American Plate. While all three types of quakes possess the potential to cause major damage, subduction zone earthquakes pose the greatest danger. Additionally, in the 2011 NHMP update process the county ranked the probability of earthquake as medium (one event likely within a 35-75 year period) and the vulnerability as high (more than 10% of the population affected).

Earthquakes cause a multitude of issues, the most obvious being structural damage to buildings and facilities. This damage can have a very direct impact on the county's ability to maintain services and programs. Another less obvious, but potentially crippling impact can be damage to critical equipment contained within buildings or injuries resulting from falling objects in buildings. Restraining nonstructural hazards, such as securing bookcases, copiers, shelving units, and other common office equipment and furniture will help to reduce the county's overall earthquake risk by reducing the potential impact of an earthquake and ensuring the ability of essential county functions can be restored quickly after the quake.

Ideas for Implementation:

- Compile resources that have already been developed and provide them property owners, renters, and contractors during regular interactions with the county such as at the building counter, during the permit process (e.g. developers packet), homeowner outreach for property maintenance or utilities, on the county website, and through local media outlets
    - Sources could include Federal Emergency Management Agency (FEMA), United States Geological Survey (USGS), Institute for Business and Home Safety (IBHS) Fortified for Safer Living and Fortified for Existing Homes programs,

Coordinating Organization:	Josephine County Building Safety
Internal Partners:	**External Partners:**
Josephine County Emergency Management Board, Emergency Management, Assessor, Planning	State Office of Emergency Management, DOGAMI, Chamber of Commerce, Business associations, construction companies and homebuilders, public utility providers, media
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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3.4. Promote non-structural retrofit strategies in county-owned facilities.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☒ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

In the past, seismic events were thought to pose little or no threat to Oregon communities. However, recent earthquakes and scientific evidence indicate that the risk to people and property is much greater than previously thought. Oregon and the Pacific Northwest in general are susceptible to earthquakes from three sources: 1) the off-shore Cascadian Subduction Zone; 2) deep intraplate events within the subducting Juan de Fuca Plate; and 3) shallow crustal events within the North American Plate. While all three types of quakes possess the potential to cause major damage, subduction zone earthquakes pose the greatest danger. Additionally, in the 2011 NHMP update process the county ranked the probability of earthquake as medium (one event likely within a 35-75 year period) and the vulnerability as high (more than 10% of the population affected).

Earthquakes cause a multitude of issues, the most obvious being structural damage to buildings and facilities. This damage can have a very direct impact on the county's ability to maintain services and programs. Another less obvious, but potentially crippling impact can be damage to critical equipment contained within buildings or injuries resulting from falling objects in buildings. Restraining nonstructural hazards, such as securing bookcases, copiers, shelving units, and other common office equipment and furniture will help to reduce the county's over all earthquake risk by reducing the potential impact of an earthquake and ensuring the ability of essential county functions can be restored quickly after the quake.

Ideas for Implementation:

- Include non-structural stability assessment as a part of the regularly scheduled facility assessment
- Provide information about non-structural retrofit to building and office managers and department managers
- Incorporate non-structural retrofit as a priority during maintenance and office redesign / reorganization cycles.

Coordinating Organization:	Josephine County Building Safety
Internal Partners:	**External Partners:**
Josephine County Emergency Management, Emergency Management Board, Board of County Commissioners, Josephine County Safety Committee, all departments	Oregon Emergency Management
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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3.5. Develop Catastrophic Recovery Plan / Framework.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☒ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☒ Goal 6 ☐

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

The National Response Plan describes a catastrophic event as likely to "almost immediately exceed resources normally available to state, local, tribal, and private-sector authorities in the impacted area". Long Term Catastrophic Recovery is the re-establishment of a healthy, functioning community that will sustain itself over time.

Post-Disaster Recovery Planning can help:

- Local governments make decisions in advance of an emergency reducing potential losses
- Retain local control of decision making process
- Organize a more efficient redevelopment effort
- Preserve taxable property values and protect local economic resources

Planning for recovery before a catastrophic event impact the community will ensure that the local community has the capability to manage:

- Recovery and redevelopment decisions;
- Multiple financial resources to achieve broad-based community support;
- Reconstruction and redevelopment opportunities to enhance economic and community vitality;
- Environmental and natural resource opportunities to enhance natural functions and maximize community benefits;
- Exposure to risk to a level that is less than what it was before the disaster; and
- Integration of recovery efforts with existing plans and policies

Additionally, in the 2011 NHMP update process the county ranked the probability of earthquake as medium (one event likely within a 35-75 year period) and the vulnerability as high (more than 10% of the population affected).

Ideas for Implementation:

- Identify capacity and capability within the county for plan development
- Assess applicability of current recovery plan/framework models (e.g., ESF 14)
- Utilize the DOGAMI Rapid Visual Assessment method to inventory and categorize the risk of damage to and collapse of buildings downtown, historic districts, and economic core
- Identify permit programs that will need 'fast-track' permitting to assure that new structures are built properly, in a timely fashion, and to code, so that post-disaster recovery does not create another potential problem with substandard replacement structures and/or capital improvements.

Coordinating Organization:	Josephine County Emergency Management

Internal Partners:	**External Partners:**
Josephine County Planning Department, Public Works, Sheriff, Finance,	State Office of Emergency Management , DOGAMI, Chamber of Commerce, Business associations, Oregon Partnership for Disaster Resilience, Cities of Grants Pass and Cave Junction, Josephine County Special Needs Committee
Timeline:	**If available, estimated cost:**
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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3.6. Promote the reduction of non-structural hazards in K-12 Schools

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☒ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

In the 2011 NHMP update process the county ranked the probability of earthquake as medium (one event likely within a 35-75 year period) and the vulnerability as high (more than 10% of the population affected). Non-structural hazards (e.g., falling bookshelves, water heathers that become detached, etc) can be a threat to life and safety even if a building is seismically sound. Additionally, securing non-structural aspects will allow for quicker recovery after a seismic incident. This is a State of Oregon NHMP action as well (Earthquake, Short-Term #5).

Ideas for Implementation:

- Collaborate with the school districts to provide technical resources or advocacy at the state level for mitigation actions in schools as requested

Coordinating Organization:	Josephine County Emergency Management

Internal Partners:	**External Partners:**
Josephine County Board of Commissioners	State Office of Emergency Management , Oregon State Fire Marshal, Oregon Dept. of education, School Districts in Josephine County, Oregon Seismic Safety Policy Advisory Committee,

Timeline:	**If available, estimated cost:**
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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4. Landslide

4.1. Mitigate landslide hazards in previous landslide area of Wolf Creek

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☒ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐
Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒	
Rationale for Proposed Action Item:	
In the 2011 NHMP update process the county ranked the probability of landslides as medium (one event likely within a 35-75 year period) and the vulnerability as low (less than 10% of the population affected). Even so, there are specific areas of the county that have experienced landslides and where landslide incidents impacted property owners. The Wolf Creek area landslides affected property owners and access roads. More	
Ideas for Implementation:	
• Collaborate with affected property owners in the Wolf Creek area to develop and implement landslide mitigation measures. • Utilize updated LIDAR maps from the Department of Geology and Mineral Industries (DOGAMI) to identify any additional areas for mitigation	
Coordinating Organization:	Josephine County Public Works
Internal Partners:	**External Partners:**
Josephine County Emergency Management, Planning Department	Property owners, DOGAMI
Timeline:	**If available, estimated cost:**
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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4.2. Collaborate with the Oregon Department of Geology and Mineral Industries (DOGAMI) on future acquisition of LIDAR data and creation of updated landslide maps for the county.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☒ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☒

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

Portions of the county are on the schedule for 2011 for new LIDAR mapping that will be conducted by DOGAMI. LIDAR data produces very high resolution maps that show the physical features of and landscape from above. It penetrates the surface layer of vegetation and structures to reveal the subtle topography that is not easily detected otherwise including elevation, historic landslide or flow areas, and soil types. This information can be used to better understand the vulnerability and risk of hazards.

Ideas for Implementation:

- Contact DOGAMI to obtain notification once the LIDAR is complete.
- Identify funding for acquisition of LIDAR maps.

Coordinating Organization:	Josephine County Geographic Information Systems

Internal Partners:	**External Partners:**
Josephine County Emergency Management, Public Works, Planning	DOGAMI

Timeline:	**If available, estimated cost:**
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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5. Severe Weather

5.1. Collaborate with electrical utilities to develop criteria for when to use underground construction methods based on local risk.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☒ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☐ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒

Rationale for Proposed Action Item:

In the 2011 NHMP update process the county ranked the probability of severe weather as high (one event likely within a 10-35 year period and the vulnerability as high (more than 10% of the population affected). Underground lines are not vulnerable to damage from wind or winter storms.

In 2004, the county code changed relating to new construction to require underground methods.

Ideas for Implementation:

- Identify areas of chronic utility failure during severe weather
- Review code with the intent to update it to encourage or require undergrounding of existing utilities during regular repair or maintenance work.
- Encourage that street repairs include an opportunity for burying utilities.

Coordinating Organization:	Josephine County Public Works
Internal Partners:	**External Partners:**
Josephine County Emergency Management, Planning Department, Building Safety	Local utility and service providers including: Pacific Power, Qwest Communications, Avista Utilities,
Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	
Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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5.2. Promote wind-mitigation strategies in both building location and construction practices among property owners, renters and contractors.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☒ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☒ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☐ Originated in 2004 NHMP ☒

Rationale for Proposed Action Item:

In the 2011 NHMP update process the county ranked the probability of severe weather as high (one event likely within a 10-35 year period and the vulnerability as high (more than 10% of the population affected). While it has a high correlation with the fall and winter season, wind damage is possible at any time of year. Building construction and maintenance techniques can determine the resilience of a structure. Additionally, the vegetation and environment surrounding the building could increase the vulnerability, as in the case of old trees or overhanging branches. Wind mitigation will help the building, be it commercial or residential, be resilient to impacts from hazards. This level of dependability following a hazard incident will add value to the response and recovery process overall

Ideas for Implementation:

- Seek funding for wind safety funding and doing public awareness campaigns that encourage residents to build or retrofit properties with wind resistance in mind.
- Review county code for efficiency in protecting structures from wind damage and to ensure it supports wind-mitigation in both building location and construction practices
- Compile resources that have already been developed and provide them property owners, renters, and contractors during regular interactions with the county such as at the building counter, during the permit process (e.g. developers packet), homeowner outreach for property maintenance or utilities, on the county website, and through local media outlets
    - Sources could include Federal Emergency Management Agency (FEMA), United States Geological Survey (USGS), Institute for Business and Home Safety (IBHS) Fortified for Safer Living and Fortified for Existing Homes programs (http://www.ibhs.org/fortified)

Coordinating Organization:	Josephine County Building Safety

Internal Partners:	**External Partners:**
Josephine County Emergency Management, Emergency Management Board, Planning, Assessor,	Construction firms; IBHS, Oregon Building Codes Division,

Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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5.3. Collaborate with Grants Pass and Cave Junction to assess the feasibility of a policy and procedures for opening heating and cooling shelter sites

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☒ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

In the 2011 NHMP update process the county ranked the probability of severe weather as high (one event likely within a 10-35 year period and the vulnerability as high (more than 10% of the population affected). Summertime high temperatures can reach and exceed 100 degrees (F), and in the wintertime can drop below 0 degrees (F). While extreme temperatures are not typical, they can occur. When temperatures soar or fall to the extremes, many people face life or health safety risks. Heating stations open to those vulnerable populations protect people from hypothermia, frost bite, exhaustion, and heart attacks caused by overexertion. Additionally, residents with burst pipes or damaged roofs due to heavy snow or wind will need shelter and temporary assistance. Cooling stations that provide water and regulated temperatures assist those without access to air conditioning and who may be already more vulnerable to heat related health concerns, such as the elderly, children, or pregnant women.

Ideas for Implementation:

- Evaluate state, regional, and national best practices for establishing and operating heating and cooling shelters
- Develop a list of shelter sites that already are operational throughout the county
- Determine the conditions under which shelters would need to be made available and what services need to be provided by shelter sites
- Determine potential costs and funding solutions
- With partner organizations, assign responsibilities for shelter operations
- Develop MOUS with heating and cooling site owners to establish the terms and conditions for use.

Coordinating Organization:	Josephine County Emergency Management

Internal Partners:	**External Partners:**
Josephine County Emergency Management Board, Josephine County Public Health	Regional Vulnerable Populations Committee, Cave Junction, Grants Pass, Red Cross, School districts, community organizations, churches; Josephine County Special Needs Committee
Timeline:	**If available, estimated cost:**
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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5.4. Establish designated parking areas within the county proximate to major transportation corridors (I-5, OR-199) for stranded motorists during severe weather events

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☒ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☒ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

Severe weather is a regular winter occurrence in Josephine County. Commercial and private motorists have gotten stranded in attempts to cross the highway passes during weather events. The passes are at significant elevation and grade that it could be take an extended, and potentially dangerous, amount of time before rescue vehicles could reach the stranded motorists. Providing a safe alternative where drivers could wait until the roads become passable would protect the life and safety of those drivers as well as the emergency response personnel that would be called to respond.

Ideas for Implementation:

- Identify the services and amenities, if any, that would be provided at or near the parking areas.
- Develop list of parking areas
- Develop MOUS with government and commercial entities as needed
- Publicize location of the designated parking areas through media channels and signage before and leading up to severe weather events

Coordinating Organization:	Josephine County Public Works

Internal Partners:	**External Partners:**
Josephine County Public Health; Josephine County Emergency Management; Emergency Management Board, Sherriff, Fairgrounds	Red Cross, School district, community organizations, churches; large retailers; Oregon Department of Transportation, Oregon State Police
Timeline:	**If available, estimated cost:**
☐ Ongoing ☒ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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6. Fire

6.1. Coordinate fire mitigation actions through the Josephine County Integrated Fire Plan

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☐ 8. Wildfire ☒	Goal 1 ☒ Goal 2 ☐ Goal 3 ☐ Goal 4 ☐ Goal 5 ☐ Goal 6 ☒

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

The Josephine County Integrated Fire Plan developed an extensive risk assessment and identified mitigation actions. The Plan undergoes annual review and update. The Integrated Fire Plan should be considered the Wilfire section of the NHMP as it contains more accurate and extensive information about the vulnerability, risk, and mitigation actions that this NHMP.

Ideas for Implementation:

- Continue annual review and update of the Integrated Fire Plan

Coordinating Organization:	Josephine County Emergency Management Board

Internal Partners:	**External Partners:**
Josephine County Emergency Management	City of Grants Pass, City of Cave Junction, State Office of Emergency Management, Oregon Department of Forestry

Timeline:	**If available, estimated cost:**
☒ Ongoing ☐ Short Term (0-2 years) ☐ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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7. Drought

7.1. Support the City of Grants Pass' efforts to address localized drought management strategies.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☒ 7. Volcanic ☐ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☒ Goal 4 ☐ Goal 5 ☒ Goal 6 ☐

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

In the 2011 NHMP update process the county ranked the probability of drought as high (one event likely within a 10-35 year period) and the vulnerability as medium (between 1% and 10% of the population affected). Even so, the primary impact is to the City of Grants Pass and within that, the tourism industry is vulnerable to fluctuations in visitors due to restrictions to water sports or damage to reputation in subsequent seasons after a drought.

Ideas for Implementation:

- Share outreach material between the City and the County
- Convene joint information session if appropriate
- Provide information to farmers and ranchers regarding management practices for crops and livestock provide information via mail / newsletter or outreach at stores
- Include information about drought management techniques (e.g. native plantings) with distribution of wildfire material
- Include drought-impacted businesses or business sectors in any studies of the impact of hazards in the county.
- Encourage water-dependent businesses such as river tourism to develop diverse offerings.

Coordinating Organization:	Josephine County Emergency Management and Planning Department

Internal Partners:	**External Partners:**
Josephine County Public Works	OSU Extension Service, ODA, ODFW, WRDs

Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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8. Volcanic Eruption

8.1. Provide information about the risk and vulnerability to the impact due to volcanic ash fall vulnerable facilities from impact due to ash fall.

Hazard Type Addressed	**Alignment with Plan Goals:**
1. Multihazard ☐ 2. Flood ☐ 3. Earthquake ☐ 4. Landslide ☐ 5. Severe Weather ☐ 6. Drought ☐ 7. Volcanic ☒ 8. Wildfire ☐	Goal 1 ☒ Goal 2 ☐ Goal 3 ☒ Goal 4 ☐ Goal 5 ☐ Goal 6 ☐

Action development: New in 2011 update ☒ Originated in 2004 NHMP ☐

Rationale for Proposed Action Item:

Indirect impacts of a nearby volcanic eruption could include ash fall and significant deterioration of air quality. Ash can clog storm drains or even clog the drain if ash mixes with water. Air intake systems on buildings can be strained and overloaded by ash in the air and sensitive electronic equipment can be permanently damaged if affected by ash. Also, similarly to a high pollen count or smoke from nearby fires, volcanic ash can pose a health risk to vulnerable and sensitive populations such as the elderly, children, and people with weakened respiratory systems

Ideas for Implementation:

- Identify facilities most vulnerable to ash fall (e.g. buildings with sensitive equipment).Assess public buildings for vulnerable HVAC systems or air intake points.
- Educate county personnel on how to protect buildings and equipment from ash fall.
- For private facilities, educate building owners about how to protect HVAC intake points from disruption by ash
- Update the county website with information about health risks from reduced air quality and particulate matter in the air.

Coordinating Organization:	Josephine County Building Safety

Internal Partners:	**External Partners:**
Josephine County Public Works, Building Safety, Public Health	Oregon State University Extension Service, ODA, ODFW, WRDs

Timeline:	**If available, estimated cost:**
☐ Ongoing ☐ Short Term (0-2 years) ☒ Long Term (2-4 or more years)	

Submitted by:	Josephine County Natural Hazard Mitigation Plan Steering Committee

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Wildfire **ARE YOU PREPARED?**

Josephine County Integrated Fire Plan
Emergency Management Board Meeting

September 9, 2010
1:00 pm – 3:00 pm

Josephine County Search & Rescue Building
250 Tech Way in Merlin

Agenda

1. Open Meeting – NHMP Kickoff Meeting (1:00-2:00)
- Introductions (5 minutes)
- Overview of NHMP Update Needs (20 minutes)
- Roles and Responsibilities (10 minutes)
- Community Involvement (20 minutes)
- Next Steps: Vulnerability/Probability Assessments (5 minutes)

2. Committee Updates *(5 minutes each)*
- Fuels / Risk Assessment Committee
- Stewardship Committee
- Education & Outreach Committee
- Special Needs Committee
- Emergency Management Board

3. Old Business
- Annual report/update video

4. New Business

5. Good of the Order

- Next EMB meeting

Meeting: Josephine County NHMP Kickoff
Date: September 9, 2010
Time: 1:00 pm – 3:00 pm
Location: 250 Tech Way, Grants Pass (Josephine Search and Rescue Facility)

Meeting Minutes

1. Welcome & Introductions **(5 minutes)**

- Megan provided a brief overview of OPDR, and have a short history of OPDR's involvement with statewide Pre-Disaster Mitigation planning efforts. Megan discussed the benefits of having a natural hazards mitigation plan, and explained why / how OPDR received a grant to assist Josephine County with its mitigation plan update process.

- Megan passed a sign-in sheet around to document meeting attendance. Meeting attendees will serve as the county's steering committee throughout this process. The following steering committee member also participated in Josephine County's 2004 plan development process:

  - Sara Rubrecht (previously Nicholson), Josephine Co. Emergency Services

  All of the remaining steering committee members are new to this process. Members include:

  - John O'Connor, Oregon Department of Forestry
  - Jim Wolf, Josephine County Integrated Fire Plan
  - Rick Dryer, Oregon Department of Forestry
  - Derek Davenport, USFS Wild Rivers Ranger District
  - Steve Scrivner, City of Grants Pass
  - Bob Hamblin, City of Grants Pass
  - Terry Haugen, City of Grants Pass Public Works
  - Paul Galloway, USFS Rogue River – Siskiyou National Forest
  - Jenny Zeltvay, Josephine County Public Health
  - Tanya Phillips, Josephine County Public Health
  - Travis Robbins, City of Cave Junction
  - Jeff Wheaton, Josephine County Public Works
  - Neil Benson, Josephine County Integrated Fire Plan
  - Tim Gonzales, Medford BLM
  - Phil Turnbull, Rural Metro Fire Department

  A large portion of the above members are part of the county's Integrated Fire Plan Emergency Management Board. This first kick-off meeting occurred during one of the board's regularly scheduled meetings. (Meetings happen quarterly).

2. Overview of NHMP Update Needs **(20 minutes)**

- Josephine County's NHMP expired on September 30, 2009. Megan explained the implications of plan expiration (i.e., Josephine County no longer has access to the federal mitigation funding programs: Pre-Disaster Mitigation; Hazard Mitigation Grant Program; and Flood Mitigation Assistance)
- Megan provided an overview of mitigation plan content, including examples of natural hazards mitigation projects. Megan emphasized the difference between mitigation and response / recovery / preparedness. Each meeting participant received a copy of "the Disaster Cycle" – a document that explains the difference between all four phases in a disaster.

- Megan also distributed a copy of FEMA's mitigation plan crosswalk, which is what FEMA uses to review mitigation plans. The crosswalk lists all Code of Federal Regulation (CFR) requirements for natural hazards mitigation plans. Megan briefly explained how the requirements will influence plan content, as well as future plan update meeting content.
- Planning process: Megan summarized the content of future meetings. At the next meeting, for example, the committee will review & update content within the plan's risk assessment. At the third meeting, the committee will discuss mitigation action items, and at the fourth meeting, the committee will discuss plan implementation and maintenance strategies. OPDR will distribute handouts & resources before the meeting, as needed.

3. Roles and Responsibilities **(10 minutes)**

- OPDR will be responsible for:
    - Providing planning resources (templates, training manual, research on existing plans/policies/community organizations);
    - Develop and facilitate a total of four plan development meetings;
    - Develop and compile the final draft mitigation plan; and
    - Provide technical assistance on the FEMA plan review process.
- Josephine County will be responsible for:
    - Providing a steering committee that will help guide and assist with the plan update process;
    - Attending 3 additional steering committee meetings;
    - Document match (the county will be paying for wildfire mitigation billboards);
    - Provide information regarding the hazard history of the area;
    - Provide information regarding what actions have been taken to mitigate the impacts of natural disasters;
    - Encourage cities to participate in the county's plan update process; and
    - Adopt the final FEMA-approved mitigation plan via resolution

4. Community Involvement **(20 minutes)**

- Megan facilitated a discussion regarding public involvement. FEMA requires jurisdictions to involve the public during the plan update process. Similarly, FEMA requires jurisdictions to allow for public comment on final drafts of the mitigation plan. During the plan update process, Josephine County agreed to explore the following public involvement options:
    - Host at booth at the grower's market to solicit information regarding local vulnerabilities, and to disseminate information about the mitigation plan's content & plan update process.
    - Repeat some of the public involvement strategies that were completed in the initial plan development process (refer to existing plan for examples).
    - The Illinois Valley Fire Protection Plan will be updated this fall, and these meetings will be open to the public. A representative from Josephine County's Steering Committee may attend these meetings to: 1) describe the content within Josephine County's mitigation plan, and 2) solicit input regarding local vulnerabilities and/or ideas for mitigation actions within the community.
    - Work with OPDR to conduct stakeholder interviews with persons, organizations, businesses, and government departments throughout the county.

5. Next Steps: Vulnerability/Probability Assessments **(5 minutes)**

- The next meeting will be on November 10, from 1-3pm.
- At the next meeting, the steering committee will:
    - Review & update hazard histories
    - Identify and discuss specific vulnerabilities within Josephine County – for each hazard in the plan
    - Review the status of mitigation actions that were identified in the 2004 NHMP
- If needed, steering committee members are encouraged to invite additional persons to attend the next meeting.

Meeting Sign-In

Josephine County NHMP Kickoff. September 9, 2010. 1:00-3:00pm
250 Tech Way, Grants Pass, OR (Josephine Search & Rescue Facility)

Name	Representing	Email	Roundtrip mileage (if applicable)
Megan Findley	Oregon Partnership for Disaster Resilience	mfindley@uoregon.edu	/
John O'Connor	Oregon Dept Forestry	jpoconnor@odf.state.or.us	
Jim WOLF	JOSEPHINE COUNTY INTERGRATED FIRE PLAN	FIREPLAN COORDINATOR @ GMAIL.COM	
Rick DRYER	ODF	rick.dryer@odf.state.or.us	
DEREK DAVENPORT	USFS WILD RIVERS RANGER DISTRICT	ddavenport@fs.fed.us	
STEVE SCRIVNER BOB HAMBLIN	City of Grants Pass " "	sscrivner@grantspassoregon.gov bhamblin@ . . .	
Terry Haugen	City of Grants Pass Public Works	thaugen@grantspassoregon.gov	
PAUL GALLOWAY	ROGUE RIVER-SISKIYOU NF	pgalloway@fs.fed.us	

Name	Representing	Email	Roundtrip mileage (if applicable)
Jenny Zeitvay	Josephine County Public Health	JLZEITVAY@CO.JOSEPHINE.OR.US	
Tanya Phillips	Josephine County Public Health	tphillips@co.josephine.or.us.	
Travis Robbins	City of Cave Junction	cityofcjsdc@cavenet.com	
Jeff Wheaton	Josephine Co. Public Works	jwheaton@co.josephine.or.us	
Neil Benson	JoCo Integrated Fire Plan	nbenson@jeffnet.org	
Tim Gonzales	Medford BLM GPRA	tim_gonzales@blm.gov	
Phil Turnbull	Rural/Metro F.D.		
Sara Rubrecht	Josephine County E.M.	srubrecht@co.josephine.or.us	

Welcome !

Josephine County

Natural Hazard Mitigation Plan
Second Meeting

November 23, 2010

Work Session Objectives

Topic: Risk Assessment

- Review and update hazard histories.
- Review and update probability/vulnerability scores
- Identify and discuss specific vulnerabilities for each hazard in the plan.

Introductions

- Introductions
  - Name
  - Organization
- Bathrooms
- Handouts

Process Overview

Josh Bruce
Assistant Director
Oregon Partnership for Disaster Resilience
Community Service Center
University of Oregon
jbruce@uoregon.edu

Project Goal

To update the Josephine County Natural Hazard Mitigation Plan (NHMP)

Project Deliverables

- NHMP Table of Contents
  - Introduction
  - Community Profile
  - **Risk Assessment**
  - Goals and Action Items
  - Maintenance and Implementation
  - Appendices
    - Public Process
    - Action Item Forms

The KEY is the Process

"Natural hazard mitigation planning is the **process** of figuring out how to reduce or eliminate the loss of life and property damage resulting from natural hazards such as floods, earthquakes, and tornadoes."

SOURCE: FEMA STATE AND LOCAL MITIGATION PLANNING how-to guide: **Understanding Your Risks**

Mitigation Planning Process

Organize Resources

Assess Risk

Create Your Addendum

Implement the Plan

What is a Risk Assessment?

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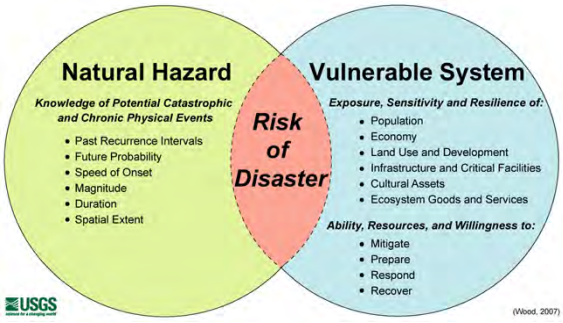
How We Look at Risk



Multi-Hazard Mitigation Planning

- A thoughtful risk assessment provides:
  - The foundation for effective mitigation strategies & community partnerships
  - Basis of strong project & grant application development
  - Coordination among multiple entities & priorities
- Resources Used More Efficiently & Effectively

Source: Federal Emergency Management Agency

Understanding Risk

Community-wide hazard identification

Risk analysis

Community-wide vulnerability assessment

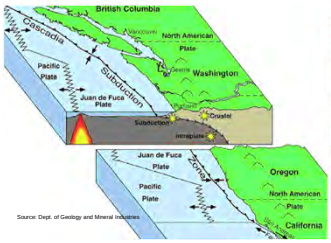
Level 1: Hazard Identification

Process of estimating the geographic extent of the hazard, its intensity, and its probability of occurrence.

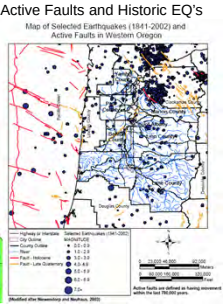
What are Hazard Sources?

Earthquake Sources in the Northwest

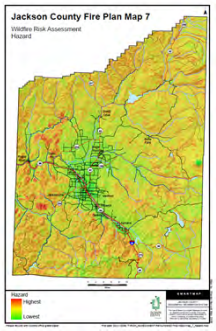
- Subduction Zone (Cascadia)
- Intraplate (Nisqually 2001)
- Crustal (Scotts Mills 1993)

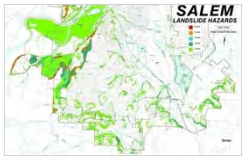


Active Faults and Historic EQ's



Example Hazard ID





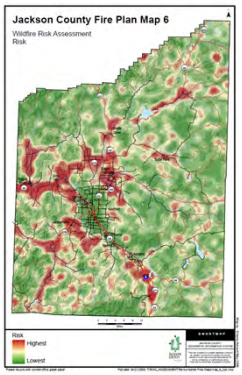
LEVEL 2: Vulnerability Assessment

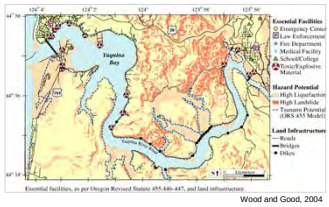
Combines information from the hazard identification with an inventory of the existing (or planned) property and population exposed to a hazard.

Examples of Vulnerability Information

- **Demographics:** Population, Employment, Housing
- **Building Stock:** Residential, Commercial, Industrial
- **Essential Facilities:** Hospitals, Schools, Police Stations, Fire Stations
- **Transportation:** Highways, Bridges, Railways, Tunnels, Airports, Ports and Harbors, Ferry Facilities
- **Utilities:** Waste Water, Potable Water, Oil, Gas, Electric Power, Communication Facilities
- **High Potential Loss Facilities:** Dams and Levees, Nuclear Facilities, Hazardous Material Sites, Military Installations

SOURCE: FEMA HAZUS Overview





Wood and Good, 2004

LEVEL 3: Risk Analysis

Community-wide hazard identification

Risk analysis

Community-wide vulnerability assessment

Involves estimating the damage, injuries, and costs likely to be experienced in a geographic area over a period of time. Risk has two measurable components: 1) the magnitude of the harm that may result, defined through vulnerability assessment; and 2) the likelihood or probability of the harm occurring.

Risk Assessment

Hazard ID

- Causes & Characteristics
- Hazard History
- Probability Assessments
- Location and Extent

Vulnerability Assessment

- Description of impacts to local community
- Assessment of hazard impacts on:
  - Population
  - Economy
  - Land Use & Development
  - Environment
  - Critical Facilities & Infrastructure

Hazard Identification

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Level 1: Hazard Identification

Community-wide hazard identification

Risk analysis

Community-wide vulnerability assessment

Process of estimating the geographic extent of the hazard, its intensity, and its probability of occurrence.

Hazard Categories

Wildfire	Landslide
Flood	Drought (New)
Earthquake	Other Hazards?
Severe Weather*	

* NOTE: Some communities split sever weather into two hazard categories – winter storm and wind storm.

Probability

- Probability
  - High: One event likely within a 10-35 year period
  - Moderate: One event likely within a 35-75 year period
  - Low: One event likely within a 75-100 year period

Vulnerability

- Vulnerability
  - High: More than 10% of the population affected
  - Moderate: Between 1% and 10% of the population affected
  - Low: Less than 1% of the population affected

Hazard Identification Exercise

Hazard Identification and Event History Memo

Risk Assessment Exercise

Concept:

Certain human and environmental conditions make a community more susceptible to losses

Exercise:

To identify intersection of hazards and assets and discuss implications of loss

LEVEL 2: Vulnerability Assessment

Community-wide hazard identification

Risk analysis

Community-wide vulnerability assessment

Combines information from the hazard identification with an inventory of the existing (or planned) property and population exposed to a hazard.

Population

Economy

- Are businesses vulnerable to natural hazards? What types of businesses? Which ones are location-dependent?
- What businesses represent significant components of your community's economy (e.g., employees, tax base)?
- Are alternate commercial spaces available if current stock is damaged?
- Which cultural or historic resources also represent significant economic assets?

Land Use and Development

- Do current development patterns or land use plans minimize development in the hazardous areas?
- Is your community growing or projected to grow denser in hazardous zones?
- Are there policies in place to address post-disaster redevelopment?
- Is the community capable of providing temporary shelter and housing?

Environment

- Are there significant or unique natural features, assets or resources in region?
  - Examples: forests, watersheds, wetlands
- Are there processes associated with a disaster that could impact a sensitive area?
  - Examples: sedimentation, hazardous material spill
- Are there any environmental assets that, if lost or damaged, could have significant long-term economic impacts?
  - Examples: Reduced agricultural or harvesting productivity
  - Reduced tourism trade

Critical Facilities and Infrastructure

- Which facilities/infrastructure are in hazard zones?
  - Which are critical for residents?
  - Which are critical for the economy?
- Which roads/bridges provide access ?
- Which systems are not redundant?
- Where will new facilities be needed?

Next Steps

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For Steering Committee

For the Steering Committee:

- Get OPDR any edits to the Community Overview
- Set next meeting date

For OPDR:

- Incorporate input into Risk Assessment Section
- Resources on website (http://opdr.uoregon.edu)

Meeting: **Josephine County NHMP - Risk Assessment Meeting**
Date: November 23, 2010
Time: 1:00 to 3:00 pm
Location: 250 Tech Way, Grants Pass (Josephine Search and Rescue Facility)

AGENDA

1. Welcome and Introductions **(10 minutes)**
2. Process Overview **(15 minutes)**
3. What is a Risk Assessment? **(15 minutes)**
4. Risk Assessment Exercise **(70 minutes)**
5. Next Steps: Mitigation Strategy **(10 minutes)**

List of Handouts:

- Hazard Identification and Event History Memo
- Community Asset Issue Identification Worksheets
- OPDR Plan Update Manual Stage 2: Reviewing the Risk Assessment

Oregon Partnership for Disaster Resilience
Community Service Center • 1209 University of Oregon
Eugene • Oregon • 97403-1209
Phone: 541.346.7331 • Fax: 541.346.2040

Meeting: Josephine County NHMP
Date: February 9th, 2011
Time: 1:00 pm – 3:00 pm
Location: 250 Tech Way, Grants Pass (Josephine Search and Rescue Facility)

AGENDA

1. Welcome & Introductions

2. Review NHMP Goals and Mission

3. Mitigation Actions
    - Review, edit, remove, update list to reflect past projects, current need, and new risk

4. Public Outreach and Involvement
    - Identify audience (include Grants Pass input)
    - Define strategy / method, including length

Oregon Partnership for Disaster Resilience
Community Service Center • 1209 University of Oregon
Eugene • Oregon • 97403-1209
Phone: 541.346.2305 • Fax: 541.346.2040

Welcome !

Josephine County

Natural Hazard Mitigation Action Item Meeting

February 9, 2011

PARTNERSHIP FOR DISASTER RESILIENCE
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CSC Community Service Center

UNIVERSITY OF OREGON

OREGON emergency management

FEMA

Phase 2: Activity Re-cap

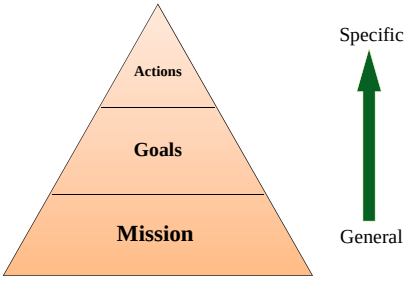
- Held Risk Assessment Work Session on Nov. 23rd
- Begun drafting Risk Assessment Chapter
- Developed list of potential mitigation actions
- Documented the planning process

Workshop Overview

Afternoon (1-3pm)

- Mission & Goals
- Action Item Overview
- Action Item Review /Update
- Action Item Development
- Conclusion & Next Steps

Mission, Goals and Actions



Mission & Goals

The Rule (*44 CFR Section 201.6)* states that your plan SHALL…

Include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Mission Statement Overview

- A statement that describes the purpose of the plan
- Reflects a realistic determination of what the plan is, who it serves, what it does, and what it can accomplish

Example Mission:

- *To create a disaster resilient and sustainable city*

Current Mission Statement

Josephine County will establish a process of natural hazard mitigation that will prevent or reduce the loss of life and property by,

1. Identifying and analyzing potential hazards;
2. Educating and involving our residents; and
3. Improving our response capabilities.

Mitigation Plan Goals

- Describe the outcomes to be produced
- Goals drive actions

Examples from State NHMP:

- *Protect life and reduce injuries resulting from natural hazards*
- *Minimize public and private property damages and the disruption of essential infrastructure and services from natural hazards*
- *Increase the resilience of local, regional, and statewide economies*
- *Minimize the impact of natural hazards while protecting and restoring the environment*
- *Enhance and maintain state capability to implement a comprehensive statewide hazard loss reduction strategy*
- *Document and evaluate Oregon's progress in achieving hazard mitigation*

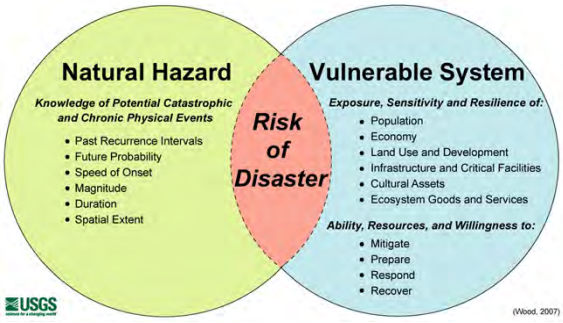
Current Goals

Goal 1: *Prevent or reduce the loss of life and property*

Goal 2: *Educate our residents in mitigation, preparedness, and response planning*

Goal 3: *Increase governmental and citizen preparedness and participation in emergency situations*

Mitigation Plan Actions



Mitigation Plan Actions

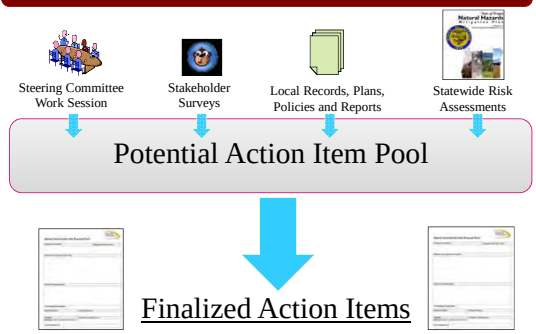
Your plan SHALL*…

- Identify and analyze a **comprehensive range** of specific mitigation actions and projects for each hazard
- Identify actions and projects that reduce the effects of hazards on **new** buildings and infrastructure
- Identify actions and projects that reduce the effects of hazards on **existing** buildings and infrastructure?

Also: Repetitive Flood Loss and NFIP Compliance

*44 CFR, Section 201.6

Where Do Actions Come From?



Types of Mitigation Actions

- Prevention
- Emergency Services
- Property Protection
- Structural Projects
- Public Education and Awareness
- Natural Resource Protection

Natural Hazard Action Item Proposal Form[1]

Proposed Action Item:	Alignment with Plan Goals:
Rationale for Proposed Action Item:	
Ideas for Implementation:	
Coordinating Organization:	
Internal Partners:	External Partners:
Timeline:	If available, estimated cost:
Short Term (0-3 years) / Long Term (3 or more years)	
Form Submitted by:	

- Detailed
- Recommendations
- County owned
- Reduce risk

Action Item Review & Update

- **Was it accomplished? Was progress made?**
  - No judgment, just documenting the last 5 years
  - Yes: Who, what, were, when?
  - No: Why not?
- **Is it still relevant?**
  - Address Risk and Vulnerability
  - Coordinating Body (who will do the work?)
  - Timeline
  - Action-Oriented?
- **What is missing?**

Outreach & Public Involvement

Your plan SHALL include opportunities for*…

✔ Neighboring communities, agencies, businesses, private / non-profit, etc

- The public to comment on the plan during the drafting stage prior to plan approval

*44 CFR, Section 201.6

Outreach & Public Involvement

Example Outreach Options:

- Web Based Survey
  - Post to websites
- Press Release
  - Existing Newsletters
- Targeted outreach
  - Survey
  - Review of parts / all

Tasks:

- Choose Strategy / Strategies
  - Medium
  - Content
- Identify Audience
- Set Timeline

Next Steps: Implementation

- **Homework:** Review Action Item Forms
- Add Implementation Ideas
  - Details, Details, Details!
  - Implementation through existing plans?
    - E.g., Capital Improvements Plans, Zoning and/or Development Codes, Watershed Management Plans, etc.

Next Steps: Final Meeting

- Identify plan "convener" and future public involvement strategies
- Discuss partnership opportunities
- Discuss mitigation grant programs & others
- Create final draft of mitigation plan

Homework

Actions:

- Review list
- Add Implementation ideas

Outreach:

- Collect public comments for review at next meeting

Meeting Sign-In

Josephine County NHMP
Goals and Actions Meeting. February 9, 2011

Name	Representing	Email	Roundtrip mileage (if applicable)
NEIL BENSON	JC&FP	nbenson@jeffnet.org	
MIKE HOLCUIN	U.S. FOREST SERVICE		
John O'Connor	OOF	jpoconnor@odf.state.or.us	
LANG JOHNSON	GRANTS PASS Fire Rescue & Public Safety		

Meeting Sign-In

Josephine County NHMP
Goals and Actions Meeting. February 9, 2011

Name	Representing	Email	Roundtrip mileage (if applicable)
JEFF WITHERTON	Jo. Co. PUBLIC WORKS		
John Jensen	Wolf Creek Fire		
Tonya Phillips	Public Health		
Jenny Zeltvay	Emergency Management		
RICK DRYER	ODF		
Allan Mitchell	BLM		
Tim Gonzales	BLM		
JIM WOLF	Jo Co FIRE PLAN	Jameswolf@gmail.com	

Wildfire **ARE YOU PREPARED?**

Emergency Management Board Meeting

Sign In Sheet

4/13/2011

Name	Agency	Phone	Email
Tanya Phillips	Public Health	474-5325	tphillips@co.josephine.or.us
Jenny Zeltvan	JOCO EM	474-5300	JZeltvan@ "
David Reeves	City of Grants Pass	474-6360 x6304	dreeves@grantspassoregon.gov
LANG JOHNSON	CITY OF GRANTS PASS	450-6201	JOHNSONL@GRANTSPASSOREGON.GOV
AUSTIN PRINCE	Rural/Metro Fire Dept	474-1218	austinp@[redacted]rmfire-or.com
CHARLIE Phenix	EMB	654-5075	cphenix@budget.net
JEFF WHEATON	JoCo. PUBLIC WORKS	474-5460	jwheaton@co.josephine.or.us
Travis Robbins	City of Cave Junction	592-2156	cityofcjsdc@cavenet.com
Terry Haugen	City of GP Public Works	471-2650	thaugen@grantspassoregon.gov
RICK DRYER	ODF	474-3152	rick.dryer@odf.state.or.us
JIM GONZALES	BLM	618-2315	jim_gonzales@blm.gov
Sara Rubert	JoCo Sher. S.C	474-5301	
NEIL BENSON	JO CO. FIRE PLAN	482-4682	n.benson@jcfnet.org
TIM WOLF	" "	324-3446	timwolf@gmail.com

Josephine County
2011 NHMP Plan Update

Plan Implementation & Maintenance Work Session

April 13, 2011

Workshop Agenda

- Old Business
  - Revisit Goals
  - Action Item Review
- New Business
  - Prioritize, Implement, Administer
  - Benefit Cost Analysis
  - Monitor, Evaluate, Update
  - Implementation Through Existing plans
  - Continued Public Involvement
  - Final Plan Preparation/Crosswalk
  - FEMA Approval Process & Adoption
  - Funding Opportunities

Revisit: Goals

- City will include county goals
- Suggested change:
  - Modify Goal 1
  - Add a Goal 6

Revisit: Goals

Plan Goal 1: Prevent or reduce losses to life, private property, ~~public infrastructure~~ and natural resources resulting from natural hazards.

Plan Goal 2: Increase public awareness for the importance and benefits of preparing for and mitigating natural hazard impacts.

Plan Goal 3: Increase the level of personal responsibility and accountability among Josephine County citizens to mitigate the impacts of natural hazards.

Plan Goal 4: Support the diversification, expansion and stabilization of local and regional economies by preventing or reducing business losses resulting from natural hazards.

Plan Goal 5: Increase the amount of federal, state and local funding sources dedicated to implementing affordable multi-objective natural hazard mitigation strategies.

Revisit: Goals

Existing:

Prevent or reduce losses to life, private property, ~~public infrastructure~~, and natural resources resulting from natural hazards

New:

Prevent or reduce the disruption to essential public infrastructure and services resulting from natural hazards

Revisit: Actions

- Implementation
- Coordinating Organization
  - Get OK from all leads
  - More information on #1.4, 1.7, 3.5
- Partners

Plan Implementation & Maintenance

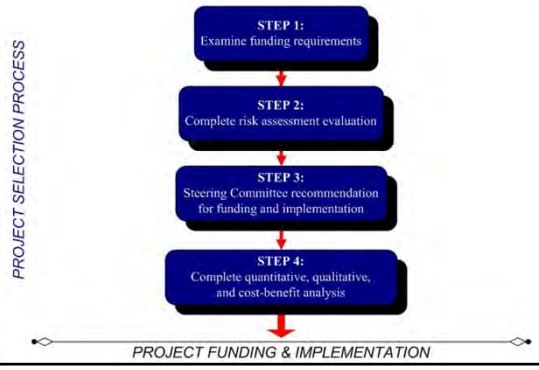
- Project Prioritization
- Implementing the Plan
- Plan Maintenance
- Public Involvement & Participation
- Five Year Review

Prioritize, Implement, and Administer Actions

Requirement: §201.6(c)(3) (iii):

- o [The mitigation strategy section **shall** include] an action plan describing how the actions… will be prioritized, implemented, and administered by the local jurisdiction.
- o Prioritization **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.

Action Item and Project Review Process



Benefit-Cost Analysis

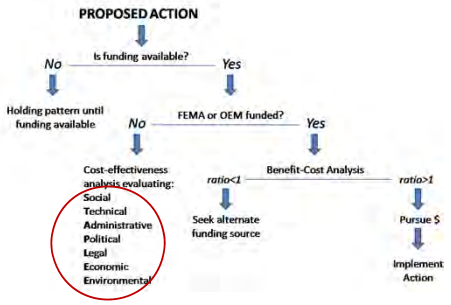
Requirement: §201.6(c)(3) (iii):

- When prioritizing mitigation actions, local jurisdictions *shall* consider the **BENEFITS** that would result from the mitigation actions **VERSUS THE COSTS** of those actions.

Note that the regulation does not require plans to include a benefit cost analysis for projects.

Cost Effective Projects

Cost Effective Projects



Factors to Consider During BCA

- Total project cost
- Life of the project
- Maintenance costs
- Displacement costs
- Value at risk and potential economic loss
- Specific, documented past damages
- The hazard:
  - frequency and severity/magnitude
- Level of protection provided

Benefit-Cost Analysis

Lakewiew high school and elementary school

$4 million in total benefits, with retrofit costs of $987,800

Building	Benefits	Costs	BCR
High School	$3,662,644	$589,700	6.211
Fremont	$323,096	$398,100	0.812
Total	**$3,985,740**	**$987,800**	**4.035**

OREGON SEISMIC REHABILITATION GRANT PROGRAM

Application from Lake County School District #7

EXECUTIVE SUMMARY

Monitor, Evaluate, Update

Requirement §201.6(c)(4)(i):

[The plan maintenance process **shall** include a section describing the] method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

- Ongoing review
  - Sections v. entire NHMP
  - Catalogue successes as they happen
  - Connect with other processes

Monitor, Evaluate, Update

Coordinating Body

Convener

Semi-Annual Meetings & Five Year Update

Monitor, Evaluate, Update

- Convener:
  - Josephine County Emergency Management
- Coordinating Body
  - Emergency Management Board
  - Quarterly / Semi-Annual Mitigation Agenda
    - Extend invitation to coordinating groups, partners
- Annual report
  - Successes
  - Updated sections

Mitigation Plan Update Toolkit

Question	*Yes*	*No*	*Plan Update Action*
Is the planning process description still relevant?			Modify this section to include a description of the plan update process. Document how the planning team reviewed and analyzed each section of the plan, and whether each section was revised as part of the update process. (This toolkit will help you do that).
Do you have a public involvement strategy for the plan update process?			Decide how the public will be involved in the plan update process. Allow the public an opportunity to comment on the plan process and prior to plan approval.
Have public involvement activities taken place since the plan was adopted?			Document activities in the "planning process" section of the plan update
Are there new hazards that should be addressed?			Add new hazards to the risk assessment section
Have there been hazard events in the community since the plan was adopted?			Document hazard history in the risk assessment section
Have new studies or previous events identified changes in any hazard's location or extent?			Document changes in location and extent in the risk assessment section
Has vulnerability to any hazard changed?			Document changes in vulnerability in the risk assessment section
Have development patterns changed? Is there more development in hazard prone areas?			
Do future annexations include hazard prone areas?			
Are there new high risk populations?			
Are there completed mitigation actions that have decreased overall vulnerability?			

Implementation Through Existing Plans

Requirement §201.6(c)(4) (ii):

[The plan shall include a] process by which local governments ***incorporate the requirements of the mitigation plan into other planning mechanisms*** such as comprehensive or capital improvement plans, when appropriate…

Implementation Through Existing Plans

For NHMP update

- In the last 5 years:
  - The updated plan *must* explain how the local government incorporated the mitigation plan into other planning mechanisms, when appropriate, as a ***demonstration of progress*** in local mitigation efforts.
- In the next 5 years:
  - The update plan *shall* ***continue to describe how information in the mitigation plan will be integrated into other planning mechanism***.

Implementation Through Existing Plans

- Examples
  - Cross listing public infrastructure upgrades in mitigation plan and capital improvement plan
  - Updating development application review process to include mitigation aspects (wildfire issues – access, water supply, etc…)
  - Goal 7 Requirement: Local governments shall adopt comprehensive plans (inventories, policies and implementing measures) to reduce risk to people and property from natural hazards.

Implementation Through Existing Plans

In JoCo, how has mitigation been incorporated?

- Land Use
  - Ord 2006-1, regarding setbacks and site plan review required in floodways and riparian corridor, and if erosion or wildfire concerns exist.
  - 2005 Comp Plan update included an expanded Flood Hazard Overlay section, clarity on
- Integrated Fire Plan:
  - 2009 Updated risk assessment, Annual Reports, outreach
- Capital Improvements?
- Budgeting?
- Other?

Implementation Through Existing Plans

Name	Date of Last Revision	Author/Owner	Description	Relation to Natural Hazard Mitigation
Harney County Comprehensive Plan	2002	Harney County Planning Department	"The Harney County Comprehensive Plan was developed for the purpose of providing a guide for the conservation of Harney County's land resources. It is a generalized long-range policy guide and decision-making tool, which will affect economic, social and physical development of Harney County.	The section "Natural Hazards - Limitations" discusses, among other things, floodplains, steep slopes, and earthquake hazards in addition to providing Natural Hazards and Limitations Policies. (Section 2.4)
Harney County Zoning Ordinance	Aug-02	Harney County Planning Department	There are several purposes including: "to serve with the subdivision ordinance as the primary implementation tools for the Harney County Comprehensive Plan. To encourage the most appropriate use and development of land."	Some of the zoning regulations may relate to natural hazards in the area, and it helps facilitate implementation of the comprehensive plan, which is related to natural hazards. The Zoning ordinance contains regulations for development on steep slopes and floodplains, as well as provisions in the forest zone to reduce the risk for fire hazards. (Sections 4.070, 4.080, 3.060.8)
Harney County Subdivision and Partitioning Ordinance	2002	Harney County Planning Department	The subdivision ordinance is created for several reasons, including: "to aid in the implementation of the Comprehensive Plan, to assist in the implementation of the Oregon Statewide Land Use Goals and Guidelines;	The Subdivision and Partitioning Ordinance contains regulations for development in the floodplain and for fire protection if a potential fire hazard exists nearby. (Sections 206 and 303)

Continued Public Involvement

Requirement §201.6(c)(4) (iii):

[The plan maintenance process shall include a] discussion on ***how the community will continue public participation in the plan maintenance process.***

Continued Public Involvement

For NHMP update

- In the last 5 years:
  - Mitigation planning regulation requires that the plan ***discuss how the community was kept involved*** during the plan maintenance process ***over the previous five years***.
- In the next 5 years:
  - The updated plan shall describe how the community ***will involve the public during the plan maintenance process***

Continued Public Involvement

- Open house
- Copy of NHMP on county website, comment box
- Newspaper articles
- Continuing stakeholder interviews
- Publicly announcing steering committee meetings
- Copy of NHMP at local library
- Use existing newsletters (school/utility/elected)
- Coordinate with existing social service providers
- Displays for fairs or festivals
- Seasonal outreach

Continued Public Involvement

All completed plans will be posted to UO's Scholars Bank

Issue Date	Title	Author(s)
15-Feb-2006	Baker County : Community wildfire protection plan	Baker County (Or.)
Aug-2002	Balancing Act : Living with fire in the Applegate	Applegate Partnership; Shaffer, Sandy; Shipley, Jack; Coogle, Diana
2006	Benton County : Natural hazard mitigation plan	Benton County (Or.); Benton County (Or.). Emergency Management Dept.; Goettel & Associates, Inc.; Oregon Natural Hazards Workgroup
Sep-2002	Clackamas County : Natural hazard mitigation plan	Clackamas County (Or.); Clackamas County. Emergency Management Dept.; Resource Assistance for Rural Environments (University of Oregon); Oregon Natural Hazards Workgroup
13-Oct-2005	Clackamas County : Wildfire protection plan	Clackamas County (Or.)
3-Jan-2005	Columbia County : Natural hazard mitigation plan	Columbia County (Or.); Goettel, Kenneth A.; Goettel & Associates
27-Sep-2005	Coos County : Natural hazards mitigation plan	Coos County (Or.); Coos County (Or.). Emergency Management Dept.; Wolf Creek Design & Research; Diversified Safety Management
Jun-2005	Crook County : Natural hazard mitigation plan	Crook County (Or.); Crook County (Or.). Wildfire Protection Plan Committee
20-Jun-2005	Curry County : Natural hazards mitigation plan	Curry County (Or.); Diversified Safety Management; Wolf Creek Design & Research

Adoption by the Local Governing Body

- 44 CFR §201.4(c)(6) and §201.6(c)(5) :
  - Documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).
  - For multi-jurisdictional plans, (or in our case City Addendums) each jurisdiction requesting approval of the plan must document that it has been formally adopted.

Resolution not Ordinance

- The plan is to be adopted via resolutions which is an expression of a governing body's opinion, will, or intention (*e.g. strategic plan*) and can be legally binding or not.
  - Next step actions within the plan may require adoption via ordinance for example:
    - Floodplain updates
    - Wildland Urban Interface zoning actions

Ensuring Adoption

- You have already performed activities that will facilitate passage of the plan:
  - Recognizing the Committee
  - Garnering Stakeholder & Public Input
  - Communicating Information

Funding Opportunities

- Federal Hazard Mitigation Programs
  - Pre-Disaster Mitigation (PDM) Program
  - Hazard Mitigation Grant Program (HMGP)
  - Flood Mitigation Assistance (FMA) Program
  - Public Assistance (PA)
- Housing and Urban Development Programs
  - Community Development Block Grants (CDBG)
- Small Business Administration
  - Disaster Loans

Funding Opportunities

- Economic Development Administration
  - Public Works Program
  - Economic Adjustment Program
  - Brownfield Economic Development Initiative
- Internal Revenue Services
  - Energy Efficiency Tax Credits
- Local Initiatives Support Corporation
- Private Foundations – Directory of Workforce Grant Opportunities – www.dol.gov/cfbci/DFWGO.pdf

Federal Hazard Mitigation Programs

City of Oregon City Mountainview Reservoir

Seismic retrofit of 100-year old reservoir in Oregon City

$910,000 total project cost

PDM funded $682,500

Cost-Effective-$7.5 million replacement cost

Federal Hazard Mitigation Programs

Home elevation
Tillamook, 1999

Funded through Flood Mitigation Assistance Program

Gabriel home relocation
Keizer, August 2000

Funded through Hazard Mitigation Grant Program

For More Information

- *Hazard Mitigation Assistance Unified Guidance FY10* (www.fema.gov)
- Oregon Emergency Management
  - Dennis Sigrist, dsigrist@oem.state.or.us

State Programs

Oregon Watershed Enhancement Board (OWEB)

- Focus on salmon and watershed restoration and improving water quality statewide
- Improvement projects can also reduce flood or landslide hazards

- God's Valley culvert replacements along God's Valley Road, Tillamook County
- $185,154 OWEB grant, $255,000 project
- Replaced 6 culverts

Local Funding Sources

- General Fund
- Capital Improvement Plans
- Partnerships with private sector

Next Steps

1) OPDR Draft Plan
2) EM Board Review
3) Public Comment
4) Final edits to NHMP
5) Submit NHMP for BOCC adoption
6) Submit NHMP for FEMA approval
7) Apply for grants!

Questions?

Jenny Zeltvay, Josephine County Emergency Management
jlzelvay@co.josephine.or.us, 541.474.5300

Emma Stocker, Emergency Management Specialist
estocker@uoregon.edu, 541.346.8213

Josh Bruce, Assistant Director of OPDR
jdbruce@uoregon.edu, 541.346.7326

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Josephine County NHMP Update Process
City Plans - Strategy Meeting
Grants Pass and Cave Junction
January 11, 2011

Objective: Clarify the strategy for accomplishing the city plans

- **Introductions / Background**
- **Review the planning strategy for Grants Pass and Cave Junction**
- **Meeting schedule**
- **County / City Risk Assessment**
- **Public engagement for review and outreach strategy**
- **Next Steps**

Meeting: Grants Pass NHMP
Date: February 9th, 2011
Time: 10:00 am – 12:00 pm
Location: Hillcrest Fire Station (199 NW Hillcrest)

AGENDA

1. Welcome & Introductions

2. Overview of the Natural Hazard Mitigation Planning Process

3. Risk Assessment
    - County Progress
    - City Specific Risk

4. Public Outreach and Involvement
    - Identify audience

5. Mitigation Actions
    - Purpose of Mitigation Action list
    - County Progress
    - Indentify preliminary City-specific actions

Oregon Partnership for Disaster Resilience
Community Service Center • 1209 University of Oregon
Eugene • Oregon • 97403-1209
Phone: 541.346.2305 • Fax: 541.346.2040

Welcome !

Grants Pass

Natural Hazard Mitigation Plan

February 9, 2010

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CSC Community Service Center

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OREGON emergency management

FEMA

Work Session Agenda

Risk Assessment

- Review and update probability/vulnerability scores
- Identify and discuss specific vulnerabilities

Outreach

- Identify Stakeholders

Mitigation Actions

- Identify City specific actions

Project Goal

To develop the Grants Pass Natural Hazard Mitigation Plan (NHMP) that will be an addendum to the updated Josephine County NHMP.

The KEY is the Process

"Natural hazard mitigation planning is the **process** of figuring out how to reduce or eliminate the loss of life and property damage resulting from natural hazards such as floods, earthquakes, and tornadoes."

SOURCE: FEMA STATE AND LOCAL MITIGATION PLANNING how-to guide: **Understanding Your Risks**

What is a Risk Assessment?

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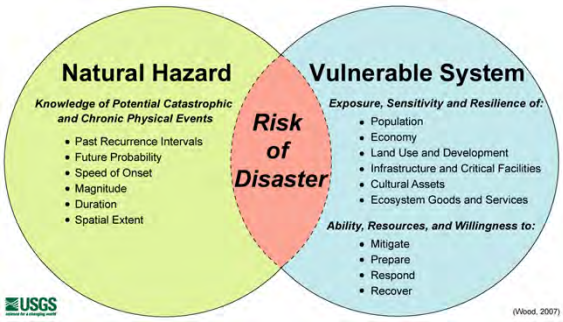
How We Look at Risk



Multi-Hazard Mitigation Planning

- A thoughtful risk assessment provides:
  - The foundation for effective mitigation strategies & community partnerships
  - Basis of strong project & grant application development
  - Coordination among multiple entities & priorities
- Resources Used More Efficiently & Effectively

Source: Federal Emergency Management Agency

Understanding Risk

Community-wide hazard identification

Risk analysis

Community-wide vulnerability assessment

Level 1: Hazard Identification

Community-wide hazard identification

Risk analysis

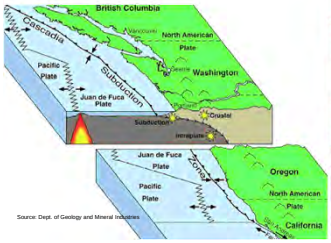
Community-wide vulnerability assessment

Process of estimating the geographic extent of the hazard, its intensity, and its probability of occurrence.

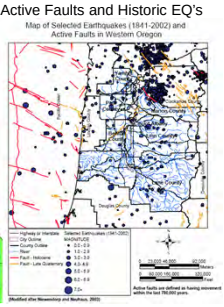
What are Hazard Sources?

Earthquake Sources in the Northwest

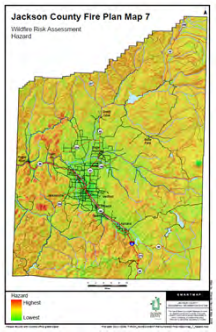
- Subduction Zone (Cascadia)
- Intraplate (Nisqually 2001)
- Crustal (Scotts Mills 1993)



Active Faults and Historic EQ's



Example Hazard ID



LEVEL 2: Vulnerability Assessment

Community-wide hazard identification

Risk analysis

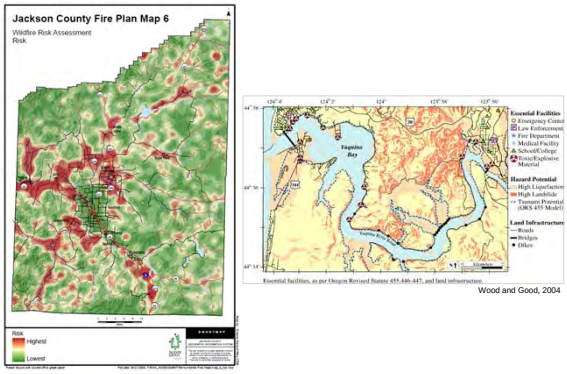
Community-wide vulnerability assessment

Combines information from the hazard identification with an inventory of the existing (or planned) property and population exposed to a hazard.

Examples of Vulnerability Information

- **Demographics:** Population, Employment, Housing
- **Building Stock:** Residential, Commercial, Industrial
- **Essential Facilities:** Hospitals, Schools, Police Stations, Fire Stations
- **Transportation:** Highways, Bridges, Railways, Tunnels, Airports, Ports and Harbors, Ferry Facilities
- **Utilities:** Waste Water, Potable Water, Oil, Gas, Electric Power, Communication Facilities
- **High Potential Loss Facilities:** Dams and Levees, Nuclear Facilities, Hazardous Material Sites, Military Installations

SOURCE: FEMA HAZUS Overview



Wood and Good, 2004

LEVEL 3: Risk Analysis

Community-wide hazard identification

Risk analysis

Community-wide vulnerability assessment

Involves estimating the damage, injuries, and costs likely to be experienced in a geographic area over a period of time. Risk has two measurable components: 1) the magnitude of the harm that may result, defined through vulnerability assessment; and 2) the likelihood or probability of the harm occurring.

Risk Assessment

Hazard ID

- Causes & Characteristics
- Hazard History
- Probability Assessments
- Location and Extent

Vulnerability Assessment

- Description of impacts to local community
- Assessment of hazard impacts on:
  - Population
  - Economy
  - Land Use & Development
  - Environment
  - Critical Facilities & Infrastructure

Risk Assessment Exercise

Concept:

Certain human and environmental conditions make a community more susceptible to losses

Exercise:

How does hazard risk incurred by the critical systems in Grants Pass (infrastructure, population, economy) ***differ*** from the hazard risk to the county overall?

Outreach & Public Involvement

Your plan SHALL include opportunities for*…

✔ Neighboring communities, agencies, businesses, private / non-profit, etc

- The public to comment on the plan during the drafting stage prior to plan approval

*44 CFR, Section 201.6

Outreach & Public Involvement

Example Outreach Options:

- Web Based Survey
  - Post to websites
- Press Release
  - Existing Newsletters
- Targeted outreach
  - Survey
  - Review of parts / all

Tasks:

- Choose Strategy / Strategies
  - Medium
  - Content
- Identify Audience
- Set Timeline

Coordination with County Outreach

Mitigation Plan Actions

Your plan SHALL*…

- Identify and analyze a **comprehensive range** of specific mitigation actions and projects for each hazard
- Identify actions and projects that reduce the effects of hazards on **new** buildings and infrastructure
- Identify actions and projects that reduce the effects of hazards on **existing** buildings and infrastructure?

Also: Repetitive Flood Loss and NFIP Compliance

*44 CFR, Section 201.6

Where Do Actions Come From?

Steering Committee Work Session

Stakeholder Surveys

Local Records, Plans, Policies and Reports

Statewide Risk Assessments

Potential Action Item Pool

Finalized Action Items

Types of Mitigation Actions

Prevention

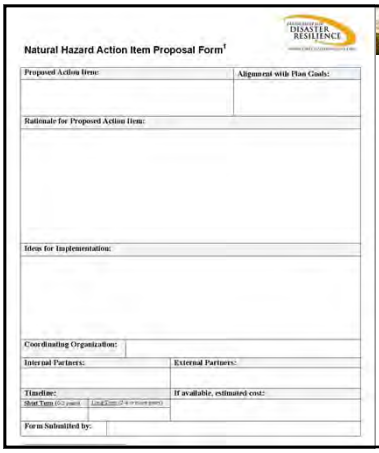
Emergency Services

Property Protection

Structural Projects

Public Education and Awareness

Natural Resource Protection



Natural Hazard Action Item Proposal Form[1]

Proposed Action Item:	Alignment with Plan Goals:
Rationale for Proposed Action Item:	
Ideas for Implementation:	
Coordinating Organization:	
Internal Partners:	External Partners:
Timeline:	If available, estimated cost:
Short Term (0-5 years) / Long Term (5 or more years)	
Form Submitted by:	

- Detailed
- Recommendations
- County owned
- Reduce risk

Action Item Review & Update

- **Was it accomplished? Was progress made?**
  - No judgment, just documenting the last 5 years
  - Yes: Who, what, were, when?
  - No: Why not?
- **Is it still relevant?**
  - Address Risk and Vulnerability
  - Coordinating Body (who will do the work?)
  - Timeline
  - Action-Oriented?
- **What is missing?**

Meeting Sign-In

Grants Pass Risk Assessment Meeting. February 9, 2011

Name	Representing	Email	Roundtrip mileage (if applicable)
Lance Holder	Holder Homes	Holderhomes@Bogef.net	
STEVE SCRIVNER	City of Grants Pass Public Works	SScrivner @ grantspassoregon.gov	
Steve Dahl	City Economic Development	sDahl@grantspassoregon.gov	
ROBERT CALLAWAY	ASANTE THREE RIVERS COMM HOSP	RCALLAWAY@ASANTE.ORG	
BOB C HAMBLIN	CITY OF GP WATER & SEWER	BHAMBLIN @ GRANTSPASSOREGON.GOV	
Terry Haugen	City of Grants Pass	thaugen@grantspassoregon.gov	
Alicia Robe	Stream Restoration Alliance of the Middle Rogue	Alicia@SRAMiddleRogue.org	
LANG JOHNSON	CITY OF GRANTS PASS	LJohnson@GRANTSPASSOREGON.GOV	

Meeting Sign-In

Grant Pass Risk Assessment Meeting. February 9, 2011

Name	Representing	Email	Roundtrip mileage (if applicable)
Jenny Zeltvay	Jo Co Emergency Management	JZeltvay@co.Josephine.or.us	

Welcome !

Grants Pass

Natural Hazard Mitigation
Action Item Meeting

March 16, 2011

PARTNERSHIP FOR DISASTER RESILIENCE
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CSC Community Service Center

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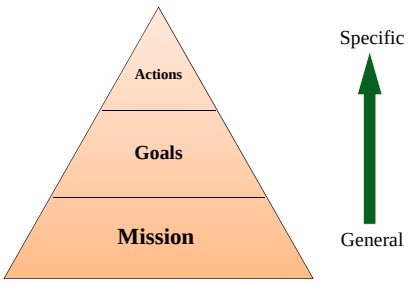
Workshop Overview

- Mission & Goals
- Action Item Overview
- Action Item Review /Update
- Action Item Development
- Conclusion & Next Steps

Mission, Goals and Actions



Mission & Goals

The Rule (*44 CFR Section 201.6)* states that your plan SHALL…

Include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Mission Statement Overview

- A statement that describes the purpose of the plan
- Reflects a realistic determination of what the plan is, who it serves, what it does, and what it can accomplish

Example Mission:

- *To create a disaster resilient and sustainable city*

County Mission Statement

The mission of the Josephine County Natural Hazard Mitigation Plan is to create a disaster resilient county

Mitigation Plan Goals

- Describe the outcomes to be produced
- Goals drive actions

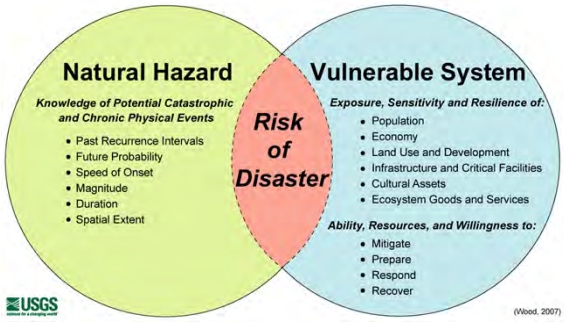
Examples from State NHMP:

- *Protect life and reduce injuries resulting from natural hazards*
- *Minimize public and private property damages and the disruption of essential infrastructure and services from natural hazards*
- *Increase the resilience of local, regional, and statewide economies*
- *Minimize the impact of natural hazards while protecting and restoring the environment*
- *Enhance and maintain state capability to implement a comprehensive statewide hazard loss reduction strategy*
- *Document and evaluate Oregon's progress in achieving hazard mitigation*

Current County Goals

- Prevent or reduce losses to life, private property, public infrastructure and natural resources resulting from natural hazards.
- Increase public awareness for the importance and benefits of preparing for and mitigating natural hazard impacts.
- Increase the level of personal responsibility and accountability among Josephine County citizens to mitigate the impacts of natural hazards.
- Support the diversification, expansion and stabilization of local and regional economies by preventing or reducing business losses resulting from natural hazards.
- Increase the amount of federal, state and local funding sources dedicated to implementing affordable multi-objective natural hazard mitigation strategies.

Mitigation Plan Actions



Mitigation Plan Actions

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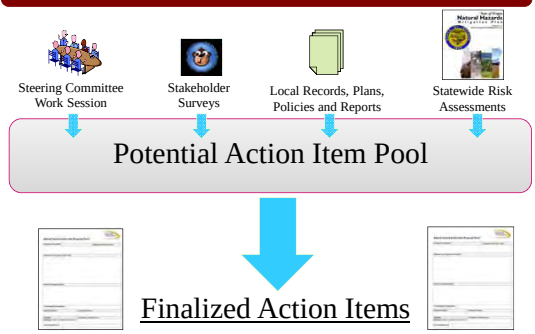
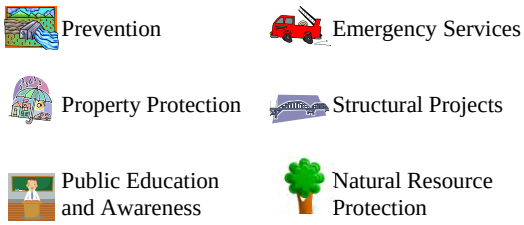
Also: Repetitive Flood Loss and NFIP Compliance

*44 CFR, Section 201.6

Where Do Actions Come From?



Types of Mitigation Actions



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Ideas for Implementation:	
Coordinating Organization:	
Internal Partners:	External Partners:
Timeline:	If available, estimated cost:
Short Term (0-2 years)	
Form Submitted by:	

- Detailed
- Recommendations
- County owned
- Reduce risk

Action Item Review

- **Review Action Item Forms**
  - Specific: measurable and achievable
  - Who is the lead? Who are partners?
- **What is missing?**

Outreach & Public Involvement

Your plan SHALL include opportunities for*…

✔ Neighboring communities, agencies, businesses, private / non-profit, etc

- The public to comment on the plan during the drafting stage prior to plan approval
  - DRAFT plan will get posted in May

*44 CFR, Section 201.6

Next Steps: Implementation

- Complete additional action item forms
- Add Implementation Ideas
  - Details, Details, Details!
  - Implementation through existing plans?
    - E.g., Capital Improvements Plans, Zoning and/or Development Codes, Watershed Management Plans, etc.

Next Steps: Final Meeting

- Identify plan "convener" and future public involvement strategies
- Discuss partnership opportunities
- Discuss mitigation grant programs & others
- Create final draft of mitigation plan

Natural Hazard Mitigation Mtg.

Sign In Sheet - March 16, 2011

1) Carla Angeli Paladino - City of GP - Planning Division
2) Terry Haugen
3) [illegible]
4) James Lowe - School Dist #7
5) Dan Shepard GPID
6) LANG JOHNSON
7) Jenny Zeltvay - JO CO EM
8) ROBERT CALLAWAY TRCM
9) KEN SANDLIN CITY OF GP
10) BOB L HAMBLIN CITY OF GP WATER & SEWER
11) Steve Dahl Econ. Dev
12) Steve Scrivner City Streets
13)
14)
15)

Grants Pass
2011 NHMP Plan

Plan Implementation & Maintenance Work Session

April 13, 2011

Workshop Agenda

- Old Business
  - Revisit Goals
  - Action Item Review
- New Business
  - Prioritize, Implement, Administer
  - Monitor, Evaluate, Update
  - Implementation Through Existing plans
  - FEMA Approval Process & Adoption
  - Continued Public Involvement
  - Benefit Cost Analysis
  - Funding Opportunities

Revisit: Goals

- City will include county goals
- Suggested change:
  - Modify Goal 1
  - Add a Goal 6
- County will consider the revision today

Revisit: Goals

Existing:

Prevent or reduce losses to life, private property, ~~public infrastructure~~, and natural resources resulting from natural hazards

New:

Prevent or reduce the disruption to essential public infrastructure and services resulting from natural hazards

Revisit: Actions

Continue Work Session on Mitigation Actions

Plan Implementation & Maintenance

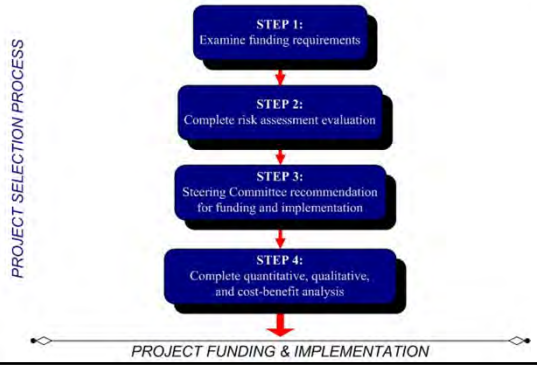
- Project Prioritization
- Implementing the Plan
- Plan Maintenance
- Public Involvement & Participation
- Five Year Review

Prioritize, Implement, and Administer Actions

Requirement: §201.6(c)(3) (iii):

- [The mitigation strategy section **shall** include] an action plan describing how the actions… will be prioritized, implemented, and administered by the local jurisdiction.
- Prioritization **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.

Action Item and Project Review Process



Monitor, Evaluate, Update

Requirement §201.6(c)(4)(i):

[The plan maintenance process **shall** include a section describing the] method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

- Ongoing review
  - Sections v. entire NHMP
  - Catalogue successes as they happen
  - Connect with other processes

Monitor, Evaluate, Update

Coordinating Body

Convener

Semi-Annual Meetings &
Five Year Update

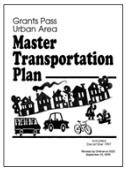
Monitor, Evaluate, Update

- Convener
  - GP City Manager? Public Safety?
- Coordinating Body
  - Establish a GP Emergency Management Board? NHMP Committee?
  - Quarterly / Semi-Annual Mitigation Agenda
- Annual report
  - Successes
  - Updated sections

Implementation Through Existing Plans

Requirement §201.6(c)(4) (ii):

[The plan shall include a] process by which local governments ***incorporate the requirements of the mitigation plan into other planning mechanisms*** such as comprehensive or capital improvement plans, when appropriate…



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Name	Date of Last Revision	Author/Owner	Description	Relation to Natural Hazard Mitigation
Harney County Comprehensive Plan	2002	Harney County Planning Department	"The Harney County Comprehensive Plan was developed for the purpose of providing a guide for the conservation of Harney County's land resources. It is a generalized long-range policy guide and decision-making tool, which will affect economic, social and physical development of Harney County.	The section "Natural Hazards - Limitations" discusses, among other things, floodplains, steep slopes, and earthquake hazards in addition to providing Natural Hazards and Limitations Policies. (Section 2.4)
Harney County Zoning Ordinance	Aug-02	Harney County Planning Department	There are several purposes including: "to serve with the subdivision ordinance as the primary implementation tools for the Harney County Comprehensive Plan, ...to encourage the most appropriate use and development of land."	Some of the zoning regulations may relate to natural hazards in the area, and it helps facilitate implementation of the comprehensive plan, which is related to natural hazards. The Zoning ordinance contains regulations for development on steep slopes and floodplains, as well as provisions in the forest zone to reduce the risk for fire hazards. (Sections 4.070, 4.080, 3.080)
Harney County Subdivision and Partitioning Ordinance	2002	Harney County Planning Department	The subdivision ordinance is created for several reasons, including: "to aid in the implementation of the Comprehensive Plan, to assist in the implementation of the Oregon Statewide Land Use Goals and Guidelines.	The Subdivision and Partitioning Ordinance contains regulations for development in the floodplain and for fire protection if a potential fire hazard exists nearby. (Sections 206 and 303)

Adoption by the Local Governing Body

- 44 CFR §201.4(c)(6) and §201.6(c)(5) :
  - Documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).
  - For multi-jurisdictional plans, (or in our case City Addendums) each jurisdiction requesting approval of the plan must document that it has been formally adopted.

Resolution not Ordinance

- The plan is to be adopted via resolutions which is an expression of a governing body's opinion, will, or intention (*e.g. strategic plan*) and can be legally binding or not.
  - Next step actions within the plan may require adoption via ordinance for example:
    - Floodplain updates
    - Wildland Urban Interface zoning actions

Ensuring Adoption

- You have already performed activities that will facilitate passage of the plan:
  - Recognizing the Committee
  - Garnering Stakeholder & Public Input
  - Communicating Information

Continued Public Involvement

Requirement §201.6(c)(4) (iii):

[The plan maintenance process shall include a] discussion on ***how the community will continue public participation in the plan maintenance process.***

Continued Public Involvement

For NHMP update

- In the last 5 years:
  - Mitigation planning regulation requires that the plan ***discuss how the community was kept involved*** during the plan maintenance process ***over the previous five years***.
- In the next 5 years:
  - The updated plan shall describe how the community ***will involve the public during the plan maintenance process***

Continued Public Involvement

- Open house
- Copy of NHMP on county website, comment box
- Newspaper articles
- Continuing stakeholder interviews
- Publicly announcing steering committee meetings
- Copy of NHMP at local library
- Use existing newsletters (school/utility/elected)
- Coordinate with existing social service providers
- Displays for fairs or festivals
- Seasonal outreach

Continued Public Involvement

All completed plans will be posted to UO's Scholars Bank

Issue Date	Title	Author(s)
15-Feb-2006	Baker County : Community wildfire protection plan	Baker County (Or.)
Aug-2002	Balancing Act : Living with fire in the Applegate	Applegate Partnership; Shaffer, Sandy; Shipley, Jack; Coogle, Diana
2006	Benton County : Natural hazard mitigation plan	Benton County (Or.); Benton County (Or.). Emergency Management Dept.; Goettel & Associates, Inc.; Oregon Natural Hazards Workgroup
Sep-2002	Clackamas County : Natural hazard mitigation plan	Clackamas County (Or.); Clackamas County. Emergency Management Dept.; Resource Assistance for Rural Environments (University of Oregon); Oregon Natural Hazards Workgroup
13-Oct-2005	Clackamas County : Wildfire protection plan	Clackamas County (Or.)
3-Jan-2005	Columbia County : Natural hazard mitigation plan	Columbia County (Or.); Goettel, Kenneth A.; Goettel & Associates
27-Sep-2005	Coos County : Natural hazards mitigation plan	Coos County (Or.); Coos County (Or.). Emergency Management Dept.; Wolf Creek Design & Research; Diversified Safety Management
Jun-2005	Crook County : Natural hazard mitigation plan	Crook County (Or.); Crook County (Or.). Wildfire Protection Plan Committee
20-Jun-2005	Curry County : Natural hazards mitigation plan	Curry County (Or.); Diversified Safety Management; Wolf Creek Design & Research

Benefit-Cost Analysis

Requirement: §201.6(c)(3) (iii):

- When prioritizing mitigation actions, local jurisdictions *shall* consider the **BENEFITS** that would result from the mitigation actions **VERSUS THE COSTS** of those actions.

Note that the regulation does not require plans to include a benefit cost analysis for projects.

Cost Effective Projects

Factors to Consider During BCA

- Total project cost
- Life of the project
- Maintenance costs
- Displacement costs
- Value at risk and potential economic loss
- Specific, documented past damages
- The hazard:
  - frequency and severity/magnitude
- Level of protection provided

Funding Opportunities

- Federal Hazard Mitigation Programs
  - Pre-Disaster Mitigation (PDM) Program
  - Hazard Mitigation Grant Program (HMGP)
  - Flood Mitigation Assistance (FMA) Program
  - Public Assistance (PA)
- Housing and Urban Development Programs
  - Community Development Block Grants (CDBG)
- Small Business Administration
  - Disaster Loans

Funding Opportunities

- Economic Development Administration
  - Public Works Program
  - Economic Adjustment Program
  - Brownfield Economic Development Initiative
- Internal Revenue Services
  - Energy Efficiency Tax Credits
- Local Initiatives Support Corporation
- Private Foundations – Directory of Workforce Grant Opportunities – www.dol.gov/cfbci/DFWGO.pdf

Federal Hazard Mitigation Programs

City of Oregon City Mountainview Reservoir

Seismic retrofit of 100-year old reservoir in Oregon City

$910,000 total project cost

PDM funded $682,500

Cost-Effective-$7.5 million replacement cost

Federal Hazard Mitigation Programs

Home elevation
Tillamook, 1999

Funded through Flood Mitigation Assistance Program

Gabriel home relocation
Keizer, August 2000

Funded through Hazard Mitigation Grant Program

For More Information

- *Hazard Mitigation Assistance Unified Guidance FY10* (www.fema.gov)
- Oregon Emergency Management
  - Dennis Sigrist, dsigrist@oem.state.or.us

State Programs

Oregon Watershed Enhancement Board (OWEB)

- Focus on salmon and watershed restoration and improving water quality statewide
- Improvement projects can also reduce flood or landslide hazards

- God's Valley culvert replacements along God's Valley Road, Tillamook County
- $185,154 OWEB grant, $255,000 project
- Replaced 6 culverts

Local Funding Sources

- Capital Improvement Plans
- General Fund
- Partnerships with private sector

Next Steps

1) OPDR draft plan
2) Grants Pass NHMP Committee review
3) Public comment
4) Final edits to NHMP
5) Submit NHMP for BOCC adoption
6) Submit NHMP for FEMA approval
7) Apply for grants!

Questions?

Terry Haugen, Grants Pass Public Works Director
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Josh Bruce, Assistant Director of OPDR
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Natural Hazard Mitigation Meeting
City of GP Steering Committee
4/13/2011

Name	Representing
Terry Haugen	City of Grants Pass
LANG JOHNSON	City of G.P.
Carla Angeli Paladino	City of GP - Planning
ROBERT CALLAWAY	TRCM
STEVE SCRIBNER	City of GP - Public Works
BOB L HAMBLIN	CITY OF GRANTS PASS WATER & SEWER
DIAN Shepard	GPID
David Reeves	City of Grants Pass -

Meeting: Grants Pass NHMP
Date: July 28, 2011
Time: 1:00pm – 3:00pm

AGENDA

1. Welcome & Introductions

2. Review Grants Pass NHMP Addendum
    - Questions:
        i. Additional Critical Facilities
        ii. Complete list of community organizations
        iii. Fires that have directly impacted the city
        iv. Additional information for “success stories” / additional “success stories
        v. Update and Maintenance
        vi. Continued public participation

3. Action Item Review

4. NHMP adoption process

Oregon Partnership for Disaster Resilience
Community Service Center • 1209 University of Oregon
Eugene • Oregon • 97403-1209
Phone: 541.346.2305 • Fax: 541.346.2040

Meeting Sign-In

Grants Pass NHMP
July 28, 2011

Name	Representing	Email
Carla Angeli Paladino	City of Grants Pass - Community Development	cangeli@grantspassoregon.gov
STEVE SCRIVNER	City of G.P - Public Works -	sscrivner@ " "
Jenny Hall	JoCOEM	Jhall@co.josephine.or.us
James Lowe	G.P. District 7 schools	Jlowe@grantspass.k12.or.us
BOB HAMBLIN	CITY OF G P. WATER & SEWER PUBLIC WORKS	bhamblin@grantspassoregon.gov
Terry Haugen	City of Grants Pass Public Works	thaugen@grantspassoregon.gov
Steve Dahl	City of Grants Pass Economic Development	sDahl@grantspassoregon.gov
LANG JOHNSON	City of Grants Pass Public Safety	lJohnson@GrantsPassOregon.gov.

Meeting Sign-In

Grants Pass NHMP
July 28, 2011

Name	Representing	Email
David Reeves Emergency Management Coordinator	City of Grants Pass	dreeves@grantspassoregon.gov

JOSEPHINE COUNTY MULTI-JURISDICTIONAL
PRESS RELEASE

DATE: May 20, 2011
TO: Community Members of Josephine County
FROM: Josephine County, City of Cave Junction and City of Grants Pass
Natural Hazards Mitigation Plan (NHMP) Steering Committees, Oregon Partnership for Disaster Resilience

Does the Plan Work for You?

Josephine County, OR — Josephine County is developing a Natural Hazards Mitigation Plan (NHMP) online, and we want your input. Two sections of the NHMP are now available for your review and comment.

- Hazard Identification, History, and Risk Assessment: This section describes the hazards and potential impact on Josephine County.
- Mitigation Actions: This section documents specific ways that the county can reduce risk of disasters due to natural hazards.

To view the NHMP sections, visit http://csc.uoregon.edu/opdr/Josephine and click on the links provided under the "Plan Drafts" section.

You can submit questions and comments there by e-mailing Oregon Emergency Management Specialist Emma Stocker.

An NHMP provides communities with goals, actions, and resources to reduce the effects of potential natural disasters. The plan and the proposed mitigation actions therein are intended to limit damage to property and critical facilities and, consequently, reduce the costs of reconstruction and recovery. In addition, the plan increases our potential to receive state and federal funding for mitigation and recovery.

The planning process increases cooperation and communication within the community. This local process includes representatives from city government, local utility providers, the Interagency Fire Board, school districts and you.

This update of the NHMP is supported by the Oregon Partnership for Disaster Resilience, utilizing funds from the Federal Emergency Management Agency (FEMA)

Josephine County is an Affirmative Action/Equal Opportunity Employer and complies with Sec. 504 of the Rehabilitation Act of 1973.

Pre-Disaster Mitigation Grant Program.

Appendix C: Economic Analysis of Natural Hazard Mitigation Projects

This appendix was developed by the Oregon Partnership for Disaster Resilience at the University of Oregon's Community Service Center. It has been reviewed and accepted by the Federal Emergency Management Agency as a means of documenting how the prioritization of actions shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

The appendix outlines three approaches for conducting economic analyses of natural hazard mitigation projects. It describes the importance of implementing mitigation activities, different approaches to economic analysis of mitigation strategies, and methods to calculate costs and benefits associated with mitigation strategies. Information in this section is derived in part from: The Interagency Hazards Mitigation Team, *State Hazard Mitigation Plan*, (Oregon State Police – Office of Emergency Management, 2000), and Federal Emergency Management Agency Publication 331, *Report on Costs and Benefits of Natural Hazard Mitigation*. This section is not intended to provide a comprehensive description of benefit/cost analysis, nor is it intended to evaluate local projects. It is intended to (1) raise benefit/cost analysis as an important issue, and (2) provide some background on how economic analysis can be used to evaluate mitigation projects.

Why Evaluate Mitigation Strategies?

Mitigation activities reduce the cost of disasters by minimizing property damage, injuries, and the potential for loss of life, and by reducing emergency response costs, which would otherwise be incurred. Evaluating possible natural hazard mitigation activities provides decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Evaluating mitigation projects is a complex and difficult undertaking, which is influenced by many variables. First, natural disasters affect all segments of the communities they strike, including individuals, businesses, and public services such as fire, police, utilities, and schools. Second, while some of the direct and indirect costs of disaster damages are measurable, some of the costs are non-financial and difficult to quantify in dollars. Third, many of the impacts of such events produce "ripple-effects" throughout the community, greatly increasing the disaster's social and economic consequences.

While not easily accomplished, there is value, from a public policy perspective, in assessing the positive and negative impacts from mitigation activities, and obtaining an instructive benefit/cost comparison. Otherwise, the decision to pursue or not pursue various mitigation options would not be based on an objective understanding of the net benefit or loss associated with these actions.

What are some Economic Analysis Approaches for Evaluating Mitigation Strategies?

The approaches used to identify the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into three general categories: benefit/cost analysis, cost-effectiveness analysis and the STAPLE/E approach. The distinction between the three methods is outlined below:

Benefit/Cost Analysis

Benefit/cost analysis is a key mechanism used by the state Office of Emergency Management (OEM), the Federal Emergency Management Agency, and other state and federal agencies in evaluating hazard mitigation projects, and is required by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended.

Benefit/cost analysis is used in natural hazards mitigation to show if the benefits to life and property protected through mitigation efforts exceed the cost of the mitigation activity. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Benefit/cost analysis is based on calculating the frequency and severity of a hazard, avoiding future damages, and risk. In benefit/cost analysis, all costs and benefits are evaluated in terms of dollars, and a net benefit/cost ratio is computed to determine whether a project should be implemented. A project must have a benefit/cost ratio greater than 1 (i.e., the net benefits will exceed the net costs) to be eligible for FEMA funding.

Cost-Effectiveness Analysis

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. This type of analysis, however, does not necessarily measure costs and benefits in terms of dollars. Determining the economic feasibility of mitigating natural hazards can also be organized according to the perspective of those with an economic interest in the outcome. Hence, economic analysis approaches are covered for both public and private sectors as follows.

Investing in Public Sector Mitigation Activities

Evaluating mitigation strategies in the public sector is complicated because it involves estimating all of the economic benefits and costs regardless of who realizes them, and potentially to a large number of people and economic entities. Some benefits cannot be evaluated monetarily, but still affect the public in profound ways. Economists have developed methods to

evaluate the economic feasibility of public decisions which involve a diverse set of beneficiaries and non-market benefits.

Investing in Private Sector Mitigation Activities

Private sector mitigation projects may occur on the basis of one or two approaches: it may be mandated by a regulation or standard, or it may be economically justified on its own merits. A building or landowner, whether a private entity or a public agency, required to conform to a mandated standard may consider the following options:

1. Request cost sharing from public agencies;
2. Dispose of the building or land either by sale or demolition;
3. Change the designated use of the building or land and change the hazard mitigation compliance requirement; or
4. Evaluate the most feasible alternatives and initiate the most cost effective hazard mitigation alternative.

The sale of a building or land triggers another set of concerns. For example, real estate disclosure laws can be developed which require sellers of real property to disclose known defects and deficiencies in the property, including earthquake weaknesses and hazards to prospective purchases. Correcting deficiencies can be expensive and time consuming, but their existence can prevent the sale of the building. Conditions of a sale regarding the deficiencies and the price of the building can be negotiated between a buyer and seller.

STAPLE/E Approach

Considering detailed benefit/cost or cost-effectiveness analysis for every possible mitigation activity could be very time consuming and may not be practical. There are some alternate approaches for conducting a quick evaluation of the proposed mitigation activities which could be used to identify those mitigation activities that merit more detailed assessment. One of those methods is the STAPLE/E approach.

Using STAPLE/E criteria, mitigation activities can be evaluated quickly by steering committees in a synthetic fashion. This set of criteria requires the committee to assess the mitigation activities based on the Social, Technical, Administrative, Political, Legal, Economic and Environmental (STAPLE/E) constraints and opportunities of implementing the particular mitigation item in your community. The second chapter in FEMA's How-To Guide "Developing the Mitigation Plan – Identifying Mitigation Actions and Implementation Strategies" as well as the "State of Oregon's Local Natural Hazard Mitigation Plan: An Evaluation Process" outline some specific considerations in analyzing each aspect. The following are suggestions for how to examine each aspect of the STAPLE/E approach from the "State of Oregon's Local Natural Hazard Mitigation Plan: An Evaluation Process."

Social: Community development staff, local non-profit organizations, or a local planning board can help answer these questions.

- Is the proposed action socially acceptable to the community?
- Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- Will the action cause social disruption?

Technical: The city or county public works staff, and building department staff can help answer these questions.

- Will the proposed action work?
- Will it create more problems than it solves?
- Does it solve a problem or only a symptom?
- Is it the most useful action in light of other community goals?

Administrative: Elected officials or the city or county administrator, can help answer these questions.

- Can the community implement the action?
- Is there someone to coordinate and lead the effort?
- Is there sufficient funding, staff, and technical support available?
- Are there ongoing administrative requirements that need to be met?

Political: Consult the mayor, city council or city board of commissioners, city or county administrator, and local planning commissions to help answer these questions.

- Is the action politically acceptable?
- Is there public support both to implement and to maintain the project?

Legal: Include legal counsel, land use planners, risk managers, and city council or county planning commission members, among others, in this discussion.

- Is the community authorized to implement the proposed action? Is there a clear legal basis or precedent for this activity?
- Are there legal side effects? Could the activity be construed as a taking?
- Is the proposed action allowed by the comprehensive plan, or must the comprehensive plan be amended to allow the proposed action?
- Will the community be liable for action or lack of action?
- Will the activity be challenged?

Economic: Community economic development staff, civil engineers, building department staff, and the assessor's office can help answer these questions.

- What are the costs and benefits of this action?
- Do the benefits exceed the costs?

- Are initial, maintenance, and administrative costs taken into account?
- Has funding been secured for the proposed action? If not, what are the potential funding sources (public, non-profit, and private?)
- How will this action affect the fiscal capability of the community?
- What burden will this action place on the tax base or local economy?
- What are the budget and revenue effects of this activity?
- Does the action contribute to other community goals, such as capital improvements or economic development?
- What benefits will the action provide? (This can include dollar amount of damages prevented, number of homes protected, credit under the CRS, potential for funding under the HMGP or the FMA program, etc.)

Environmental: Watershed councils, environmental groups, land use planners and natural resource managers can help answer these questions.

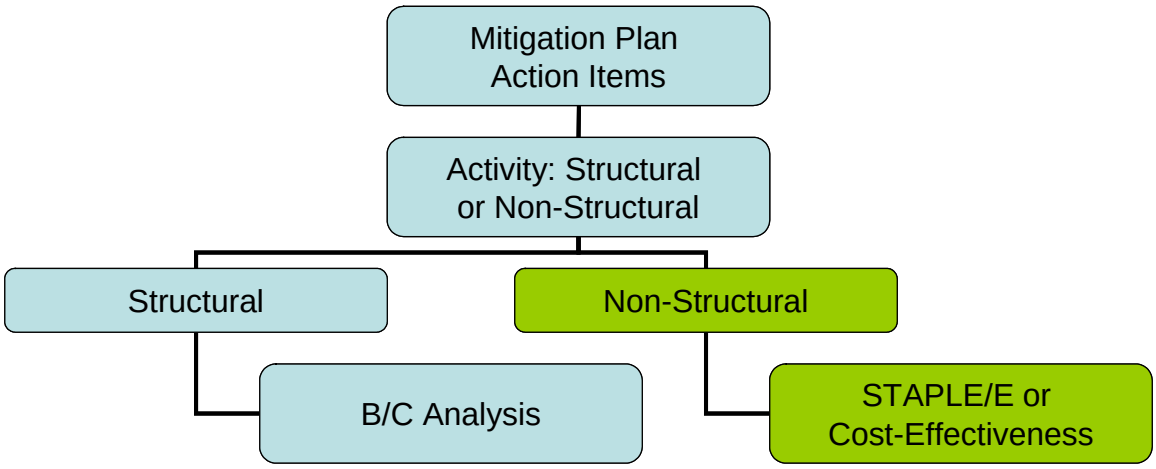
- How will the action impact the environment?
- Will the action need environmental regulatory approvals?
- Will it meet local and state regulatory requirements?
- Are endangered or threatened species likely to be affected?

The STAPLE/E approach is helpful for doing a quick analysis of mitigation projects. Most projects that seek federal funding and others often require more detailed benefit/cost analyses.

When to use the Various Approaches

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: Oregon Partnership for Disaster Resilience at the University of Oregon's Community Service Center, 2005

Implementing the Approaches

Benefit/cost analysis, cost-effectiveness analysis, and the STAPLE/E are important tools in evaluating whether or not to implement a mitigation activity. A framework for evaluating mitigation activities is outlined below. This framework should be used in further analyzing the feasibility of prioritized mitigation activities.

1. Identify the Activities

Activities for reducing risk from natural hazards can include structural projects to enhance disaster resistance, education and outreach, and acquisition or demolition of exposed properties, among others. Different mitigation projects can assist in minimizing risk to natural hazards, but do so at varying economic costs.

2. Calculate the Costs and Benefits

Choosing economic criteria is essential to systematically calculating costs and benefits of mitigation projects and selecting the most appropriate activities. Potential economic criteria to evaluate alternatives include:

- ***Determine the project cost***. This may include initial project development costs, and repair and operating costs of maintaining projects over time.
- ***Estimate the benefits***. Projecting the benefits, or cash flow resulting from a project can be difficult. Expected future returns from the mitigation effort depend on the correct specification of the risk and the effectiveness of the project, which may not be well known. Expected future costs depend on the physical durability and potential economic obsolescence of the investment. This is difficult to project. These considerations will also provide guidance in selecting an appropriate salvage value. Future tax structures and rates must be projected. Financing alternatives must be researched, and they may include retained earnings, bond and stock issues, and commercial loans.
- ***Consider costs and benefits to society and the environment***. These are not easily measured, but can be assessed through a variety of economic tools including existence value or contingent value theories. These theories provide quantitative data on the value people attribute to physical or social environments. Even without hard data, however, impacts of structural projects to the physical environment or to society should be considered when implementing mitigation projects.
- ***Determine the correct discount rate***. Determination of the discount rate can just be the risk-free cost of capital, but it may include the decision maker's time preference and also a risk premium. Including inflation should also be considered.

3. Analyze and Rank the Activities

Once costs and benefits have been quantified, economic analysis tools can rank the possible mitigation activities. Two methods for determining the best activities given varying costs and benefits include net present value and internal rate of return.

- ***Net present value***. Net present value is the value of the expected future returns of an investment minus the value of the expected future cost expressed in today's dollars. If the net present value is greater than the projected costs, the project may be determined feasible for implementation. Selecting the discount rate, and identifying the present and future costs and benefits of the project calculates the net present value of projects.
- ***Internal rate of return***. Using the internal rate of return method to evaluate mitigation projects provides the interest rate equivalent to the dollar returns expected from the project. Once the rate has been calculated, it can be compared to rates earned by investing in alternative projects. Projects may be feasible to implement when the internal rate of return is greater than the total costs of the project. Once the mitigation projects are ranked on the basis of economic criteria, decision-makers can consider other factors, such as risk, project effectiveness, and economic, environmental, and social returns in choosing the appropriate project for implementation.

Economic Returns of Natural Hazard Mitigation

The estimation of economic returns, which accrue to building or land owners as a result of natural hazard mitigation, is difficult. Owners evaluating the economic feasibility of mitigation should consider reductions in physical damages and financial losses. A partial list follows:

- Building damages avoided
- Content damages avoided
- Inventory damages avoided
- Rental income losses avoided
- Relocation and disruption expenses avoided
- Proprietor's income losses avoided

These parameters can be estimated using observed prices, costs, and engineering data. The difficult part is to correctly determine the effectiveness of the hazard mitigation project and the resulting reduction in damages and losses. Equally as difficult is assessing the probability that an event will occur. The damages and losses should only include those that will be borne by the owner. The salvage value of the investment can be important in determining economic feasibility. Salvage value becomes more important as the time horizon of the owner declines. This is important because most businesses depreciate assets over a period of time.

Additional Costs from Natural Hazards

Property owners should also assess changes in a broader set of factors that can change as a result of a large natural disaster. These are usually termed "indirect" effects, but they can have a very direct effect on the economic value of the owner's building or land. They can be positive or negative, and include changes in the following:

- Commodity and resource prices
- Availability of resource supplies
- Commodity and resource demand changes
- Building and land values
- Capital availability and interest rates
- Availability of labor
- Economic structure
- Infrastructure
- Regional exports and imports
- Local, state, and national regulations and policies
- Insurance availability and rates

Changes in the resources and industries listed above are more difficult to estimate and require models that are structured to estimate total economic impacts. Total economic impacts are the sum of direct and indirect economic impacts. Total economic impact models are usually not combined with economic feasibility models. Many models exist to estimate total economic impacts of changes in an economy. Decision makers should understand the total economic impacts of natural disasters in order to calculate the benefits of a mitigation activity. This suggests that understanding the local economy is an important first step in being able to understand the potential impacts of a disaster, and the benefits of mitigation activities.

Additional Considerations

Conducting an economic analysis for potential mitigation activities can assist decision-makers in choosing the most appropriate strategy for their community to reduce risk and prevent loss from natural hazards. Economic analysis can also save time and resources from being spent on inappropriate or unfeasible projects. Several resources and models are listed on the following page that can assist in conducting an economic analysis for natural hazard mitigation activities.

Benefit/cost analysis is complicated, and the numbers may divert attention from other important issues. It is important to consider the qualitative factors of a project associated with mitigation that cannot be evaluated economically. There are alternative approaches to implementing mitigation projects. With this in mind, opportunity rises to develop strategies that

integrate natural hazard mitigation with projects related to watersheds, environmental planning, community economic development, and small business development, among others. Incorporating natural hazard mitigation with other community projects can increase the viability of project implementation.

Resources

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 the 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, Ocbober 25, 1995.

Horner, Gerald, *Benefit/Cost Methodologies for Use in Evaluating the Cost Effectiveness of Proposed Hazard Mitigation Measures*, Robert Olsen 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.

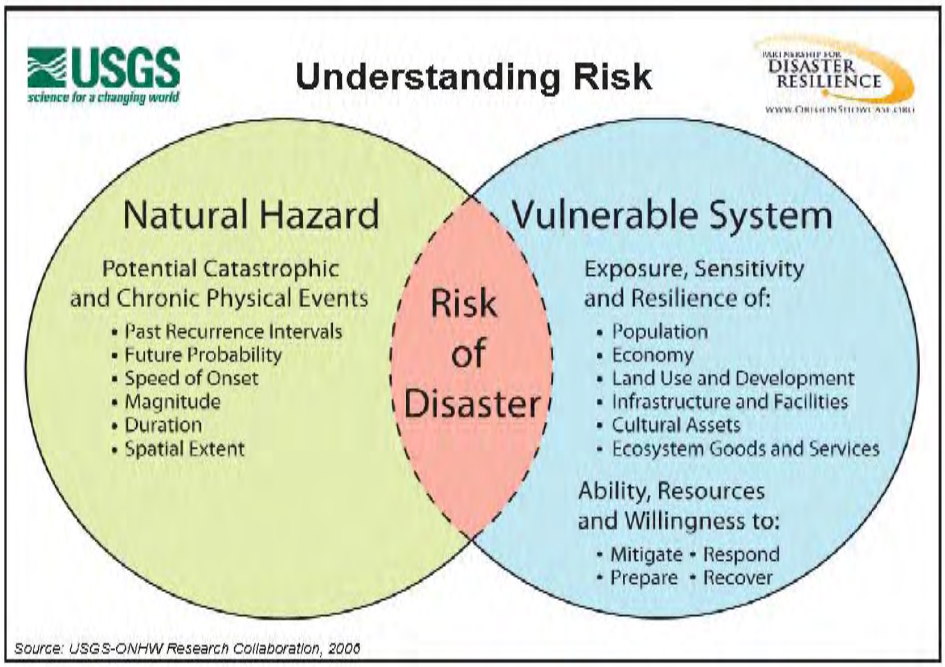
Region 4: Southwest Oregon[1]
Regional Profile

[1] Douglas (Non-Coastal), Jackson, Josephine 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 summaries 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 (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.*[i]



It is not always possible to predict exactly when a natural disaster 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 Multi-hazard Mitigation Council (MMC) highlights that for every dollar spent on mitigation society can expect an average savings of $4.[ii]

How to use this Report

The Oregon Partnership for Disaster Resilience (Partnership) 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 Program. 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 assistance from *Partnership* staff to develop and document community specific action items. For more information on *The Partnership* or the training series see: www.oregonshowcase.org.

Regional Overview

The Southwest Oregon region (Region 4 as identified in the state's natural hazard mitigation plan) includes Douglas, Jackson, and Josephine Counties. This region is at relatively high risk from wildfires, flooding, severe winter storms, windstorms, and landslides. It also faces risk from earthquakes and volcanic eruptions.

Organization of Report

This report includes four main sections that work together to develop a comprehensive picture of the region and its sensitivity to natural hazards.

Regional Maps

Critical Infrastructure Map

Using 2003 data from Oregon Department of Transportation, this map shows the approximate location of critical infrastructure, including 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

These maps depict the county's 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 July 2004.

Regional Profile and Sensitivity Analysis

Using the best available data, the regional profile includes a *Geographic Profile*, which provides a physical description of the region, a *Demographic Profile* that discusses the population in the Central

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 the region's sensitivity to natural hazards.

The data sources used in this section are all publicly available. This report examines the Central region as a whole and by individual counties when possible.

Regional Hazards 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, and updated in 2008 as part of the State's Plan Update.

Regional State Facilities Tables

The state of Oregon has prepared an analysis of state owned and managed facilities. This analysis is a first step at assessing which state owned structures are most vulnerable to the various hazards identified by region. From this overview, it is clear that a more detailed assessment in the future will yield a clearer picture of those structures specifically threatened by certain disasters and the potential damage that may occur.

Southwest Region

The Southwest Oregon region has experienced an 18% percent increase in population since 1990. The growth pattern of the region is projected to growth at a moderate rate over the next 20 years. The region's population is almost equally divided between incorporated and unincorporated areas. Twenty-seven percent of the region's houses were built before 1960, 37% between 1960 and 1980, and 36% 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.

The average commute for workers in this region is 20 minutes each way. Seventy-seven percent of the region's workers drive alone to work. Eleven percent carpool, six percent walk or use other means, and six 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.

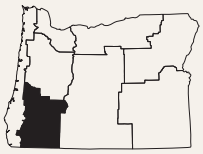
REGION FACTS

Population: 2000 Census

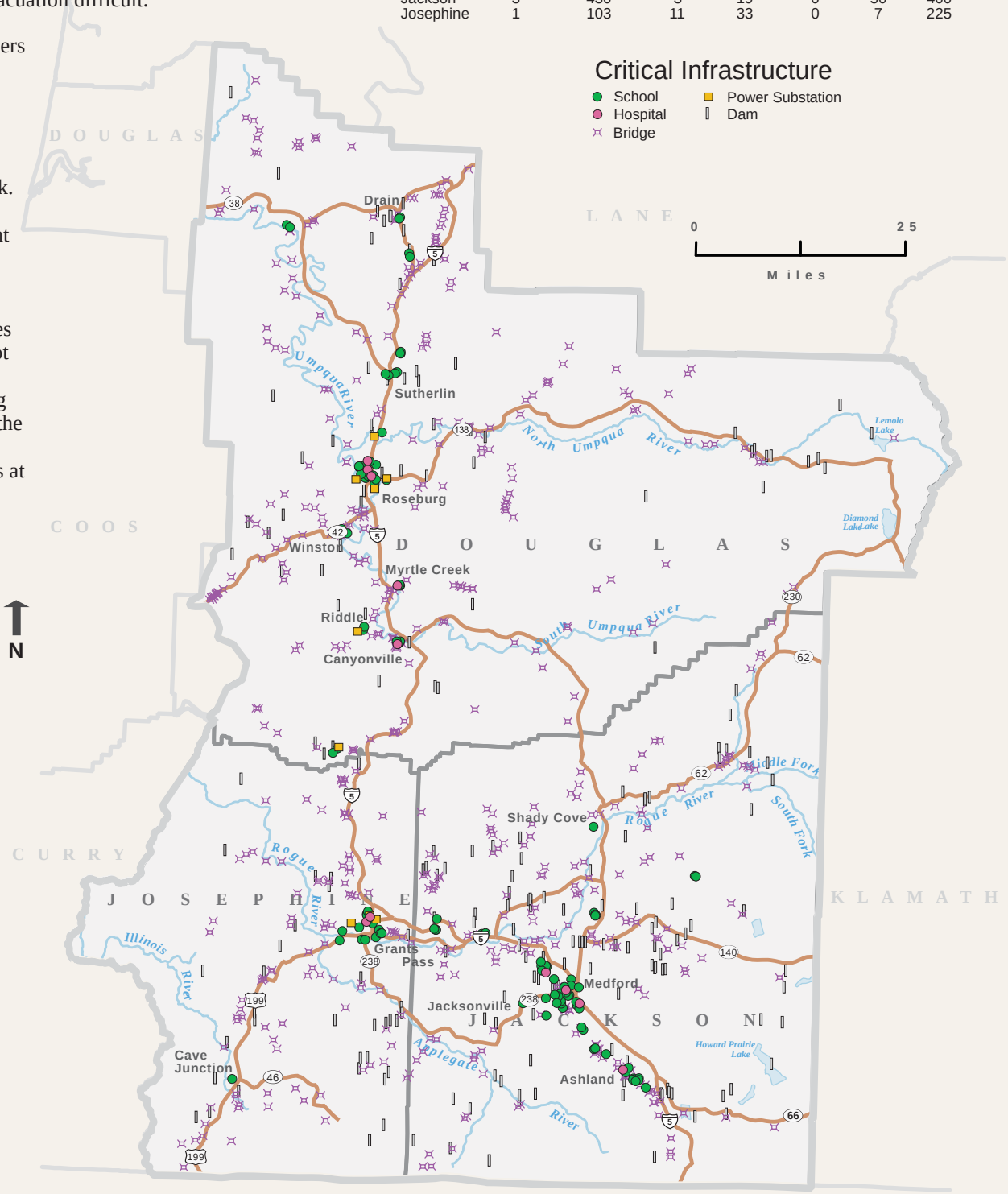
Total	350,981
Rural	168,533
Urban	182,448

Housing:

Single-Family	64%
Multi-Family	16%
Mobile Homes	19%
Boat, RV, Van, etc	1%



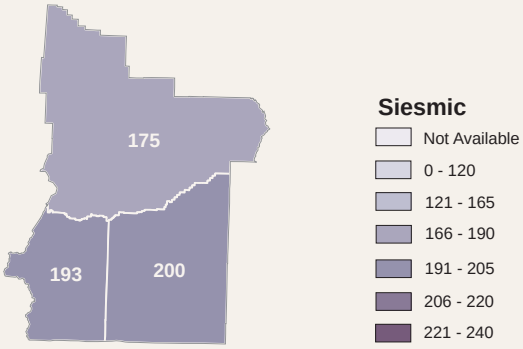
County	# of Hospitals	# of Hospital Beds	Police Stations	Fire & Rescue Stations	Power Plants	Dams	Bridges
Douglas	1	126	12	27	0	53	629
Jackson	3	430	3	19	0	50	400
Josephine	1	103	11	33	0	7	225



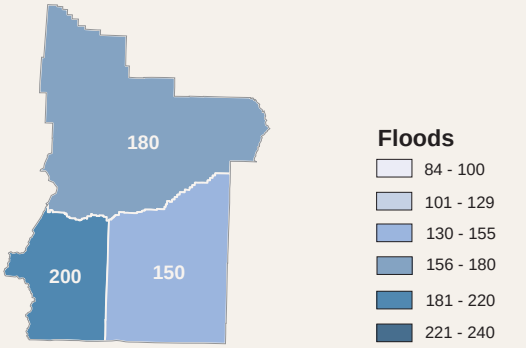
As part of the County Hazard Risk Analysis, each county develops risk scores for Oregon's major natural hazards. This score, ranging from 24 (low) to 240 (high), reflects the County's perceived risk for the particular hazard. Scores are current as of November 2008.

To obtain the most current scores, see http://www.oregonshowcase.org or contact Oregon Military Department – Office of Emergency Management http://www.oregon.gov/OMD/OEM.

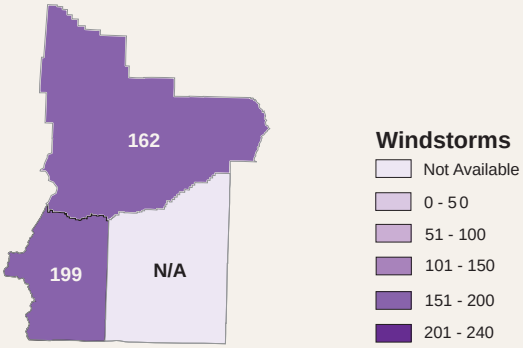
Seismic



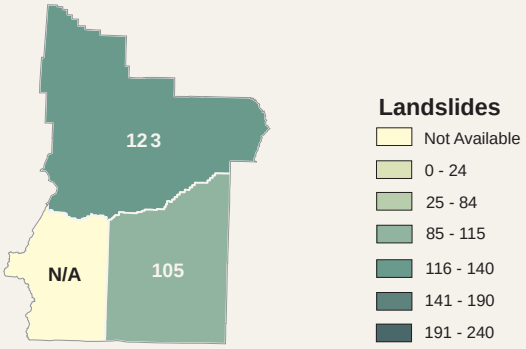
Floods



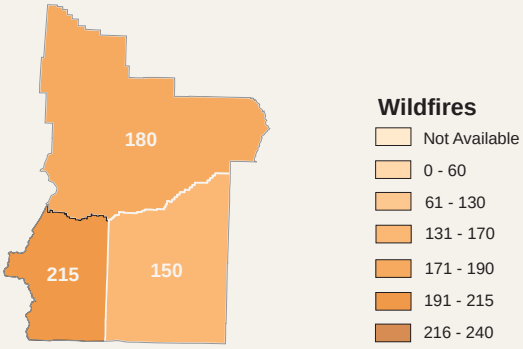
Windstorms



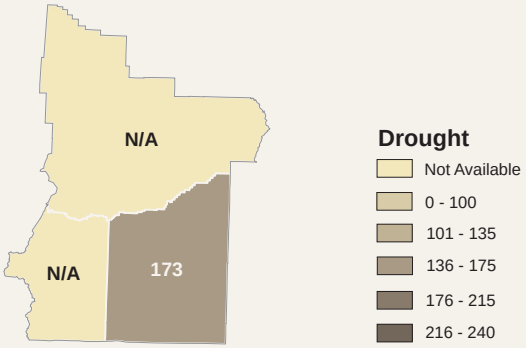
Landslides



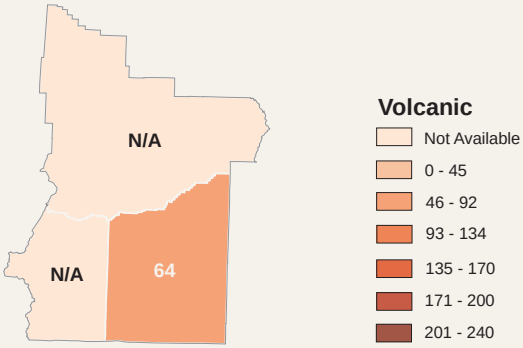
Wildfires



Drought



Volcanic



Regional Profile and Sensitivity Analysis

Section 1: Geography and Climate

The three-county area of the Southwest Oregon region is approximately 9,461 square miles. The Southwest Oregon region is shaped by mountain ranges. The region begins at the Cascades in the east, and extends to the Klamath Mountain range in the west. It extends from the Rogue-Umpqua Divide in the North to the Siskiyou Mountains at the California border in the south. The Rogue River and Illinois River run through the region. Average annual precipitation in the region ranges from 30 inches in the valleys up to 120 inches at high points in the Klamath Range.[iii]

Section 2: Demographic profile

This section describes the Southwest Oregon 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 2008, the population of the Southwest Oregon region was 393,835, representing an increase of 10.2% since 2000.[iv] This level of growth is consistent with statewide population growth over the same time frame. The Southwest Region is projected to grow an additional 16 % to over 450,000 individuals by 2020 according to the Oregon Office of Economic Analysis. Table 1 displays the population change in each Southwest Oregon region county.

Table 1. Population Growth, Southwest Oregon Region, 2008

County	2000 Population	2007 Population	2000-2008 Population Change	% Change
Douglas	100,399	105,240	4,841	4.8%
Jackson	181,269	205,305	24,036	13.2%
Josephine	75,726	83,290	7,564	10.0%
Total	**357,394**	**393,835**	**36,441**	**10.2%**

Source: Portland State University, Population Research Center. 2008. Certified 2008 Population Estimates. http://www.pdx.edu/prc/

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 Southwest region, which was $39,938 in 2007. This is below the state average of $46,230. The 18.7% median household income growth

between 2000 and 2007 in the region is greater than the 15.8% percent State growth over the same time period.

Table 2. Median Household Income, Southwest Region, 2007

County	2000	2007	% Change
Douglas	33,223	38,722	16.6%
Jackson	36,461	43,446	19.2%
Josephine	31,229	37,647	20.6%
Regional Average	**33,638**	**39,938**	**18.7%**
State Average	**40,916**	**47,385**	**15.8%**

Source: U.S. Census Bureau. 2005-2007. American Community Survey – 3 year estimates.

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

In 2007, 13.3% of the nation's population was living in poverty, less than the Southern Oregon regional poverty level of 14%. The Southwest Oregon regional poverty levels are relatively even with state levels for the same time period. Table 3 details the county, regional and state poverty rates in 2007.

Table 3. Poverty Rates, Southwest Oregon Region, 2007

	Total Population in Poverty		Children Under 18 in Poverty	
County	Number	Percent	Number	Percent
Douglas	14,113	13.7%	4,227	19.8%
Jackson	25,098	12.9%	6,929	16.4%
Josephine	12,255	15.4%	3,504	21.5%
Regional Average	**--**	**14.0%**	**--**	**19.2%**
State Average	**--**	**13.5%**	**--**	**17.4%**

Source: U.S. Census Bureau. 2005-2007. American Community Survey – 3 year estimates.

Low-income populations may require additional assistance following a disaster because they may not have the savings to withstand economic setbacks, and if work is interrupted, housing, food, and necessities become a greater burden. Additionally, low-income households are more reliant upon public transportation, public food assistance, public housing, and other public programs, all which can be impacted in the event of a natural disaster.

The age of the population is also an important consideration in hazard mitigation planning. In 2005, 35.5% of the regional population was under 14 or over 65 years of age.[vi] Table 4 provides a breakdown of the percentages of youth and elderly in the Northern Willamette region counties.

Table 4. Youth and Senior Populations, Southwest Oregon Region, 2005

County	Ages 0-14		Ages 65-74		Ages 75+	
Douglas	17,000	16.4%	10,158	9.8%	9,951	9.6%
Jackson	34,648	17.6%	15,552	7.9%	16,734	8.5%
Josephine	13,220	16.4%	8,061	10.0%	8,464	10.5%
Regional Total and Average	**64,868**	**16.8%**	**33,771**	**9.2%**	**35,148**	**9.5%**

Source: U.S. Census Bureau. 2005-2007. American Community Survey – 3 year estimates.

The elderly individuals in the region may require special consideration due to increased sensitivities to heat and cold, possible reliance upon transportation for medications, and comparative difficulty in making home modifications that reduce risk to hazards.

Young people also represent a potentially vulnerable segment of the population. In the Southwest Oregon region 16.8% 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. Non-English speaking 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 Southwest Oregon region, most citizens speak English as their primary language. However, in every county in Oregon, Spanish is the second most prominent language. Table 5 shows the percentage of the individuals in the Southwest Oregon region who speak English less than "very well". About 2% of the total population in the Southwest Oregon region speaks English less than "very well".

Table 5. Population Over Age 5 that Speaks English Less Than "Very Well", Southwest Oregon Region, 2000

County	Number	Percent
Douglas	1,098	1.2%
Jackson	5,446	3.2%
Josephine	1,001	1.4%
Regional Total and Average	**7,545**	**2.2%**

Source: US Census Bureau, 2000 Census Summary File 4

The impact in terms of loss and the ability to recover may also vary among minority population groups following a disaster. In 2000, 14% of the region's populations were minorities. Table 6 provides a breakdown of the percentages of minorities in the Southwest Oregon region.

Table 6. Population by Race*, Southwest Oregon Region, 2007

County	Hispanic or Latino	African American	American Indian	Asian
Douglas	3.9%	0.3%	1.2%	1.1%
Jackson	8.4%	0.7%	1.0%	1.3%
Josephine	5.2%	0.1%	1.5%	0.8%
Regional Average	**5.8%**	**0.4%**	**1.2%**	**1.1%**

Source: U.S. Census Bureau. 2005-2007. American Community Survey – 3 year estimates.
* Racial data is not mutually exclusive or exhaustive, respondents may identify with more than one race including races not in this table

Housing and Development

To accommodate rapid growth, communities engaged in mitigation planning should consider the vulnerability of the community's housing stock and development patterns. 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. Communities in the process of developing land for housing and industry need to ensure that these goals are being met to prevent future risks.

The urban and rural growth patterns impact how agencies prepare for emergencies as changes in development can increase risks associated with hazards. The Southwest Oregon region is growing more urban, with three percent population growth in incorporated areas between 2000 and 2005. The trend towards a more urban population does not necessarily mean that rural populations are decreasing. Between 2000 and 2005, the rural population increased in Josephine County, held steady in Douglas County and decreased in Jackson County. Table 7 illustrates the trend in urban area population growth in the Northern Willamette counties between 2000 and 2005.

Table 7. Urban/Rural Populations, Northern Willamette Region, 2000-2005

	% Incorporated Population		% Change
County	**2000**	**2005**	**2000-2005**
Douglas	45.4%	46.7%	1.3%
Jackson	65.1%	69.2%	4.1%
Josephine	32.3%	34.6%	2.4%
Regional Average	**52.6%**	**55.8%**	**3.1%**

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 8 provides a breakdown by county of the various housing types available in 2000. On average mobile homes and other non-permanent housing structures account for 16.6% of the housing in the Southwest Region. These structures are particularly vulnerable to certain natural hazards, such as windstorms, and special attention should be given to securing these types of structures.

Table 8. County Housing Profile, Southwest Oregon Region, 2007

County	Single-Family	Multi-Family	Mobile Homes	Boat, RV, Van, etc.
Douglas	68.2%	11.5%	19.0%	1.3%
Jackson	68.3%	17.5%	13.9%	0.2%
Josephine	72.8%	9.5%	16.9%	0.8%
Regional Average	**69.8%**	**12.8%**	**16.6%**	**0.8%**

Source: U.S. Census Bureau. 2005-2007. American Community Survey – 3 year estimates.

Table 8 shows that the majority of the housing stock is in single-family homes and this trend is continuing with new construction. In 2008, 98% of new non-mobile housing was in single-family units.[vii] This trend suggests that hazard mitigation efforts should provide outreach and information that specifically addresses preparedness in detached housing units.

Mobile residences make up over 16 % of housing in the region. In many disaster events, moveable structures are likely to shift on their foundations and create hazardous conditions for occupants.[viii] Because they require less infrastructure, mobile homes are more likely to be located in remote areas where wildfire danger is greater. The roadway infrastructure needs of occupants of RVs and small mobile homes should be considered when planning evacuation routes.

Aside from 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 9 illustrates the percentage of homes built per county during certain periods of time.

Table 9. Housing-Year Built, Southwest Oregon Region, 2000

County	Pre-1939 - 1959	1960-1979	1980 – 2000
Douglas	33%	37%	30%
Jackson	24%	36%	40%
Josephine	23%	38%	39%

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 Southwest Oregon region 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 region's infrastructural vulnerabilities to natural hazards.

Transportation

The largest population bases in the Southwest Oregon region are in Ashland, Grants Pass, Medford and Roseburg. All these cities are located along the Interstate 5 corridor. Population growth is continually increasing the number of local workers and automobiles and trucks on the roads. A high percentage of workers driving alone to work, coupled with interstate and international freight movement on the I-5 corridor, can cause traffic congestion and accidents. Emergency events can disrupt automobile traffic and shut down local transit systems, making local and/or regional evacuations difficult. Hazards such as localized flooding can render roads unusable. Likewise, a severe winter storm has the potential to disrupt the daily driving routine of thousands of people.

According to 2006 American Community Survey data, the average commute for workers in the Southwest Oregon Region is 19 minutes each way. Most commuters travel by automobile. Modes of transportation used by workers in the region are presented in Table 10 below.

Table 10. Commuting Patterns, Southwest Oregon Region, 2006

County	Workers over 16 years	Drove Alone	Carpooled	Public Transportation	Walked
Douglas	43,874	78.3%	10.3%	0.7%	4.5%
Jackson	88,668	76.0%	9.6%	1.3%	4.1%
Josephine	31,304	78.9%	10.0%	0.0%	4.8%
Regional Total & Average	**163,846**	**77.1%**	**9.9%**	**0.9%**	**4.3%**

Source: U.S. Bureau of the Census, Profile of Economic Characteristics 2000.

Roads and Bridges

The region's major expressway is Interstate 5. It runs north/south through the Southwest Oregon region and is the main passage for automobiles and trucks traveling along the West Coast. Other major highways that service this region include:

- US Route 42 connects Roseburg with US 101 on the Oregon Coast;
- US Highways 38 and 138 connects Douglas County with US 101 on the Oregon Coast; and
- US Highway 199 intersects with 15 in Grants Pass and runs south to Coastal California.

Daily, transportation infrastructure capacity in the Southwest Oregon region is stressed by maintenance, congestion, and oversized loads. Natural hazards can further disrupt automobile traffic and create gridlock, making evacuations difficult.

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 an important issue for the Southwest Oregon 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 11 shows the number of state, county, and city maintained bridges, 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 11. Bridge Inventory, Southwest Oregon Region, 2006

County	State Highway Bridges	County Highway Bridges	City/Municipal Highway Bridges	Historical Covered Bridges	Total
Douglas	302	309	18	0	629
Jackson	222	159	19	0	400
Josephine	101	122	2	0	225

Source: Oregon Department of Transportation

Railroads

Railroads are major providers of regional and national cargo and trade flows. Railroads that run through the Southwest Oregon region include the Central Oregon & Pacific and the White City Terminal Railroad. There is no passenger rail line through the region.[ix]

The Central Oregon & Pacific Line follows I-5 through the region, it then runs west through Lane County and loops back into the Southwest region through Reedsport. The White City Terminal Railroad is a short spur off the Central Oregon & Pacific Line in Jackson County.[x]

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.[xi] 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.[xii] 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.[xiii]

Rails are sensitive to icing from winter storms that can occur in the Southwest Oregon 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.

Airports

The Southwest Oregon region has one commercial airport, 9 public airports, 29 private airports and 14 private helipads. Table 12 shows the number and designation of the airports in the Southwest Oregon region.

Table 12. Public Airports, Southwest Oregon Region, 2007

	Number of Airports by FAA Designation			
County	**Commercial Service**	**Public Airport**	**Private Airport**	**Private Helipad**
Douglas		4	14	5
Jackson	1	3	11	6
Josephine		2	4	3
Total	**1**	**9**	**29**	**14**

Source: FAA Airport Master Record (Form 5010)

Rogue Valley International-Medford Airport is the only commercial airport in the region. The airport is owned, operated and administered by Jackson County Aviation Authority. It services eight hubs, and four air carriers with approximately 56 arriving and departing flights daily.[xiv]

Flights face the potential for closure from a number of natural hazards that are common in the Southwest Oregon 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 Southwest Oregon region are displayed in Table 13 by county.

Table 13. Critical Facilities, Southwest Oregon Region, 2006

County	Hospitals		Police Station	Fire & Rescue Station	School Districts & Colleges
	# of Hospitals	# of Beds			
Douglas	1	126	12	27	13 districts – 1 Com. College
Jackson	3	430	3	19	9 districts – 1 University
Josephine	1	103	11	33	2 districts – 1 Com. College

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 13, 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 local and regional mitigation plans.

Power Generation and Transmission

The Southwest Oregon region primarily receives oil and gas from Alaska by way of the Puget Sound through pipelines and tankers. The Rogue Valley is at the southern end of its pipeline network; oil and gas in Northern California comes from a separate network.[xv]

The majority of electrical power in the region is generated through hydropower. Dams are primarily situated on the Umpqua and Rogue Rivers. There is also a power plant that uses biomass as its energy source. [xvi]

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 an inventory of dams in Oregon. Table 14 lists the dams included in these inventories.

Table 14. Power Plants and Dams, Mid/Southern Region, 2000

County	Power Plants	Dams	
		# of Dams	Threat Potential
Douglas	7	53	9 high threat
Jackson	4	50	15 high threat
Josephine	0	7	1 high threat

Source: Oregon Department of Energy, National Inventory of Dams, Atlas of Oregon

The electric, oil, and gas lines that run through the Southwest Oregon region are both municipally and privately owned. The network of electricity transmission lines running through the Southwest Oregon region is operated by Pacific Power and Light and primarily facilitates local energy production and distribution.[xvii] Most of the natural gas

Oregon uses originates in Alberta, Canada. Avista Utilities owns the main natural gas transmission pipeline.[xviii] These lines may be vulnerable to severe, but infrequent natural hazards, such as earthquakes.

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 Southwest Oregon 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 Southwest Oregon region, informed decisions can be made about how to mitigate risk.

Economic Overview

According to the Oregon Employment Department, the Southwest Region has historically depended upon the timber industry as a major source of jobs and income. The region (in particular, Jackson and Josephine counties) has suffered losses in the timber and wood products industry due to industry slowdowns and environmental reasons. However, increased efficiency at the Douglas County lumber mills has made the industry more competitive than other areas of the state. This has resulted in Douglas County retaining much of its economic base in the timber industry. The region has been able to offset job losses in other manufactured items, such as: electronics, software, printing and transportation products. In addition, the pleasant climate and affordable lifestyle has made the region an ideal retirement location. The recent population growth (particularly in the retirement sector) has increased new opportunities in retail trade and services.

Since the middle of 2003, the region has seen about three years of rapid job growth. Job growth slowed in late 2006 and in 2007 and is expected to continue growing at a slower rate until 2016.[xix] According to the Oregon Employment Department, July 2008 unemployment rates in the region were 8.6% in Douglas County, 7.0% in Jackson County, and 8.0% in Josephine County. At the same time, the statewide unemployment rate was 5.8%.[xx]

Looking towards the future, employment in education and healthcare services, trade, and leisure and hospitality will continue to grow. However, employment may decrease in wood product manufacturing.[xxi]

As of 2007, the region employed 148,393 people with a combined annual payroll near 5 billion dollars. Table 15 displays the payroll and employee figures per county.

Table 15. Employment and Payroll, Southwest Oregon Region, 2007

County	# of Employees	Annual Payroll	Average Pay
Douglas	38,870	$1,253,912,500	$32,259
Jackson	84,411	$2,774,338,484	$32,867
Josephine	25,112	$739,601,833	$29,452
Total	**148,393**	**$4,767,852,817**	**$31,526**

Source: Oregon Employment Department.[xxii]

In 2007, there were 10,375 businesses in the Southwest Oregon region, 91% were small businesses employing fewer than 20 employees.[xxiii] The prevalence of small businesses in the Southwest Oregon region is an indication of sensitivity to natural hazards because small businesses are more susceptible to financial uncertainty.[xxiv] 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.[xxv]

Economic diversity is a general indicator of an area's fitness for weathering difficult financial times. Business activity in the Southwest Willamette region is fairly diverse. All counties in the region fall in the top third of state ranked economic diversity. Table 16 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 16. Economic Diversity Ranking, Southwest Oregon Region, 2006

County	Economic Diversity Index Ranking
Douglas	12
Jackson	7
Josephine	5

Source: Oregon Employment Department[xxvi]

Economic diversity is not a guarantor of economic fitness. All of the Southwest Oregon region counties were listed as "economically distressed" by the Oregon Economic and Community Development Department in 2007. "Economic distress" is an indicator that new jobs, average wage, and personal income are decreasing and unemployment is increasing.

In the future, the economic diversity of the region should help it to weather natural hazards. 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 businesses concerned belong to a basic sector industry. 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

Businesses in the Southwest Oregon region engage in both basic and non-basic sector industries. In 2002, the four industries in the region with the highest revenue were Manufacturing, Retail Trade, Health Care and Wholesale Trade.[xxvii] Combined, these three industries generated over $10 billion in revenue for the region. Table 17 shows the revenue that is generated by the top four regional economic sectors.

Table 17. Revenue of Top Industries (in Thousands of Dollars), Southwest Oregon Region, 2002

County	Total Revenue* (in Thousands)	Retail Trade	Manufacturing	Wholesale Trade	Health Care
Douglas	$3,285,145	24.7%	38.6%	13.9%	11.1%
Jackson	$6,945,347	37.2%	24.3%	11.8%	13.2%
Josephine	$1,860,660	40.2%	21.2%	12.8%	12.0%
Regional Total & Average	**$12,091,152**	**34.2%**	**27.7%**	**12.5%**	**12.4%**

Source: U.S. Census, Economic Census. 2002

In 2002, the *Retail Trade sector* generated $4.1 billion in the Mid/Southern Willamette region, making it the largest earning sector in the region.[xxviii] 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. 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. In summary, depending on the type and scale a disaster could affect specific segments of retail trade, or all segments. Within the region, retail businesses are primarily based in Jackson County.

Manufacturing generated nearly 30% of the revenue in the Mid/Southern Willamette region. It is highly dependent upon the transportation network in order to access supplies and send finished products to outside markets. As a base industry, manufacturers are not dependent on local markets for sales, which contribute to the economic resilience of this sector. Within the region, manufacturers are primarily based in Douglas and Jackson Counties.

Wholesale Trade is closely linked with retail trade but it has a broader client base, 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. Within the region, wholesale businesses are primarily based in Jackson County.

Health Care and Services are a relatively stable revenue sector. Businesses primarily serve a local population. The products and services provided by the health care sector could be in demand after a natural hazard event. The sector is dependent on a functional

transportation network. Health care businesses are accessible in all urban areas within the region.

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 four sectors in the Mid/Southern Willamette region with the most employees in 2007 were Federal, State, and Local Government (16%), Retail Trade (16%), Health Care and Social Assistance (13%) and Manufacturing (11%.)[xxix]

Sector employment varies within the six Mid/Southern Willamette counties. Benton, Marion and Polk Counties have the greatest density of state and local government employees. Lane, Linn and Marion Counties have the greatest density of employment in retail trade. Benton, Lane and Marion counties have the greatest density of employment in health care. Lane, Linn, Polk and Yamhill counties have the greatest density of manufacturing jobs. Table 18 shows the distribution of each county's employees across the four largest regional employment sectors. Construction; and Accommodation & Food Services are the fifth and sixth highest employment sectors.

Table 18. Total Employment and Percent of Employment by Top Sectors, Southwest Oregon Region, 2007

County	Total Employment	Retail Trade	Health Care	Federal, State & Local Government	Manufacturing
Douglas	38,870	12%	11%	22%	15%
Jackson	84,411	17%	13%	13%	8%
Josephine	25,112	15%	16%	13%	13%
Regional Total & Average	**148,393**	**16%**	**13%**	**16%**	**11%**

Source: Oregon Employment Department, 2007.[xxx]

Future Major Employment Sectors

Sectors that are anticipated to be major employers in the future also warrant special attention in the hazard mitigation planning process. Between 2006 and 2016, the largest job growth in the Southwest Oregon region is expected to occur in the education & health services; retail trade; and leisure & hospitality sectors.[xxxi]

Education & Health Services is currently the second highest employment sector in the Southwest Oregon region. In the event of a natural disaster, the Health Care sector must play an important role in

emergency response. A disaster could disrupt the infrastructure and mobilization of the health care sector. Educational buildings often play a key role in emergency response because they can be used as temporary shelters.

The *Retail Trade* sector is the highest private employment sector in the region. This sector is vulnerable to disruptions of the transportation system and to disruptions in the disposable income of regional residents.

The *Leisure & Hospitality* sector would be adversely affected by a natural disaster. The sector primarily serves regional residents with disposable income and tourists. The behavior of both of these demographics would be disrupted by a natural disaster. Regional residents may have less disposable income and tourists will not want to visit a region with unstable infrastructure.

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. The most numerous businesses in the Southwest Oregon region are engaged in Construction at 15% (1734); Retail at 13% (1550); Health and Social Assistance at 10% (1186); and Accommodations & Food Services at 9% (1049)..[xxxii]

These sectors warrant attention to their specific vulnerabilities. Many businesses in these sectors employ fewer than 20 employees. These businesses may therefore be particularly sensitive to any temporary decreases in demand following a moderate natural hazard event.

In the event of wildfires, floods, earthquakes, or other types of destructive natural disasters, residents are more likely to demand construction services and health care services. The demand for the tertiary economic services provided by retail trade and accommodation & food service sectors may decrease. These businesses should create a plan to remain economically solvent through a natural hazard event.

Regional Profile and Sensitivity Conclusion

Information presented in the Demographic, 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 action items.

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[xxii] Oregon Eomployment Department, "2007 Covered Wages and Employment Summary Report," http://www.qualityinfo.org/olmisj/CEP, accessed January 12, 2009.

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[xxiv] Alesch, Dan, et al. 2001. Organizations at Risk: What Happens When Small Businesses and Non-for-Profits Encounter Natural Disasters. http://www.riskinstitute.org/uploads/ptrdocs/Organizations_at_Risk.pdf.

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[xxx] Oregon Employment Department, "2007 Covered Employment and Wages Summary Report," (multiple counties), http://www.qualityinfo.org/olmisj/CEP, accessed January 12, 2009.

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[xxxii] Oregon Employment Department, "2007 Covered Employment and Wages Summary Report," (multiple counties) http://www.qualityinfo.org/olmisj/CEP, accessed January 12, 2009.

REGION 4
Southwest Oregon[1]
Hazards Assessment

[1] Douglas (Non-Coastal), Jackson, Josephine Counties

DROUGHT 3
Characteristics and Brief History *3*
Probability *3*
Vulnerability *4*
EARTHQUAKE 5
Characteristics and Brief History: *5*
Probability *6*
Vulnerability *7*
FIRES IN THE WILDLAND/URBAN INTERFACE 12
Characteristics and Brief History *12*
Probability *14*
Vulnerability *15*
FLOOD 19
Characteristics and Brief History *19*
Probability *21*
Vulnerability *22*
LANDSLIDE / DEBRIS FLOW 23
Characteristics and Brief History *23*
Probability *24*
Vulnerability *25*
VOLCANO-RELATED HAZARDS 26
Characteristics and Brief History *26*
Probability *26*
Vulnerability *28*
WINDSTORMS 29
Characteristics and Brief History *29*
Probability *30*
Vulnerability *31*
WINTERSTORM 32
Characteristics and Brief History *32*
Probability *33*
Vulnerability *34*

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, in both summer and winter months. Droughts appear to be cyclic, and can have a profound effect on the State's economy, particularly the hydropower and agricultural sectors. The environmental consequences also are far-reaching, including insect infestations in Oregon forests and reduced stream flows to support endangered fish species. Severe drought conditions preceded the four disastrous Tillamook fires (1933, 1939, 1945, 1951) and pitted farmer against fish protection groups during the Klamath County drought of 2001. In recent years, the State has addressed drought emergencies through the Oregon Drought Council. This interagency (state/federal) council meets to discuss forecasts and to advise the Governor as the need arises. Significant droughts are depicted in Table 1.

TABLE 1. SIGNIFICANT DROUGHTS

DATE	DESCRIPTION
1904-1905	A state-wide 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
1976-1981	Intense drought in western Oregon; 1976-77 single driest year of century
1985-1997	Generally a dry period, capped by statewide droughts in 1992 and 1994
2000-2001	Klamath drought intensifies; Low snowpack in mountains worsens conditions Draw down at Detroit Lake, Oregon, all but curtails lake recreation

Source: Taylor, George H., and Ray Hatton, 1999, *The Oregon Weather Book*.

Probability

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.

The probability that Region 4 will experience drought is 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.

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. Probability Assessment of Drought

	Douglas (Inland)	Jackson	Josephine
Probability	-	H	-

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

Vulnerability

The region's vulnerability to drought is depicted in Table 3 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 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 3. Vulnerability Assessment of Drought

	Douglas (Inland)	Jackson	Josephine
Vulnerability	-	M	-

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

EARTHQUAKE

Characteristics and Brief 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 no historic earthquakes of any significance that were centered in the region. However, the region has been shaken historically by crustal and intraplate earthquakes and prehistorically by subduction zone earthquakes centered outside the area (Table 3). All considered, there is good reason to believe that the most devastating future earthquakes would probably originate along shallow crustal faults in the region and along the Cascadia Fault Zone. The 7.3M deep-seated intra-plate event centered near Brookings in 1873 was probably felt throughout Southwest Oregon 4 (Table 4), however there have been no intraplate events in the region's history. The 1993 Klamath Falls earthquake was felt in the region, but no damage was reported.

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.

Since Oregon adopted the International Building Code 2003 (IBC 2003), it no longer uses the seismic zones to define the hazard. The IBC 2003 uses the maps from the USGS earthquake program, which depict a much more

accurate spatial distribution of the hazard. The old Uniform Building Codes (UBC) maps displayed the hazard as spatially changing along county boundaries.

TABLE 4. 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 tsunami 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
November, 1873	Brookings area	7.3	Chimneys fell at Port Orford, Grants Pass, and Jacksonville. No aftershocks. Origin probably Gorda block of the Juan de Fuca plate. Intraplate event
March, 1993	Scotts Mills	5.6	$28 million in damage. Damage to homes, schools, businesses, state buildings (Salem). Crustal Event (FEMA-985-DR-OR)
September, 1993	Klamath Falls	5.9 to 6.0	Two earthquakes causing two deaths and extensive damage. $7.5 million in damage to homes, commercial, and government buildings. Crustal event (FEMA-1004-DR-OR)

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.

Notes: * BCE: Before the Common Era

Probability

Scientists estimate the chance in the next 50 years of a great subduction zone earthquake is between 10 and 20 percent, assuming that the recurrence is on the order of 400 +/- 200 years. These events are estimated to have an average recurrence interval between 500 and 600 years, although the time interval between individual events ranges from 150 to 1000 years. The last CSZ event occurred approximately 300 years ago.

Establishing a probability for crustal earthquakes is more difficult given the lack of historic events in the region. Earthquakes generated by volcanic activity in Oregon's Cascade Range are possible, but likewise unpredictable.

The probability that Region 4 will experience earthquakes is depicted in Table 5 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.

TABLE 5. Probability Assessment of Earthquake

	Douglas (Inland)	Jackson	Josephine
Probability	L	M	M

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

Vulnerability

Region 4 is especially vulnerable to earthquake hazards because much of the area is susceptible to earthquake-induced landslides, liquefaction, and/or strong ground shaking.

In 2007, DOGAMI completed a rapid visual screening (RVS) of educational and emergency facilities in communities across Oregon, as directed by the Oregon Legislature in Senate Bill 2 (2005). RVS is a technique used by the Federal Emergency Management Agency (FEMA), known as FEMA 154, to identify, inventory, and rank buildings that are potentially vulnerable to seismic events. DOGAMI surveyed a total of 3,349 buildings, giving each a 'low,' 'moderate,' 'high,' or 'very high' potential of collapse in the event of an earthquake. It is important to note that these rankings represent a probability of collapse based on limited observed and analytical data and are therefore *approximate* rankings.[2] To fully assess a building's potential of collapse, a more detailed engineering study completed by a qualified professional is required, but the RVS study can help to prioritize which buildings to survey.

[2] State of Oregon Department of Geologic and Mineral Industries, *Implementation of 2005 Senate Bill 2 Relating to Public Safety, Seismic Safety and Seismic Rehabilitation of Public Building,* May 22, 2007, iv.

Table 6 below shows the number of buildings surveyed in each county with their respective rankings.

TABLE 6. REGION 4 BUILDING COLLAPSE POTENTIAL

County	Level of Collapse Potential			
	Low (< 1%)	Moderate (>1%)	High (>10%)	Very High (100 %)
Douglas*	74	45	40	10
Jackson	139	13	87	22
Josephine	37	15	16	1

Source: DOGAMI 2007. Open File Report 07-02. Statewide Seismic Needs Assessment Using Rapid Visual Assessment.

*Does not include the Douglas County coastal communities of Gardiner, Reedsport, and Winchester Bay which are addressed in the Region 1 Profile.

The Oregon Department of Geology and Mineral Industries (DOGAMI) has also 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 7-8.

TABLE 7. PROJECTED DOLLAR LOSSES BASED ON A M8.5 SUBDUCTION EVENT AND A 500-YEAR MODEL

REGION 4 COUNTIES	ECONOMIC BASE LOSS IN THOUSANDS (1999)	GREATEST ABSOLUTE LOSS IN THOUSANDS (1999) FROM AN 8.5 CSZ EVENT	GREATEST ABSOLUTE LOSS IN THOUSANDS (1999) FROM A 500-YEAR (CRUSTAL) EVENT
DOUGLAS	$4,631,000	$275,000	$546,000
JACKSON	$7,829,000	$538,000	$1,191,000
JOSEPHINE	$3,240,000	$593,000	$848,000

Source: DOGAMI, 1999, Special Publication 29: Earthquake Damage in Oregon.

TABLE 8. ESTIMATED LOSSES ASSOCIATED WITH TWO EARTHQUAKE SCENARIOS[1]

	ESTIMATED LOSSES: 8.5 CSZ EVENT			ESTIMATED LOSSES: 500-YEAR MODEL		
COUNTIES	**DOUGLAS**	**JACKSON**	**JOSEPHINE**	**DOUGLAS**	**JACKSON**	**JOSEPHINE**
INJURIES	151	428	418	294	930	585
DEATHS	2	8	7	4	18	11
DISPLACED HOUSEHOLDS	255	650	573	534	1,458	872
ECON LOSSES FOR BUILDINGS[2]	$275 million	$538 million	$593 million	$546 million	$1.2 billion	$847 million
OPERATIONAL "DAY AFTER" THE QUAKE[3]						
Fire Stations	66%	75%	22%	N/A	N/A	N/A
Police Stations	57%	62%	45%	N/A	N/A	N/A
Schools	44%	70%	34%	N/A	N/A	N/A
Bridges	74%	84%	73%	N/A	N/A	N/A
ECONOMIC LOSSES TO						
Highways	$43 million	$10 million	$16 million	$69 million	$34 million	$29 million
Airports	$5 million	$2 million	$5 million	$9 million	$8 million	$10 million
Communications	$7 million	$2 million	$4 million	$12 million	$9 million	$8 million
DEBRIS GENERATED (THOUSANDS OF TONS)	222	434	476	411	889	614

Source: DOGAMI, 1999, Special Paper 29: Earthquake Damage in Oregon.

Table 8 Notes:

[1]Every part of Oregon is subject to earthquakes. The 500-year model is an attempt to quantify the risk across the state. The estimate does not represent a single earthquake. Instead, the 500-year model includes 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. More and higher magnitude earthquakes than used in this model may occur. (DOGAMI, 1999).

[2]There are numerous un-reinforced masonry structures (URMs) in Oregon, the currently available default building data does not include any URMs. Thus, the reported damage and loss estimates may seriously under-represent the actual threat" (page 126 – 1998, DOGAMI)

[3]Because the 500-year model includes several earthquakes, the number of facilities operational the "day after" cannot be calculated.

The region's vulnerability to earthquakes is depicted in Table 9 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 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 9. Vulnerability Assessment of Earthquake

	Douglas (Inland)	Jackson	Josephine
Vulnerability	H	H	H

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

FIRES IN THE WILDLAND/URBAN 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.

Table 10 below describes some of the more noteworthy fires in Oregon's history. Table 11 describes more recent fires that occurred in the urban/wildland interface.

TABLE 10. SIGNIFICANT WILDFIRES

Year	Name of Fire	Counties	Acres Burned	Remarks
1987	Bland Mountain	Douglas	10,300	Near Canyonville; 2 structures lost
1987	Silver	Southern Coast Range	97,000	
1992	East Evans Creek	Jackson	10,135	4 structures lost
1994	Hull Mountain	Jackson	8,000	1 life and 44 structures were lost. The fire was an act of arson.
1994	Sprignett Butte	Jackson	1,631	Arson
2000	Antioch road	Jackson	376	
2002	Squires Peak/Wall Creek	Jackson	3,125	
2002	Timbered Rock	Jackson	27,111	
2002	Biscuit	Curry, Josephine	500,000	Estimated to be one of Oregon's largest in recorded history, the Biscuit Fire encompassed most of the Kalmiopsis Wilderness.
2003	Cove Road	Jackson	700 acres	Three miles east of Ashland *excerpted from State Plan, 2006

Source: Brian Ballou, August 2002, A Short History of Oregon Wildfires, Oregon Department of Forestry, unpublished; and Oregon Emergency Management, State Natural Hazard Mitigation Plan, 2003, Wildland/Urban Interface chapter.Source: State Interagency Hazard Mitigation Team (2006). The state of Oregon Natural Hazards Mitigation Plan. Available from http://www.oregonshowcase.org/index.cfm?mode=stateplan

Note: This list is representative of a lengthy wildfire history. There have been many fires, named and unnamed. Statistics differ, depending on the source.

TABLE 11: SIGNIFICANT INTERFACE FIRES

YEAR	NAME OF FIRE	LOCATION	DAMAGE	REMARKS
1992	Sage Flat Evans Creek Lone Pine	Deschutes Co. (near Sisters) Jackson Co. (near Rogue River) Klamath Co. (near Chiloquin)	5 homes destroyed 10,000 ac. burned. Four homes destroyed 31,000 ac. burned. Three homes destroyed	$8 million suppression costs
1994	Hull Mountain	Jackson Co. (near Sams Valley)	8,000 ac. burned. 8 homes, 36 out buildings destroyed.	1 fatality

Source: Ballou, Brian, 2002, Oregon Department of Forestry, *A Short History of Oregon's Wildfires,* Unpublished.

Probability

The natural ignition of forest fires is primarily a function of weather and fuel. Human-caused fires add another dimension to probability. Dry and diseased forests can be mapped accurately and some statement can be made about the probability of lightening strikes. Each forest is different and consequently has different probability / recurrence estimates.

This document defines wildfire as an uncontrolled burning of forest, brush, or grassland. Wildfire always has been a part of these ecosystems, sometimes with devastating effects. Table 9 provides an overview of some of Oregon's most devastating wildfires. Wildfires result from natural causes (e.g., lightening strikes), a mechanical failure (Oxbow Fire), or they are human-caused (unattended campfire, debris burning, or arson). The severe fire season of 1987 resulted in a record setting mobilization of firefighting resources. Most wildfires can be linked to human carelessness.

The intensity and behavior of wildfire depends on a number of factors including fuel, topography, weather, and density of development. There are a number of often-discussed strategies to reduce the negative impacts of these phenomena. They include land-use regulations, management techniques, site standards, building codes, and a recently passed Oregon Forestland-Urban Interface Fire Protection Act (1997). All of these things have a bearing on a community's ability to prevent, withstand, or recover from a wildfire event.

The probability that Region 4 will experience fires in interface areas is depicted in Table 12 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.

TABLE 12. Probability Assessment of Wildfire

	Douglas (Inland)	Jackson	Josephine
Probability	H	H	H

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

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.

Many Oregon communities (incorporated and unincorporated) are within or abut areas subject to serious wildfire hazards. These communities have been designated “Interface Communities” and include those in Table 13.

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 area;

- 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;
- 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 13. REGION 4 INTERFACE COMMUNITIES

COUNTIES			
Douglas		**Jackson**	**Josephine**
Ash Valley	Idleyld Park	Antelope Creek	Galice
Azalea	Lelomo Lake	Applegate	Grants Pass
Camas Valley	Lookingglass	Ashland	Illinois Valley
Canyonville	Myrtle Creek	Butte Falls	Merlin
Curtin	Oakland	Colestin	Murphy
Days Creek	Rice Hill	Crow Foot	Oregon Caves
Diamond Lake	Riddle	Elk Creek	Selma
Dillard	Roseburg	Gold Hill	Sunny Valley
Dixonville	Steamboat	Green Springs	Wilderville
Drain	Sutherlin	Jacksonville	Williams
Dry Creek	Tenmile	Lake Creek	Wolf Creek
Elkton	Tiller	Medford	
Fair Oaks	Toketee	Prospect	
Glenbrook	Tri City	Rogue River	
Glendale	Umpqua	Sams Vallet	
Glide	Union Gap	Shady Cove	
Green Acres	Wilber	Trail	
Winston	Wolf Creek	Union Creek	
Yoncalla		Upper Applegate	
		Wimer	

Source: August 17, 2001, *Federal Register*, V.66, N. 160.

The region's vulnerability to fires is 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 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 14. Vulnerability Assessment of Wildfire

	Douglas (Inland)	Jackson	Josephine
Vulnerability	H	L	M

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

FLOOD

Characteristics and Brief History

A number of large floods have been recorded in Southwest Oregon, many of which were very destructive. Recurrence is virtually assured, especially since some areas at risk are rapidly urbanizing. This region has the distinction of having two major rivers (the Umpqua and Rogue Rivers) that have their origin in the Cascade Mountains and continue to flow through the Coast Range to the Pacific Ocean. Their headwaters receive an abundance of mountain snow; at lower elevations they may receive runoff from intense Pacific storms, which are not uncommon in western Oregon. A combination of rapidly melting snow and intense rain can produce disastrous flood conditions. Table 15 lists some significant floods that affected southwest Oregon communities. Table 16 includes tributary streams that also have produced disastrous floods.

The physical beauty of the area has attracted a large number of people to various stream valleys, where they are placed at risk despite fairly stringent National Flood Insurance Program (NFIP) requirements. This is somewhat offset by Oregon's land-use program which generally prohibits the subdivision of farm and forestland for residential purposes.

TABLE 15. SIGNIFICANT FLOODS

DATE	LOCATION	CHARACTERISTICS	TYPE OF FLOOD
03/1931	Western Oregon	Wet, mild weather. Bridges and homes destroyed	Rain on snow (ROS)
10/1950	Southwest Oregon	Severe flooding in Region 4. Six fatalities. Bridges and roads destroyed	ROS
01/1962	Western Oregon	Heavy rain (3" –4" in Rogue Valley); 84 people Evacuated. Great loss of farmland.	ROS
12/1964	Entire State	Infamous '64 flood that has become an Oregon benchmark. Record flows on Rogue and Umpqua rivers.	ROS
01/1974	Western Oregon	Series of storms with mild temperatures; large snowmelt with rapid runoff.	ROS
01/1986	Entire State	Significant flooding in western Oregon attributable to warm, intense rain	Snow melt (SM)
01/1990	Western Oregon	Significant flooding in western Oregon	ROS
11/1996	Entire State	Tropical air mass; Intense rain; landslides; power outages. (FEMA-1149-DR-OR)	ROS
12/1996	Entire State	Mild weather continues. Severe flooding in Ashland. FEMA declaration. (FEMA-1160-DR-OR)	ROS
12/2005	Douglas, Jackson, Josephine Counties	$2,840,000 *damage estimate includes areas outside of Region 4	
6/2006	Jackson	Heavy Rain brought flash flooding to Jacksonville, but no reported damages.	Riverine
8/2007	Jackson	Heavy rains caused flash flooding near Ashland, no major estimated damages.	Riverine

Source: Taylor, George and Raymond Hatton, 1999, *The Oregon Weather Book;* 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 ;

National Climatic Data Center, Storm Events, available at http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms

TABLE 16. PRINCIPAL FLOOD SOURCES IN REGION 4

REGION 4 COUNTIES		
DOUGLAS (Non-Coastal)	**JACKSON**	**JOSEPHINE**
N & S Umpqua Rivers and Tributaries	Rogue River and Tributaries	Rogue River and Tributaries
Scholfield Cr Deer Cr N&S Myrtle Creeks Cow Cr Newton Cr	Jump Off Joe Cr Louse Cr Waters Cr Applegate River Slate Cr Murphy Cr Illinois Cr East and West Forks of the Illinois River Deer Cr	Lazy Cr Larson Cr Griffin Cr Pleasant Cr Foots Cr Little Butte Cr Lone Pine Cr Lassen Dr Crooked Cr Daisy Cr Evans Cr Wagner Cr Ashland Cr Colman Cr Clay Cr Bear Cr

Sources: FEMA, April 21, 1999, Douglas County Flood Insurance Study (FIS9; and FEMA, May 15, 2002, Jackson County FIS; and FEMA, Sept 27, 1991, Josephine County FIS.

Probability

The Federal Emergency Management Agency (FEMA) has mapped most flood-prone streams in Oregon. The maps depict the 1% flood (100-year) upon which the National Flood Insurance Program is based. All of the Region 4 counties have Flood Insurance Rate Maps (FIRM); however, some of the maps are old and could be outdated. The FIRM maps were issued at the following times:

- Douglas, April 21, 1999;
- Jackson May 15, 2002;
- Josephine, September 27, 1991.

A cursory examination of Table 12 above provides some indication of flooding in Region 4. Significant flooding occurs approximately every 10-15 years, and flood losses continue to be high.

The probability that Region 4 will experience floods is depicted in Table 17 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.

TABLE 17. Probability Assessment of Flooding

	Douglas (Inland)	Jackson	Josephine
Probability	H	H	H

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

Vulnerability

The region's vulnerability to floods is 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 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 18. Vulnerability Assessment of Flooding

	Douglas (Inland)	Jackson	Josephine
Vulnerability	H	L	M

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

LANDSLIDE / DEBRIS FLOW

Characteristics and Brief History

Landslides and debris flows always have and always will shape Oregon's landscape. Landslides become problematic, however, when people place buildings and infrastructure in harm's way. Additionally, development practices can cause or contribute to the severity of landslides.

There are several categories of landslides, based on configuration (slide mechanism), slide materials, and rate of movement. Some slides are ancient, deep-seated, and slow moving. Others move rapidly as a mass of rock, mud, and large woody debris. All can be problematic when in the vicinity of buildings and infrastructure. Fast-moving landslides, or debris flows, occur throughout Oregon, but are especially noteworthy in the Cascade and Coast Ranges.

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 that are over 25% or have a history of landslides might signal a landslide problem.

In recent events, particularly noteworthy landslides accompanied storms in 1964, 1982, 1966, and 1996. Two major landslide producing winter storms occurred in Oregon during November 1996. Intense rainfall on recently and past logged land as well as previously un-logged areas triggered over 9,500 landslides and debris flows that resulted directly or indirectly in eight fatalities. Highways were closed and a number of homes were lost. The fatalities and losses resulting from the 1996 landslide events brought about the passage of Oregon Senate Bill 12, which set site development standards, authorized the mapping of areas subject to rapidly moving landslides and the development of model landslide (steep slope) ordinances.

Counties with the highest percentage of reported landslides are: Lane (24%), Douglas (11%), Linn (10%), Tillamook (9%), Lincoln (8%), and Multnomah (7%).[3] Table 19 describes the history of more significant landslides and debris flows in the area.

[3] Hofmeister, YEAR, *Slope Failures in Oregon*; and DOGAMI, 2000, Special Paper 34.

TABLE 19. NOTABLE LANDSLIDES / DEBRIS FLOW EVENTS IN REGION 4

DATE	INCIDENT
01/1974	Nine employees working in a telephone building were killed when the building was pushed by a mudslide into Canyon Creek near Canyonville
02/1996	Heavy rains and rapidly melting snow contributed to hundreds of landslides / debris flows across the state. Many occurred on clear cuts that damaged logging roads
11/1996	Heavy rain triggered mudslides in Lane and Douglas counties; eight fatalities and several injuries in Douglas County

Source: George Taylor and Ray Hatton, 1999. The Oregon Weather Book; Oregon Department of Transportation Emergency Operations Plan, October, 2002.

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.

Table 19 describes significant landslide events. Though not all of those listed occurred in Region 4, they are indicative of the type of event that could be expected there.

The probability that Region 4 will experience landslides is 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.

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 20. Probability Assessment of Landsides

	Douglas (Inland)	Jackson	Josephine
Probability	H	H	-

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

Vulnerability

The region's vulnerability to landslides is depicted in Table 21 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 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 21. Vulnerability Assessment of Landsides

	Douglas (Inland)	Jackson	Josephine
Vulnerability	M	L	-

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

VOLCANO-RELATED HAZARDS

Characteristics and Brief History

The eastern boundary of Douglas and Jackson counties coincide with the crest of the Cascade Mountains, a volcanic range. The Cascade Mountains are still active as has been demonstrated by Mt. St. Helens in Washington State. Volcanic activity in the Cascades will continue, but questions regarding how, to what extent, and when, remain. In short, both counties are at some risk from volcano-associated hazards however remote. Josephine County is west of the Cascade Mountains and is not subject to the same risks.

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. These characteristics make predictions, recurrence intervals, or probability very difficult to ascertain.

Southwest Oregon communities are close to several prominent volcanic peaks, one of which is a National Park (Crater Lake). The other peaks include Mt. Bailey (elevation 8,363 ft.), Mt. Thielsen (9,182 ft.), and Mt. McLaughlin (9,495 ft.). Of the three, Crater Lake (6,178 ft.) may pose the greatest risk. It is a caldera and the remnant of a mountain (Mt. Mazama) that probably had an elevation between 10,800 and 12,000 ft. The massive eruption, which produced the caldera, took place about 7,700 years ago (fairly recently in terms of geological time). The long history at Mt. Mazama strongly suggests that this volcanic center will be active in the future[4]. The presence of the lake means that any future eruption likely will be violent; there are many examples of explosive activity brought about by magma coming into contact with water.

Douglas and Jackson counties should consider the impact of volcano-related activity on small mountain communities, tourist attractions (e.g., Crater Lake) dams, reservoirs, and highways. These counties also should consider probable impacts on the local economy (e.g., wood products, tourism and recreation).

Probability

There is virtually no risk from volcanoes in Josephine County, other than the possibility of ash fall. Ash fall could come from several sources in the Cascade Range, including Mt. Shasta in California or Crater Lake in Oregon. The probability of ash fall totaling 1 cm or more in Josephine County, from any Cascade volcano, is about 1 in 10,000;

[4] United States Geologic Survey (USGS) Open File Report 97-487, p. 7.

Douglas and Jackson counties are at greater risk. The probability of a 1 cm or greater ash fall varies between 1 in 5,000 to 1 in 10,000[5].

The United States Geologic Survey (USGS) has addressed volcanic hazards in the Crater Lake region and has prepared a map depicting the areas at greatest risk; this map shows the park itself in the greatest risk category. In Douglas County, the upper reaches of the Umpqua and Clearwater rivers are subject to volcano-associated hazards, as is the Highway 62 corridor in Jackson County[6].

Based on the total number of eruptive episodes in the past 100,000 years, the average recurrence interval in the Crater Lake area is about 10,000 years. The annual probability of an eruption then, is about one in 10,000; the 30-year probability is about 1 chance in 330.[7] The probability of an event is summarized in Table 22 below for each of the counties in Region 4.

TABLE 22. PROBABILITY OF VOLCANO-RELATED HAZARDS

Volcano Related Hazards	Douglas	Josephine	Jackson	Remarks
Tephra (volcanic ash) (annual probability of 1cm or more accumulation from eruptions throughout the Cascade Range)	1 in 5,000 to 1 in 10,000	1 in 10,000	1 in 5,000 to 1 in 10,000	OFR 97-513
Lahar	Source: Crater Lake	No Risk	Source: Crater Lake	OFR 97-487
Lava flow	No Risk	No Risk	No Risk	OFR 97-487
Debris flow / avalanche	No Risk	No Risk	Source: Crater Lake	OFR 97-487
Pyroclastic flow	Source: Crater Lake	No data available	Source: Crater Lake	OFR 97-487

Source: USGS Open File Reports 97-487 and 97-513

The probability that Region 4 will experience volcanic activity is depicted in Table 23 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:

[5] USGS Open File Report 97-513, p.9.

[6] USGS Open File Report 97-487, Plate 1

[7] USGS Open File Report 97-487, p.13.

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.

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 23. Probability Assessment of Volcano Related Hazards

	Douglas (Inland)	Jackson	Josephine
Probability	-	L	-

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

Vulnerability

The region's vulnerability to volcano-related hazards is depicted in Table 24 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 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 24. Vulnerability Assessment of Volcano Related Hazards

	Douglas (Inland)	Jackson	Josephine
Vulnerability	-	L	-

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

WINDSTORMS

Characteristics and Brief History

Extreme winds (other than tornadoes) are experienced in all of Oregon's eight regions. The most persistent high winds occur along the Oregon Coast and the Columbia River Gorge; consequently these areas have special building code standards. An historic overview of other significant windstorms in Oregon would include the following (Table 25).

Tornadoes have not been recorded in Jackson, Josephine, or non-coastal Douglas counties.

TABLE 25. SIGNIFICANT WINDSTORMS

DATE	AFFECTED AREA	CHARACTERISTICS
Apr., 1931	Western Oregon	Unofficial wind speeds reported at 78 mph. Damage to fruit orchards and timber.
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	Most of Oregon	Highest winds since 10/62. Wind speed 71 mph in Salem. Marinas, airports and bridges severely damaged
Jan., 1990	Statewide	Heavy rain with winds exceeding 75 mph. Significant damage. One fatality
Dec., 1995	Statewide	Followed path of Columbus Day Storm. Wind speeds 62 mph in Willamette Valley. Damage to trees (saturated soil a factor) and homes
Nov., 1997	Western Oregon	Wind speed 52 mph in Willamette Valley. Trees uprooted. Considerable damage to small airports.

Source: Taylor, George H., and Ray Hatton. (1999), The Oregon Weather Book. p.151-157, Hazard Mitigation Team Survey Report, Severe Windstorm in Western Oregon, February 7, 2002 (FEMA-1405-DR-OR); 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 ; National Climatic Data Center, Storm Events, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms.

TABLE 25. SIGNIFICANT WINDSTORMS Cont'd

Feb., 2002	Western Oregon	Strongest storm to strike western Oregon in several years. Many downed power lines (trees); damage to buildings; water supply problems (lack of power). Estimated damage costs: $6.14 million
Feb., 2004	Jackson County	Heavy winds caused $4,000 in damages in Jackson County.
Dec. 2006	Douglas, Josephine County	High winds up to 90 mph caused $150,000 in damages in Douglas and Josephine. The storm also impacted Coos and Curry Counties for a storm damage total of $300,000.
July 2007	Josephine, Jackson County	Severe thunderstorms with winds up to 60 mph down numerous trees damaging vehicles and trailers. $100,000 in damage in Jackson County. Lightening struck the steeple of a church in Josephine County, causing $60,000 in damages.

Source: Taylor, George H., and Ray Hatton. (1999), The Oregon Weather Book. p.151-157, Hazard Mitigation Team Survey Report, Severe Windstorm in Western Oregon, February 7, 2002 (FEMA-1405-DR-OR); 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 ; National Climatic Data Center, Storm Events, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms.

Probability

The recurrence interval of a windstorm on the order of the Columbus Day storm is about 100 years (George Taylor); a windstorm on the order of the February 7, 2002 event has a 10 to 12 year recurrence interval.

The probability that Region 4 will experience windstorms is depicted in Table 26 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.

TABLE 26. Probability Assessment of Windstorms

	Douglas (inland)	Jackson	Josephine*
Probability	H	-	H

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

* Probability and vulnerability scores are for severe weather which combines both wind and winter storms.

Vulnerability

Many buildings, utilities, and transportation systems within Region 4 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. Many roofs have been destroyed by uprooted ancient trees growing next to a house. 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 region's vulnerability to windstorms is depicted in Table 27 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 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 27. Vulnerability Assessment of Windstorms

	Douglas (Inland)	Jackson	Josephine*
Vulnerability	M	-	H

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

* Probability and vulnerability scores are for severe weather which combines both wind and winter storms.

WINTERSTORM

Characteristics and Brief History

Severe winter weather in this region is characterized by extreme cold, snow, ice, and sleet. Although such conditions may be expected in the Cascade Mountains and eastern Oregon, they are considered to be unusual in southwestern Oregon valleys. This is where the problem begins. Some Southwest Oregon communities are unprepared, financially and otherwise, although outbreaks of very cold air occur with some degree of regularity. Severe weather conditions do not last long in lowland areas, and this is cause to relegate winter-preparedness to a low priority. A historical summary of extreme winter conditions in this region is shown in Table 28.

TABLE 28. SEVERE WINTERSTORMS

DATE	LOCATION	CHARACTERISTICS
Dec., 1861	Statewide	First snow of the year covered the entire Pacific Northwest. Snowfall varied between 1 and 3 feet.
Jan., 1916	Statewide	Two snow storms, each totaling 5 inches or more
Jan. 1932	SW Oregon Mtns.	Crater Lake record snowfall up to this date: 879 inches
Jan.-Feb., 1937	Statewide	Heavy snow throughout the state
Jan., 1950	Statewide	Heaviest snowfall since 1890. Many highway closures. Considerable property damage.
Jan., 1951	Crater Lake	New annual record snowfall at Crater Lake (for 1950)
Jan., 1956	Western Oregon	Packed snow became ice. Many automobile accidents throughout the region
Mar., 1960	Statewide	Snowfall: 3-12 inches, depending on location. More than 100 snow related accidents in Marion County
Jan., 1969	Statewide	Lane County surpassed old snowfall record. Eugene (Lane Co.) had a total snow depth of 47 inches. Three to $4 million in property damage
Jan., 1980	Statewide	A series of storms bringing snow, ice, wind, and freezing rain. Six fatalities.
Feb., 1985	Statewide	Western valleys received between 2-4 inches of snow; Massive power failures (tree limbs broke power lines)

Source: Taylor, George and Ray Hatton, 1999, *The Oregon Weather Book* p.118-122.

TABLE 28. SEVERE WINTERSTORMS Cont'd

Feb., 1986	Cascades	Unusually heavy snowfall
Mar., 1988	Statewide	Strong winds and heavy snow
Feb., 1989	Statewide	Heavy snowfall and record low temperatures.
Nov., 1989	Siskiyou	Unusually heavy snowfall
Dec., 1992	Western Oregon	Heavy snow. Interstate Highway closed.
Feb., 1993	Western Oregon	Record snowfall at Salem airport
Winter 1998-9	Statewide	Series of storms. One of the snowiest winters in Oregon history
Winter 2003-4	Statewide	The most significant winter storm in several years brought snowfall to most of Oregon in late December 2003. Among the events was the largest snowstorm to hit the Siskiyou Pass in Jackson County in a quarter century. It shut down Interstate 5 for nearly an entire day beginning December 28, 2003 as ODOT maintenance crews and Oregon State Police troopers dug stranded motorists out of snowdrifts reaching five to six feet.

Source: Taylor, George and Ray Hatton, 1999, *The Oregon Weather Book* p.118-122.

Source: Oregon Department of Transportation, 2008. *State Natural Hazard Mitigation Plan*, Winter Storm Chapter.

Probability

Severe winterstorms occur about every four years. The probability that Region 4 will experience winterstorms is depicted in Table 29 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.

TABLE 29. Probability Assessment of Winterstorms

	Douglas (Inland)	Jackson	Josephine*
Probability	M	H	H

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

* Probability and vulnerability scores are for severe weather which combines both wind and winter storms.

Vulnerability

The region's vulnerability to winterstorms is depicted in Table 30 below. These scores are based on the perceptions of area emergency managers.

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 30. Vulnerability Assessment of Winterstorms

	Douglas (Inland)	Jackson	Josephine*
Vulnerability	M	H	H

Source: Oregon Emergency Management, November 2008, County Hazard Analysis Scores.

* Probability and vulnerability scores are for severe weather which combines both wind and winter storms.

Region 4: Southwest Oregon*
State Owned Building Inventory

* Includes the counties of Douglas, Jackson and Josephine.

Region 4: Southwest Oregon State Owned Building Inventory

Building Name	County	Replacement Value	Contents Value	Total Bldg Value	Usage	Earthquake		Fire/WUI		Flood		Landslide		Windstorm		Winterstorm	
						Prob.	Vuln.	Prob.	Vuln.	Prob.	Vuln.	Prob.	Vuln.	Prob.	Vuln.	Prob.	Vuln.
PROCESSING PLANT	Douglas	4,458,598	1,478,480	5,937,079	TREE PROCESSING	L	H	H	H	H	H	H	M	H	M	M	M
SW REGIONAL HQ	Douglas	1,465,920	750,000	2,215,920	ADMINISTRATIVE	L	H	H	H	H	H	H	M	H	M	M	M
ROSEBURG ARMORY	Douglas	3,158,844	5,722	3,164,566	ARMORY	L	H	H	H	H	H	H	M	H	M	M	M
REGION 3 OFFICE	Douglas	7,151,026	3,575,513	10,726,539	OFFICE/ADMIN	L	H	H	H	H	H	H	M	H	M	M	M
Canyonville Maint Station Bldg	Douglas	953,062	476,531	1,429,593	Maintenance Station Bldg	L	H	H	H	H	H	H	M	H	M	M	M
CHURCHILL HALL	Jackson	6,184,200	327,748	6,511,948	ADMINISTRATION	M	H	H	L	H	L	H	L	-	-	H	H
CASCADE COMPLEX	Jackson	21,391,370	466,478	21,857,848	DORMS/FOOD CAFETERIA	M	H	H	L	H	L	H	L	-	-	H	H
LIBRARY	Jackson	10,727,805	32,415,250	43,143,055	LIBRARY	M	H	H	L	H	L	H	L	-	-	H	H
VISUAL ARTS CENTER	Jackson	3,135,000	453,473	3,588,473	INSTRUCTION	M	H	H	L	H	L	H	L	-	-	H	H
ASHLAND ARMORY	Jackson	4,127,375	5,543	4,132,918	ARMORY	M	H	H	L	H	L	H	L	-	-	H	H
CENTRAL POINT CRIME LAB	Jackson	4,429,984	10,000	4,439,984	DISTRICT 3 HQ	M	H	H	L	H	L	H	L	-	-	H	H
MEDFORD ARMORY	Jackson	6,601,068	28,890	6,629,958	ARMORY	M	H	H	L	H	L	H	L	-	-	H	H
HATCHERY	Jackson	1,018,490	600,000	1,618,490	FISH HATCHERY	M	H	H	L	H	L	H	L	-	-	H	H
BRITT CENTER - SOU	Jackson	3,307,260	495,849	3,803,109	ADMINISTRATION	M	H	H	L	H	L	H	L	-	-	H	H
BRITT CENTER - SOU	Jackson	4,904,460	0	4,904,460	ADMINISTRATION	M	H	H	L	H	L	H	L	-	-	H	H
STEVENSON UNION- SOU	Jackson	4,209,975	815,331	5,025,306	DINING HALL	M	H	H	L	H	L	H	L	-	-	H	H
STEVENSON UNION- SOU	Jackson	9,755,955	0	9,755,955	STUDENT ACTIVITIES	M	H	H	L	H	L	H	L	-	-	H	H
TAYLOR HALL-SOU	Jackson	7,079,325	91,132	7,170,457	INSTRUCTION/ADMIN	M	H	H	L	H	L	H	L	-	-	H	H
SUSANNE HOMES HALL-SOU	Jackson	4,307,930	20,235	4,328,165	RESIDENCE HALL	M	H	H	L	H	L	H	L	-	-	H	H
COMPUTER SERVICES-SOU	Jackson	5,487,405	2,156,187	7,643,592	INSTRUCTION/ADMIN	M	H	H	L	H	L	H	L	-	-	H	H
MARION ADY BLDG-SOU	Jackson	5,775,000		5,775,000	INSTRUCTION/ADMIN/RESEARCH	M	H	H	L	H	L	H	L	-	-	H	H
SCIENCE HALL-SOU	Jackson	13,364,670	1,731,726	15,096,396	INSTRUCTION	M	H	H	L	H	L	H	L	-	-	H	H
SISKIYOU HALL-SOU	Jackson	2,623,610	85,271	2,708,881	RESIDENCE HALL	M	H	H	L	H	L	H	L	-	-	H	H
CENTRAL HALL-SOU	Jackson	7,121,235	472,698	7,593,933	INSTRUCTION/ADMIN	M	H	H	L	H	L	H	L	-	-	H	H
ROY W MCNEAL HALL-SOU	Jackson	15,875,640	295,439	16,171,079	PHYSICAL EDUCATION	M	H	H	L	H	L	H	L	-	-	H	H
GREENSPRINGS COMPLEX-SOU	Jackson	7,280,416	68,320	7,348,736	RESIDENCE HALL	M	H	H	L	H	L	H	L	-	-	H	H
CENTRAL HEATING PLANT-SOU	Jackson	3,967,200	0	3,967,200	PHYSICAL PLANT	M	H	H	L	H	L	H	L	-	-	H	H
EDUCATION PSYCHOLOGY-SOU	Jackson	7,798,890	87,292	7,886,182	INSTRUCTION	M	H	H	L	H	L	H	L	-	-	H	H
RESIDENCE HALL STORAGE-SOU	Jackson	4,560,435	115,483	4,675,918	STORAGE/MAINTENANCE	M	H	H	L	H	L	H	L	-	-	H	H
MUSIC-SOU	Jackson	7,189,380	462,866	7,652,246	INSTRUCTION	M	H	H	L	H	L	H	L	-	-	H	H
THEATRE ARTS-SOU	Jackson	6,577,230	94,466	6,671,696	INSTRUCTION	M	H	H	L	H	L	H	L	-	-	H	H
STADIUM FACILITY-SOU	Jackson	4,318,545	148,452	4,466,997	ATHLETICS	M	H	H	L	H	L	H	L	-	-	H	H
CASCADE THEATRE-SOU	Jackson	3,022,470		3,022,470	INSTRUCTION/ADMIN/RESEARCH	M	H	H	L	H	L	H	L	-	-	H	H
FAMILY HOUSING UNIT #18-SOU	Jackson	1,280,620		1,280,620	RESIDENCE & DINING HALL	M	H	H	L	H	L	H	L	-	-	H	H

Source: DAS data 2005

Region 4: Southwest Oregon State Owned Building Inventory

Building Name	County	Replacement Value	Contents Value	Total Bldg Value	Usage	Earthquake		Fire/WUI		Flood		Landslide		Windstorm		Winterstorm	
FAMILY HOUSING UNIT #6-SOU	Jackson	1,280,620		1,280,620	RESIDENCE & DINING HALL	M	H	H	L	H	L	H	L	-	-	H	H
FAMILY HOUSING UNIT #12-SOU	Jackson	1,280,620	0	1,280,620	RESIDENCE & DINING HALL	M	H	H	L	H	L	H	L	-	-	H	H
Ashland POE Inspection Bldg	Jackson	796,510	398,255	1,194,765	Inspect Scale, Weigh Stat	M	H	H	L	H	L	H	L	-	-	H	H
Central Point Maint Station Bldg	Jackson	1,335,832	667,916	2,003,748	Maintenance Station Bldg	M	H	H	L	H	L	H	L	-	-	H	H
GRANTS PASS ARMORY	Josephine	2,853,398	6,040	2,859,438	ARMORY	M	H	H	M	H	M	-	-	H	H	H	H
ROGUE VALLEY YCF	Josephine	10,602,600	737,157	11,339,757	CORRECTION FACILITY	M	H	H	M	H	M	-	-	H	H	H	H
WOLF CRK TAVERN INN	Josephine	3,156,038	330,170	3,486,208	HISTORIC TOURS/CONCESSION/INN/RESTAURANT	M	H	H	M	H	M	-	-	H	H	H	H
Regional Totals		**208,728,561**	**43,587,667**	**252,316,228**													

Source: DAS data 2005

Appendix E: Grant Programs

Hazard Mitigation Programs

Post-Disaster Federal Programs

- Hazard Mitigation Grant Program
  - The Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.
  - http://www.fema.gov/government/grant/hmgp/
- Physical Disaster Loan Program
  - When physical disaster loans are made to homeowners and businesses following disaster declarations by the U.S. Small Business Administration (SBA), up to 20% of the loan amount can go towards specific measures taken to protect against recurring damage in similar future disasters.
  - http://www.sba.gov/services/disasterassistance/index.html

Pre-Disaster Federal Programs

- Pre-Disaster Mitigation Grant Program
  - The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds.
  - http://www.fema.gov/government/grant/pdm/index.shtm
- Flood Mitigation Assistance Program
  - The overall goal of the Flood Mitigation Assistance (FMA) Program is to fund cost-effective measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other National Flood Insurance Program (NFIP) insurable structures. This specifically includes:
    - Reducing the number of repetitively or substantially damaged structures and the associated flood insurance claims;
    - Encouraging long-term, comprehensive hazard mitigation planning;
    - Responding to the needs of communities participating in the NFIP to expand their mitigation activities beyond floodplain development activities; and
    - Complementing other federal and state mitigation programs with similar, long-term mitigation goals.
  - http://www.fema.gov/government/grant/fma/index.shtm

Detailed program and application information for federal post-disaster and pre-disaster programs can be found in the FY10 Hazard Mitigation Assistance Unified Guidance, available at http://www.fema.gov/library/viewRecord.do?id=3649

For Oregon Emergency Management grant guidance on Federal Hazard Mitigation Assistance, visit: http://www.oregon.gov/OMD/OEM/plans_train/grant_info/hma.pdf

OEM contact: Dennis Sigrist, dsigrist@oem.state.or.us

State Programs

- Community Development Block Grant Program
  - Promotes viable communities by providing: 1) decent housing; 2) quality living environments; and 3) economic opportunities, especially for low and moderate income persons. Eligible Activities Most Relevant to Hazard Mitigation include: acquisition of property for public purposes; construction/reconstruction of public infrastructure; community planning activities. Under special circumstances, CDBG funds also can be used to meet urgent community development needs arising in the last 18 months which pose immediate threats to health and welfare.
  - http://www.hud.gov/offices/cpd/communitydevelopment/programs/
- Oregon Watershed Enhancement Board
  - While OWEB's primary responsibilities are implementing projects addressing coastal salmon restoration and improving water quality statewide, these projects can sometimes also benefit efforts to reduce flood and landslide hazards. In addition, OWEB conducts watershed workshops for landowners, watershed councils, educators, and others, and conducts a biennial conference highlighting watershed efforts statewide. Funding for OWEB programs comes from the general fund, state lottery, timber tax revenues, license plate revenues, angling license fees, and other sources. OWEB awards approximately $20 million in funding annually.
  - http://www.oweb.state.or.us/

Federal Mitigation Programs, Activities & Initiatives

Basic & Applied Research/Development

- National Earthquake Hazard Reduction Program (NEHRP), National Science Foundation. Through broad based participation, the NEHRP attempts to mitigate the effects of earthquakes. Member agencies in NEHRP are the US Geological Survey (USGS), the National Science Foundation (NSF), the Federal Emergency Management Agency (FEMA), and the National Institute for Standards and Technology (NIST). The agencies focus on research and development in areas such as the science of earthquakes, earthquake performance of buildings and other structures, societal impacts, and emergency response and recovery. http://www.nehrp.gov/

- Decision, Risk, and Management Science Program, National Science Foundation. Supports scientific research directed at increasing the understanding and effectiveness of decision making by individuals, groups, organizations, and society. Disciplinary and interdisciplinary research, doctoral dissertation research, and workshops are funded in the areas of judgment and decision making; decision analysis and decision aids; risk analysis, perception, and communication; societal and public policy decision making; management science and organizational design. The program also supports small grants for exploratory research of a time-critical or high-risk, potentially transformative nature.
  http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5423&org=SES

Hazard ID and Mapping

- National Flood Insurance Program: Flood Mapping; FEMA. Flood insurance rate maps and flood plain management maps for all NFIP communities. http://www.fema.gov/plan/prevent/fhm/index.shtm
- National Digital Orthophoto Program, DOI – USGS. Develops topographic quadrangles for use in mapping of flood and other hazards. http://www.ndop.gov/
- Mapping Standards Support, DOI-USGS. Expertise in mapping and digital data standards to support the National Flood Insurance Program. http://ncgmp.usgs.gov/ncgmpstandards/
- Soil Survey, USDA-NRCS. Maintains soil surveys of counties or other areas to assist with farming, conservation, mitigation or related purposes. http://soils.usda.gov/survey/

Project Support

- Community Development Block Grant Entitlement Communities Program, HUD. Provides grants to entitled cities and urban counties to develop viable communities (e.g., decent housing, a suitable living environment, expanded economic opportunities), principally for low- and moderate- in come persons. http://www.hud.gov/offices/cpd/communitydevelopment/programs/entitlement/
- National Fire Plan (DOI – USDA) Provides technical, financial, and resource guidance and support for wildland fire management across the United States. Addresses five key points: firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability. http://www.nps.gov/fire/fire/fir_nationalfireplan.cfm
- Assistance to Firefighters Grant Program, FEMA. Grants are awarded to fire departments to enhance their ability to protect the public and fire service personnel from fire and related hazards. Three types of grants are available: Assistance to Firefighters Grant (AFG), Fire Prevention and Safety (FP&S), and Staffing for Adequate Fire and Emergency Response (SAFER). http://www.fema.gov/firegrants/
- Emergency Watershed Protection Program, USDA-NRCS. Provides technical and financial assistance for relief from imminent hazards in small watersheds, and to reduce vulnerability of life and property in small watershed areas damaged by severe natural hazard events. http://www.nrcs.usda.gov/programs/EWP/
- Rural Development Assistance – Utilities, USDA. Direct and guaranteed rural economic loans and business enterprise grants to address utility issues and development needs. http://www.usda.gov/rus/
- Rural Development Assistance – Housing, USDA. Grants, loans, and technical assistance in addressing rehabilitation, health and safety needs in primarily low-income rural areas. Declaration of major disaster necessary. http://www.rurdev.usda.gov/rhs/
- Public Assistance Grant Program, FEMA. The objective of the Federal Emergency Management Agency's (FEMA) Public Assistance (PA) Grant Program is to provide assistance to State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President. http://www.fema.gov/government/grant/pa/index.shtm
- National Flood Insurance Program, FEMA. Makes available flood insurance to residents of communities that adopt and enforce minimum floodplain management requirements. http://www.fema.gov/business/nfip/

- HOME Investments Partnerships Program, HUD. Grants to states, local government and consortia for permanent and transitional housing (including support for property acquisition and rehabilitation) for low-income persons.
  http://www.hud.gov/offices/cpd/affordablehousing/programs/home/
- Disaster Recovery Initiative, HUD. Grants to fund gaps in available recovery assistance after disasters (including mitigation).
  http://www.hud.gov/offices/cpd/communitydevelopment/programs/dri/driquickfacts.cfm
- Emergency Management Performance Grants, FEMA. Helps state and local governments to sustain and enhance their all-hazards emergency management programs.
  http://www.fema.gov/government/grant/empg/index.shtm#0
- Partners for Fish and Wildlife, DOI – FWS. Financial and technical assistance to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats.
  http://www.fws.gov/partners/
- North American Wetland Conservation Fund, DOI-FWS. Cost-share grants to stimulate public/private partnerships for the protection, restoration, and management of wetland habitats.
  http://www.doi.gov/partnerships/wetlands.html
- Federal Land Transfer / Federal Land to Parks Program, DOI-NPS. Identifies, assesses, and transfers available Federal real property for acquisition for State and local parks and recreation, such as open space. http://www.nps.gov/ncrc/programs/flp/flp_questions.html
- Wetlands Reserve program, USDA-NCRS. Financial and technical assistance to protect and restore wetlands through easements and restoration agreements.
  http://www.nrcs.usda.gov/Programs/WRP/
- Secure Rural Schools and Community Self-Determination Act of 2000, US Forest Service. Reauthorized for FY2008-2011, it was originally enacted in 2000 to provide five years of transitional assistance to rural counties affected by the decline in revenue from timber harvests on federal lands. Funds have been used for improvements to public schools, roads, and stewardship projects. Money is also available for maintaining infrastructure, improving the health of watersheds and ecosystems, protecting communities, and strengthening local economies.
  http://www.fs.fed.us/srs/

More resources at: http://csc.uoregon.edu/opdr/stateplan/part4
(Click on Appendix 5 of the State's Enhanced Natural Hazard Mitigation Plan: Hazard Mitigation Funding Programs)