

Section 3: Risk Assessment

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What is a Risk Assessment?

Conducting a risk assessment can provide information on the location of hazards, the value of existing land and property in hazard locations, and an analysis of risk to life, property, and the environment that may result from natural hazard events. Specifically, the three levels of a risk assessment are as follows:

- 1) **Hazard Identification** identifies the geographic extent of the hazard, the intensity of the hazard, and the probability of its occurrence. Maps are frequently used to display hazard identification data. Yamhill County identified seven major hazards that consistently affect this geographic area: floods, landslides, wildfires, earthquakes, severe winter storms, windstorms, and drought. The geographic extent of each of the identified hazards has been identified by the Yamhill County GIS department using the best available data, and is illustrated by the maps listed in Table 3-1.

Profiling Hazard Events describes the causes and characteristics of each hazard, how it has affected Yamhill County in the past, and what part of Yamhill County's population, infrastructure, and environment has historically been vulnerable to each specific hazard. A profile of each hazard discussed in this plan is provided in each hazard section. For a full description of the history of hazard specific events, please see the appropriate hazard chapter.

- 2) **Vulnerability Assessment/Inventorying Assets** combines hazard identification with an inventory of the existing (or planned) property and population exposed to a hazard. Critical facilities are of particular concern because these entities provide essential products and services to the general public that are necessary to preserve the welfare and quality of life in the county and fulfill important public safety, emergency response, and/or disaster recovery functions. The critical facilities have been identified, mapped, and are illustrated in Map 3 in Section 2 of this plan. A description of the critical facilities in Yamhill County is also provided in Section 2. In addition, this plan includes a community issues summary in each hazard section to identify the most vulnerable and problematic areas in the county, including critical facilities, and other public and private property.
- 3) **Risk Analysis/Estimating Potential Losses** involves estimating the damage, injuries, and financial losses likely to be sustained in a geographic area over a given period of time. This level of analysis involves using mathematical models. The two measurable components of risk analysis are magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework with which to measure the effects of hazards on assets. For each hazard where data was available, quantitative estimates for potential losses are included in the hazard assessment.

Assessing Vulnerability/Analyzing Development Trends

provides a general description of land uses and development trends within the community so that mitigation options can be considered in land use planning and future land use decisions. This plan provides comprehensive description of the character of Yamhill County in the Community Profile. This description includes the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns. Analyzing these components of Yamhill County can help in identifying potential problem areas, and can serve as a guide for incorporating the goals and ideas contained in this mitigation plan into other community development plans.

Table 3-1. List of Hazard Mitigation Plan Maps

Map #	Type of Map	Section of the Plan
1	Base Map of Yamhill County	Section 1: Introduction
2	Critical Facilities	Section 2: Community Profile
3	Essential Facilities	Section 2: Community Profile
4	County 100-Year Flood plain	Section 6: Flood
5	Hydrologic Subbasins Map	Section 6: Flood
6	Fire Districts	Section 8: Wildfire
7	Geological Fault Lines	Section 12: Earthquake

Risk assessments are subject to the availability of hazard-specific data. Gathering data for a risk assessment requires a commitment of resources on the part of participating organizations and agencies. Each hazard-specific section of the plan includes a section on hazard identification using data and information from county or state agency sources.

**THREE PHASES OF RISK ASSESSMENT:
Hazard Identification → Vulnerability Assessment → Risk Analysis**

Yamhill County conducted a vulnerability assessment for the flood hazard using Geographic Information Systems (GIS) to identify the geographic extent of the hazard and assess the land use and value at risk from the flood hazard. The vulnerability assessment for the earthquake hazard is addressed in part from FEMA’s HAZUS analysis model. Insufficient data exists to conduct vulnerability assessments and risk analyses for the other hazards addressed in the plan: landslides, severe winter storms, windstorms, drought and wildfires.

Regardless of the data available for risk assessments, there are numerous strategies the county can take to reduce risk. These strategies are described in the action items detailed in each hazard section of this Plan. Mitigation strategies can further reduce disruption to critical services, reduce the risk to human life, and alleviate damage to personal and public property and infrastructure. Action items throughout the

hazard sections provide recommendations to collect further data to map hazard locations and conduct hazard assessments.

Federal Requirements for Risk Assessment

Recent federal regulations for hazard mitigation plans outlined in 44 CFR Part 201 include a requirement for risk assessment.¹ This risk assessment requirement is intended to provide information that will help communities identify and prioritize mitigation activities that will reduce losses from the identified hazards. There are seven hazards profiled in the mitigation plan: floods, landslides, wildfires, earthquakes, winter storms, drought and windstorms. The Federal criteria for risk assessment and information on how the Yamhill County Natural Hazard Mitigation Plan meets those criteria is outlined in Table 3-2 below.

Table 3-2. Federal Criteria for Risk Assessment

Section 201 Requirement	How is this addressed?
Identifying Hazards	Each hazard section includes an inventory of the best available data sources that identify hazard areas. To the extent that GIS data are available, the county developed maps identifying the location of the hazard in the county. The Executive Summary and the Hazard Assessment sections of the plan include a list of the hazard maps.
Profiling Hazard Events	Each hazard section includes documentation of the history, and causes and characteristics of the hazard in the county.
Assessing Vulnerability: Identifying Assets	Where data is available, the vulnerability assessment for each hazard addressed in the mitigation plan includes an inventory of all publicly owned land within hazardous areas. Each hazard section provides information on vulnerable areas in the county in the Community Issues section. Each hazard section also identifies potential mitigation strategies.
Assessing Vulnerability: Estimating Potential Losses	The Hazard Assessment Section of this mitigation plan identifies key critical facilities and lifelines in the county and includes a map of these facilities. Vulnerability assessments have been completed for the hazards addressed in the plan, and quantitative estimates were made for each hazard where data was available.
Assessing Vulnerability: Analyzing Development Trends	The Yamhill County Community Profile Section of this plan provides a description of the development trends in the county, including the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns.

Critical Facilities and Infrastructure

Facilities critical to government response and recovery activities (i.e., life, safety and property and environmental protection) include: 911 centers, emergency operations centers, police and fire stations, public works facilities, sewer and water facilities, hospitals, bridges and roads, shelters, and shelters. Facilities that, if damaged, could cause serious

secondary impacts may also be considered “critical.” A hazardous material facility is one example of this type of critical facility. Critical facilities are those facilities that are vital to the continued delivery of key government services or that may significantly impact the public’s ability to recover from the emergency. These facilities may include: buildings such as the county jail, law enforcement center, public services building, community corrections center, the courthouse, and juvenile services building and other public facilities such as schools.

Summary

Natural hazard mitigation strategies can reduce the impacts concentrated at large employment and industrial centers, public infrastructure, and critical facilities. Natural hazard mitigation for industries and employers may include developing relationships with emergency management services and their employees before disaster strikes, and establishing mitigation strategies together. Collaboration among the public and private sector to create mitigation plans and actions can reduce the impacts of natural hazards.

ⁱ 44 CFR Ch.1, Section 201.4(c)(2).