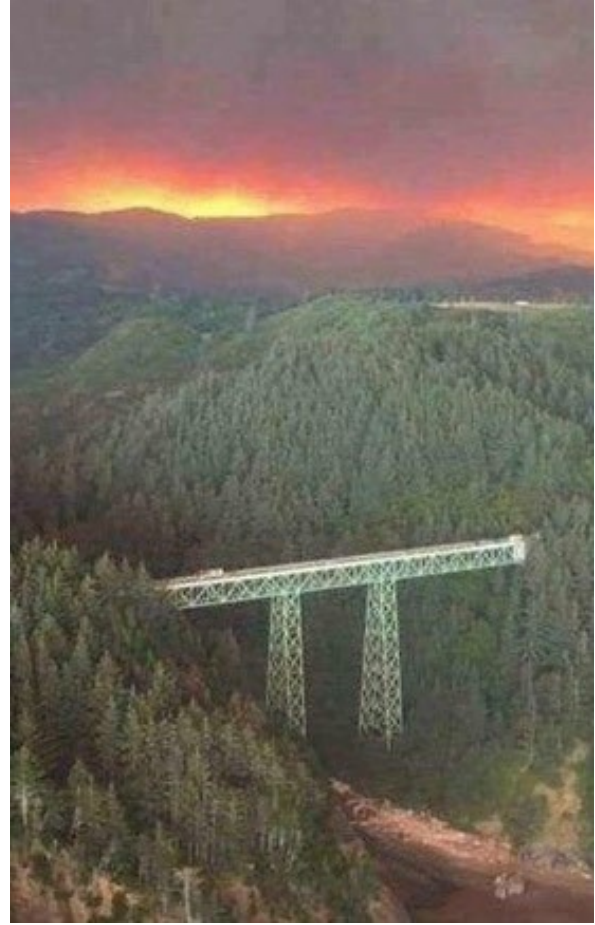




Curry County

MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN



- Curry County
- City of Brookings
- City of Gold Beach
- City of Port Orford
- Port of Gold Beach
- Port of Port Orford



FEMA

Effective Month November 9, 2022 through November 8, 2027

The 2022 Curry County Multi-Jurisdictional Hazards Mitigation Plan is a living document that will be reviewed and updated periodically to address the requirements contained in 44 CFR 201. It will be integrated with existing plans, policies, and programs. The Disaster Mitigation Act of 2000 (DMA2K) and the regulations contained in 44 CFR 201 require that jurisdictions maintain an approved mitigation plan in order to receive federal funds for hazard mitigation grants. This plan meets those requirements as evidenced by FEMA approval which is effective per the cover date range of this plan.

Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan Mission:

To create a disaster-resilient Curry County.

**For further information and to provide comments,
contact:**

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Emergency Management Coordinator
Curry County Emergency Management
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Acknowledgements

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Janell Howard, City Manager

City of Gold Beach

Jodi Fritts-Matthey, City Manager
Will Newdall, Public Works Superintendent
Jordan White, Chief of Police

City of Port Orford

Pat Cox, Mayor
Jessica Ginsburg, City Administrator
Gary Burns, City Councilor

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Special thanks to FEMA and OEM for providing FEMA grant PDMC-PL-10-OR-2018-005 to support the project.

Cover photos (clockwise): Thomas Creek Bridge (2017) courtesy of the Chetco Bar incident command team; Winter Storm Surge (2014), Port of Port Orford; and Hooskanaden Creek Slide (2019), Oregon Department of Transportation.

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FEMA

December 21, 2022

The Honorable John Herzog
Chair, Curry County Board of Commissioners
94235 Moore Street, Suite 122
Gold Beach, Oregon 97444

Dear Mr. John Herzog:

On November 9, 2022, the United States Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Curry County Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's Hazard Mitigation Assistance grants projects through November 8, 2027, through your state:

Curry County	City of Port Orford	Port of Port Orford	Port of Gold Beach
City of Brookings	City of Gold Beach		

The updated list of approved jurisdictions includes the City of Brookings and the City of Gold Beach that recently adopted the Curry County Hazard Mitigation Plan. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Joseph Murray, Planner with Oregon Department of Emergency Management, at 503-378-3929, who coordinates and administers these efforts for local entities.

Sincerely,

**KRISTEN C
MEYERS**

Kristen Meyers, Director
Mitigation Division

Digitally signed by KRISTEN C
MEYERS
Date: 2022.12.21 13:59:51 -08'00'

Enclosures

cc: Anna Feigum, Oregon Department of Emergency Management

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A. Introduction

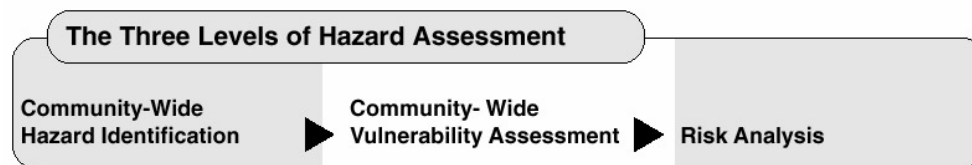
This Risk Assessment applies to Curry County; the cities of Brookings, Gold Beach, and Port Orford; and the special districts of the Port of Gold Beach and Port of Port Orford. These are the six plan holder jurisdictions/ participants in the 2022 Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP) update.

What is a Risk Assessment?

A risk assessment consists of three phases: hazard identification, vulnerability assessment, and risk analysis. This three-phase approach to developing a risk assessment should be conducted sequentially because each phase builds upon data from prior phases. However, gathering data for a risk assessment does not need to follow a specific order.

The following figure illustrates the three-phase risk assessment process:

Figure I-1. Three Phases of a Risk Assessment



Source: Planning for Natural Hazards: Oregon Technical Resource Guide, 1998

- Phase 1: Identify hazards that can impact the jurisdiction. This includes an evaluation of potential hazard impacts – type, location, extent, etc.
- Phase 2: Identify important community assets and system vulnerabilities. Example vulnerabilities include critical facilities, community centers, individuals, homes, businesses, roads, historic places and drinking water sources.
- Phase 3: Evaluate the extent to which the identified hazards overlap with, or have an impact on, the important assets identified by the community.

The hazard specific information presented in the Risk Assessment, the hazard chapters and community characteristics presented in the Community Profile, is used to inform the risk reduction actions identified in the Mitigation Strategy. In addition, this information can assist with addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards. The risk assessment process is graphically depicted in the table below. Ultimately, the goal of hazard mitigation is to reduce the area where hazards and vulnerable systems overlap.

Figure I-2. Understanding Risk

- Source: Oregon Partnership for Disaster Resilience.

Hazard Identification

Curry County identifies nine natural hazards that could have an impact on the county and each of the participating jurisdictions. The table below lists the hazards identified in the county in comparison to the hazards identified in the State of Oregon NHMP for Coastal Oregon (Region 1), which includes Curry County.

Table I-1. Hazard Comparison: Curry County NHMP vs. Oregon NHMP

Curry County Hazards 2022	Oregon Coast Region 1 Hazards 2020
Coastal Erosion	Coastal Hazards*
Drought	Droughts
Earthquake	Earthquakes
--	Extreme Heat
Flood	Floods
Landslide	Landslides
Tsunami	Tsunamis
--	Volcanoes
Wildfire	Wildfires
Windstorm	Windstorms
Winter Storm	Winter Storms

*In the Oregon NHMP, Coastal Hazards include Coastal Erosion (short/long term), Landslides, Earthquakes, and Tsunami. Source: Curry County Sheriff's Office (2021) and State of Oregon (Draft) NHMP, Region 1: Coastal Oregon (2020).

Federal Disaster Declarations

Reviewing past events can provide a general sense of the hazards that have caused significant damage in the county. Where trends emerge, disaster declarations can help inform hazard mitigation project priorities.

President Dwight D. Eisenhower approved the first federal disaster declaration in May 1953 following a tornado in Georgia. Since then, federally declared disasters have been approved within every state as a result of natural hazard related events. As of April 2021, FEMA has approved a total of 38 major disaster declarations, four emergency declarations (two in 2020: COVID-19 and Wildfires), and 57 fire management assistance declarations in Oregon (sixteen occurring in 2020). When governors ask for presidential declarations of major disaster or emergency, they stipulate which counties in their state they want included in the declaration.

Table I-2 summarizes the major disasters declared in Oregon that affected Curry County, since 1964. There have been eleven major disaster declarations for the county, four since the last plan update. Nine of these events were severe wind or storm events resulting in flooding, landslides and windstorm damage. The other two were: 1) a distant tsunami event triggered by the 2011 Tohoku Earthquake in Japan; and 2) the 2017 Chetco Bar Fire.

Table I-2. FEMA Major Disaster Declarations for Curry County

Number	Date Declared	Incident Date(s)	Incident
DR-4452	7/9/2019	4/6/2019-4/21/2019	Severe Storms, Flooding, Landslides, And Mudslides.
DR-4432	5/2/2019	2/23/2019-2/26/2019	Severe Winter Storms, Flooding, Landslides, and Mudslides.
FM-5198	8/20/2017	8/19/2017-9/20/2017	Chetco Bar Fire.
DR-4258	2/17/2016	12/6/2016-12/23/2016	Severe Winter Storms, Straight-line Winds, Flooding, Landslides, and Mudslides.
DR-4055	3/2/2012	1/17/2012-1/21/2012	Severe storm, Flooding, Landslides, and Mudslides.
DR-1964	3/25/2011	3/31/2011	Tsunami wave surge.
DR-1733	12/8/2007	12/01/2007-12/17/2007	Severe Storm, Flooding, Landslides.
DR-1632	3/20/2006	12/18/2005-1/21/2006	Severe Storm, Flooding, Landslides.
DR-1405	3/12/2002	2/7/2002-2/8/2002	Severe Windstorm.
DR-413	1/25/1974	1/25/1974	Severe Storm, Flooding.
DR-184	12/24/1964	12/24/1964	Heavy rains and Flooding.

Source: FEMA. (2021). *Declared Disasters*. <https://www.fema.gov/disaster/declarations> accessed 09/22/2021.

Hazard Vulnerability Analysis

Vulnerability includes the percentage of population and property likely to be affected under an “average” occurrence of the hazard. Curry County evaluated the best available data to develop the vulnerability scores presented below.

The table below presents the vulnerability scores for each of the natural hazards present in Curry County and for participating cities. Hazard chapters were not developed for the three lowest ranked hazards—dust storm, extreme heat, and volcano. Windstorm and winter storm were ranked separately but had the same score and are presented together in the 2022 Curry County NHMP update.

For the purposes of this NHMP, the county utilized the Oregon Department of Emergency Management (OEM) Hazard Analysis methodology vulnerability definitions to determine hazard probability.

Table I-3. Curry County Hazard Vulnerability Analysis

Hazard	History	Vulnerability	Maximum Threat	Probability	Total
Coastal Erosion	8	20	50	56	134
Drought	16	20	80	56	172
Dust Storm	2	5	10	7	24
Earthquake – Cascadia	2	50	100	56	208
Earthquake – Crustal	10	50	100	56	216
Extreme Heat	2	20	70	35	127
Flood – Riverine	18	45	90	63	216
Flood – Tidal	4	15	30	14	63
Landslide/ Debris Flow	20	50	100	70	240
Tsunami – Local/ Cascadia	2	50	100	70	222
Tsunami – Distant	6	35	80	63	184
Volcano	2	5	10	7	24
Wildfire	16	50	100	70	236
Windstorm/ Winter Storm	18	45	100	63	226

Source: Curry County, 2021.

DOGAMI Natural Hazard Risk Report for Curry County, Oregon

Williams, M.C. and Anthony, L.H. (2020). NATURAL HAZARD RISK REPORT FOR CURRY COUNTY including the Cities of Brookings, Gold Beach, Port Orford, and the Unincorporated Communities of Harbor and Nesika Beach. (Open File Report O-20-15). Portland: Department of Geology of Mineral Industries. <https://www.oregongeology.org/pubs/ofr/p-O-20-15.htm>

This report is cited as a source in tables and figures as Williams & Anthony, 2020.

The Natural Hazard Risk Report for Curry County, Oregon, including the Cities of Brookings, Gold Beach, Port Orford and Unincorporated Communities of Harbor and Nesika Beach, consists of an 82-page report, 7 tabloid size map plates, one Esri® geodatabase with internal metadata, and external metadata in .xml format. It is the principal risk assessment reference used for the 2022 Curry NHMP plan update. This report was prepared for the communities of Curry County, Oregon, with funding provided by the Federal Emergency Management Agency (FEMA) by staff from the Oregon Department of Geology and Mineral Industries (DOGAMI).

The purpose of the risk report is to provide communities with a detailed understanding of their risk from natural hazards, to give communities the ability to compare their risk across multiple hazards, and to prioritize mitigation actions that will reduce risk. The report quantifies the impacts of natural hazards to these communities to enhance the decision-making process in planning for disaster. DOGAMI arrived at the findings and conclusions by completing three main tasks: compiling an asset database, identifying and using best available hazard data, and performing natural hazard risk assessment.

The results of this study informed the natural hazard mitigation planning process for the 2022 update. The primary findings and conclusions of this project are integrated into this risk assessment section, particularly the relevant hazard chapters (coastal erosion, earthquake, flood, landslide, tsunami, and wildfire). The following table clarifies which hazards and which community areas are evaluated in the Risk Report.

Table I-4. Hazards and Communities Addressed in the DOGAMI Risk Report for Curry County

	Unincorporated Curry County	Unincorporated Communities: Harbor Nesika Beach	City of Brookings	City of Gold Beach	City of Port Orford
Coastal Erosion	X	X	X	X	X
Drought					
Earthquake	X	X	X	X	X
Flood	X	X	X	X	X
Landslide	X	X	X	X	X
Tsunami	X	X	X	X	X
Wildfire	X	X	X	X	X
Windstorm/ Winter Storm					

Table I-5. Selected Countywide Results - Natural Hazard Risk Report

Selected Countywide Results Total buildings: 20,767 Total estimated building value: \$1.6 billion	
Cascadia Subduction Zone Magnitude 9.0 Earthquake^a Red-tagged buildings ^b : 5,924 Yellow-tagged buildings ^c : 2,277 Loss estimate: \$451 million	Cascadia Subduction Zone Tsunami Inundation (Medium-sized) Number of buildings exposed: 1,755 Exposed building value: \$169 million
100-year Flood Scenario Number of buildings damaged: 410 Loss estimate: \$5.9 million	Landslide Exposure (High and Very High-Susceptibility) Number of buildings exposed: 3,969 Exposed building value: \$309 million
Coastal Erosion Exposure (Moderate-Hazard) Number of buildings exposed: 107 Exposed building value: \$19 million	Wildfire Exposure (High Hazard) Number of buildings exposed: 303 Exposed building value: \$25 million
^a Results reflect damages caused by earthquake to buildings outside of the tsunami zone. Earthquake and tsunami results combined estimate the total damages from a CSZ M9.0 event. ^b Red-tagged buildings are considered to be uninhabitable due to complete damage. ^c Yellow-tagged buildings are considered to be of limited habitability due to extensive damage.	

Source: Williams and Anthony, 2020.

OCCRI Future Conditions Report for Curry County, Oregon

Dalton, Meghan, Erica Fleishman, and Dominique Bachelet. (2022, May.). Future Climate Projections: Curry County. Oregon Climate Change Research Institute. College of Earth, Ocean and Atmospheric Sciences, Oregon State University.

<https://oregonstate.box.com/s/5aczwkfekk3glw8zja830opgpsxf3u90>

This report is cited as a source as Dalton et al., 2022.

The Future Conditions Report for Curry County, Oregon, provides a scientific basis for determining how hazards that affect Curry County might change due to climate change. Climate change is expected to increase the occurrence of many climate-related natural hazards. Confidence that the risk of heat waves will increase is very high (Table 1) given strong evidence in the peer-reviewed literature, consistency among the projections of different global climate models, and robust theoretical principles underlying increasing temperatures in response to ongoing emissions of greenhouse gases. Confidence that the risk of many other natural hazards will increase as climate changes is high or medium (Table 1), reflecting moderate to strong evidence and consistency among models, yet these risks are influenced by multiple secondary factors in addition to increasing temperatures. Confidence in projections of changes in risks is indicated as low if projections suggest relatively few to no changes or evidence is limited.

Table I-6. Influence of climate on hazards

Table 1. Projected direction and level of confidence in changes in the risks of climate-related natural hazards. Very high confidence means that the direction of change is consistent among nearly all global climate models and there is robust evidence in the peer-reviewed literature. High confidence means that the direction of change is consistent among more than half of models and there is moderate to robust evidence in the peer-reviewed literature. Medium confidence means that the direction of change is consistent among more than half of models and there is moderate evidence in the peer-reviewed literature and. Low confidence means the direction of change is small compared to the range of model responses or there is limited evidence in the peer-reviewed literature.

	Low Confidence	Medium Confidence	High Confidence	Very High Confidence
Risk Increasing 	 Reduced Air Quality	 Drought  Expansion of Pests, Pathogens, and Non-native Invasive Species	 Heavy Rains  Flooding  Wildfire  Changes in Ocean Temperature and Chemistry  Coastal Hazards	 Heat Waves
Risk Unchanging =	 Windstorms			
Risk Decreasing 	 Loss of Wetlands			 Cold Waves

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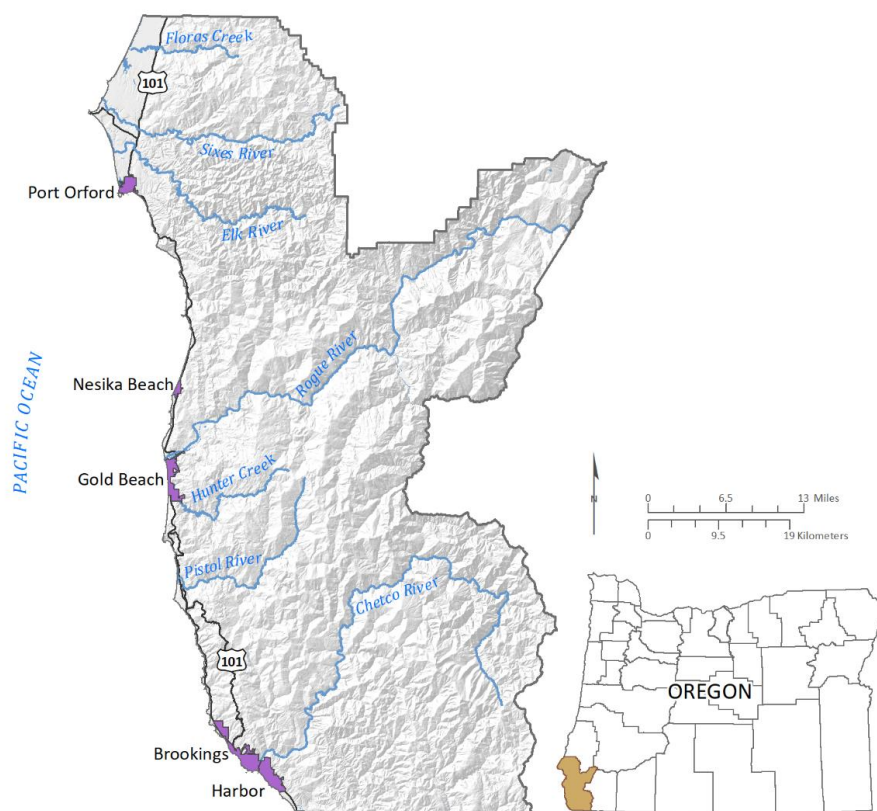
Geography

Approximately 66% of the lands within Curry County are federal forest lands such as those managed by the US Forest Service and the Bureau of Land Management, and the State of Oregon manages about 1% of county land as the Oregon Parks and Recreation Department (parks, beaches, dunes) and the Department of State Lands. Private timberland ownership accounts for 22% of county land ownership (Curry County, 2012). The balance of the lands in the county are unincorporated county and incorporated cities. Cities are required to provide services such as water and sewer, their growth is guided by Urban Growth Boundaries (UGBs). There are three incorporated cities in Curry County.

Curry County

Curry County is located in southwest coastal Oregon and encompasses 1,627 square miles. The county is bounded to the north by Coos County, to the northeast by Douglas County, to the east by Josephine County, and to the south by California. Curry County has a diverse geography. The Curry County coast is known for its remote nature and striking views of haystack rock formations and islands, many of which are managed as the Oregon Islands National Wildlife Refuge. The coastal terrain of the north county is relatively flat, yet inland to the east and south, the Coast Range and the Klamath Mountains create a mountainous topography with elevations ranging from sea level to over 5,000 feet. Mount Brandy as the county's highest elevation at 5,298 feet. Major rivers in Curry County include the Rogue, Chetco, and many coastal watersheds.

Figure I-3. Map of Curry County



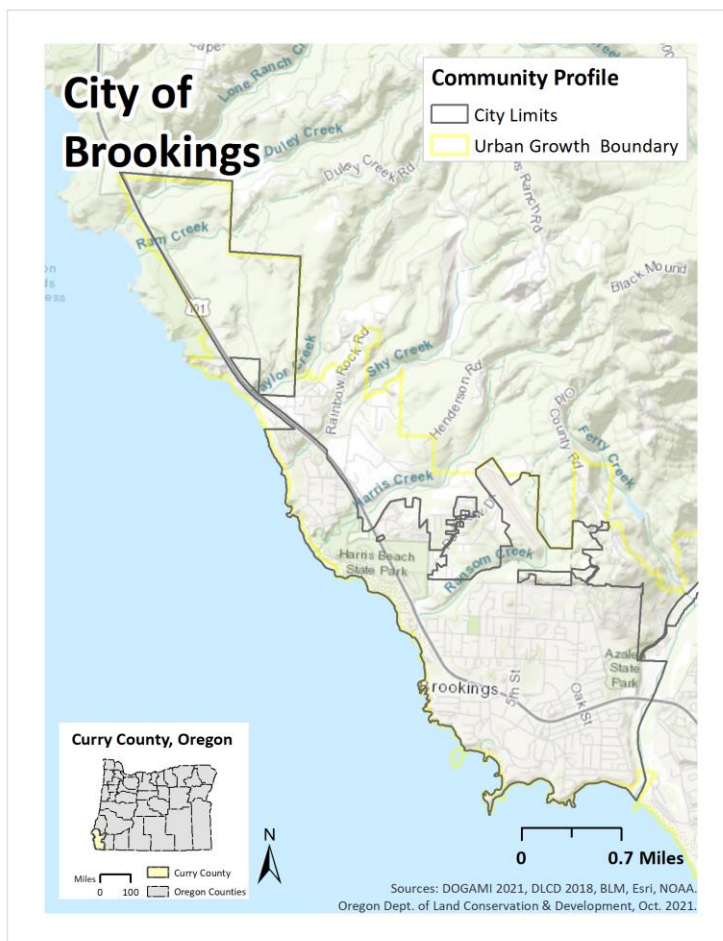
Source: Williams & Anthony, 2020. Curry County

City of Brookings

The City of Brookings is the southernmost incorporated city along the Oregon coast, just 5 miles north of the California border. The city is bounded by the ocean to the west, the Rogue River-Siskiyou National Forest to the east, and the Chetco River and the Port of Brookings-Harbor to the south, and Harris Beach State Park to the north. Since its incorporation in 1951, the City of Brookings has grown in population and area; it is now the largest city in Curry County. Much of the City's population growth since the 1980s, when Brookings was "discovered" as a great place to live, has been from retirees moving to the area to enjoy the mild climate, beautiful coastline, and many scenic and recreational amenities.

Brookings originally thrived on the lumber and commercial and sports fishing industries. Lily bulb farming was introduced in the 1920's. Although dwindling, lumber and fishing are still strong factors in the City's economy and the lily bulb farms, which are in a 12-mile area between Brookings and Smith River, California, produce 100% of the lily bulbs grown in North America. Because of these stable industries, Brookings is less dependent on the tourist trade than many Oregon coast cities (Brookings, 2021).

Figure I-4. Map of Brookings City Limits



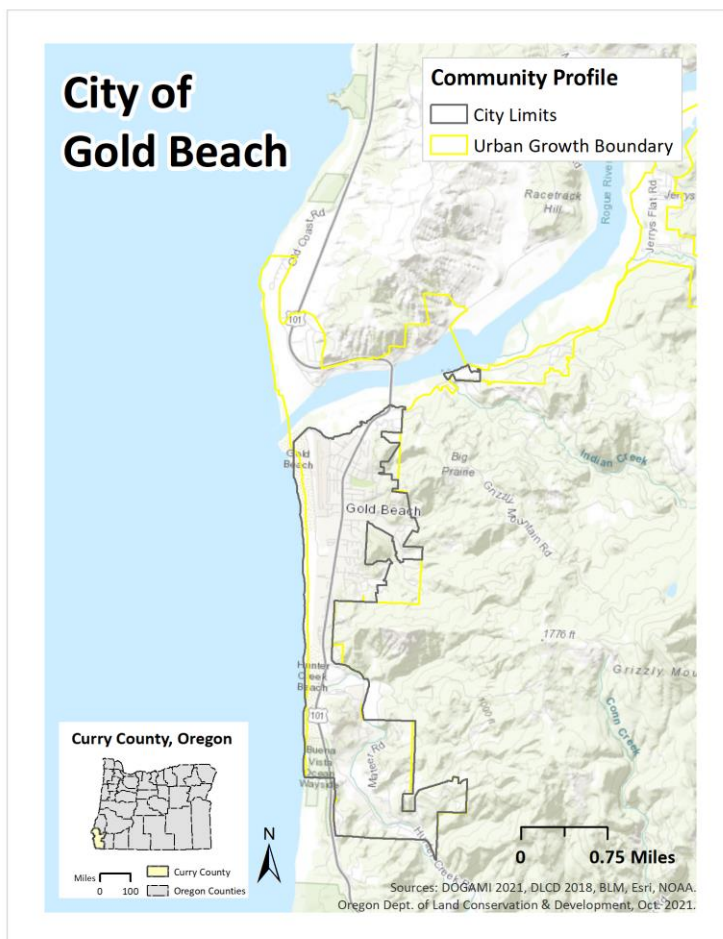
Source: DLCD, 2021.

City of Gold Beach

The City of Gold Beach was established on the Pacific Coast at the mouth of the Rogue River in the 1850s. Miners dubbed their coastal settlement “Gold Beach” in the early 1850s when they discovered gold in the sands at the mouth of the Rogue River. In 1876, R.D. Hume established a fish cannery in Gold Beach at the mouth of the Rogue River. From this time on, fishing began to replace mining as the main economic activity in Gold Beach. Abundant supplies of salmon, as well as steelhead trout, shell fish, and sea urchins supported a prosperous commercial fishing industry.

Commercial fishing on the Rogue River ended in 1935. Following the closure of commercial fishing, sport fishing in the area has become even more popular. Eventually, timber harvesting grew to be Gold Beach’s largest industry until over harvesting and other factors contributed to a shortened supply of timber beginning in the early 1980s. In 1986 the local Champion plywood mill closed its operations. The US Forest Service and the Bureau of Land Management own much of the remaining timber in the vicinity of Gold Beach. The community’s natural resources continue to draw large numbers of tourists and sport fishermen to the area.

Figure I-5. Map of Gold Beach City Limits

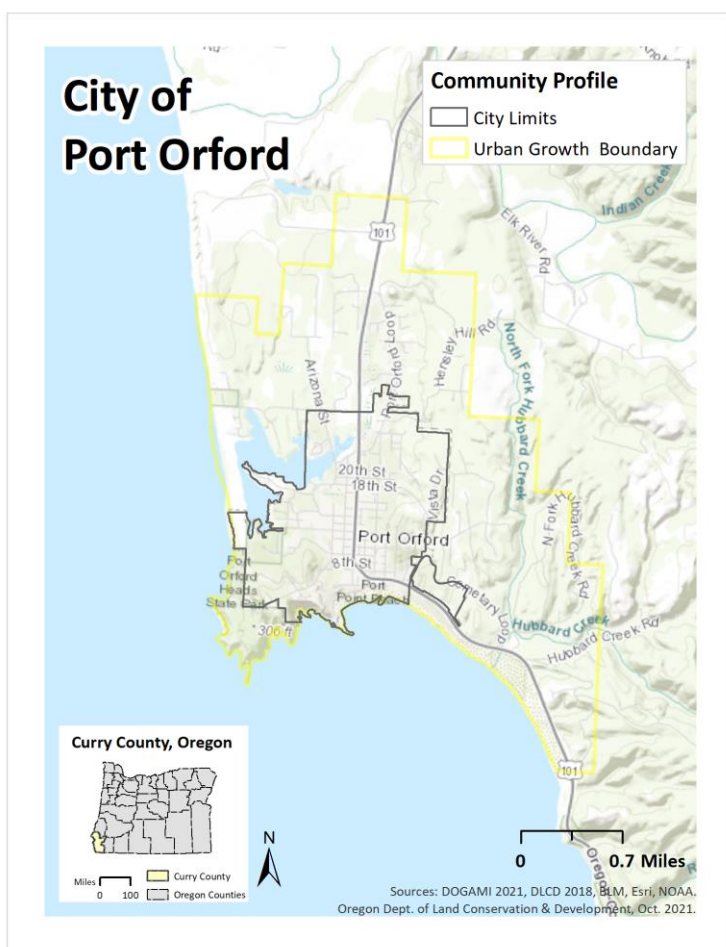


Source: DLCD. 2021.

City of Port Orford

Port Orford is the oldest town on the Oregon Coast and the most westerly in the 48 states. The city sits on the coast at Port Orford Head and is bound by Garrison Lake to the north. Amenities include a working fishing port, an active art community, and a great place for visitors who want to enjoy spectacular natural beauty without the crowds. The City of Port Orford regulates development and provides services to areas within city limits, in addition to managing water and wastewater utilities, and providing police service and fire defense to local residents.

Figure I-6. Map of Port Orford City Limits



Source: DLCD. 2021.

Unincorporated Curry County Communities

Curry County regulates development and provides services to rural areas and unincorporated communities that are outside of city limits. These include:

- Harbor
- Nesika Beach
- Agness
- Langlois
- Carpenterville
- Wedderburn

Harbor

Harbor is an unincorporated community located across the Chetco River from the city of Brookings. It is named for the Port of Brookings Harbor and is a popular retirement and recreation community.

Nesika Beach

Located five miles north of Gold Beach, Nesika Beach is a coastal destination near the confluence of Euchre Creek and the Pacific Ocean. Highway 101 is located at or near sea level in this area which allows for unique ocean access for tourism but increases the risk of coastal hazard impacts.

Agness

Located in eastern Curry County near the confluence of the Lower Rogue and Illinois Rivers, Agness is an unincorporated community surrounded by federal forest land.

Langlois

Located on Highway 101 in north Curry County just south of Bandon in Coos County, Langlois and neighboring Denmark were historic dairy-producing areas known for blue cheese.

Carpenterville

Located on the former alignment of U.S. Route 101 known as the Roosevelt Highway (now Oregon Route 255 or the Carpenterville Highway), about 16 miles north of Brookings. Carpenterville was the highest point on the former main coastal highway and the area is known for its views.

Wedderburn

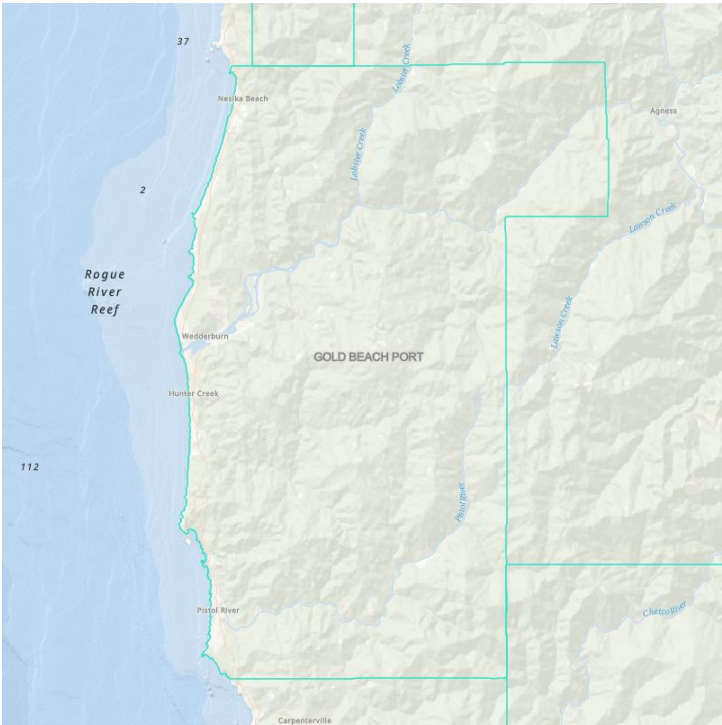
Located to the north of, and across the mouth of the Rogue River from Gold Beach, on U.S. Route 101, the Isaac Lee Patterson Bridge connects Wedderburn with Gold Beach. It is the historic site of a salmon fishery cannery.

Ports

There are three port districts in Curry County, two of which are plan holders in this effort and a third with their own stand-alone plan. All three districts have taxing districts—these jurisdictional boundaries sourced from the Oregon Department of Revenue are shown below.

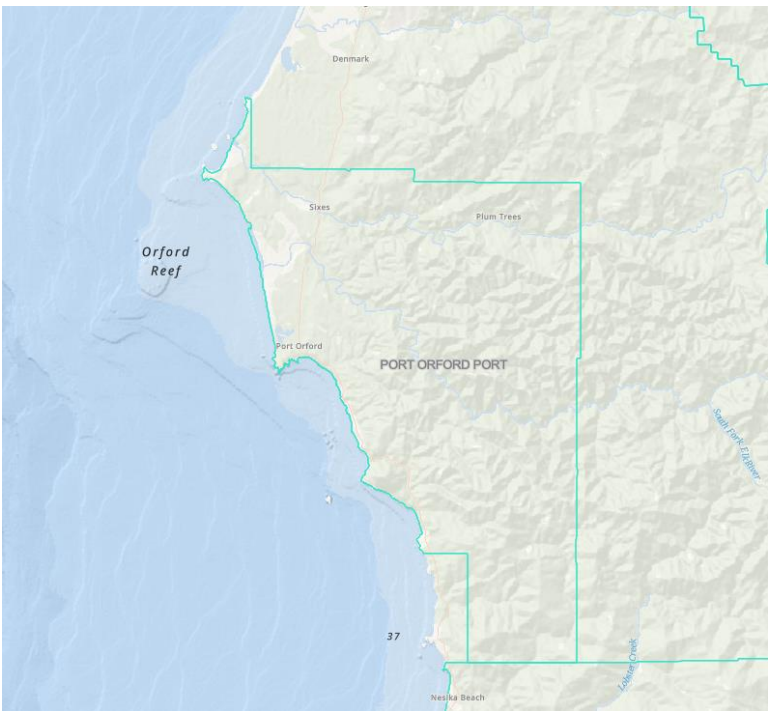
Port of Gold Beach

Figure I-7. Gold Beach Port District Boundary



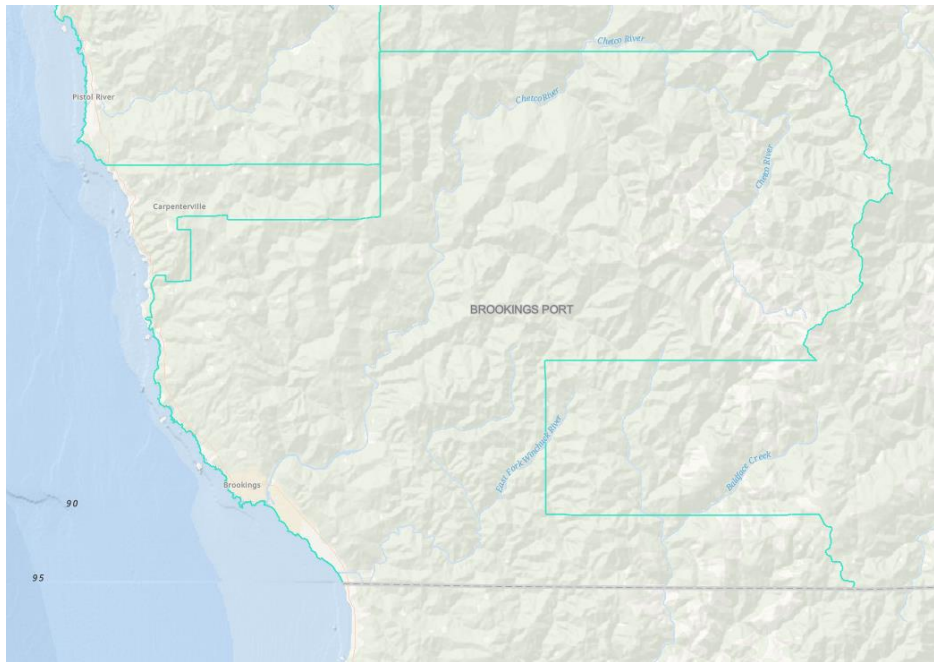
Port of Port Orford

Figure I-8. Port Orford Port District Boundary



Port of Brookings-Harbor

Figure I-9. Brookings-Harbor Port District Boundary



Environment

The capacity of the natural environment is essential in sustaining all forms of life including human life, yet it often plays an underrepresented role in community resiliency to natural hazards. The natural environment includes land, air, water and other natural resources that support and provide space to live, work and recreate. Natural capital such as wetlands and forested hill slopes play significant roles in protecting communities and the environment from weather-related hazards, such as flooding and landslides. When natural systems are impacted or depleted by human activities, those activities can adversely affect community resilience to natural hazard events.

Watersheds

A watershed is the area of land where all the water that drains into the same body of water. Watersheds include streams, rivers, lakes, wetlands, and groundwater in the same geographical region. Curry County watersheds include:

- New River (Floras Creek)
- Sixes River
- Elk River
- Euchre Creek
- Lower Rogue River
- Hunter Creek
- Pistol River
- Chetco River
- Winchuck River
- Hubbard Creek/ Coastal Watersheds

Curry County is served by the Curry Watersheds Partnership, which is a group of non-regulatory organizations working together to help local landowners and communities keep our shared lands and rivers healthy and sustainable. The Curry Watersheds Partnership includes the Curry Soil and Water Conservation District, the South Coast and Lower Rogue Watershed Councils, and the Curry Watersheds Nonprofit. They work together to preserve the natural functions of local watersheds and ecosystems by helping landowners access grant funds to improve their lands. See <https://www.currywatersheds.org/> for detailed studies on these watersheds, including data and recommendations that can assist with flood management, water quality, and erosion control.

Climate

Curry County has a mild and humid marine climate that results from the moderating influences of the Pacific Ocean and from rainfall induced by the coast mountain range. The average January temperature is 48.2 degrees F and the average July temperature is 59.7 degrees F. Rainfall amounts vary depending on the location. Along the lower coastal elevations, rainfall averages between 65 to 90 inches per year, while areas on the higher west slopes of the coast mountain range may receive up to 200 inches of precipitation annually. While Curry County's climate is generally considered temperate, in most winters one or two storms bring strong and sometimes damaging winds to the coastal areas.

Vulnerabilities

- Environmental assets, particularly those along the coastal margin, are vulnerable to sea level rise, salt water intrusion and ocean acidification. Changes in these areas are largely being driven by changes in global temperature and climate regimes. Jurisdictions may need to consider strategies such as coastal retreat to sufficiently meet long term community needs.
- Higher sea levels and more powerful storms will alter coastal shorelines, shorelands and estuaries. Increased wave heights and storm surges can also lead to loss of natural buffeting functions of beaches, tidal wetlands and dunes.
- Forest ecosystems are also vulnerable to drought, wildfire and severe storm impacts.

Population

According to the U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates, Curry County has a population of 22,650 people. The City of Brookings, population 6,431 people, is located six miles north of the California border on U.S. Highway 101. The City of Gold Beach, population 2,418 people, is located at the mouth of the Rogue River, and the City of Port Orford, population 954 people, is located in the north county. The population data includes the unincorporated communities of Harbor, Langlois, and Nesika Beach which are included below as found in the data as “Census Designated Places” or CDPs. The unincorporated Curry County population can be estimated by subtracting the city population totals from the county total (12,847). This includes 2,408 people who live in three CDPs and approximately 6,416 people who live in other parts of unincorporated Curry County including Agness, Carpenterville, Wedderburn, and other rural and urban places, such as those near cities but outside of city limits.

Table I-7. Curry County Population

Curry County Population								
	Oregon	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Harbor	Langlois	Nesika Beach
Total Population	4,129,803	22,650	6,431	2,418	954	1,958	135	315

Source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates.

The Population Research Center, Portland State University. (2020). 2020 Annual Oregon Population Report Tables provides a different view of the data. These are the numbers used for community development purposes and are considered accurate for Oregon policy use.

Table I-8. Curry County Population Estimates 2016-2020

July 1 Population Estimates					
	2020	2019	2018	2017	2016
Curry County	23,005	23,000	22,915	22,805	22,600
Brookings	6,670	6,645	6,630	6,595	6,550
Gold Beach	2,310	2,290	2,265	2,275	2,275
Port Orford	1,150	1,150	1,145	1,145	1,140
Unincorporated	12,875	12,915	12,875	12,790	12,635

Source: Population Research Center, 2020.

Age

Table I-9. Population by Age

Curry County Population by Age							
	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Harbor	Langlois	Nesika Beach
Total Population	22,650	6,431	2,418	954	1,958	135	315
Median Age	56.3	48.8	54.2	61.2	71.7	59.6	69.4
% 65 years and over	33.7%	29.2%	28.2%	42.2%	70.9%	21.5%	61.9%
% Under 18 years	14.6%	18.5%	12.4%	2.7%	1.7%	0%	0%

Source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates.

Table I-10. Population by Age Cohort

Population by Age Cohort						
	All Ages	< 20 years	20- 44 years	45-59 years	60-74 years	75 + years
Curry County	22,650	3,477	4,969	9,270	6,774	3,129
City of Brookings	6,431	1,256	1,742	1,013	1,558	862
City of Gold Beach	2,418	352	689	413	770	194
City of Port Orford	954	37	158	255	316	188

Source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates.

Veteran Status

Table I-11. Veterans by Jurisdiction

Veterans by Jurisdiction				
	Curry County	City of Brookings	City of Gold Beach	City of Port Orford
Civilian Population 18 years and over	19,317	5,214	2,119	928
Civilian Veterans	2,973	642	252	133

Source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates.

Persons with a Disability

Table I-12. Disability by Jurisdiction

Persons with a Disability by Jurisdiction				
	Curry County	City of Brookings	City of Gold Beach	City of Port Orford
Total Civilian Population (non-institutionalized)	22,491	6,330	2,379	954
With a Disability	5,279	1,077	554	382
Under 18 years	3,299	1,189	299	26
With a Disability	194	113	0	22
18 to 64 years	11,636	3,322	1,399	525
With a Disability	2,229	511	298	162
65 years and over	7,556	1,819	681	403
With a Disability	2,856	453	256	198

Source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates.

Population Vulnerabilities

- According to the ACS 2015-2019 5-year estimates, the median age in Curry County is 56.3 years—17 years older than the median age of Oregon as a whole 39.3 years. The largest age cohorts in the county are the 60-84 years age groups. The unincorporated communities of Harbor and Nesika Beach have median age populations of 71.7 and 69.4 years, with 70.9% and 61.9% of the population being over 65 years respectively.
- According to the 2018 PSU Population Research Center estimates, as of April 2020, over one-quarter (35.1% or 8,072 people) of Curry County's population is over the age of 64; that number is projected to grow to 36% (or roughly 10,500 individuals) by 2030.
- Forty percent (40%) of residents in Port Orford live with a disability.
- Nearly one-quarter of residents in Curry County live with a disability (23.5%). Thirty-eight (38%) percent of individuals over the age of 65 are disabled.

Critical Facilities and Infrastructure

Critical facilities such as hospitals, ports, fire districts, and police stations are all vital to the functioning of the region. Critical facilities and local communities rely on infrastructure such as roads, bridges, electric power, fuel, communication, and food. These infrastructure systems of society are considered “lifelines” for the economy and in the event of a disaster. The information provided in this section of the community profile can serve as the basis for informed decisions about how to reduce the vulnerability of Curry County’s infrastructure to natural hazards.

Critical Facilities

The following Curry County Critical Facilities are key buildings and structures that serve first responders and other emergency services personnel and the community in the event of a disaster.

Table I-13. Curry County Critical Facility List

Agness Communication Tower	Gold Beach High School
Agness Illahee FD	Gold Beach Municipal Airport
Azalea Middle School	Gold Beach Police Department
Black Mound Communication Tower	Gold Beach Public Works
Bosley Butte Communication Tower	Gold Beach Ranger District, Rogue River-Siskiyou National Forest
Brookings Airport	Grizzly Peak Communication Tower
Brookings City Hall	Harbor Rural Fire Protection District
Brookings Fire & Rescue	Harbor Water Public Utility District
Brookings Police Department	Kalmiopsis Elementary School
Brookings Public Works	Langlois Rural Fire Protection District
Brookings-Harbor High School	North Bend Medical Center—Gold Beach
Calvert Peak Airport	Oak Street Health Care Center
Cape Blanco Communication Tower	Ophir Rural Fire Protection District
Cape Blanco State Airport	Oregon State Police
Cape Ferrelo Rural Fire Protection District	Pacific High School
Cedar Valley - North Bank Rural Fire Protection District	Pistol River Rural Fire Protection District
Coos Curry Electric Cooperative	Port of Brookings- Harbor
Coos Forest Protective Association, Brookings Station	Port of Gold Beach
Curry County Annex	Port of Port Orford
Curry County Courthouse	Port Orford City Hall
Curry County Jail	Port Orford Police Department
Curry County Road Department	Port Orford RFPD Engine Building
Curry County Sheriff’s Office	Port Orford RFPD Station
Curry Emergency Operations Center	Port Orford-Langlois School District Office
Curry Family Medical	Riley Creek Elementary School
Curry General Hospital	Sixes Rural Fire Protection District
Curry Medical Center	Upper Chetco Rural Fire Protection District
Driftwood Elementary School	US Coast Guard - Station Chetco River
Gold Beach City Hall	Winchuck Rural Fire Protection District
Gold Beach Fire Department	Winkle Bar Airport

Source: Curry County Steering Committee, 2021. Note: See the full list with descriptions in the Appendix.

Curry Health Network

The Curry Health Network offers community-based health care in all three population centers in Curry County. Brookings is home to the Curry Medical Center, Gold Beach is home to Curry General Hospital which includes Curry Medical Practice, and Port Orford is home to Curry Family Medical.

Curry General Hospital in Gold Beach, Oregon, is a general medical and surgical acute care and critical access facility. It was founded in 1951 and has been part of the Curry Health Network since 1983. New facilities were opened in May 2017. In November 2013, District voters overwhelmingly approved a ballot measure to help fund the construction of a replacement Curry General Hospital in Gold Beach. The new, state-of-the-art 62,000 square foot facility opened in May, 2017, replacing the 65+ year old building which no longer met building code or served the community's needs.

Figure I-10. Curry General Hospital in Gold Beach



Source: USDA Rural Development, 2020. <https://www.youtube.com/watch?v=RxBV5S-N3TA>

The Curry Medical Center offers Primary Care, Specialty Care including some surgical capabilities, and a 24/7 Emergency Department.

Figure I-11. Curry Medical Center in Brookings



Source: Curry Health Network, 2021. <https://www.curryhealthnetwork.com/CurryMedicalCenter?sub=Locations>

Ports

Port of Gold Beach

Established in 1955, the Gold Beach Port District has grown to own and manage a diverse portfolio of interests in the Gold Beach area, including the port, the Gold Beach Municipal Airport, and Huntley Park. Historically, the Port of Gold Beach served the fishing industry from its position at the mouth of the Rogue River, but the volatility of local fisheries prompted the Port to diversify into tourism, recreation and other economic development activities. For example, today the Port is home to Jerry's Rogue Jets, a jetboat tour service on the Rogue River.

Figure I-12. Port of Gold Beach Cannery and moorings



Source: Port of Gold Beach website, 2021. <https://portofgoldbeach.com/photo-gallery/>

The Port maintains and operates the port infrastructure, including a recreation dock; a commercial dock with marine fueling capability; a public boat launch ramp with moorings; a storage facility; Port offices, as well as the Cannery, a commercial facility with shops;. In addition, the Gold Beach Port District operates the Huntley Park campgrounds and RV Park, located upriver of Gold Beach on the Rogue River, which offers a scenic environment for the community and tourists to enjoy (IFA, 2014).



Port of Port Orford

The Port of Port Orford is located 75 miles north of the California border in north Curry County. The port is situated just south of Port Orford headland on the open ocean. As such, it is an open-water dock with no natural protection from a bay or jetty and boasts the title of being the only dry-dock port on the West Coast. The Port of Port Orford harbor that has been in use since the 1850s and was primarily used for shipping lumber. The first Port District was formed in 1911 and dock construction began in 1919. A breakwater was built in 1971 in an attempt to protect the dock from winter storms. Shoaling became a problem shortly after and dredging became necessary. Although no longer a deep harbor, Port Orford is still home to many commercial fishermen and is used as a harbor of refuge by many during severe storms (Port of Port Orford, 2021).

Figure I-13. Port of Port Orford, Aerial View.



Source: Port of Port Orford. Manuela Durson, photo credit.

Fishing boats and other vessels are lifted in and out of the water by cranes operated by port staff. The boats are then set upon custom-made dollies and parked in rows on the dock. As a result, it is known as a “dolly dock”.

Figure I-14. Port of Port Orford Dolly Dock



Source: Port of Port Orford, June 2012. Notes: 1. See boats and cranes on dock itself. 2. Shoaling of the harbor as seen at minus tide, showing dock sheet pile construction and aging high-capacity cranes used to launch and retrieve vessels.

Port of Brookings-Harbor

The Port of Brookings-Harbor (POBH) is a port authority within Curry County, Oregon, United States, and serving the neighboring community of Harbor. The Port is governed by a five-member commission elected at-large from the service district population of approximately 16,000.

It is the busiest recreational port on the Oregon Coast, generating more than 31,000 boat trips for more than 95,000 people, and is one of the most active harbors for Chinook salmon on the coast. The Port owns approximately 60 acres of marine property at the mouth of the Chetco River in Curry County. The Port operates and maintains a Sport Basin that accommodates approximately 298 recreational vessels, and a Commercial Basin that accommodates approximately 250 vessels. In addition to the boat basins, Port facilities include receiving and fuel docks, icehouse and cold storage facilities, a boat yard, a boardwalk, an RV park, and numerous commercial buildings. There are two rock jetties at the mouth of the Chetco River. The US Army Corps of Engineers constructed the rock jetties in 1957. Modifications were completed in 1969 to extend the north jetty 450 feet and improve the entrance channel to 14 feet deep and 120 feet wide.

Figure I-15. Port of Brookings-Harbor at the Chetco River.



Source: <https://marinas.com/>, accessed 12/01/21.

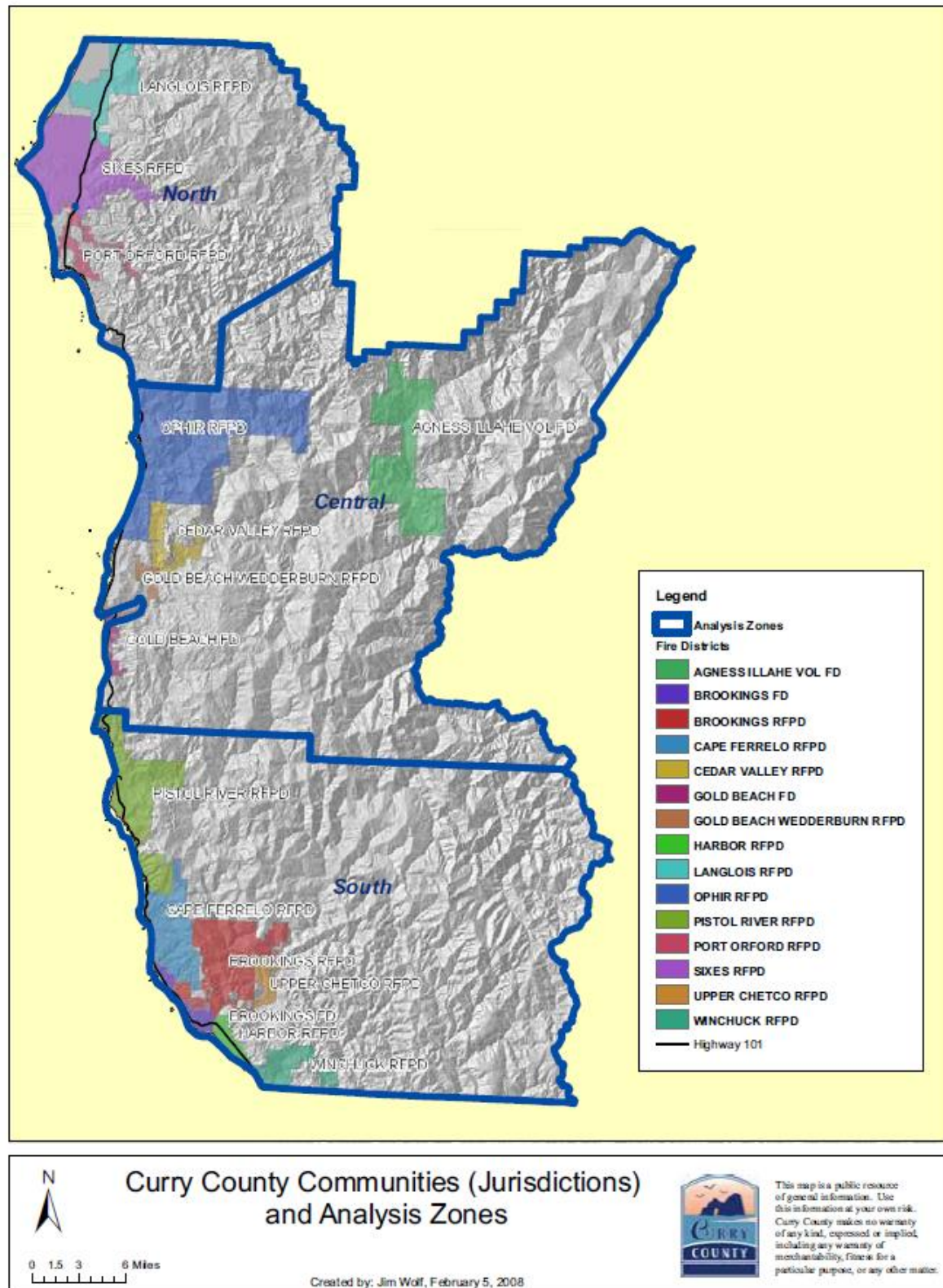
Fire Protection Services

Fire protection services are available throughout the county from a variety of different organizations and agencies including municipal fire departments, rural fire protection districts, the Coos Forest Protective Association (CFPA), and state and federal agencies. Fire-protection services are typically more limited in rural areas than urban areas (CWPP, 2008).

Rural Fire Protection Districts

There are 15 rural fire protection districts within the county. These districts have the capacity to provide fire suppression and structural defense and coordinate through mutual aid agreements.

Figure I-16. Map of Fire Districts in Curry County



Source: ISE, 2008.

Coos Forest Protective Association

The Coos Forest Protective Association (CFPA) serves a large area of Oregon's South Coast with fire protection services as well as community education and outreach. Local, state and federal agencies in Curry, Coos and the western corner of Douglas County rely on CFPA for fire protection services. In addition to their own resources, the CFPA have agreements in place with the Oregon Department of Forestry (ODF) and local contractors augment their capacity when necessary. During a typical fire season the CFPA employs between 75 and 100 staff that are trained in wildfire suppression.

The CFPA website: <http://www.coosfpa.net> houses information on burn permits, fire season restrictions, and links to information about how to create defensible space (CWPP, 2008).

Rogue River-Siskiyou National Forest

The Gold Beach District office is a headquarters for wildfire staff on the Rogue River-Siskiyou National Forest. The Division Chief and Battalion Chief (formerly Fire Management Officer and Assistant Fire Management Officer) are the two full-time staff positions responsible for supervising wildfire-related activities on the Gold Beach District of the Siskiyou National Forest. The Gold Beach District office maintains two type 6 wildland fire engines for initial response to ignitions on Forest Service lands. Two captains and two assistant captains that are permanent, seasonal positions staff each engine. During fire season, the Gold Beach District has access to a Forest Service helicopter and rappel crew that is based out of Merlin in neighboring Josephine County. In addition, the district office operates a prevention patrol module staffed by two seasonal employees to conduct outreach to the public at Forest Service Campgrounds.

The Rogue River-Siskiyou National Forest operates two dispatch centers, one in Grants Pass and another in Medford. Through these centers, the Gold Beach District office is able to coordinate with private contract crews to augment capacity as necessary. Response times are limited by distance of resources ordered (CWPP, 2008).

Coos Bay District, Bureau of Land Management

The Coos Bay District, BLM receives fire protection services through a partnership with the CFPA. However, the district does maintain two wildfire engines and conducts regular wildfire training and certification for up to 50 BLM staff. During a typical fire season, these trained staff are available to lend support to other BLM districts throughout the region when fire danger is high (CWPP, 2008).

Infrastructure & Lifelines

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 in both pre-disaster and post-disaster planning, it deserves special attention in the context of creating more resilient communities. The information provided in this section of the profile can serve as the basis for informed decisions about how to reduce the vulnerability of Curry County's infrastructure to natural hazards.

Emergency Communications

Emergency Communications in Curry County are high priority for mitigation and resilience improvements.

Communication Towers

Many agencies rely on the 5 towers the county maintains. One of the most vulnerable critical infrastructure assets is the Grizzly Communication Tower—it is the hub of all First Responder communications for the county. For example, the Agness microwave link/cell relies on the Grizzly Tower.

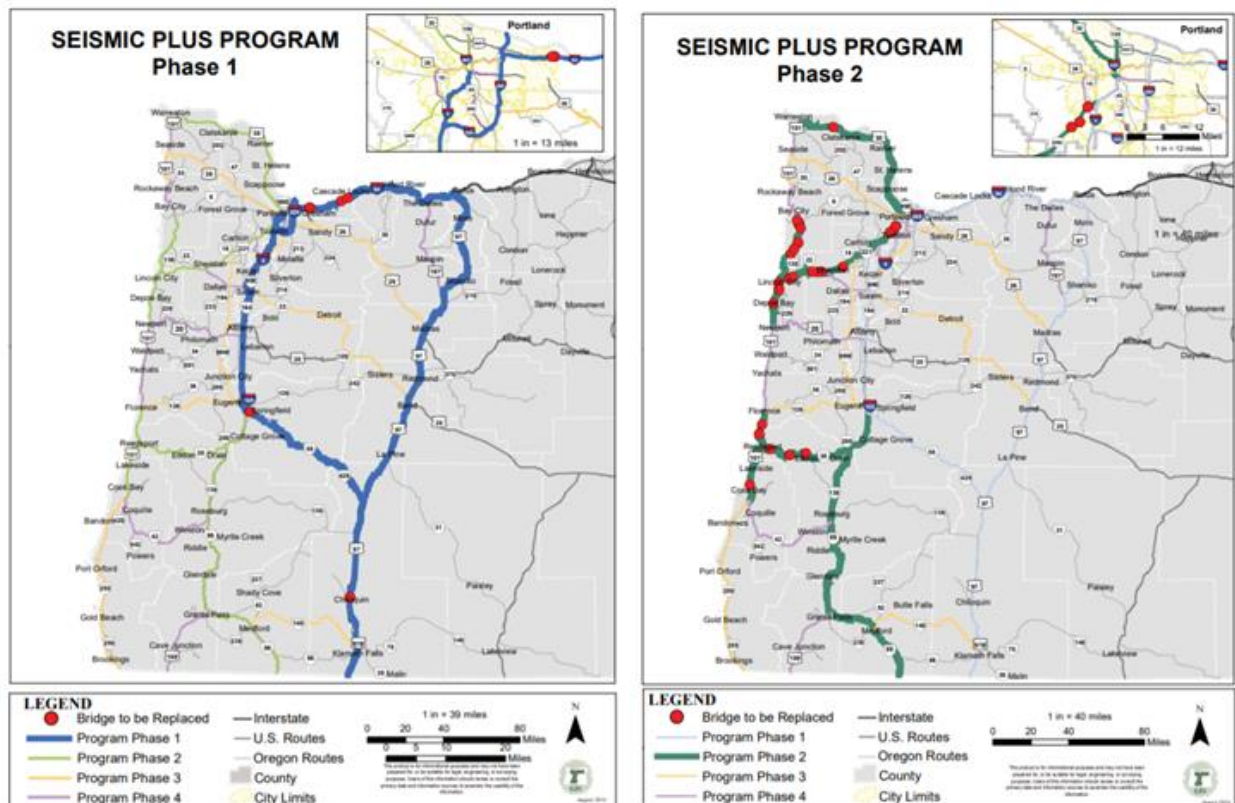
Oregon Department of Transportation (ODOT) and the Curry County Road Department rely on same towers. Some Private networks may be co-located on our towers while others are stand alone. Brookings has own system but uses county towers as redundant backup. Public and private services that depend on communication towers include:

- Curry County Dispatch
- Private Telecom
- Day Wireless

Roads and Bridges

Four State Highways-- US Highway 101, Cape Blanco Highway (Hwy 250), Carpenterville Highway (Hwy 255), and Port Orford Highway (Hwy 251)—are located in Curry County. Highways 250 and 251 are relatively minor highways that do not serve a large population area. Highway 101 runs north-south along the Pacific Coast, providing the only major highway connection between Curry County and the other surrounding counties. The figure below shows the county's primary transportation routes.

Figure I-17. ODOT Map Seismic Plus Phases 1 & 2



Source: ODOT, 2014..

Airports

There are three airports in Curry County: Brookings Airport, Gold Beach Municipal Airport, and Cape Blanco Airport.

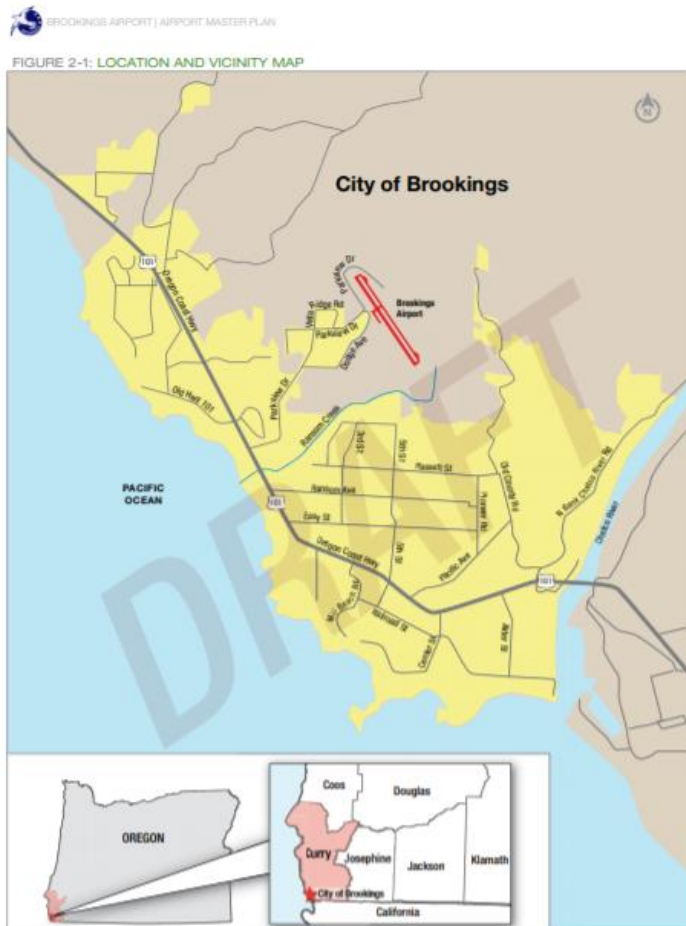
Brookings Airport

Brookings Airport (BOK) is operated by the City of Brookings. The city assumed management of the airport from Curry County in July 2018 (Brookings, 2020). The airport is home to 31 aircraft and is a local general aviation airport (role IV) but includes a full-service flight-based operations (FBO), restrooms, pilot lounge, and telephone (ODA, 2017).

Of the 63,000 square feet of building space at the Brookings Airport, 58,000 square feet of that space is dedicated to airport hangars. The City of Brookings owns and operates the Fixed Based Operations (FBO) building (922 sf.) and one hangar (1,068 sf.). This includes bathroom facilities and a pilot lounge. REACH Cal/Ore Life Flight operates an office (1,680 sf.) and a business hangar (10,157 sf.) on site. The balance of space is private.

The Brookings Airport Master Plan (2020) discusses the use of the airport by commercial entities (FedEx, South Coast Lumber, Cal-Ore Life Flight) such as those conducting emergency medical transports or shipping cargo. The trend of increasing use may necessitate future airport improvements related to accommodate increased flights from larger craft.

Figure I-18. Brookings Airport Location



Source: David Evans Associates, 2020.

Gold Beach Municipal Airport

Gold Beach Municipal Airport is operated by the Port of Gold Beach, a special district. According to the 2017 Oregon Aviation Plan, Gold Beach Muni is home to 13 aircraft and is a local general aviation airport (role IV). Annually, the airport facilitates 5,500 takeoffs and landings (ODA, 2017) and accounts for more than 4,000 visitor arrivals (IFA, 2014). The Port provides facilities for local and visiting pilots, supports a fuel station, and invests in facility maintenance (Port of Gold Beach, 2021).

Figure I-19. Gold Beach Municipal Airport



Source: <https://portofgoldbeach.com/photo-gallery/>

Cape Blanco State Airport

The Cape Blanco State Airport is 14 nautical miles south of the Bandon State Airport. There are restrooms on site, but no fuel or other services. The ODOT Regional Resiliency Assessment program indicates that Cape Blanco has been identified as a disaster logistics staging area, which is difficult to understand considering the lack of airport resources and its distance from population centers. It is assumed that this is based on seismic analysis of the site for suitability with specific planned operations.

Figure I-20. Cape Blanco Airport Identified as Disaster Logistics Staging Area



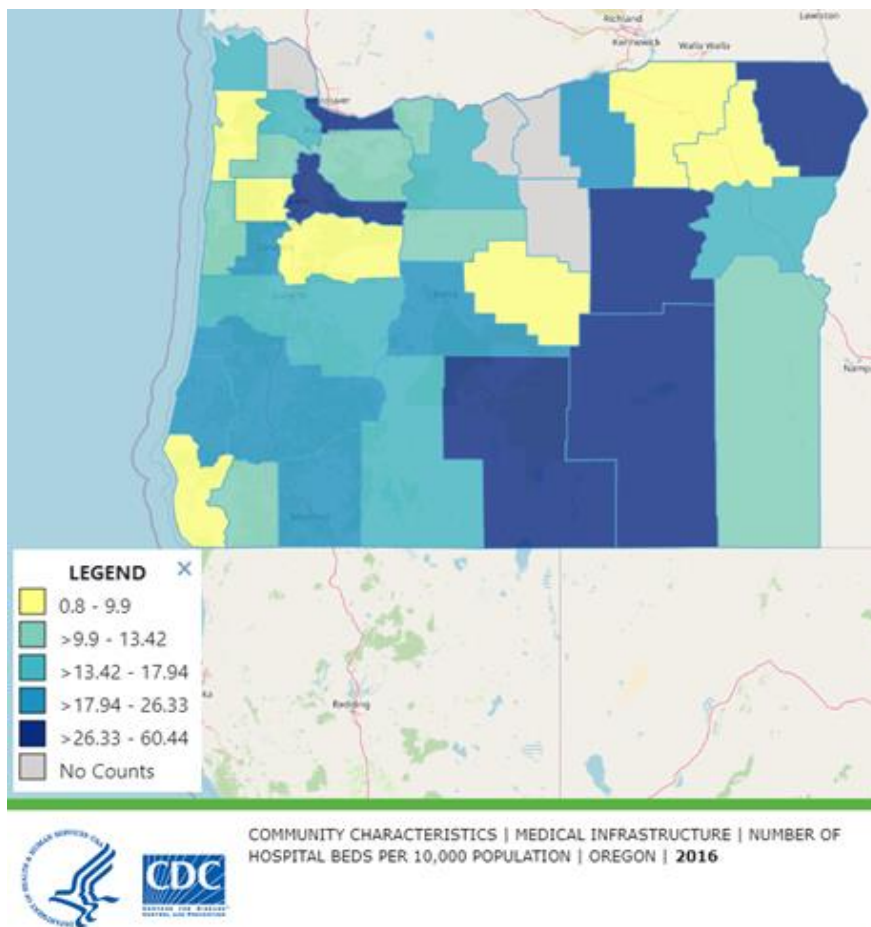
FIGURE 1.—Planned Locations of CSZ Earthquake Disaster Logistics Staging Areas in Oregon.

Source: ODOT Regional Resiliency Assessment Program, 2021.

Vulnerabilities

- In 2016, Curry County had one hospital with 16 beds which provided a capacity of 7.15 beds per 10,000 people. The number of hospital beds per capita in Curry County is one of the lowest in the state. However, neighboring Coos County has three hospitals with a capacity of 26.33 beds per 10,000 people, which provides additional support for medical capacity in north Curry County.
- Virtually all state and county roads and bridges in Curry County are vulnerable to multiple hazards including flood, landslide, earthquake, tsunami and coastal erosion. Curry County has over 70 bridge or culvert crossings on Highway 101 alone. Impacts to the transportation system can result in the isolation of vulnerable populations, limit access to critical facilities such as hospitals and adversely impact local commerce, employment and economic activity.
- All of Curry County's power is generated outside the region; there is no redundancy in power transmission and only limited redundancy in the power distribution network.
- Curry County has one high hazard potential dam—Ferry Creek Dam. The county has eight dams in total: Ferry Creek, Big Creek, Shipler Reservoir, Camp Creek #2, and four additional structures on tributaries of Elk River and Floras Lake. Ferry Creek dam and two of the low threat structures are listed in the National Inventory of Dams (NID).

Figure I-21. Hospital Beds by Population



Source: CDC National Environmental Public Health Tracking Network. (2021, Dec.) <https://ephtracking.cdc.gov/DataExplorer>

Note: This map shows the number of hospital beds per 10,000 people

Built Environment

How buildings are built and regulated are an important aspect of hazard mitigation. People spend much of their lifetimes within the built environment—at work, school, home, and in the community—and these are the places that need to be resilient to disaster in order to reduce harm in the event of a disaster.

Plans and Policies

Integrating natural hazards mitigation actions into existing planning processes improves the ability of a community to implement risk reduction actions. Common planning processes where hazard mitigation action may be integrated include foundational documents, such as the Comprehensive Plan, zoning and development codes, infrastructure and capital improvement plans, or emergency planning instruments, such as Emergency Operations Plans and Continuity of Operations Plans.

Curry County, the incorporated cities, and the port districts have plans, codes, programs and resources in place that relate to natural hazards. Such integration is possible when these plans, policies and codes are consulted during plan updates such as this one. During the process of the 2022 Curry County MJNHMP update, many of the plans and codes listed below were reviewed.

Table I-14. Existing Plans, Codes and Ordinances.

Jurisdiction	Document	Year
Curry County	Curry County Comprehensive Plan	2018
Curry County	Emergency Operations Plan	2015
Curry County	6-Year Road Department Capital Improvement Plan	2021
Curry County	Transportation System Plan	2005
Curry County	Community Wildfire Protection Plan	2013
City of Brookings	Brookings Comprehensive Plan	2020
City of Brookings	Emergency Operations Plan	2013
City of Brookings	Airport Master Plan	2020
City of Brookings	Brookings Housing Needs Assessment	2017
City of Brookings	Emergency Action Plan, Ferry Creek Dam	2017
City of Gold Beach	Gold Beach Comprehensive Plan	2009
City of Gold Beach	Gold Beach Transportation System Plan	2000
City of Port Orford	Port Orford Comprehensive Plan	2021
City of Port Orford	Comp Plan Update: Tsunami Hazard Overlay Zone	2019
City of Port Orford	Port Orford Transportation System Plan	2002
Port of Brookings-Harbor	Natural Hazards Mitigation Plan	2018
Port of Gold Beach	Strategic Plan	2014
Port of Gold Beach	Airport Master Plan	2018
Port of Port Orford	Strategic Business Plan	2016
Port of Port Orford	Facility Master Plan	2009

Source: Comp plan updates: DLCD, 2022. PAPA Database <https://www.oregon.gov/lcd/CPU/Pages/Adopted-Plan-Amendments.aspx>; UO, 2022. <https://scholarsbank.uoregon.edu/xmlui/handle/1794/4228> Note: Year is year acknowledged or last revision.

Building Units

Table I-15. Curry County building inventory

Community	Total Number of Buildings	Percentage of Buildings	Total Estimated Building Value (\$)	Percentage of Building Value
Unincorporated County (rural)	10,027	48%	665,168,000	41%
Harbor	3,556	17%	227,074,000	14%
Nesika Beach	399	2%	19,602,000	1%
Total Unincorporated County	13,982	67%	911,844,000	56%
Brookings	3,949	19%	462,342,000	28%
Gold Beach	1,912	9%	189,329,000	12%
Port Orford	924	5%	73,077,000	4%
Total Curry County	20,767	100%	1,636,592,000	100%

Source: DOGAMI, 2018.

It is important to locate all housing and other buildings and land uses that foster a density of people, away from hazard zones or to ensure easy access to safe areas via trails, sidewalks, and other evacuation routes that are well-signed, well-built, and easy to find in the event of a disaster.

Table I-16. Total Housing Units

	Total Housing Units		AAGR	Share of County	Share of County	Change
	2000	2010	2000-2010	2000	2010	(2000-2010)
Curry County	11,406	12,613	1.0%	100.0%	100.0%	0.0%
Brookings	5,652	5,938	0.5%	49.6%	47.1%	-2.5%
Gold Beach	1,538	1,912	2.2%	13.5%	15.2%	1.7%
Port Orford	987	1,168	1.7%	8.7%	9.3%	0.6%
Unincorporated	3,229	3,595	1.1%	28.3%	28.5%	0.2%

Source: U.S. Census Bureau, 2000 and 2010 Censuses; PSU 2018. Note: For simplicity, each UGB is referred to by its primary city's name.

Land Use and Development

Curry County and the three cities provide planning and development services to their service areas. In Oregon, all communities are responsible for developing comprehensive plans that define how the statewide land use planning system will be implemented locally.

Building Permits

Housing age (year-built date) and type are two important considerations in mitigation planning. As time goes by, practices improve, and new buildings are built to higher standards. This is because building codes have been improved as scientific understanding of natural hazards has grown. Certain housing types tend to be less disaster resistant and warrant special attention. Manufactured or mobile homes, for example, are an important component of affordable housing and the designs are improving but are generally more prone to wind and water damage than standard stick-built homes. Retrofitting buildings to modern seismic building codes can reduce damages and losses from earthquake. In a DOGAMI simulation of potential loss reduction from seismic retrofits by upgrading buildings to at least moderate code, the estimated loss for the entire study area was reduced from 28% to 18% (Williams and Anthony, 2020).

Building permits are a general metric for changes in development. As presented in the table below for the numbers of building permits issued for new construction of residential properties, 528 residential building permits were issued between 2015 and 2020 in Curry County. Curry County issued the majority of residential building permits in the county for a total of 365 or 69.1%. Just two of those permits were issued within the floodplain. Brookings issued 17% or 90 permits; Gold Beach issued 8% or 42 permits; and Port Orford issued 5.9% or 31 permits. This information does not contain multi-family residential permits.

Residential

Table I-17. Total New Residential Construction Permits by Year

	2015	2016	2017	2018	2019	2020
Total	87	89	75	84	112	81
Unincorporated Curry County	76	65	59	52	64	49
Brookings	4	13	11	16	24	22
Gold Beach	5	4	4	13	11	5
Port Orford	2	7	1	3	13	5

Source: Curry County Planning Department, July 2021; City of Brookings, November 2021.

This table shows the building permits issued for new construction of residential properties in the mapped FEMA floodplain as it appears on the effective Flood Insurance Rate Map (FIRM) from November 16, 2018.

Table I-18. New Structures in the 100-Year Floodplain

Permits Issued by Jurisdiction: New Residential Structures in the 100-Year Floodplain		
	2019	2020
Total Curry County	0	2
Unincorporated Curry County	0	2
Brookings	0	0
Gold Beach	0	0
Port Orford	0	0

Source: Curry County Planning Department, July 2021; City of Brookings, November 2021.

Multi-Family Dwellings

Multi-family housing is an important housing type for a number of reasons. Efficiencies in use of space result in reduced costs to serve and operate utilities, and in overall construction. Living in closer proximity to other people can foster community or provide a safety net or social opportunity for seniors, people with a disability, busy professionals, or single parents. Most importantly, multi-family dwellings can provide housing to more people for less cost than new single-family dwellings.

Table I-19. New Multi-Family Construction Permits by Jurisdiction 2016-2020

	Hotel/ Hospitality Business Name	# of units	Address	Tsunami Zone? (Y or N)	Flood Zone? (Y or N)
Curry County	0	0	#	#	#
Brookings	0	0	n/a	0	0
Gold Beach	Deer Haven	4	94353 Leith Rd	Y	N
Port Orford	n/a	-	-	-	-

Source: Curry County Planning Department, July 2021; City of Brookings, November 2021.

Manufactured Homes

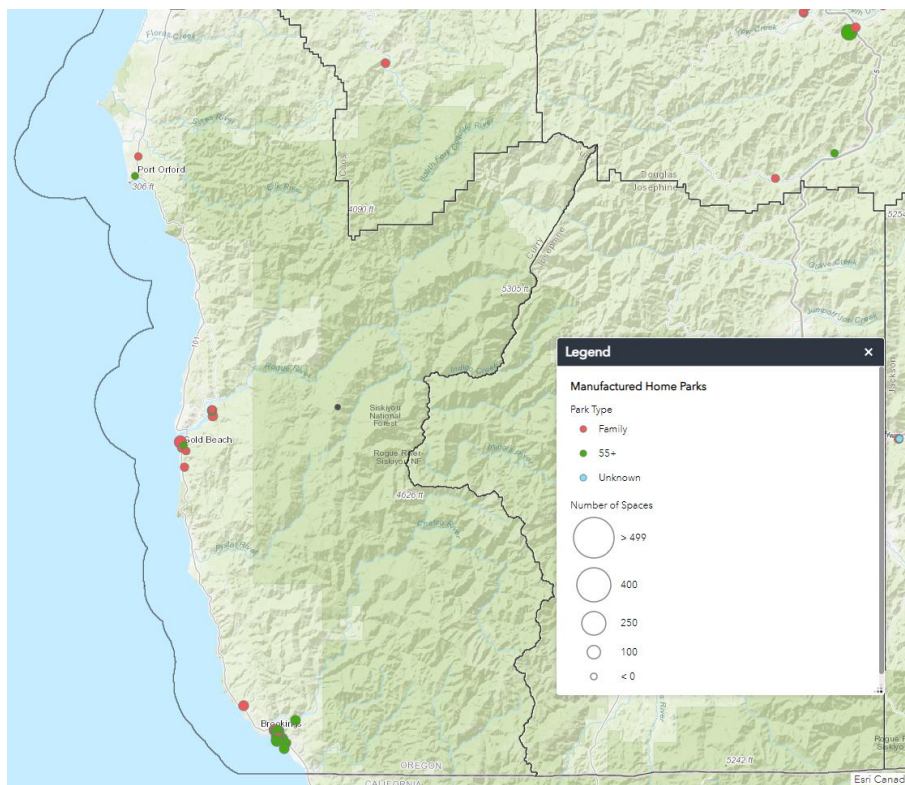
According to Oregon Housing and Community Services, Curry County was home to 1,146 spaces that accommodate homes located in parks in 2020. Mobile and manufactured home park living is accessible from the standpoint of lower cost—land rental fees typically include water, sewer, and garbage/recycling pickup. There are often community perks of shared events and facilities, and many parks are specifically for people aged 55 and over. These benefits come with autonomy of managing one's own home, but with less maintenance, and good locations. Mobile and manufactured home parks are an appealing housing choice for seniors in Curry County. Unfortunately, a high percentage of the structures currently occupied were built before 1980—for example, unincorporated Harbor is part of a Census tract that has >331-792 mobile homes pre-1980.

Table I-20. Mobile Homes by Census Tract

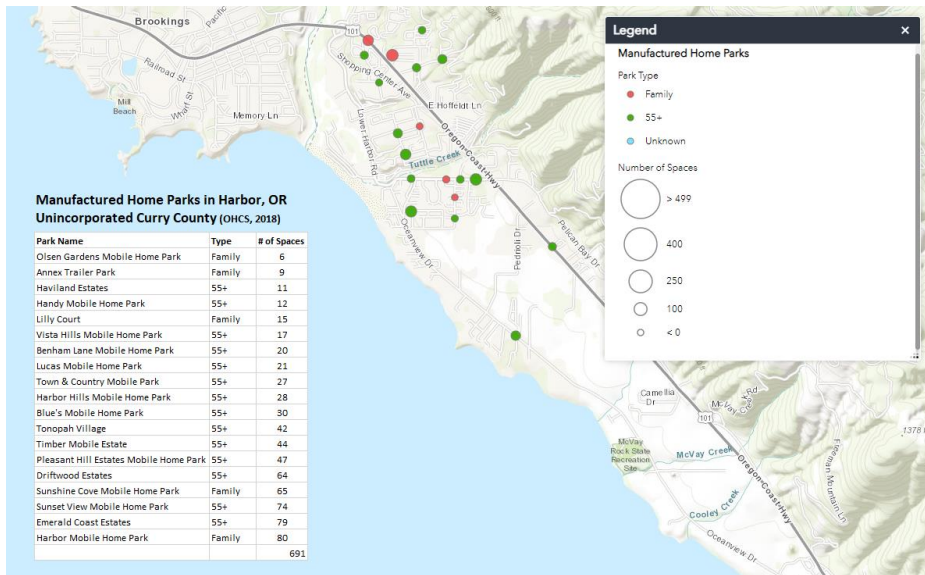
Mobile Home Units and Demographics					
Census Tract	Pre-1980 MH	Population	Area (sq mi)	Ave. Age	Poverty Rate
9501 (41015950100)	199	3,167	657	57	29.4%
9502 (41015950200)	358	5,287	166	54	10%
9503.01 (41015950301)	239	4,302	570	52	9.3%
9503.02 (41015950302)	85	5,012	3.46	51	10.9%
9504 (41015950400)	566	4,596	240	61	21.7%

Note: Pre-1980 MH is the number of mobile home units built before 1980. Source: Bolton, Megan. Oregon Housing and Community Services (OHCS). 2018 Oregon Manufactured Home Parks and Demographics.

<http://www.oregon.gov/ohcs/Pages/manufactured-dwelling-park-services-oregon.aspx> American Community Survey 5-Year Estimates for 2012-2016 (US Census Bureau)

Figure I-22. Map of Manufactured Homes in Curry County

Source: OHCS, 2018.

Figure I-23. Map of Manufactured Homes in Unincorporated Harbor

Source: OHCS, 2018; DLCD, 2021.

Housing Stock Upgrade Initiative

The Housing Stock Upgrade Initiative program in Curry County <https://orsolutions.org/osproject/HSUI> was conceived to upgrade or replace mobile homes and manufactured homes that have long outlived their designed life span. The objective of the project was to identify and integrate sufficient resources, incentives, and savings necessary for homeowners to replace rural substandard housing, specifically obsolete manufactured homes or MMHATs (mobile homes, manufactured homes and trailers). The goal was to create options and pathways, with a simplified approach, that are financially realistic to the homeowner, while identifying potential risks and liabilities.

In November 2013, NeighborWorks Umpqua, an Oregon Solutions project partner, received a grant for over \$450,000 from the Meyer Memorial Foundation that would jump start the reHome Oregon project in Curry County. In June, 2015, Curry County's Health Impact Assessment won a national award at the Health Impact Assessment National Meeting in Washington DC. The recognition was for a health impact assessment project that improved community health and well-being. This project was selected because the health information and personal stories included in the assessment helped decision-makers change a state affordable housing policy that excluded residents of manufactured housing. The assessment also helped NeighborWorks Umpqua, the community developer implementing the pilot project in Curry County, to make the case for funding. To date, Meyer Memorial Trust has committed almost \$1.5 million to repair and replace substandard manufactured homes in Curry.

The Health Impact Project (a joint project of the Robert Wood Johnson Foundation and the Pew Charitable Trusts) made a very moving short film about the project for the HIA National Meeting. Watch the video: <http://www.pewtrusts.org/en/multimedia/video/2015/health-impact-assessment-helps-families-replace-unsafe-manufactured-housing> Read more about the Curry County project on the Oregon Health Impact Assessment program website: www.healthoregon.org/hia

National Flood Insurance Program (NFIP) in Curry County

Curry County and the Cities of Brookings, Gold Beach, and Port Orford are participants in the National Flood Insurance Program in good standing. The following tables describe the relevant program details.

All four jurisdictions updated their flood maps and flood ordinances in 2018 prior to the FEMA maps going effective on August 16, 2018. Since the last NHMP update, there have been three claims paid, all within the City of Brookings and all of which were “pre-FIRM” claims—that is, homes that were built prior to when the first Flood Insurance Rate Maps (FIRMs) were released.

Table I-21. National Flood Insurance Program (NFIP) Dates

Jurisdiction	Effective FIRM and FIS	Initial FIRM Date	Last Community Assistance Visit
Curry County	8/16/2018	4/3/1978	2/23/2001
City of Brookings	8/16/2018	9/18/1985	8/25/2001
City of Gold Beach	8/16/2018	11/15/1985	8/14/2018
City of Port Orford	8/16/2018	1/29/1980	N/A

Source: FEMA Community Information System, 04/07/2021, Mitch Paine, FEMA Region 10

Table I-22. National Flood Insurance Program (NFIP) Insurance Information

Jurisdiction	Insurance in Force	Total Paid Claims	Pre-FIRM Claims Paid	Substantial Damage Claims	Total Paid Amount
Curry County	\$42,419,200	60	34	1	\$623,855
City of Brookings	\$14,840,000	7	6	0	\$26,452
City of Gold Beach	\$14,304,500	12	9	0	\$349,589
City of Port Orford	\$5,110,000	4	3	0	\$9,238

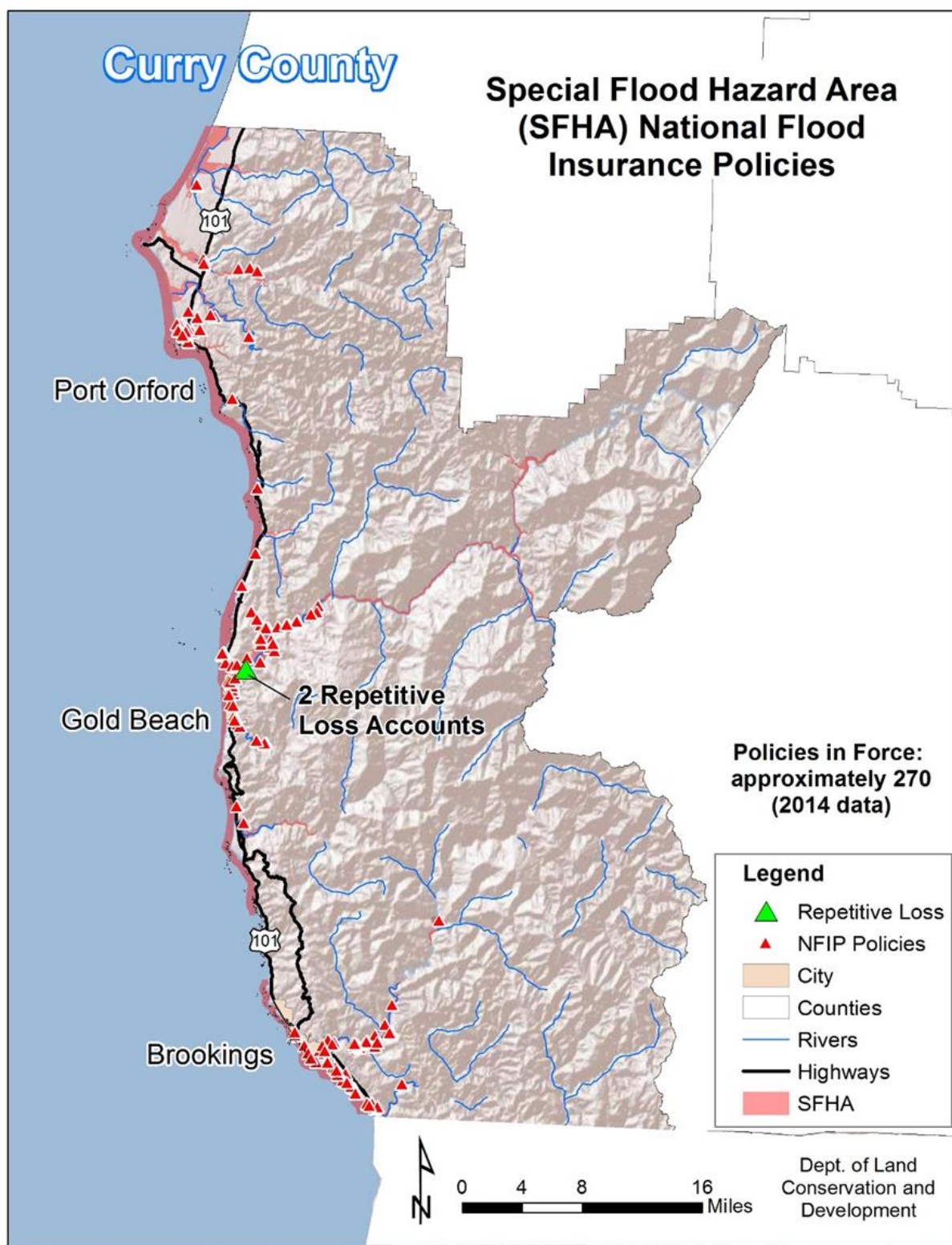
Source: FEMA Community Information System, 04/07/2021, Mitch Paine, FEMA Region 10

Table I-23. NFIP Repetitive Loss & Severe Repetitive Loss Properties and CRS

Jurisdiction	Repetitive Loss Structures	Severe Repetitive Loss Structures	CRS Class Rating
Curry County	2	0	10
City of Brookings	0	0	10
City of Gold Beach	2	0	10
City of Port Orford	0	0	10

Source: FEMA Community Information System, 04/07/2021, Mitch Paine, FEMA Region 10

Figure I-24. Curry County NFIP and Repetitive Loss Properties



Source: DLCD, 2014. Note: This map is included in the plan update upon Curry County's request.

Risk Rating 2.0

- For new policies: effective October 1, 2021
- For existing policies, effective April 1, 2022

FEMA is dramatically changing the way the National Flood Insurance Program evaluates risk and prices flood insurance. Changes include:

- Pricing based on location, price of structure, structure type, first floor height— with a higher insurance price for buildings with higher replacement cost value.
- Prior NFIP claims will be used as a direct rating factor.
- Mitigation discounts will be expanded to beyond the special flood hazard area (SFHA)
- Multi-year pricing will provide a “glidepath” to full price. Existing regulations like getting a discount for newly mapped flood risk will continue.
- Phasing out Preferred Risk Policies (PRP) and grandfathered policies.
- Base Flood Elevation (BFE) and flood zones will no longer be used for rating.
- Elevation Certificates (ECs) are not being eliminated
- FIRMS will continue to be used for floodplain management and mandatory purchase requirements.
- Uniform discounts are available throughout Community Rating System (CRS) communities.

For more information, contact your local floodplain manager or the NFIP Coordinator.

Built Environment Vulnerabilities

- Extensive overall damage and losses are expected from a Cascadia M9.0 earthquake and tsunami. Due to its proximity to the CSZ, every community in Curry County will experience significant impact and disruption from a CSZ M9.0 earthquake event resulting in building losses of 30% to 50% across all communities. The community of Gold Beach can expect a very high percentage of losses due to tsunami hazard.
- Most of the critical facilities in the county are at high risk to a CSZ earthquake and tsunami. DOGAMI estimates that 93% of Curry County’s 40 critical facilities will be non-functioning after a CSZ event, with 9 of those located within the tsunami zone. For comparative purposes, 13% (5) of critical facilities are at risk to landslide.
- Exposure analysis shows some residential structures adjacent to the beach in the community of Nesika Beach as being vulnerable to high coastal erosion hazard. (Williams and Anthony, 2020).
- Mobile home and other non-permanent residential structures account for 25.6% of the housing in Curry County. In Gold Beach and Port Orford, mobile homes account for 19.7% and 16.3% respectively. These structures are particularly vulnerable to certain natural hazards, such as earthquake, tsunami, windstorms and heavy flooding events.
- Based on U.S. Census data, more than 55% of the residential housing in Curry County was built after the current seismic building standards of 1990.
- Curry County issued the majority of residential building permits in the unincorporated areas of the county for a total of 365 or 69.1%. Just two of those permits were issued within the floodplain. Curry County as a whole recorded 528 new private residential building permits between 2015 and 2020. Brookings issued 17% or 90 permits; Gold Beach issued 8% or 42 permits; and Port Orford issued 5.9% or 31 permits.

Economy

Economic diversification, employment and industry are measures of economic capacity. However, economic resilience to natural disasters is far more complex than merely restoring employment or income in the local community. Building a resilient economy requires an understanding of how the component parts of employment sectors, workforce, resources and infrastructure are interconnected in the existing economic picture. The current and anticipated financial conditions of a community are strong determinants of community resilience, as a strong and diverse economic base increases the ability of individuals, families and the community to absorb disaster impacts for a quick recovery.

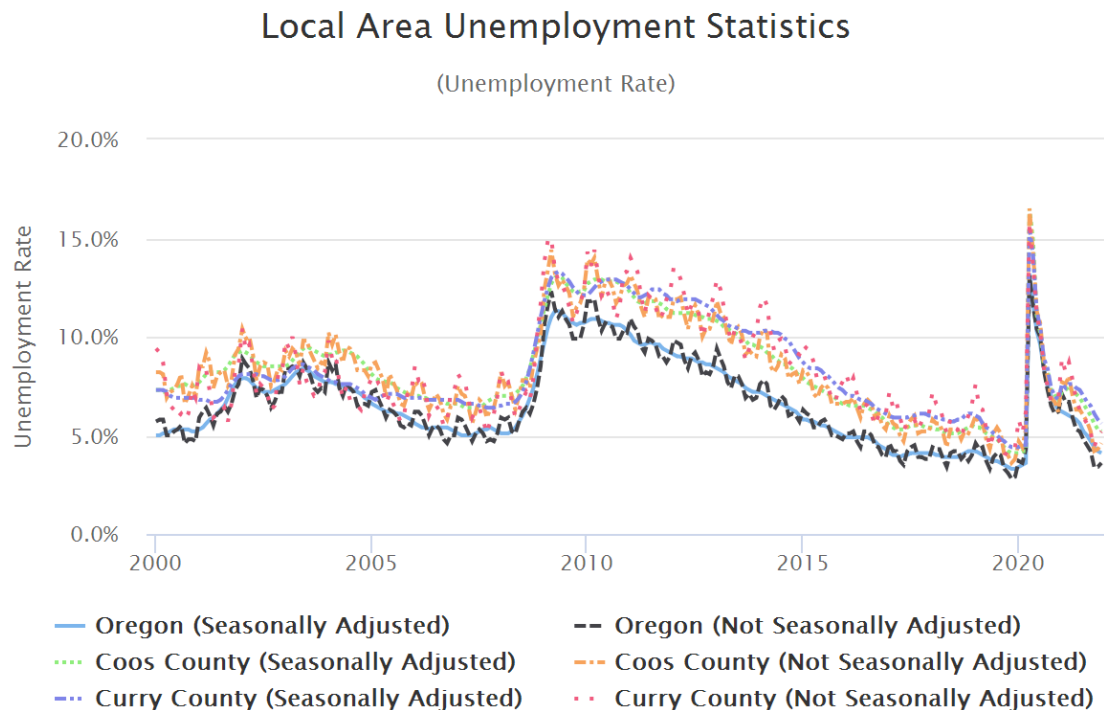
Employment

In December 2021, the State of Oregon Employment Department reported 8,943 persons in the civilian labor force in Curry County. The major sectors of employment included:

Total nonfarm employment: 6,430/ 6,940 (seasonally adjusted)

- Total private: 5,240
- Mining, logging, and construction: 530
- Manufacturing (primarily wood products): 640
- Trade, transportation, and utilities: 1,340, of which 1,090 is retail trade
- Leisure and hospitality: 1,100
- Government: 1,190

Figure I-25. Local Area Unemployment Statistics



- Source: Oregon Employment Department [Qualityinfo.org](https://www.qualityinfo.org)
- Source: <https://www.qualityinfo.org/ed-uesti/?at=1&t1=4101000000,4104000011,4104000015~unemprate~y,n~2000~2021>

Over 2021, overall payroll employment in Curry County increased by 30 jobs. Gains were estimated in leisure and hospitality (+60) and retail trade (+50). Private education and health services lost 20 jobs over the year. Other industries showed little change since December 2020 in Curry County. Government employment lost 50 jobs, with losses in local government education (-30) and local government excluding education (-20) accounting for the loss. These totals result in a 5.2% unemployment rate (or 5.6% if seasonally adjusted) at the end of 2021.

Table I-24. Unemployment Rates in Selected Years, Oregon and Curry County 2000-2021*

	2000	2010	2015	2016	2017	2018	2019	2020	2021
Oregon	5.0%	10.7%	5.5%	4.7%	4.1%	4.0%	3.7%	7.6%	5.1%
Curry County	7.1%	12.7%	8.0%	6.6%	6.0%	5.9%	5.1%	8.7%	6.5%

Source: OED QualityInfo.org, 2022. Note: *No difference for any year in seasonally adjusted versus non-seasonally adjusted rates.

Table I-25. Current Employment, Curry County 2022



Workforce & Economic Research Division
QualityInfo.org
January 25, 2022

Curry County Current Labor Force and Industry Employment

	December 2021	November 2021	December 2020	--Change From--	
				November 2021	December 2020
Labor Force Status					
Civilian labor force	8,943	9,003	8,938	-60	5
Unemployed	463	450	617	13	-154
Unemployment rate	5.2%	5.0%	6.9%	0.2	-1.7
Unemployment rate (seasonally adjusted)	5.6%	5.8%	6.8%	-0.2	-1.2
Employed	8,480	8,553	8,321	-73	159
Nonfarm Payroll Employment					
Total nonfarm employment	6,430	6,510	6,400	-80	30
Total nonfarm employment (seasonally adjusted)	6,490	6,530	6,460	-40	30
Total private	5,240	5,280	5,160	-40	80
Mining, logging, and construction	530	540	540	-10	-10
Mining and logging	120	120	120	0	0
Construction	410	420	420	-10	-10
Manufacturing	640	640	640	0	0
Wood product manufacturing	510	510	500	0	10
Trade, transportation, and utilities	1,340	1,320	1,270	20	70
Retail trade	1,090	1,080	1,040	10	50
Information	30	30	30	0	0
Financial activities	310	310	310	0	0
Professional and business services	290	290	300	0	-10
Education and health services	820	810	840	10	-20
Health care	550	550	560	0	-10
Leisure and hospitality	1,100	1,160	1,040	-60	60
Arts, entertainment, and recreation	40	40	30	0	10
Accommodation and food services	1,060	1,120	1,010	-60	50
Other services	180	180	190	0	-10
Government	1,190	1,230	1,240	-40	-50
Federal government	90	100	80	-10	10
State government	100	100	110	0	-10
Local government	1,000	1,030	1,050	-30	-50
Local education	350	370	370	-20	-20
Local government excluding educational services	650	660	680	-10	-30

The most recent month is preliminary, the prior month is revised. Prepared in cooperation with the U.S. Department of Labor, Bureau of Labor Statistics.

Civilian labor force includes employed and unemployed individuals 16 years and older by place of residence.

Employed includes payroll employment, self-employed, unpaid family workers, domestics, agriculture, and labor disputants.

Unemployment rate is calculated by dividing unemployed by civilian labor force.

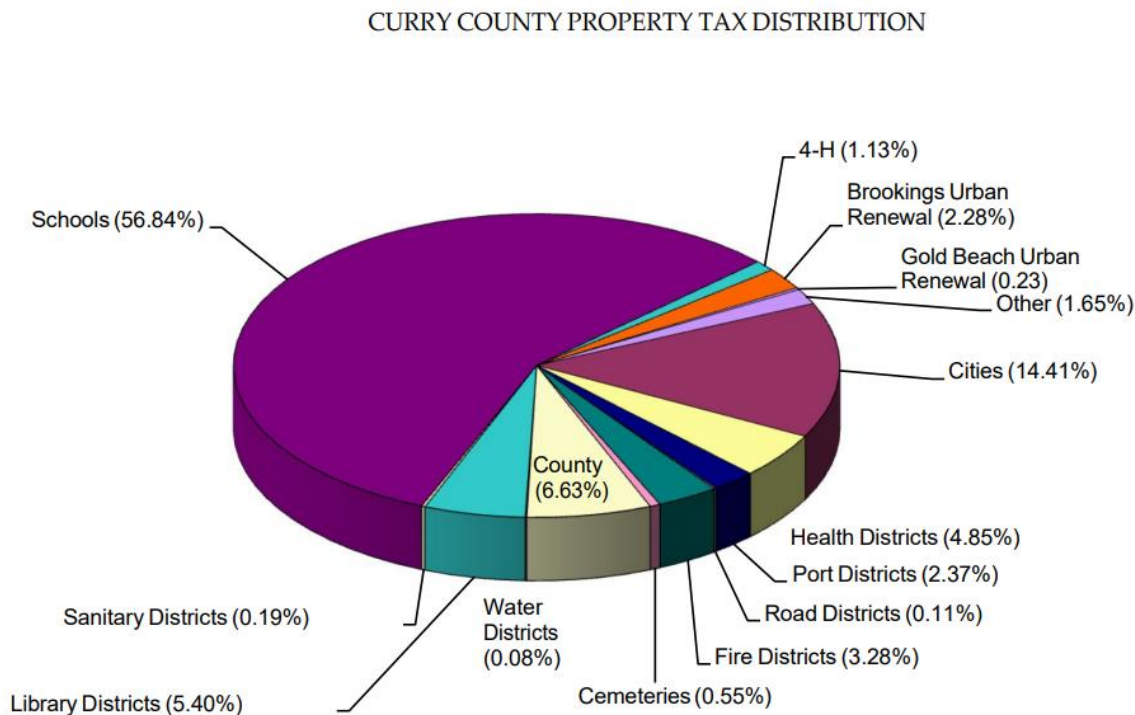
Nonfarm Payroll Employment: Data are by place of work and cover full- and part-time employees who worked or received pay for the pay period that includes the 12th of the month. The data exclude the self-employed, volunteers, unpaid family workers, and domestics.

Source: OED, 2022.

Curry County Budget

According to the Curry County Adopted Budget for FY 2021-2022, the Curry County property tax rate for fiscal year 2021-2022 was \$0.5996/\$1,000 of assessed property value per resolution R2021-17 approved on June 9, 2021. Revenues from the general fund were anticipated to be 13% lower than in the prior fiscal year (2020-2021), a difference of \$1.28 million dollars. The Curry County fiscal year 2021-2022 adopted budget was \$64,844,996, but excluded \$21,046,115 in unappropriated balances/reserves, resulting in an appropriated 2021-2022 budget of \$43,798,881 of which \$7,978,230 is general fund. All other funds totaling \$35,820,651 are restricted special revenue funds.

Figure I-26. Curry County Property Tax Distribution



Source: Curry County, 2021.

Household Income

Per Capita Personal Income (PCPI) is a measure of financial capacity on the individual or household level. According to the Oregon Employment Department, three major components make up per capita personal income (PCPI): net earnings; transfer receipts; and dividends, interest, and rent. In general, counties with higher PCPI have a higher percentage of PCPI attributable to net earnings. In 2020, net earnings in Curry County made up just 37% of PCPI, where dividends, interest, and rent comprised 21%, while the share of per capita income from transfer receipts was 40% in Curry County in 2020.

Areas with a higher concentration of older residents tend to have lower PCPI because older populations leave the workforce which reduces the contribution to the earnings component of PCPI. PCPI represents income, rather than wealth. Older residents may have substantial wealth but less relative income, unless it was income-generating investments that would show up in the “dividends, interest, and rent” portion of PCPI. The “transfer receipt” component of PCPI are primarily government social benefits, such as

Social Security (retirement), Medicare (health insurance program for people age 65 or older), Medicaid, and unemployment insurance.

Table I-26. Excerpt of Per Capita Personal Income Table

Area/ Ranking	Per Capita Personal Income	Net Earnings	Dividends, Interest, Rent	Transfer Receipts
Gilliam/ 1	\$67,754	\$44,021	\$9,022	\$14,710
Multnomah/ 5	\$63,852	\$39,622	\$11,733	\$12,496
Oregon	\$56,312	\$32,523	\$10,398	\$13,391
Clatsop	\$48,777	\$24,640	\$8,430	\$15,707
Curry/ 20	\$48,046	\$17,798	\$10,085	\$19,443

Source: Oregon Employment Department, 2020.

Economic Vulnerabilities

- Seniors on a fixed income comprised a significant percentage of the population in Curry County in 2020 as is reflected in 40% of per capita income coming from “transfer receipts.” In rural Oregon, the share of the population that is age 65 and older increased from 18% in 2010 to 25% percent in 2020. A higher share of retirees means a higher share of transfer receipts. According to the Employment Department, “the story behind the higher transfer receipts is one of age demographics.”
- Income from transfer receipts is generally higher in counties with lower PCPI. Retirees generally rely on less income in order to stretch the financial resources they have or to reduce their tax burden.
- Curry County unemployment experiences seasonal variation. When rates are adjusted for this, they are lower has decreased from 13% in 2009 to 10.6% in 2013.
- The largest sectors of employment in Curry County are Government (19%) Trade, Transportation, and Utilities (19%), Leisure and Hospitality (17%), and Education and Health Services (11%).
- The largest revenue sectors in Curry County are Retail Trade (\$227.7 million), Manufacturing (\$190.6 million) and Health Care and Social Assistance (\$61.8 million).
- The Education and Health Services sector is expected to have the most growth from 2012 to 2022 at 17%. Natural Resources and Mining and Leisure and Hospitality are the next closest growth sectors, with both projecting 9% growth from 2012 to 2022.
- Curry County has the second lowest property tax rate in the state at 0.5996 per \$1,000 of assessed value.

Community Organizations

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. 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. Community organizations and programs are another avenue through which the mitigation strategy is integrated into the existing capacity of the community to implement specific mitigation actions.

Often, actions identified by the plan involve communicating with the public or specific subgroups within the population (e.g., elderly, children, low income). The County can use existing social systems as resources for implementing such communication-related activities because these service providers already work directly with the public on a number of issues, one of which could be natural hazard preparedness and mitigation.

Figure I-27. Table of Community Organizations

Name	Contact Information	Description	Service Area/ Populations
American Legion	421 11 th Street/ PO Box 334 Port Orford, OR 97465	Grassroots organizations, works on public benefit issues.	North County/ Veterans, seniors, families.
Boy Scouts	Girl Troop 4032524 Pine St #A Brookings, OR 97415 Boy Troop 0032 414 Azalea Park Rd Brookings, OR 97415 Local Council – Oregon Trail 2525 Martin Luther King Jr. Blvd. Eugene, OR 97401 541-485-4433 Website: https://www.otcbsa.org/	For over 100 years, the Boy Scouts of America has helped families instill in their children's lives the values of Character, Citizenship, Fitness and Leadership. Youth are taught Emergency Preparedness and receive training through CERT Program.	Brookings, Curry County / Youth
Brookings Elks Lodge 1934	800 Elk Drive / PO Box 5000, Brookings, OR 97415 541-469-2169 Website: https://www.elks.org/lodges/home.cfm?LodgeNumber=1934	Elks invest in their communities through programs that help children grow up healthy and drug-free, meet the needs of today's veterans, and improve the quality of life.	South County/ Seniors, families, veterans
Curry Community Cares	PO Box 1212 Brookings, OR 97415 (541) 412-7166 Website: http://currycommunitycaresinc.org/	Works in partnership with people in need to build safe, decent housing. Non-profit Resale Store provides Curry County with access to affordable new & lightly used home repair supplies, fixtures, & furnishings. Its Grant Program provides qualified home owners with minor home safety repairs & installations, at no cost.	South County/ families, low income, disabled.

Name	Contact Information	Description	Service Area/ Populations
Brookings Harbor Community Helpers	539 A Hemlock Street, Brookings, OR 97415 541-469-6988 Website: https://www.brookingsharborfoodbank.org/	Local Food Bank	South County/ Seniors, children, families
Brookings Harbor Lion's Club	PO Box 1105 Brookings, OR 97415 541-469-1926 Website: https://e-clubhouse.org/sites/brookingsharbor/index.php	The efforts of Lions Clubs in the field of vision are expansive and well documented. (lionsclubs.org)	South County/ Seniors, Vision-impaired, children, families.
Chetco Activity Center	550 Chetco Lane Brookings, OR 97415 541-469-6822 Website: http://chetcoac.org/	Provides services such as: Lunch meals, meals on wheels, AARP driving classes, activity programs, and exercise classes.	South County/ Seniors
Community Organizations Active in Disaster (COAD)		COAD promotes cooperation, communication, coordination and collaboration, and fosters more effective delivery of services to communities affected by disaster. https://www.nvoad.org/	Curry County
Curry County Health Foundation	PO Box 1274 Gold Beach, OR 97444 (541) 247-3189	Supports Curry General Hospital and the delivery of health care services throughout Curry County.	Curry County
Curry Homeless Coalition	541-425-0426 PO Box 349, Gold Beach, OR 97444 Email: Curryhomelesscoalition@gmail.com Website: https://curryhomelesscoalition.org/	The Coalition is developing a county wide network of services to decrease instances of homelessness and reduce the financial strain to the communities. The goal is to ensure that those in need receive services with dignity, to identify gaps in services, and advocate & educate on behalf of people with housing needs.	Curry County
Curry County Veterans Services	517 Railroad St, Brookings, OR 97415 541-247-3205	Provides information for veterans, connects veterans with local and state support agencies and veterans' affairs.	Curry County/ Veterans, Seniors, families.
Curry Watersheds Partnership	29286 Ellensburg Ave/ PO BOX 666 Gold Beach, OR 97444	The Curry Watersheds Partnership is a group of non-regulatory organizations working together to help local landowners and communities keep our shared lands and rivers healthy and sustainable. The Curry Watersheds Partnership includes the Curry Soil and Water Conservation District, the South Coast and Lower Rogue Watershed Councils, and the Curry Watersheds Nonprofit. We support our communities to care for our lands and waters, now and into the future.	Curry County

Name	Contact Information	Description	Service Area/ Populations
Girl Scouts	Medford Service Center 2001 N Keene Way Dr Medford, OR 97504 541-773-8423 Eugene Service Center 72C Centennial Loop, Suite 300 Eugene, OR 97401 541-246-1241 Website: https://www.girlscoutsw.org/?utm_campaign=gsusa&utm_medium=web&utm_source=council_finder	Members of Girl Scout troop 30581 experience many new opportunities to learn about themselves and make a difference in their world – all in a girl-led, inclusive, and safe environment with a focus on: Entrepreneurship, healthy living, life skills, and the outdoors.	Brookings, South County
Gold Beach Lion's Club	PO Box 12 Gold Beach, OR 97444	The efforts of Lions Clubs in the field of vision are expansive and well documented. (lionsclubs.org)	North County/ Seniors, Vision-impaired, children, families.
Gold Beach Main Street	PO Box 1203 Gold Beach, OR 97444	The mission of Gold Beach Main Street is to enhance the livability and safety of our community while restoring and preserving the aesthetics of the town. We endeavor to collaborate with citizens, community organizations, business and property owners and government entities.	Gold Beach/ Businesses
Gorse Action Group	Email: gorseactiongroup@gmail.com Website: https://gorseactiongroup.org/	Gorse (Ulex europaeus) is a highly flammable invasive species on the southern Oregon coast. It impacts the success of native species, the economy, and public safety. The Gorse Action Group (GAG) is an informal group of participants including federal and state agencies, non-profit organizations, private industry, and landowners. The GAG is working to control and reduce the spread of gorse, minimize the impact of gorse on our economy and natural resources, and provide a successful process to share with others facing gorse infestations.	South Coast
Masonic Temple-- Sidney Croft Lodge #206	416 Azalea Park Rd, Brookings, OR 97415 541-469-3454 Email: brookingsmasons@frontier.com Website: http://www.brookingsmasons.com/index.html	Child I.D Program, youth development	South County

Name	Contact Information	Description	Service Area/ Populations
Oregon Coast Community Action	1855 Thomas Ave Coos Bay, OR 97420 (541) 435-7080	Oregon Coast Community Action (OR-CCA), is a private non-profit organization that provides cost effective joint administration, leadership, and support for children's programs and emergency services on the Southern Oregon Coast.	Curry and Coos Counties
OSU Extension Service & 4-H Curry County	29390 Ellensburg Ave Gold Beach, OR 97444 (541) 247-6672 Websites: https://extension.oregonstate.edu/curry https://extension.oregonstate.edu/4h/curry	Extension faculty, staff, and trained volunteers work alongside local partners to provide educational workshops, activities, and services tailored to the unique industries, natural resources, and people in our communities.	Curry County
Rotary Club of Gold Beach	PO Box 1289, Gold Beach, OR 97444 Website: https://goldbeachrotary.com/	Fundraises and develops projects to support scholarships, youth services, community service.	Gold Beach and Curry County
Rotary Club of Port Orford	P.O. Box 1284 Port Orford, Oregon 97465 Email: info@portorfordrotary.org Website: https://www.portorfordrotary.org/	Fundraises and develops projects to support scholarships, youth services, community service.	Port Orford and Curry County
Rotary Club of Brookings-Harbor	PO Box 357 Brookings, OR 97415 541-469-5400 Website: http://www.brookingsharborrotary.org/	Fundraises and develops projects to support scholarships, youth services, community service.	Brookings, Harbor, and Curry County
Salvation Army	409 Hillside Avenue, Brookings, OR 97415 541-469-9577	A branch office of the Christian non-profit Salvation Army, whose mission emphasizes aiding the poor and people in need. The Salvation Army offers human services through its programs, including disaster relief and public emergency services, while taking an evangelical approach. Runs stores that sell used goods.	Curry County / low income and those at need
South Coast Head Start	541-888-3717 420 Redwood Spur, Brookings, OR 97415 505 Pacific Ave (Azalea Middle School), Brookings, OR 97415 29513 Ellensburg Ave, Suite 2, Gold Beach, OR 97444 2040 Washington St, Port Orford, OR 97465	South Coast Head Start is a comprehensive early childhood program that serves children and pregnant women of income eligible families throughout the Southern Oregon Coast. The program is funded by both state and federal grants. All services are provided at no cost to the families.	Coos, Curry, and Coastal Douglas Communities

Name	Contact Information	Description	Service Area/ Populations
Southwestern Oregon Community College, Curry County Campuses	Website: https://www.socc.edu/	Southwestern Oregon Community College fulfills the educational and cultural needs of our diverse communities by providing equitable access to exceptional teaching and learning in a collaborative, engaging, sustainable environment, which supports innovation, lifelong enrichment, and contribution to global society.	Coos, Curry, and Western Douglas Counties
St Timothy's Episcopal Church	401 Fir St, Brookings, OR 97415 (541) 469-3314 Email: office@sttimothyeiscopal.org Website: https://www.sttimothyeiscopal.org/ Hours: 9am-Noon M/W/F	St. Timothy's has several ministries dedicated to helping people including soup kitchen Tuesdays 12-1pm, Sunday sack lunches 12-12:30pm, and other basic health and hygiene programs.	Brookings
Veterans of Foreign Wars Post 966	507 Pacific Ave, Brookings, OR 97415 541-412-7214	The VFW and its Auxiliaries are dedicated to veterans' service, legislative advocacy, and military and community service programs worldwide	South County / Veterans
Veterans of Foreign Wars Post 4439	94131 Caughell St. / PO Box 24, Gold Beach, OR 97444 541-247-6024	Aid needy Veterans & families. Provide a safe environment for Veterans to gather.	Curry County / Veterans
Wild Rivers Coast Alliance Bandon Dunes Golf Resort	57744 Round Lake Rd. Bandon, OR 97411 (541) 347-8843 Email: information@wildriverscoastalliance.com Website: https://wildriverscoastalliance.com/	Wild Rivers Coast Alliance is a grant making department of Bandon Dunes Golf Resort, and we are committed to supporting communities along the South Coast of Oregon. Objective: Support and promote healthy fish and species habitats, working landscapes and seascapes, sustainable tourism, community collaboration, and sustainable businesses	South Coast
Wild Rivers Community Foundation Curry County	(541) 412-6277 990 Front Street Crescent City, CA 95531 Website: https://www.wildriverscf.org/	Wild Rivers Community Foundation works to connect donors who invest in our community with projects in their area of interest to put local capital to work for local priorities and the public good.	Curry and Del Norte Counties
Additional Resources			
American Red Cross	Eugene Office: 440 E Broadway Ave. Suite 200 Eugene, OR 97401 541-344-5244 Medford Office: 1050 Crater Lake Blvd, Suite A Medford, OR 97504 541-779-3773 Website: https://www.redcross.org/local/oregon/about-us/locations/southwest-oregon-chapter.html	In the Cascades Region, which covers the vast area of Oregon and Southwest Washington, approximately 2,600 volunteers provide response, relief and recovery services; save lives through health and safety training; provide assistance to active military members, their families and local veterans; and ensure we maintain a safe and stable blood supply for patients in need.	Southwest Oregon

Name	Contact Information	Description	Service Area/ Populations
Coos Forest Protective Association (CFPA)	CFPA Headquarters 63612 Fifth Road Coos Bay, OR 97420 (541) 267-3161	Private, nonprofit corporation that provides protection from fires on 1.5 million acres of private, county, state, and Bureau of Land Management timber and grazing lands in Coos, Curry, and western Douglas counties.	Coos and Curry Counties
US Department of Agriculture (USDA) Farm Service Agency	376 N Central Blvd Coquille, OR 97423-1244 (541) 396-4323	Administer a variety of commodity, loan, conservation, and emergency disaster assistance programs to small farms. Maintains an “emergency plan” for continuity of operations and assistance to producers.	Coos and Curry Counties

C. Natural Hazards

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1. Coastal Erosion

Coastal erosion occurs through a complex interaction of many geologic, atmospheric, and oceanic factors. Two important natural variables for coastal change are the beach sand budget (balance of sand entering and leaving the system) and processes (waves, currents, tides, and wind) that drive the changes. Erosion becomes a hazard when development, human life, or community safety are threatened.

Coastal erosion occurs throughout the year in Curry County, but is accelerated during the winter months, November through February, resulting in episodic and recurrent erosion of beaches, sand spits, dunes, and bluffs. Shoreline retreat may be gradual over a season or many years, or it can be drastic, with the loss of substantial upland area during the course of a single storm event.

Human activities also influence, and in some cases, intensify the effects of erosion and other coastal hazards. Major actions such as jetty construction and maintenance dredging can have long-term effects. Residential and commercial development can affect shoreline stability over shorter periods of time and in smaller geographic areas. Activities such as grading and excavation, surface and subsurface drainage alterations, vegetation removal, and vegetative as well as structural shoreline stabilization can all reduce shoreline stability (DLCD, 2020).

Although the Pacific Coast in Curry County is vulnerable to the coastal erosion hazard, some areas experience more erosion than others.

- *Cliffs and bluff-backed beaches* dominate the coast of Curry County. Bluff-backed shorelines, while less susceptible to rapid shoreline retreat from wave attack, can be associated with deep currents of fast-moving water. A rip current embayment is an erosion "hot spot" seen in the shoreline and formed by a rip current system. Rip embayments are crescent shaped features and have steeper slopes at the maximum point of erosion. The size, spacing, and location are dependent upon the magnitude of the rip current system. Relative to the adjacent section of beach, wave energy can propagate further towards the shoreline through the center of the embayment due to an increased nearshore water depth and reduced beach width. This wave energy can induce erosion and attack the coastal dunes, cliffs, bluffs, and coastal infrastructure (OSU, 2021).
- *Beaches and dune-backed shorelines* are interspersed along the Pacific coast in Curry County. Sand and other sediments circulate within littoral cells defined by ocean currents and nearshore features causing some areas to aggrade or add sand while others accrete or lose sand. Wave attack, such as that occurring during storms and king tides, is the primary risk to dune-backed shorelines, resulting in undercutting and wave overtopping.
- *The Rogue and Chetco river estuaries* begin where the rivers meet the ocean. Tidal influences continue for miles upstream, but storm surges and waves are largely attenuated by the narrow and long river channel. Nonetheless, tidal and stormwater flooding is a contributor to local erosion in low-lying areas.

Hazard History

The following table provides information on the previous occurrences of coastal erosion. No new coastal erosion events have been identified and two historic events have been added for the 2022 update.

Table I-27. Historic Coastal Erosion Events

Date	Location	Description
2004	Otter Point State Park	Coastal erosion destroyed a hiking trail.
Feb. 1998	Port Orford	Heavy surf damaged Port Orford's sewage treatment plan, causing approximately \$300,000 in damage and eroding the foredune that separates the ocean from Garrison Lake, one of Port Orford's sources of water.
Jan. 1939	Garrison Lake, Elk River lowland; Coastwide	Storm surge overtopped the foredune.

Note: * indicates newly listed event for the 2022 NHMP update. Source: Curry NHMP 2016; 2020 OR NHMP; Curry County Emergency Management Hazard Analysis 2021.

Future Climate Conditions: Coastal Erosion

Variability in water levels associated with the El Niño–Southern Oscillation, tides, storm surges, and waves, especially in conjunction with relative sea level rise, can result in flooding and erosion along the Oregon coast. Coastal hazards may become more severe and more frequent in the future due to a projected increase in local sea levels along the Oregon coast which raises the starting point for storm surges and high tides.

Local sea level at the National Oceanic and Atmospheric Administration (NOAA) water-level station at Charleston, Oregon rose about one inch from 1978–2013. Climate change is expected to accelerate sea level rise along the southern Oregon coast during the twenty-first century. Local sea level is projected to rise by 1.2–5.3 feet by 2100 (Climate Central, 2022) given the intermediate-low and intermediate-high global sea level scenarios used in the 2018 U.S. National Climate Assessment (Dalton et al., 2022).

Vulnerability Assessment

There are eleven critical facilities that are exposed to the coastal erosion hazard in Curry County according to the 2020 Oregon NHMP. Overall, Curry County is ranked fourth of seven coastal counties for its vulnerability to coastal erosion in the State Plan (DLCD, 2020).

The following assets and locations are generally the most vulnerable to coastal erosion:

- Coastal erosion is gradually eroding the Nesika Beach area, north of Gold Beach, threatening beachfront homes.
- Gold Beach, Hunter Creek (erosion)
- In the Dawson Tract Subdivision north of Brookings, a home had to be torn down due to coastal erosion.
- Harris Beach State Park experiences coastal erosion on a regular basis.
- In February 1998, heavy surf damaged Port Orford's sewage treatment plant, causing approximately \$300,000 in damage and eroding the dune that separates the ocean from

Garrison Lake, which is one of Port Orford's sources of water. The dune breach has since been repaired and is monitored regularly.

- Multiple coastal erosion sections affecting Highway 101 (landslides and erosion).

Figure I-28. Hunter Creek Northward Migration, 2010



Source: Allan and Stimely, 2013.

Allan and Stimely (2013) measured shorelines and compared against both recent historical (lidar) shorelines and older historical shorelines (e.g., 1920s, 1950s, and 1960s era). The beach monitoring efforts completed thus far have identified the following large-scale beach responses:

Gold Beach:

- Erosion is occurring immediately north and south of the Rogue River jetties. Hunter Creek had remained relatively unchanged when compared to historical shoreline information for many years.
- Significant erosion has occurred adjacent to Hunter Creek due to northward migration of the creek coupled with ocean wave attack. The mouth of the creek is now migrating in a southerly direction. In early spring 2010, Hunter Creek migrated so far northward that it began to erode the toe of several homes constructed immediately adjacent to the creek and beach.
- At the north end of the littoral cell (north of the community of Rogue Shores) the beach has been gaining sand, which has resulted in seaward progradation of the shore.

Nesika Beach:

- Significant erosion is occurring along the coastal bluffs that front the community of Nesika Beach. The mean change in the toe of the bluffs between 1967 and 2008 was determined to be -15.4 m (-50.5 ft).
- Estimates of the bluff erosion rate indicate that the bluffs are receding at an average rate of -0.38 m/year (-1.25 ft/year).
- Recent mapping (2011) of the bluff toe and top indicates little erosion has occurred along the bluff top since the lidar was flown in 2008. For the most part, this finding applies to measurements of the bluff toe. However, in a few discrete shore sections, we observed some 2 to 3 m (6.6 to 9.8 ft) of additional retreat, causing the bluffs to become oversteepened in those areas.
- At the north end of the cell the beaches are actively advancing (prograding) seaward.

Rogue Shores:

- The beach and shoreline north of the Rogue River are presently eroding and have been retreating since at least the mid-1960s. The erosion extends at least 1.6 km (1 mile) north of the Rogue River, with the greatest shoreline retreat (~85 m [279 ft]) adjacent to the jetty.
- Adjacent to the community of Rogue Shores the beach appears to be a hinge point, separating the erosion in the south from accretion to the north.
- North of Rogue Shores the beach is actively accreting and prograding, with the shoreline having advanced seaward by about 50–80 m (164–262 ft).

Table I-28. Coastal erosion exposure

Community*	Total Number of Buildings	Total Estimated Building Value (\$)	<i>(all dollar amounts in thousands)</i>								
			Very High Hazard			High Hazard			Moderate Hazard		
			Number of Buildings	Building Value (\$)	Ratio of Exposure Value	Number of Buildings	Building Value (\$)	Ratio of Exposure Value	Number of Buildings	Building Value (\$)	Ratio of Exposure Value
Unincorp. County (rural)	10,027	665,167	44	9,166	1.4%	79	16,445	2.5%	106	21,680	3.3%
Nesika Beach	399	19,602	9	762	3.9%	28	2,369	12%	34	3,096	16%
Total Curry County	10,426	684,769	53	9,928	1.4%	107	18,814	2.7%	140	24,776	3.6%

Source: Williams & Anthony, 2020.

Risk Reduction Recommendations

The science of risk reduction is an emerging field. These potential coastal erosion mitigation actions are listed along with the hazard description so that readers understand the type of mitigation actions being considered or that might be considered current best practices. Source: various.

- Maintain existing erosion control structures.
- Consider limiting development in coastal erosion zones.
- Identify and relocate infrastructure near coastal erosion areas.
- Monitor the effects and drivers of coastal change such as high tide, large wave, and storm events in erosion-prone and low-lying areas.
- Consider land value losses due to coastal erosion in future risk assessments.
- Local citizens can observe and help document the impacts of climate change. Twice a year, high tides in Oregon are higher than usual. These extreme high tides, commonly called "King Tides," occur when the moon is closest to the Earth, and the Earth is closest to the sun. Because these events are associated with localized flooding and erosion, they are being used to measure the potential impacts of sea level rise and changing wave dynamics. A citizen science photo documentation project can be viewed or participated in online at <https://www.oregonkingtides.net/>.

Figure I-29. Geomorphic changes to Nesika Beach

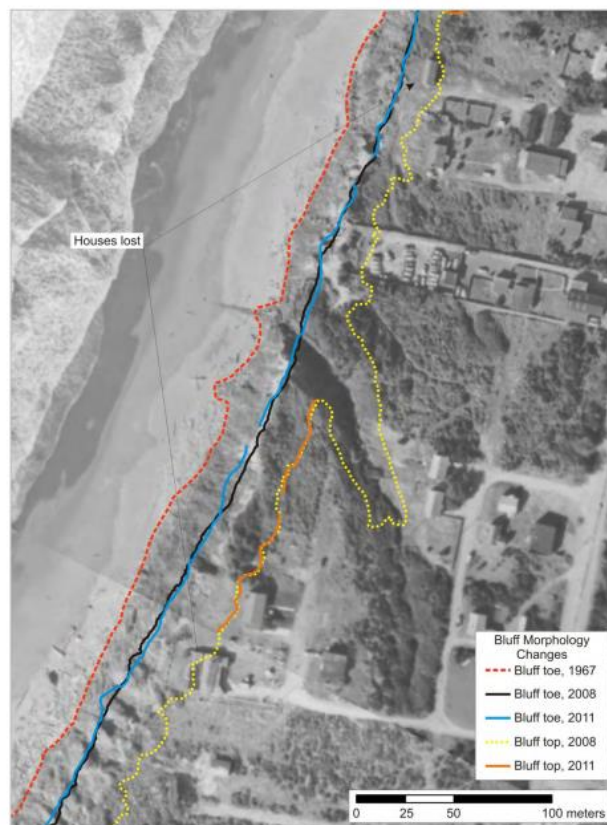


Figure 22. Close-up view of geomorphic changes (bluff toe and top) along a portion of the Nesika Beach shore depicted on a 1967 orthorectified image. Note the two homes identified in the 1967 aerial images that have been lost due to retreat of the bluffs.

Source: Allan and Stimely, 2013.

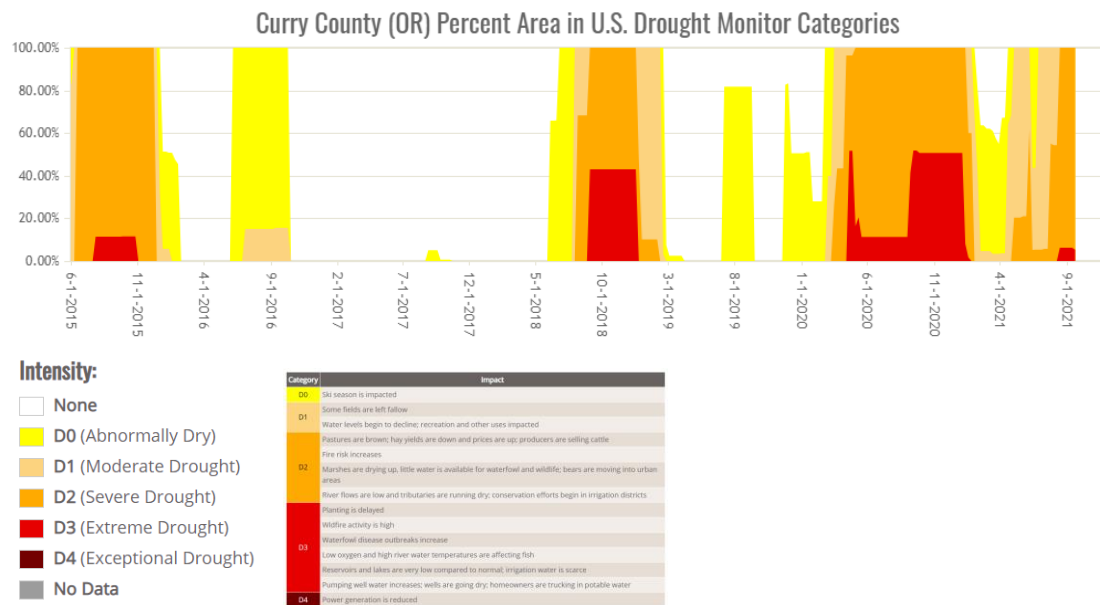
2. Drought

Drought is commonly defined as a deficiency of precipitation over an extended period (usually a season or more), resulting in a water shortage (NDMC, 2020). The extent of drought events depends upon the degree of moisture deficiency, and the duration and size of the affected area. Typically, droughts occur as regional events and often affect more than one city and county. Drought is frequently an "incremental" hazard; the onset and end are often difficult to determine. In addition, the effects of drought may accumulate slowly over a considerable period and may linger for years after the event.

Figure I-30. Definitions and characteristics of various drought classes

Drought Class	Definition & Characteristics
Meteorological	• lack of precipitation • evaporative demand that exceeds precipitation • minimum period of time for consideration operationally is 90 days
Hydrological	• prolonged meteorological drought affects surface or subsurface water supply, such as streamflow, reservoir and lake levels, or groundwater levels • tends to evolve more slowly than meteorological drought, with extents longer than six months
Agricultural	• occurs when meteorological and hydrological drought impacts agricultural production • reflects precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, and reduced availability of irrigation water
Socioeconomic	• occurs when meteorological, hydrological, or agricultural drought reduces the supply of some economic or social good or service • often affects state and federal drought declarations
Ecological	• undesirable changes in ecological state caused by deficits in water availability • usually caused by meteorological or hydrological drought • sensitivity to water limitation varies among species and life stages
Flash	• relatively short periods of warm surface temperatures, low relative humidities and precipitation deficits, and rapidly declining soil moisture • tend to develop and intensify rapidly within a few weeks, and may be generated or magnified by prolonged heat waves
Snow	• snowpack—or snow water equivalent (SWE)—is below average for a given point in the water year, traditionally 1 April • often followed by summers with low river and stream flows • warm snow drought—low snowpack with above average precipitation and temperature • dry snow drought—low snowpack and low precipitation

Source: Dalton and Fleishman, 2021; Fleishman et al., unpublished

Table I-29. Drought Occurrences Last 5 Years

Source: NDMC, 2021.

Hazard History

The following two tables provide information on the previous occurrences of droughts. The first lists official drought declarations by the State of Oregon. The second captures drought history—three new drought events in addition to an emergency declaration by a municipal water provider have occurred since 2016 and five historic events have been added for the 2022 plan update.

Table I-30. Drought Disaster Declarations for Curry County

Drought Year	Executive Order Number	County Request Date	Governor Declaration Date	Drought Begin Date	Drought End Date
2021	21-35	09/15/2021	11/17/2021	11/17/2021	12/31/21
2020	20-21	4/1/2020	4/23/2020	4/23/2020	12/31/2020
2015	15-08	6/29/2015	7/21/2015	7/21/2015	12/31/2015
2002	02-26	n/a	12/1/2002	12/1/2002	6/26/2003
1992	92-21	n/a	9/3/1992	9/3/1992	10/31/1992

Source: Oregon Water Resources Department. (2021). Drought Declarations.

https://apps.wrd.state.or.us/apps/wr/wr_drought/declaration_status_report.aspx accessed 09/27/2021 & 1/26/22.

Table I-31. Historic Drought Events

Date	Location	Description
Apr. 2022*	Curry County	The Curry County Board of Commissioners declared a drought emergency on April 20, 2022 due to an extremely dry early spring, but increased precipitation occurred before a Governor's declaration occurred.
Sept. 2021*	City of Port Orford	The City of Port Orford issued a state of emergency on 9/1/2021 due to water supply issues related to the drought, impoundment structural issues, distribution system leaks, and demand. One third of raw water has leaked from the Hubbard Creek impoundment and supply lines of finished water have severe leakage as well.
Sept. 2021*	Curry County	The Curry County Board of Commissioners declared a drought emergency and requested a drought declaration from the Governor's Office.
2018*	Curry County	No drought requested or declared but fall and winter of 2018-2019 saw low water levels and high fire danger.
July 2015	Curry County	Drought declaration EO 15-08 issued for Curry County. Statewide drought, low snow pack levels, and low water conditions for 25 counties in Oregon.
Dec. 2014	Curry County	Lane, Douglas, and Curry Counties- Drought disaster declaration for the three counties due to below average snowpack.
Aug. 2013	Curry County	Agricultural losses due to recent drought. Curry County designated as primary natural disaster area.
2004-2005	Coos, Curry, and Douglas Counties	Counties declared primary natural disaster area due to drought.
2001-2003 (Dec. 2002)	Coos, Curry, and Douglas Counties	Governor Declared State of Drought Emergency declared "due to conditions caused by drought and low water." The second most intense drought in Oregon's history; 18 counties with state drought declaration (2001); 23 counties state-declared drought (2002); some of the 2001 and 2002 drought declarations were in effect through June or December 2003; Coos and Curry Counties in Region 1 were not under a drought declaration until December of 2002.
2000-2001	Statewide	The second most intense drought in Oregon's history.
1985-1997	Curry County	A general dry period throughout the state, capped by statewide droughts in 1992 and 1994.; the Governor issued a Drought Declaration for Curry County in 1992.
1992	Curry County; Statewide	The winter of 1991-1992 was a moderate El Niño event, which can manifest itself in warmer and drier winters in Oregon; Governor declared a drought for all 36 counties in September 1992.
1988*	Curry County	Extreme drought during general dry period throughout the state spanning 1985-1997.
1976-1981	Western Oregon	1976-1977 was the single driest water year of the century; during a 5-year period of intense drought.
1961	Coos and Curry counties	Abnormally high temperatures in the two counties.
1939-1941*	Oregon	A three-year intense drought: Water Year 1939 was one of the more significant drought years on the Oregon Coast during that period.
1917-1931*	Oregon	A very dry period, punctuated by brief wet spells in 1920-21 and 1927. The 1920s and 1930s, known more commonly as the Dust Bowl, were a period of prolonged mostly drier than normal conditions across much of the state and country; moderate to severe drought affected much of the state except southeastern Oregon.
1924*	Oregon	A prolonged statewide drought that caused major problems for agriculture.
1904-1905*	Oregon	A drought period of about 18 months.

Note: * indicates newly listed event for the 2022 NHMP update. Source: Curry NHMP 2016; 2020 OR NHMP; Curry County Emergency Management Hazard Analysis 2021; OWRD, 2021.

Future Climate Conditions: Drought

Drought is common in the Northwest. The incidence, extent, and severity of drought has increased over the last 20 years relative to the twentieth century, and this trend is expected to continue under future climate change (Dalton et al., 2022). Weather variability, increased dryness, reduced precipitation, and reduced snow pack are all key climate change impacts expected to exacerbate the drought hazard in future years.

The Future Conditions Report for Curry County presents projected changes in four variables indicative of drought: low spring snowpack (snow drought), low summer soil moisture from the surface to 140 cm below the surface (agricultural drought), low summer runoff (hydrological drought), and low summer precipitation (meteorological drought).

In Curry County, spring snowpack (that is, the snow water equivalent on April 1), summer runoff, summer soil moisture, and summer precipitation are projected to decline under both lower (RCP 4.5) and higher (RCP 8.5) emissions scenarios. Therefore, seasonal drought conditions will occur more frequently by the 2050s under both emissions scenarios (Dalton et al., 2022).

Vulnerability Assessment

Drought conditions are not uncommon in Curry County. Drought poses a risk of reduced water availability for communities and agricultural producers during peak demand in late summer. This limits the growth of community development and of overall production of products that have a late summer water demand. The environmental and economic consequences can be significant, particularly those employed in agriculture. Domestic water-users may be subject to stringent conservation measures.

The drought occurring as this plan is underway has highlighted dependencies and water supply needs across Curry County.

- The Chetco River is the sole drinking water supply source for Harbor Water District PUD which supplies the unincorporated community of Harbor.
- On June 23, 2021, the Chetco River cubic feet per second flow data shows that river flow was 60% below the 1992 record low, 35% of the 45-year median flow, and only 26% of the 45-year mean flow level.
- The Harbor Water District's intake is up river 2 miles from the sea and extracts water from the aquifer below the riverbed through a Ranney collector well down 35 feet into the south bank of the Chetco River from the aquifer zone of water-saturated rock, sand and gravel; and
- Low Chetco River flows in the late summer of 2014, coupled with high tides and an intake placement two miles upstream, caused significant salt water intrusion into the Harbor Water District's municipal system, threatening the health of Harbor residents, the elderly, animals and agriculture production; and
- There are 197 agricultural producers, covering 63,342 acres with \$33,782,000 in annual gross agricultural sales. This economic sector is dependent upon stream flows that were at record low levels in 2021.

- The Curry Soil & Water Conservation District <https://www.currywatersheds.org/about-us/curry-soil-water-conservation-district/> can provide technical resources to local landowners and agricultural producers.

Risk Reduction Recommendations

The science of risk reduction is an emerging field. These potential drought mitigation actions are listed along with the hazard description so that readers understand the type of mitigation actions being considered or that might be considered current best practices.

- Develop and implement water conservation plans.
- Support the use of water conservation practices by agricultural, industrial, and municipal water users.
- Coordinate with local watershed organizations and soil and water conservation districts to implement best practices for water management such as:
 - Restore watershed integrity and improve land management to increase water availability during the dry season. Prioritize municipal water sources: Brookings/Harbor – **Chetco River** (primary), Ferry Creek (secondary); Gold Beach – **Rogue River**; Port Orford – North Fork **Hubbard Creek** (primary), Garrison Lake (secondary); and Langlois – Floras Creek. Each of these watersheds has an associated Action Plan, which can be found on the Curry Watersheds Partnership website at: <https://www.currywatersheds.org/watershed-overview/>
- Key drought-resiliency actions for municipal watersheds include:
 - Reduce water withdraws by updating irrigation infrastructure and technology
 - Retain soil moisture by restoring native vegetation, improving grazing practices, and promoting forest management that retains woody debris on the forest floor
 - Increase groundwater recharge by protecting and expanding wetlands, constructing stormwater retention basins, increasing floodplain inundation (where appropriate), increasing instream roughness (log structures), and by dispersing road drainage
 - Reduce sedimentation in reservoir watersheds by improving or decommissioning roads, managing development, improving livestock and crop management, increasing stream buffers, and decreasing the risk of wildfire

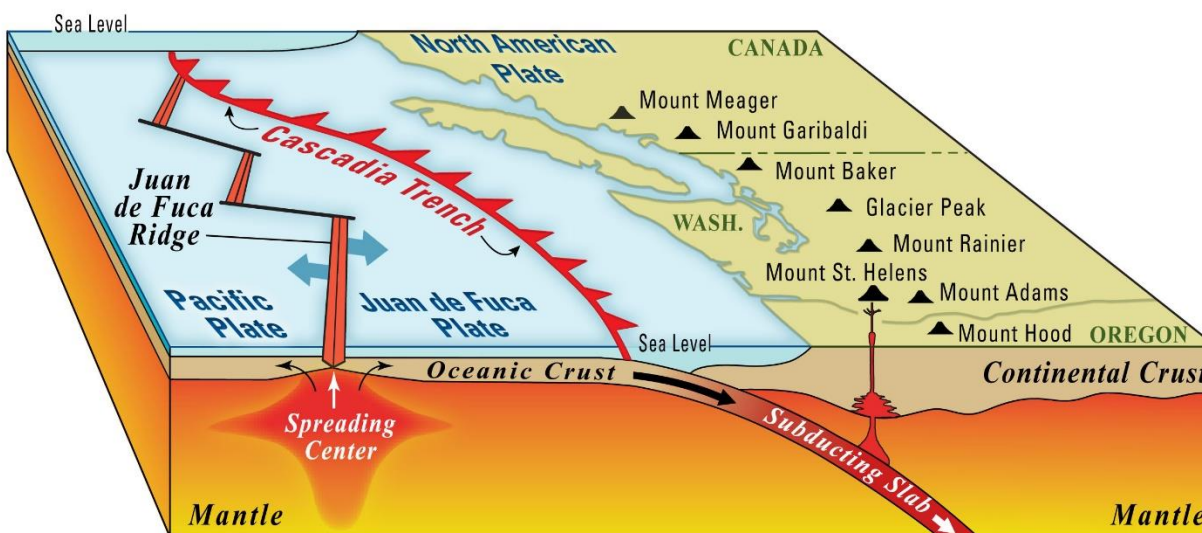
3. Earthquake

Oregon and the Pacific Northwest in general are susceptible to earthquakes from four sources: 1) the off-shore Cascadian Fault Zone; 2) deep intra-plate events within the subducting Juan de Fuca Plate; 3) shallow crustal events within the North American Plate; and 4) earthquakes associated with volcanic activity.

Curry County has not experienced any major earthquake events in recent history. Seismic events do, however, pose a significant threat. In particular, a Cascadia Subduction Zone (CSZ) event could produce catastrophic damage and loss of life in Curry County. The geographical position of Curry County makes it also susceptible to deep intraplate events within the subducting Juan de Fuca Plate, and shallow crustal events within the North American Plate.

According to the Oregon NHMP, the return period for the largest of the CSZ earthquakes (Magnitude 9.0+) is 530 years with the last CSZ event occurring on January 26, 1700. The probability of a 9.0+ CSZ event occurring in the next 50 years ranges from 7 - 12%. Notably, 10 - 20 "smaller" Magnitude 8.3 - 8.5 earthquakes identified over the past 10,000 years affect only the southern half of Oregon and northern California. The average return period for these events is roughly 240 years. The combined probability of any CSZ earthquake occurring in the next 50 years is 37 - 43%.

Figure I-31. Cascadia Subduction Zone



Source: Dzurisin et al., 2013. <https://www.usgs.gov/media/images/subduction-juan-de-fuca-plate-beneath-north-american-pla>

Hazard History

The following table provides information on the previous occurrences of earthquakes. Two new earthquake events has occurred since 2016 and six historic events have been added for the 2022 update.

Table I-32. Historic Earthquake Events

Date	Magnitude	Location	Description
June 2021* (06/04/2021)	5.9	Oregon Coast	A 5.9 magnitude earthquake occurred off the Oregon coast 95 miles west of Gold Beach, OR at a depth of 16.6 km. A second M 5.9 occurred around 15 minutes later (USGS , 2021).
Aug. 2018* (08/22/2018)	6.2	Oregon Coast	A 6.2 magnitude earthquake occurred off the Oregon coast 170 miles northwest of Brookings, OR at a depth of 10.0 km.
Apr. 2012	5.9	Oregon Coast	A 5.9 magnitude earthquake occurred off the Oregon coast. The earthquake was 196 miles away from Brookings. There were no reported damages.
Feb. 2012	6.0	Oregon Coast	A 6.0 magnitude earthquake occurred off the Oregon coast about 190 miles northwest of Brookings. There were no reported damages.
Oct. 2011	5.3	Oregon Coast	A 5.3 magnitude earthquake occurred off the Oregon coast.
Aug. 2010* (08/28/2010)	5.2	Oregon Coast	A 5.2 earthquake occurred 80 miles west of Reedsport, OR.
Apr. 2008	5.0-5.4	Oregon Coast	A swarm of 5.0-5.4 earthquakes occurred off the Central Oregon coast near Newport, OR.
Aug. 2004	4.7	Oregon Coast	No damages, event recorded northeast of Newport, OR.
July 2004	4.9	Oregon Coast	No damages, event recorded southwest of Newport, OR.
Feb. 2001* (02/28/2001)	6.8	Nisqually, WA	400 injured; \$2 billion in damage; 'Deep' earthquake.
Sept. 1993 (09/21/1993)	5.9 and 6.0	Klamath Falls, OR	Two deaths; \$7.5 million in damage to homes, commercial, and government buildings. Two crustal earthquakes; 8.5 and 8.6 km depth respectively. (FEMA-1004-DR-OR).
Mar. 1993 (03/25/1993)	5.6	Willamette Valley, OR	A 5.6 magnitude crustal earthquake centered near Scotts Mills, OR (east of Woodburn) caused \$27 million in damage to homes, schools, businesses, and state buildings. (FEMA-985-DR-OR).
May 1980* (05/18/1980)	5.1	Mt. St. Helens, WA	A 5.1 magnitude earthquake occurred prior to the volcanic eruption of Mt. Saint Helens.
Jun. 1973* (06/16/1973)	5.6	Oregon Coast	A 5.6 magnitude earthquake occurred 80 miles west of Lincoln City, OR.
Mar. 1964* (03/28/1964)	9.2	Prince William Sound, AK	The largest recorded earthquake in U.S. history was this 9.2 magnitude earthquake that occurred in Prince William Sound, AK resulting in a local tsunami that contributed to the 140 fatalities and \$311 million in damage.
Nov. 1962 (11/06/1962)	5.2-5.5	Portland, OR	Damage to many homes (chimneys, windows, etc.) Crustal event 16.0 km depth.
Dec. 1941* (12/19/1941)	5.6	Portland, OR	
Nov. 1873	7.3	Oregon Coast	A 7.3 earthquake occurred offshore from Brookings, OR. Chimneys fell at Port Orford, Grants Pass, and Jacksonville. Intraplate event, Gorda block off the Juan de Fuca plate. No aftershocks.
Jan. 1700 (01/26/1700)	9.0	Pacific NW coast	The most recent "local" earthquake on the Cascadia Subduction Zone fault along the entire coast of the Pacific Northwest resulted in an approximately 9.0 earthquake. This catastrophic event is understood to have generated a very large tsunami that struck Oregon, Washington, and Japan.

Note: * indicates newly listed event for the 2022 NHMP update. Source: Curry NHMP 2016; 2020 OR NHMP; Curry County Emergency Management Hazard Analysis 2021; USGS, <https://earthquake.usgs.gov/earthquakes/>; Sullivan, W.L., 2018.

Vulnerability Assessment

We identified locations within the study area that are comparatively more vulnerable or at greater risk to CSZ M9.0 earthquake hazard:

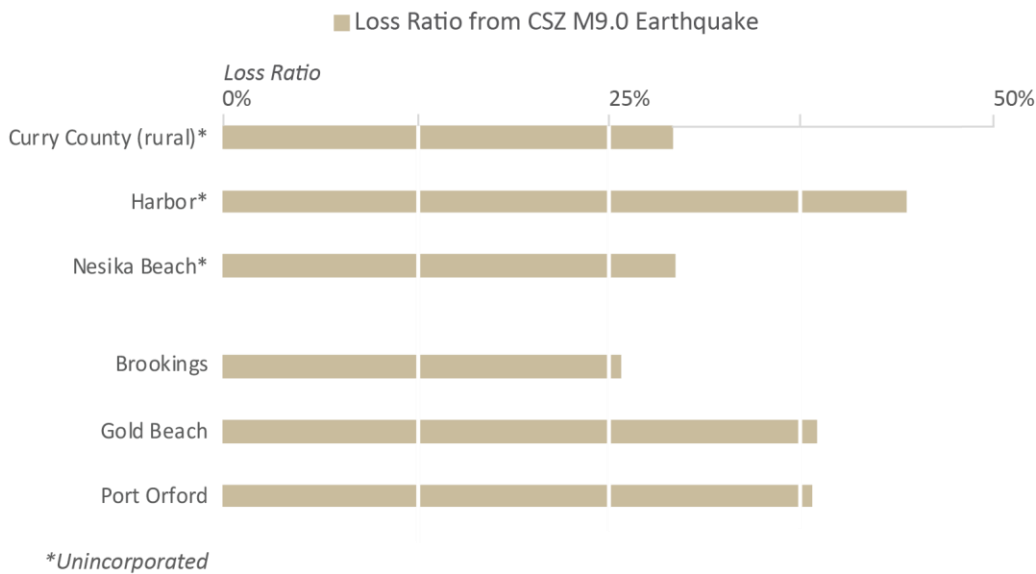
- A high percentage of building inventories for the communities of Harbor, Gold Beach, and Port Orford were built before seismic design codes were implemented and thus more vulnerable to earthquake damage.
- The community of Harbor is estimated to see losses to total building inventory at 41% from the earthquake.
- Because of the liquefaction and landslides, these communities will likely be “islands” disconnected from other communities by severed transportation routes. With losses up to 44%, it is very important for the community to be able to respond to emergencies within its own community.
- Nearly all of Curry County’s critical facilities are predicted to be non-functioning following the CSZ earthquake.

Curry countywide CSZ M9.0 earthquake results (not including buildings or population within the Medium-sized tsunami zone):

- Number of red-tagged buildings: 5,924
- Number of yellow-tagged buildings: 2,277
- Loss estimate: \$450,992,000
- Loss ratio: 28%
- Non-functioning critical facilities: 26
- Potentially displaced population: 5,773

Source: Williams & Anthony, 2020.

Figure I-32. Earthquake loss ratio by Curry County community
Total Building Value Loss Ratio from M 9.0 Earthquake



Source: Williams & Anthony, 2020.

Table I-33. Cascadia subduction zone earthquake loss estimates

<i>(all dollar amounts in thousands)</i>												
Community	Total Number of Buildings	Total Estimated Building Value (\$)	Total Earthquake Damage*		Earthquake Damage outside of Medium Tsunami Zone							
			Buildings Damaged		Buildings Damaged				All Buildings Changed to At Least Moderate Code			
			Sum of Economic Loss	Loss Ratio	Yellow- Tagged Building s	Red- Tagged Buildings	Sum of Economi c Loss	Loss Rati o	Yellow- Tagged Buildings	Red- Tagged Buildings	Sum of Economic Loss	Loss Ratio
Unincorp. County (rural)	10,027	665,168	195,121	29%	1,040	2,949	174,519	26%	1118	1758	129,933	20%
Harbor	3,556	227,074	100,791	44%	470	1,554	92,369	41%	879	634	57,631	25%
Nesika Beach	399	19,602	5,759	29%	53	110	5,446	28%	60	46	3,449	18%
Total Unincorp. County	13,982	911,844	301,671	33%	1,563	4,613	272,334	30%	2057	2438	191,013	21%
Brookings	3,949	462,342	119,554	26%	446	757	117,620	25%	331	361	70,841	15%
Gold Beach	1,912	189,329	72,989	39%	149	347	37,164	20%	120	212	25,657	14%
Port Orford	924	73,077	27,971	38%	119	207	23,874	33%	92	100	13,553	19%
Total Curry County	20,767	1,636,592	522,185	32%	2,277	5,924	450,992	28%	2,600	3,112	301,064	18%

Note: *All losses calculated from earthquake inside or outside of the medium tsunami zone. Source: Williams & Anthony, 2020.

Risk Reduction Recommendations

The science of risk reduction is an emerging field. These potential actions to address earthquakes are placeholders following the hazard description, so the community and other readers understand the some of the mitigation best practices under consideration (Williams & Anthony, 2020.)

- Evaluate critical facilities for seismic preparedness by identifying structural deficiencies and vulnerabilities to dependent systems (e.g., water, fuel, power).
- Address vulnerabilities of critical facilities. We estimate that 88% of critical facilities (Appendix A: Community Risk Profiles) will be damaged by the CSZ event (includes tsunami), which will have many direct and indirect negative effects on first response and recovery efforts.
- Conduct awareness campaigns to encourage home and business owners to perform seismic retrofits. Our findings indicate that seismic upgrades can significantly reduce losses to buildings.
- Ensure seismic building codes are strictly enforced, especially for manufactured homes.
- Consider implementing regulations in highly liquefiable soil zone areas or using planning to reduce risk.

4. Flood

Flooding results when rain and snowmelt results in water flow that exceeds the carrying capacity of rivers, streams, channels, ditches, and other watercourses. In Oregon, flooding is most common from October through April when storms from the Pacific Ocean bring intense rainfall. Most of Oregon's destructive natural disasters have been floods.

Flooding can be aggravated when rain is accompanied by snowmelt and frozen ground; the spring cycle of melting snow is the most common source of flood in the region. The principal types of flooding that occurs in Curry County include King Tide/storm surge flooding or riverine flooding resulting from spring/snow melt flooding or warm winter rain-on-snow flooding.

The major rivers within the county are the Rogue and Chetco Rivers. Some of the notable minor streams are Floras Creek, Elk River, Sixes River, Euchre Creek, Turtle Creek, Hunter Creek, Pistol River, and Winchuck River. All the listed rivers are subject to flooding and causing damage to buildings within the floodplain. Other flooding effects are due to coastal flooding from the Pacific Ocean for low-lying coastal developments and within Curry County's two main estuaries.

Figure I-33. Lower Rogue River near Gold Beach



Source: Curry Watersheds Partnership website <https://www.currywatersheds.org/watersheds/lower-rogue/>

Hazard History

The following table provides information on the previous occurrences of flooding. Eight new flood events have occurred since the last plan update and six historic events have been added for the 2022 update.

Table I-34. Historic Flood Events

Date	Location	Event Type	Magnitude	Details
Apr. 2019* (4/6/2019- 4/21/2019)	Statewide 6 counties	Heavy Rain Flooding Landslides Mudslides	21.93'	Two days of very heavy rainfall combined with snowmelt led to severe flooding and landslides on Hunter Creek near Gold Beach and the Winchuck River near Brookings. DR-4452 declared for Severe Storms, Flooding, Landslides, And Mudslides. A Gold Beach culvert washed out, the Port of Brookings Harbor had basin damage due to erosion and debris, and major highways were closed.
Feb. 2019*	S. Oregon Coast	Heavy Rain Flooding	18.32'	Very heavy rain along with the melting of recent snowfall caused flooding at several locations in southern Oregon in late February. The Rogue River at Agness rose above flood stage (17.0 feet) at 25/2100 PST, crested at 18.32 feet
Jan. 2019* (01/20/2019)	Curry County	Heavy Rain Flooding	19.36'	A weekend of very heavy rain led to river rises across southern Oregon. The Rogue River at Agness exceeded flood stage on this day.
Feb. 2017*	Curry County	Heavy Rain Flooding	18.64'	Heavy rain combined with snow melt caused flooding along the Rogue River in southwest Oregon.
Jan. 2017* (01/10/2017- 01/11/2017)	Curry County	Heavy Rain Flooding	21.88'	An extended period of heavy rain combined with snowmelt to cause rises in the Rogue River at Agness.
Dec. 2016* (12/15/2016- 12/16/2016)	Curry County	Flooding	24.14'	Heavy rains brought flooding to several rivers and creeks in southwest Oregon. The Rogue River at Agness rose above flood stage (17.0 feet) at 15/0015 PST. The river crested at 24.14 feet at 15/1215 PST.
Dec. 2015* (12/13/2015- 12/14/2015)	Curry County	Flooding	17.7' at Agness	A moist pacific front produced heavy rainfall across Northwest Oregon which resulted in river flooding, urban flooding, small stream flooding, landslides, and a few sink holes. After a wet week (December 5 through Dec 11), several rivers were near bank full ahead of another front on December 12th. The Rogue River at Agness exceeded the flood stage of 17.0 feet at 13/1954 PST, crested above minor flood stage at 17.7 feet at 13/2300 PST,
Feb. 2015*	Curry County	Flooding		Heavy rains caused flooding on the Rogue River at Agness.

Date	Location	Event Type	Magnitude	Details
Nov. 2012	Curry County	Heavy Rain Flooding Landslides	9.84"	Heavy rain caused \$4 million in damages to infrastructure. Rain flooded the Chetco River and Hunter Creek, and 9.84 inches of rain were recorded at Harbor in a 24-hour period.
Mar. 2012	Coos and Curry Counties	Heavy Rain, Flooding, Mudslides, Landslides	n/a	Winds and heavy rains caused flooding, mudslides, and landslides in twelve counties. There was an estimated \$5,856,881 in damage to state highways.
Jan. 2012	Coos and Curry Counties	Heavy Rain, Flooding, Landslides	n/a	A severe winter storm caused flooding along with landslides and mudslides in Southern Oregon.
Dec. 2007	Oregon Coast	Heavy Rain	n/a	Strong storms along the entire Oregon Coast. Curry County was included in Presidential Disaster Declaration DR-1733.
Dec. 2005	Southwest Oregon	Heavy Rain		Heavy flooding in Curry County due to heavy rains. Damages occurred in Curry, Coos, Josephine, and Jackson Counties.
Dec. 2004* (12/08/2004- 12/09/2004)	W. Oregon	High surf; Heavy rain; Mudslides	25 ft. Surf	A large powerful Pacific storm brought a wide variety of weather to Western Oregon. Heavy rain accompanied this storm resulting in mud slides. Buoys 20 miles off the Oregon Coast reported maximum seas of 25 to 26 feet.
Dec. 2002* (12/27/2002- 12/28/2002)	Curry County	Heavy Rain	2-4"	Heavy rains resulted in small streams running high.
Jan. 2000* (01/13/2000)	Brookings	Heavy Rain Flooding	4.72"	Brookings recorded 4.72 inches of rain, a record for the date. A Flood Warning was issued for the lower Rogue River from Agness to Gold Beach. The Curry Coastal Pilot (Brookings, OR) newspaper reported extensive urban and small stream flooding due to heavy rains.
Jan. 1997	Statewide	Heavy Rain Flooding		Flooding widespread throughout Oregon, with many roads closed due to high water and landslides. The governor declared a State of Emergency in January due to heavy rains that began December 21, 1996 and caused flooding, landslides, and erosion in 18 counties, including Curry County.

Date	Location	Event Type	Magnitude	Details
Nov. 1996 - Dec. 1996	Five Western States	Heavy Rain, Freezing Rain/Heavy Wet Snow	6-18 in. rain west of the Cascades; 8 in. in 24 hrs. in Coast Range	During the period from mid-November to mid-December 1996, many areas received above-normal precipitation, greatly increasing the snowpack over mid and high elevations. Three sequential storms brought moderate to heavy rain, with the last creating a rain-on-snow event which resulted in incredible amounts of runoff. All-time one-day precipitation records were set at many locations. Power outages occurred over much of the state from November 18th-20 th but the event continued until December 11th. Disaster Declaration for flooding, landslides, and mudslides.
Feb. 1996 (2/4/1996; 2/21/1996)	Statewide	Heavy Rain Floods Debris Flow	7 deaths; 100s of homes destroyed; \$1 billion in damage.	A river of subtropical atmospheric moisture flowed above northern Oregon producing very heavy rainfall. Five Oregon residents died, thousands of people were sheltered, and hundreds of homes were destroyed in storms on February 4th and 21st.
Nov. 1991*	Oregon Coast	High Wind High Surf	25 ft. waves	This slow-moving storm generated 25-foot waves and resulted in damage to buildings, boats, and transmission lines.
Nov.-Dec. 1977*	Western Oregon	Heavy Rain, Flooding	n/a	Rain on snow event; \$16.5 million in damages.
Jan. 1972*	Western Oregon	Heavy Rain, Flooding	n/a	Record flows on coastal rivers.
Dec. 1964 - Jan. 1965	Oregon	Heavy Rain Flooding Mudslides		Rain on snow event; record flood on many rivers. The December 1964 rainstorm was among the most severe in western Oregon since the late 1870s. Hundreds of miles of roads and highways were washed out or badly damaged, and thousands of people had to be evacuated due to ensuing floods. Rivers in Curry County were above the flood stage, and mudslides, bridge failures, and inundation closed several roads.
Oct. 1953	Curry County	Heavy Rain Flooding	9.8"	Period of heavy rain from a wet winter storm. Gold Beach had a storm total of 9.8 inches of rain, while Port Orford recorded 7.25 inches of rain.
Oct. 1950	Curry County	Heavy Rain Flooding		Period of heavy rainfall with 10 to 12 inches recorded for the County.

Note: * indicates newly listed event for the 2022 NHMP update. Source: Curry NHMP 2016; 2020 OR NHMP; Curry County Emergency Management Hazard Analysis 2021; NOAA Storm Events Database, <https://www.ncdc.noaa.gov/stormevents/>, accessed 12/2/2019; Oregon NHMP, 2020.

Future Climate Conditions: Flood

Streams in the Northwest are projected to shift toward higher winter runoff, lower summer and fall runoff, and earlier peak runoff, particularly in snow-dominated regions. These changes are expected to result from increases in the intensity of heavy precipitation; warmer temperatures that cause more precipitation to fall as rain and less as snow, in turn causing snow to melt earlier in spring; and increasing winter precipitation and decreasing summer precipitation (Dalton et al., 2022).

Future conditions for flood for Curry County will likely be more variable with less overall flooding but potentially more severe events. Curry County's riverine flood risk is generally low and will likely continue to be low. Storm surge and King Tides may increase in frequency and severity as sea level rise occurs and wave heights increase.

Vulnerability Assessment

Since there are not vast floodplains within the study area, buildings that are vulnerable to flooding are limited to a few areas. Locations within Curry County that are comparatively more vulnerable or at greater risk to flood hazard (Williams & Anthony, 2020):

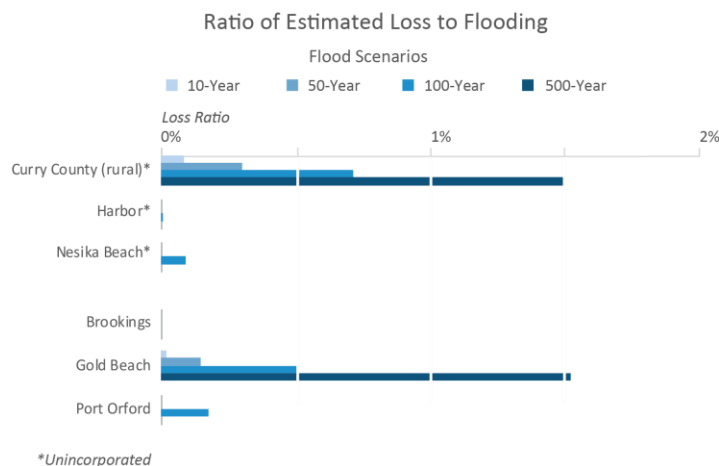
- Buildings along the Rogue River upstream of Gold Beach are threatened by the 100-year flood.
- Buildings at the mouth of the Winchuck River in unincorporated Curry County (rural) are threatened by the 100-year flood.

Curry countywide 100-year flood loss:

- Number of buildings damaged: 410
- Loss estimate: \$5,869,000
- Loss ratio: 0.4%
- Damaged critical facilities: 1
- Potentially displaced population: 411

Source: Williams & Anthony, 2020.

Figure I-34. Flood loss estimates by Curry County community



Note: In addition to the four riverine flood scenarios, coastal flooding information is only available for the 100-year flood scenario for portions of Curry County (rural) and the community of Nesika Beach. Source: Williams & Anthony, 2020.

Table I-35. Flood loss estimates

Community	Total Number of Buildings	Total Estimated Building Value (\$)	(all dollar amounts in thousands)											
			10% (10-yr)			2% (50-yr)			1% (100-yr)*			0.2% (500-yr)		
			Number of Buildings	Loss Estimate	Loss Ratio	Number of Buildings	Loss Estimate	Loss Ratio	Number of Buildings	Loss Estimate	Loss Ratio	Number of Buildings	Loss Estimate	Loss Ratio
Unincorp. County (rural)	10,027	665,168	60	555	0.1%	224	1,997	0.3%	343	4,753	0.7%	511	9,934	1.5%
Harbor	3,556	227,074	0	0	0%	0	0	0%	4	14	0%	0	0	0%
Nesika Beach	399	19,602	0	0	0%	0	0	0%	1	18	0.1%	0	0	0%
Total Unincorp. County	13,982	911,844	60	555	0.1%	224	1,997	0.2%	348	4,785	0.5%	511	9,934	1.1%
Brookings	3,949	462,342	0	0	0%	0	0	0%	0	0	0%	1	0	0.
Gold Beach	1,912	189,329	13	37	0%	38	277	0.1%	58	956	0.5%	143	2,881	1.5%
Port Orford	924	73,077	0	0	0%	0	0	0%	4	128	0.2%	0	0	0%
Total Curry County	20,767	1,636,592	73	592	0%	262	2,274	0.1%	410	5,869	0.4%	655	12,815	0.8%

Note: *1% results include coastal flooding source. Source: Williams & Anthony, 2020.

Table I-36. Flood exposure

Community	Total Number of Buildings	Total Population	1% (100-yr)*			
			Potentially Displaced Residents from Flood Exposure	% Potentially Displaced Residents from flood Exposure	Number of Flood Exposed Buildings	Number of Flood Exposed Buildings Without Damage
Unincorp. County (rural)	10,027	8,564	355	4.1%	380	38
Harbor	3,556	3,681	2	0.1%	9	5
Nesika Beach	399	388	1	0.2%	1	0
Total Unincorp. County	13,982	12,633	358	2.8%	390	43
Brookings	3,949	6,334	0	0%	0	0
Gold Beach	1,912	2,264	54	2.4%	70	12
Port Orford	924	1,129	0	0%	4	0
Total Curry County	20,767	22,361	411	1.8%	464	55

Note: *1% results include coastal flooding source. Source: Williams & Anthony, 2020.

Risk Reduction Recommendations

The science of risk reduction is an emerging field. These potential flood mitigation actions are listed along with the hazard description so that readers understand the type of mitigation actions being considered or that might be considered current best practices.

- Restore watershed integrity and improve land management to reduce peak discharge, dissipate flood energy, stabilize streambanks, and reduce damage to infrastructure.
- Enhance riparian buffers along stream and rivers by increasing buffer widths, eradicating invasive weeds, and restoring native riparian forests
- Where appropriate, dissipate flood energy by reconnecting streams and rivers to their floodplains, restoring secondary channels and other natural storage areas, and enhancing the quality and acreage of wetlands
- Decrease peak discharge by dispersing road drainage, decommissioning unnecessary roads, decreasing impervious surfaces, constructing retention basins, reforesting fallow land, and increasing floodplain inundation, where appropriate
- In developed areas, reduce stormwater runoff by installing water catchments, bioswales, pervious surfaces, etc.

For jurisdictions that participate in the National Flood Insurance Program (NFIP), the following practices are recommended. Detailed information about the NFIP program can be found in the Built Environment chapter of the Risk Assessment starting on page 51.

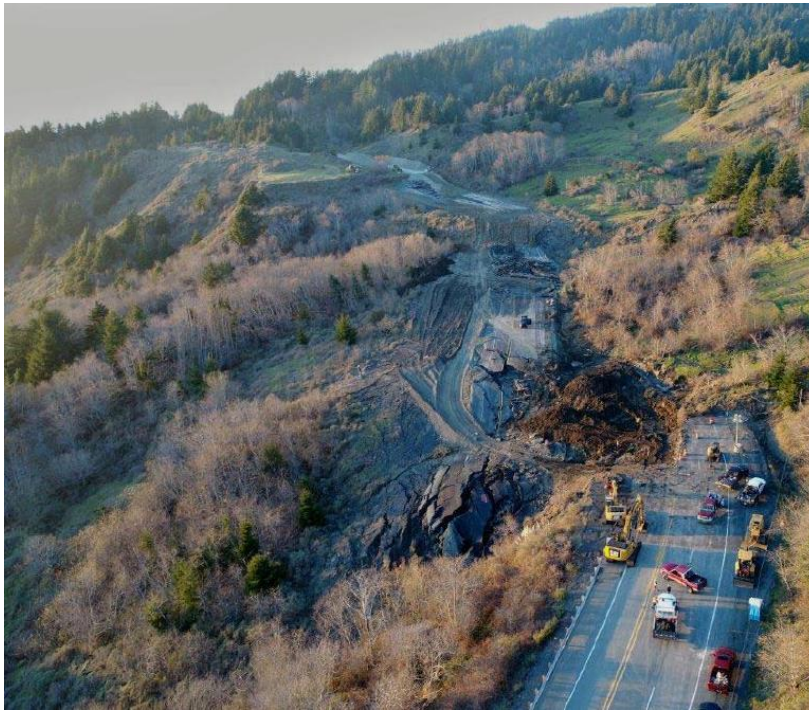
- Enforce minimum NFIP requirements by implementing the flood ordinance and permitting requirements.
- Consider adopting higher standards such as adding freeboard to base flood elevation requirements (e.g., +1' or +2' BFE) or regulating to the 500-yr floodplain rather than the 100-yr.
- Encourage the purchase of flood insurance by sending a flood awareness message out in early fall.
- Relocate or elevate vulnerable structures to above the estimated base flood elevation. In some cases, communities can use FEMA's property acquisition or "buyout" program to remove structures that have repeatedly flooded in the past. https://www.fema.gov/media-library-data/20130726-1507-20490-4551/fema_317.pdf
- Find opportunities to increase flood water storage areas.
- Develop incentive programs to encourage flood mitigation retrofits such as: add flood vents, elevate HVAC and electrical equipment, or add flood-resistant materials to buildings built before modern flood code was adopted.
- Address repetitive loss and severe repetitive loss structures using FEMA's property acquisition or "buyout" program (Flood Management Assistance or FMA) to remove structures that have repeatedly flooded in the past.
- Create more permeable surfaces within urban areas to improve drainage and reduce flood peaks. Large parking lots are great candidates for improved permeability.

5. *Landslide*

Landslides are downhill movements of rock, debris, or soil. There are many different types of landslides in Oregon. In Curry County, the most common are debris flows and shallow- and deep-seated landslides. The Statewide Landslide Information Layer for Oregon [SLIDO], is an inventory of mapped landslides in the State of Oregon. Most of the landslide inventory mapping in Curry County was done in 2014 with LiDAR—see the online viewer at: <https://www.oregongeology.org/slido/>

Landslides are classified according to the type and rate of movement and the type of materials that are transported. In 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. The severity or extent of landslides is typically a function of geology and the landslide triggering mechanism. Rainfall initiated landslides tend to be smaller, and earthquake induced landslides may be very large. Even small slides can cause property damage, result in injuries, or take lives.

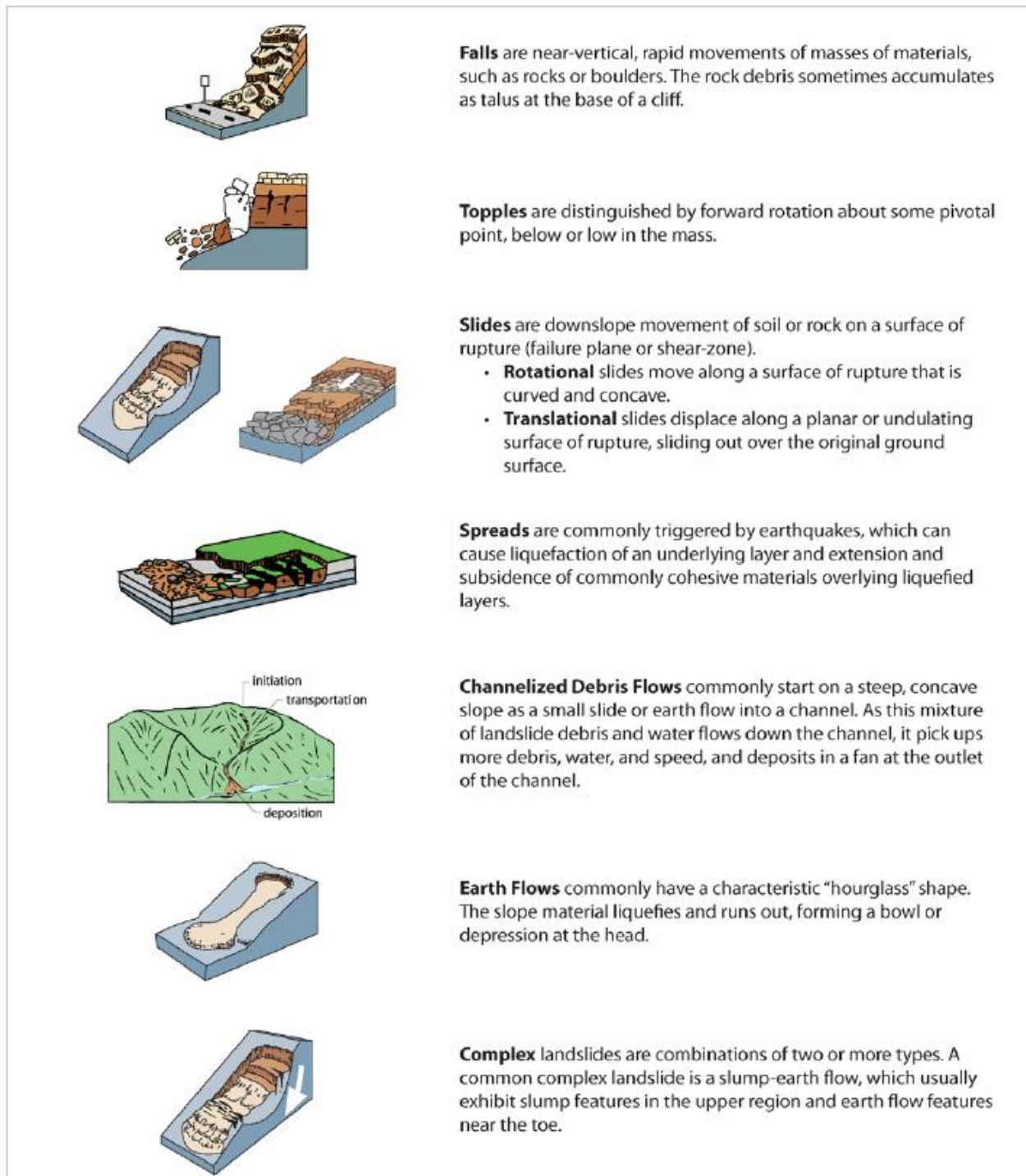
Figure I-35. Hooskanaden Slide on Hwy 101, 2019



Source: Tidewater Contractors 2019.

Landslides along U.S. 101 require the identification and use of alternate routes, few of which exist or are feasible for large vehicles. Alternate routes may also be affected by the landslide, requiring repairs before traffic can move through the county. Developing resilient evacuation and alternate routes has been identified as an action item in the Curry County 2022 Natural Hazards Mitigation Plan.

Figure I-36. Landslide Types and Processes



Source: USGS, 2004.

Hazard History

The following table provides information on the previous occurrences of landslides. Two new landslide events have occurred since 2016 and no historic events have been added for the 2022 update.

Table I-37. Historic Landslide Events

Date	Location	Description
April 2019*	Curry County	Gardner Ridge Road collapse occurred northeast of Brookings during a heavy rain event which also closed portions of Hwy 101. The landslide left only one lane available for travel, which affected residential access for 10 families and logging activities. Gardner Ridge Road is an also an alternate route for Hwy 101.
Feb. 2019*	Curry County	Hooskanaden slide closed U.S. 101 at mile point 344, 12 miles north of Brookings. All motorists had to use Carpenterville Road as an alternate route, large trucks were unable to use the alternate route causing an impact on resource movement.
Jan. 2016*	Community of Harbor	Two earth movements occurred, locally known as sinkholes, one of which closed U.S. 101. Storm drain, sanitary sewer, local businesses, and homeowners were affected by the events.
Mar. 2011	13 counties	Winds and heavy rains caused flooding, mudslides, and landslides in 13 counties. Damage to state highways estimated at \$5,856,881.
2008	Curry County	Heavy rains caused approximately 3,000 tons of mud and debris and covered Harbor Heights Road in the Harbor Hills area southeast of Brookings, blocking access to several homes.
Jan. 2006	Curry County	Gregory Point landslide 2.2 miles south of Port Orford blocked Highway 101.
2001	Curry County	Landslide on Highway 101 at Slide Creek (MP 310.6-310.8) cost \$1,100,000 to repair. A landslide at Humbug State Park near Bear Trap Creek (MP 307.06-307.16) cost \$175,000 to repair.
1999	Curry County	Landslide on Highway 101 at Reinhart Creek (MP 311.2-311.7) cost \$1,300,000 to repair. There was \$500,000 worth of repairs on Highway 101 and 80-Acres Road (MP 332.5-333).
1996-1997	Curry County	Significant landslide events occurred in Curry County during the winter season of 1996-1997 resulting from intense rainfall from the February storms. The governor declared two State of Emergencies for Curry County during this period.
1994-1995	Curry County	Hooskanaden slide closed Highway 101, 18 miles south of Gold Beach.
1993	Curry County	The "Arizona Inn Slide" shut down Highway 101 for two weeks. ODOT has since installed new drainage systems. Previous slides occurred in 1938, 1954, 1978, and 1981.
1953	Curry County	Landslide near the Harbor Hills area (southeast of Brookings) damaged a home and closed Highway 101.

Note: * indicates newly listed event for the 2022 NHMP update. Source: Curry NHMP 2016; 2020 OR NHMP; Curry County Emergency Management Hazard Analysis 2021.

Future Climate Conditions: Landslide

The risk of landslide related to climate is tied to the frequency, duration, and amount of heavy precipitation. Precipitation can influence the movement of hillslopes and debris when the weight of water in the soil exceeds the shear forces that keep it in place. While the overall risk of landslide due to heavy precipitation is projected to decrease by one day by the 2050s in Curry County, there is only one landslide model available, and it is guided by the average number of days that rainfall exceeds 0.75". This metric happens to decrease for Curry County while other precipitation metrics are projected to increase, including wettest day and wettest five days.

The following quotes about precipitation from the OCCRI Future Climate Conditions for Curry County report (Dalton et al., 2022) make it clear that intense precipitation might influence future infrastructure management.

- "The frequency and intensity of heavy precipitation has increased across most land areas worldwide since the 1950s (IPCC, 2021)."
- "There is greater uncertainty in projections of future precipitation than projections of future temperature. Precipitation has high natural variability, and the atmospheric patterns that influence precipitation are represented differently among GCMs (global climate models)."
- "As the atmosphere warms, it holds more water vapor. As a result, the frequency and intensity of extreme precipitation, including atmospheric rivers, is expected to increase (Dalton et al., 2017; Kossin et al., 2017; Dalton and Fleishman, 2021). Atmospheric rivers are associated with the majority of fall and winter extreme precipitation events in Oregon. Climate models project an increase in the number of days on which an atmospheric river is present, and they project that atmospheric rivers will account for an increasing proportion of total annual precipitation across the Northwest (Dalton and Fleishman, 2021)."

The model available to guide projections of how changes in precipitation might impact the number of landslide risk days was developed for Seattle, WA by the U.S. Geological Survey. While the overall impact of climate change is to increase weather variability and increase rainfall, the manner in which the model calculates landslide risk is tied to the manner in which a summary of a projected 18-day period is calculated. While the average amount of precipitation over a five-day period will increase in both scenarios, the average number of days that rainfall exceeds 0.75" is projected to decrease which results in a finding of decreased landslide risk using this model.

"In Curry County, the number of days per year on which a threshold for landslide risk, which is based on prior 18-day precipitation accumulation, is exceeded is projected to decrease by 1 day (range -4–1 days) by the 2050s, relative to the 1971–2000 historical baselines, under the higher emissions scenario. However, landslide risk depends on multiple factors, and this metric does not reflect all aspects of the hazard." (Dalton et al., 2022). While one model shows no increased landslide risk from rainfall, jurisdiction managers should not entirely discount precipitation-driven landslide risk when it is clear that weather variability is increasing, that atmospheric rivers contribute to extreme precipitation in fall and winter, and that the frequency of extreme precipitation is expected to increase.

Vulnerability Assessment

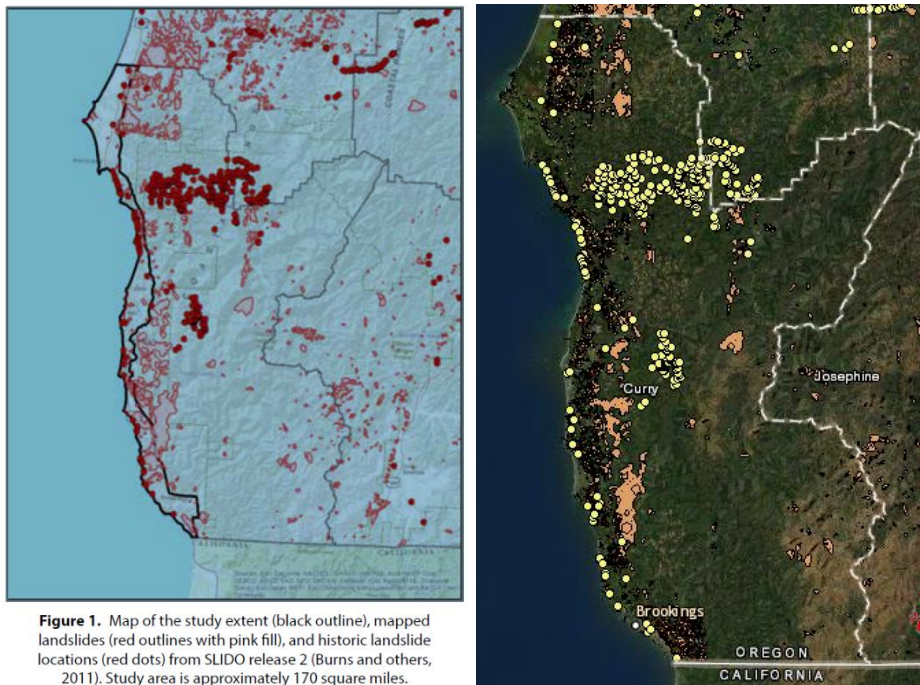
All of Curry County's communities have some exposure to the landslide hazard. Communities that developed in terrain with moderate to steep slopes or at the base of steep hillsides may be vulnerable to landslides. The Coast Range runs through eastern Curry County, so much of the area is steep and landslide prone. The combination of rugged terrain, historically active landslides, and large amounts of rainfall make landslide hazard a serious threat. Locations in Curry County that are comparatively more vulnerable or at greater risk to landslide hazard include the community of Harbor on the landward side of Highway 101. Also, developed areas in the inland part of unincorporated Curry County (rural) are far more likely to be exposed to high or very high landslide susceptibility than buildings located along the coast (Williams & Anthony, 2020).

Curry countywide landslide exposure (High and Very High susceptibility):

- Number of buildings: 3,969
- Exposure value: \$308,646,000
- Percentage of exposure value: 19%
- Critical facilities exposed: 5
- Potentially displaced population: 3,696

Source: Williams & Anthony, 2020.

Figure I-37. Landslide Inventories of Coastal Curry County



Left - Figure 1 from Open-File Report O-14-10 Landslide Inventory of Coastal Curry County, Oregon, 2014 – Oregon Department of Geology and Mineral Industries (DOGAMI). This figure displays many landslide events beyond coastal Curry County, reported by SLIDO. Right – Statewide Landslide Information Layer for Oregon (SLIDO) report displaying the following layers: Historic landslide records, scarp, head scarp, and deposits.

Table I-38. Landslide exposure

Community	Total Number of Buildings	Total Estimated Building Value (\$)	<i>(all dollar amounts in thousands)</i>								
			Very High Susceptibility			High Susceptibility			Moderate Susceptibility		
			Number of Buildings	Building Value (\$)	Ratio of Exposure Value	Number of Buildings	Building Value (\$)	Ratio of Exposure Value	Number of Buildings	Building Value (\$)	Ratio of Exposure Value
Unincorp. County (rural)	10,027	665,168	1,127	77,859	12%	1,714	113,687	17%	4,470	287,534	43%
Harbor	3,556	227,074	87	13,901	6.1%	228	15,655	6.9%	1,452	76,850	34%
Nesika Beach	399	19,602	24	1,327	6.8%	46	2,172	11%	108	4,344	22%
Total Unincorp. County	13,982	911,844	1,238	93,087	10%	1,988	131,514	14%	6,030	368,728	40%
Brookings	3,949	462,342	51	7,848	1.7%	256	39,773	8.6%	1,473	166,031	36%
Gold Beach	1,912	189,329	52	4,461	2.4%	284	23,640	13%	815	89,243	47%
Port Orford	924	73,077	2	127	0.2%	98	8,196	11%	346	26,830	37%
Total Curry County	20,767	1,636,592	1,343	105,523	6.4%	2,626	203,123	12%	8,664	650,832	40%

Source: Williams & Anthony, 2020.

Risk Reduction Recommendations

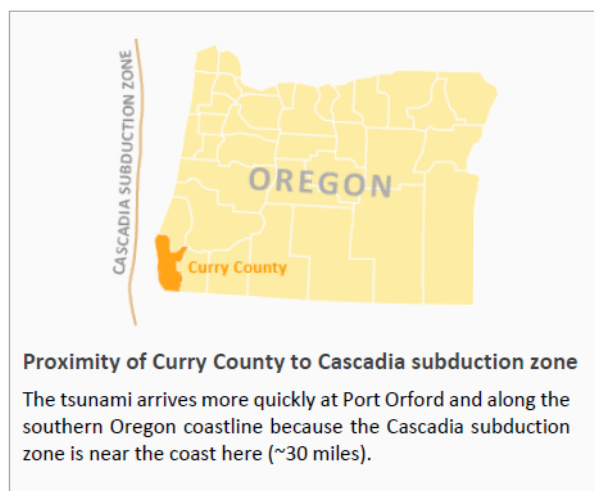
The science of risk reduction is an emerging field. From the DOGAMI Risk Report, these potential landslide mitigation actions are listed along with the hazard description so that readers understand the type of mitigation actions being considered or that might be considered current best practices.

- Create modern landslide inventory and susceptibility maps and use in planning and regulations for future development.
- Control storm water in landslide-prone areas.
- Monitor ground movement in high susceptibility areas.
- Implement grading codes, especially in high susceptibility areas.
- Use landslide inventory and susceptibility maps in planning and regulations for future development.

6. Tsunami

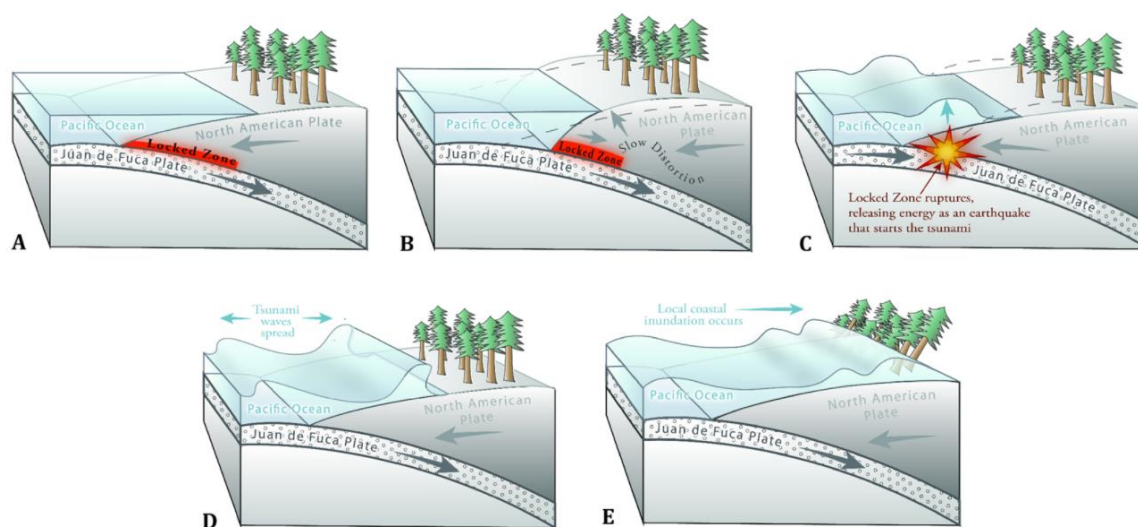
A tsunami generally begins as a single wave but quickly evolves into a series of ocean waves, generated by disturbances from earthquakes, underwater volcanic eruptions, or landslides (includes landslides that start below the water surface and landslides that enter a deep body of water from above the water surface). The initial tsunami wave mimics the shape and size of the sea floor deformation that causes it.

Figure I-38. Proximity to Cascadia subduction zone



Source: DOGAMI Open-File Report O-20-05

Figure I-39. How a Subduction Zone Earthquake Can Generate a Tsunami

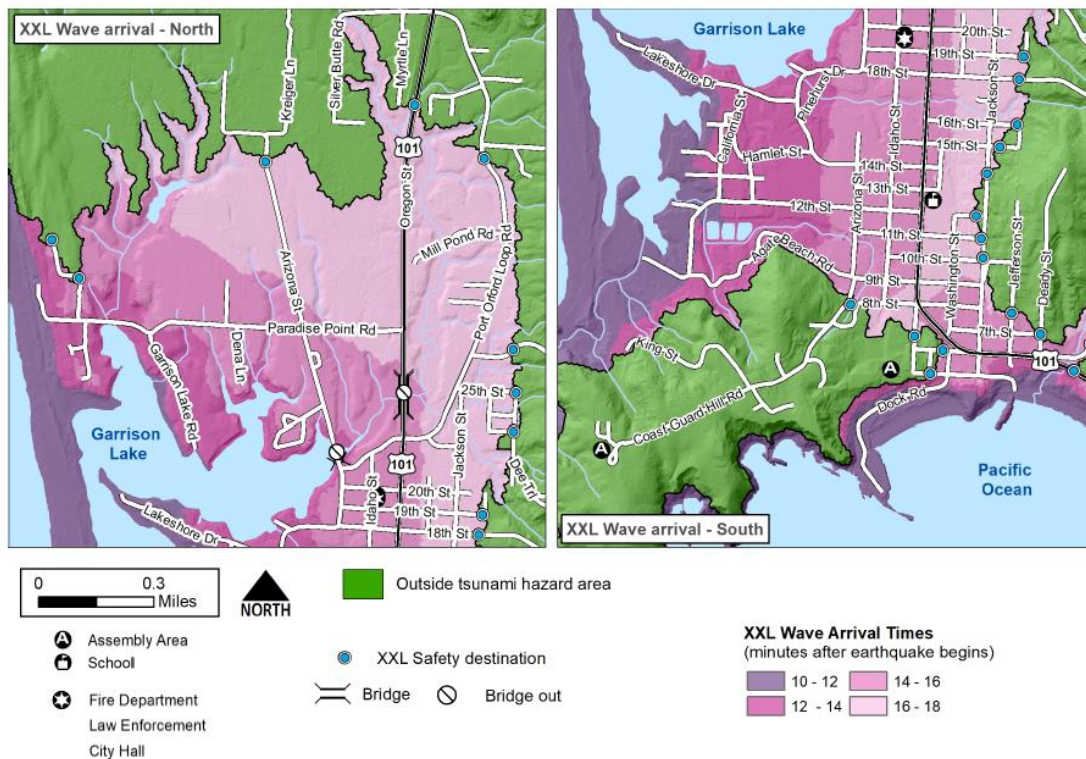


Source: DOGAMI, 2013.

A tsunami from a local source will likely be stronger, higher and travel farther inland (overland and up river) than a distant tsunami (generated from a distant earthquake event such as in Alaska or Japan). The local tsunami wave may be traveling at 30 mph when it hits the coastline and have heights of 20 to 60 feet, potentially higher depending on the coastal bathymetry (water depths) and geometry (shoreline features). Significant portions of Port Orford, Gold Beach, and parts of Brookings are susceptible to tsunamis, particularly those generated by CSZ events.

Figure I-40. Tsunami Wave Arrival Times, Port Orford Example

Figure 3-1. Illustration of tsunami wave arrival times after a Cascadia subduction zone XXL earthquake for Port Orford (left) north and (right) south.



Source: DOGAMI Open-File Report O-20-05

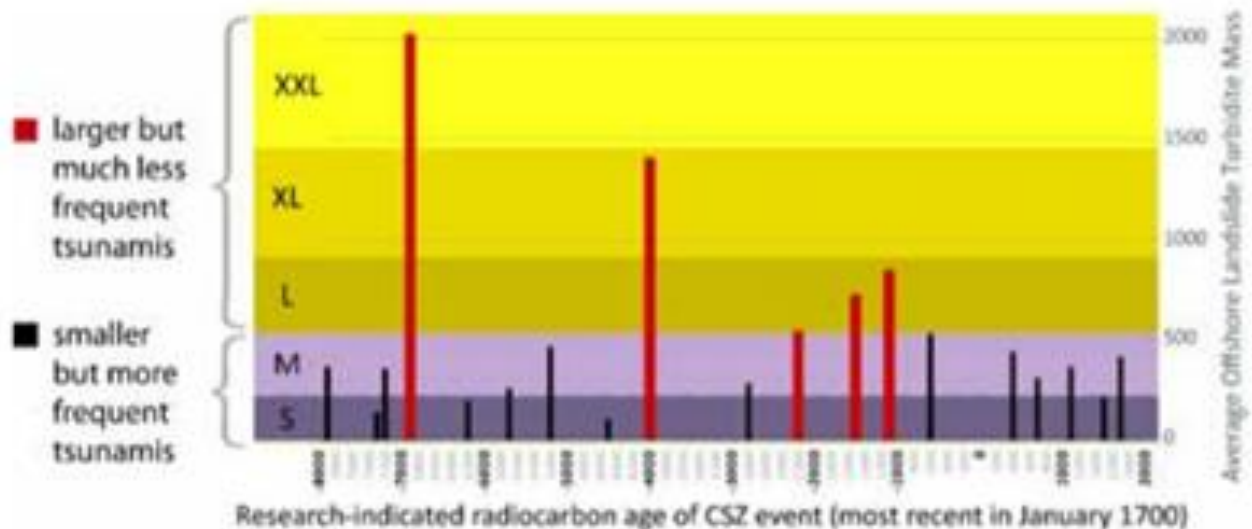
Figure I-41. Tohoku Tsunami Impacts in Curry County, 2011



Note: Impacts at the Port of Brookings-Harbor from the March 2011 Tohoku tsunami. Source: 2016 Curry NHMP (Port).

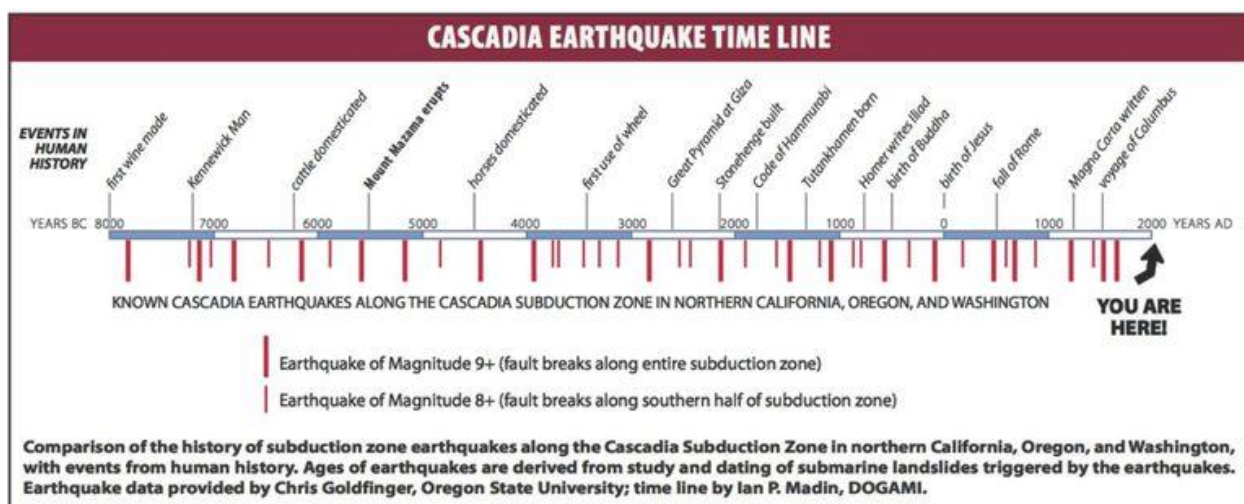
The frequency and probability of a large earthquake and tsunami event is the focus of extensive geologic research. Historical record in terms of both geologic evidence and Indigenous oral history are major data sources. The following two graphics indicate the number of events (tsunami and earthquake respectively) that have occurred over the past 10,000 years—as you can see five major tsunami events (red lines on the first figure that is hard to read) have been identified.

Figure I-42. Relative Size of Cascadia Subduction Zone Tsunami Events



Source: DOGAMI, 2013.

Figure I-43. Cascadia Earthquake Timeline



Source: OPB, OSU, DOGAMI <https://www.opb.org/news/series/unprepared/what-is-a-90-earthquake/>

Hazard History

The following table provides information on the previous occurrences of tsunamis. No new tsunami events have occurred since 2016 and one new historic event has been added for the 2022 update.

Table I-39. Historic Tsunami Events

Date	Type	Location/ Source	Details
Jan. 2022 (01/15/2022)	Distant	Oregon Coast	A volcanic eruption in Tonga caused King Tide level waves, extensive warnings for 1-3 feet of impacts, but minimal damages along the Oregon coast. The event occurred at 8:30am on a Saturday morning.
Mar. 11, 2011	Distant	Oregon Coast/ Japan	The magnitude 9.0 Tōhoku earthquake originated off the northeast coast of the Tōhoku region of Japan's Honshu Island. It caused a catastrophic tsunami event with waves heights of 38 meters that killed 20,000 people. The event triggered a nuclear disaster. The direct economic loss from the earthquake, tsunami, and nuclear disaster is estimated at \$360 billion. Within half a day, Tsunami waves reached the U.S. Pacific Coast as a distant tsunami and caused \$6.7 million worth of damages along the Oregon coast. In particular, there was extensive damage to the Port of Brookings, as well as the Port of Depoe Bay, and Charleston Harbor.
Nov. 2006*	Distant		Tidal surge damaged docks in Crescent City
Mar. 1964	Distant	Oregon Coast/ Alaska	A tsunami struck southeastern Alaska following an earthquake beneath Prince William Sound. The tsunami arrived along the Alaskan coastline between 20 and 30 minutes after the quake, devastating coastal villages. The tsunami spread across the Pacific Ocean and caused damage and fatalities in other coastal areas, including Oregon. Coos Bay suffered \$20,000 in damages. Along the entire Oregon Coast, damage was estimated to be between \$750,000 and \$1 million.
Nov. 1952 (11/04/1952)	Distant	Bandon/ Alaska	An earthquake in Kamchatka, Russia caused a four-foot tsunami in Bandon where log decks broke loose from their foundation piers.
Apr. 1946 (04/01/1946)	Distant	Oregon Coast/ Alaska	A tsunami generated by a magnitude 7.8 earthquake in the Aleutian Islands of Alaska killed 165 people and cost over \$26 million. The highest inundation waves occurred in Hawaii, where a 12-meter run-up was recorded. The tsunami arrived at the island of Hilo 4.9 hours after the earthquake originated, and 96 people lost their lives. A 10-foot wave was recorded at Coos Bay and Bandon, but no damages were recorded.
Nov. 1873	Crustal	Port Orford	An earthquake in northern California generated a tsunami. Structures at the high tide line in Port Orford were damaged.
Jan. 1700 (01/26/1700)	CSZ/ Local	Pacific NW coast	Approximately 9.0 earthquake generated a tsunami that struck Oregon, Washington, and Japan; destroyed Native American villages along the coast.

Note: * indicates newly listed event for the 2022 NHMP update. Sources: Curry NHMP 2016; Curry County Emergency Management Hazard Analysis 2021; USGS, <https://earthquake.usgs.gov/earthquakes/events/alaska1964/>; <https://www.worldvision.org/disaster-relief-news-stories/2011-japan-earthquake-and-tsunami-facts>; Sullivan, W.L., 2018.

Vulnerability Assessment

The DOGAMI Risk Report identified locations within Curry County that are comparatively more vulnerable or at greater risk to CSZ M9.0 tsunami hazard:

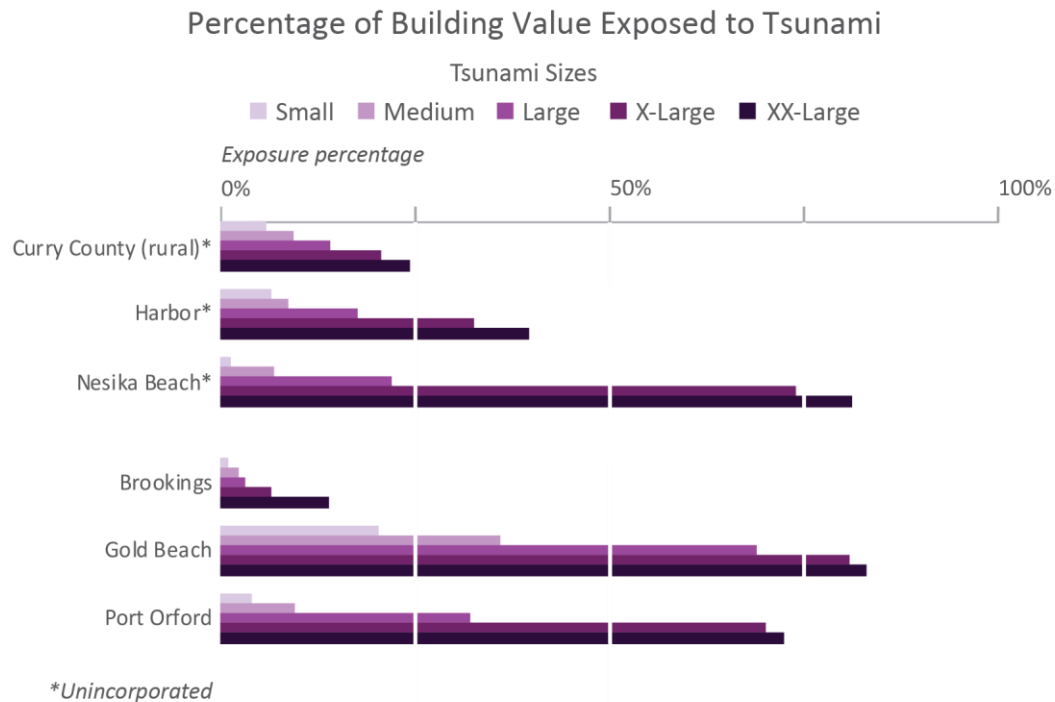
- The coastal and low-lying areas of Gold Beach are predicted to be inundated by the most likely tsunami scenario. A significant portion (36%) of the community is exposed to the medium sized tsunami zone.
- Portions of the communities of Port Orford and Harbor are exposed to tsunami hazard.
- A large area of residential buildings at the mouth of the Winchuck River are threatened by the most likely tsunami scenario.

Curry countywide CSZ M9.0 tsunami exposure (Medium tsunami scenario):

- Number of buildings exposed: 1,755
- Exposure value: \$168,728,000
- Percentage of exposure value: 10%
- Critical facilities exposed: 9
- Potentially displaced population: 1,560

Source: Williams & Anthony, 2020.

Figure I-44. Tsunami inundation exposure by Curry County community



Source: Williams & Anthony, 2020.

Table I-40. Tsunami exposure

(all dollar amounts in thousands)																	
		Small (Low Severity)				Medium (Moderate Severity)			Large (High Severity)			X Large (Very High Severity)			XX Large (Extreme Severity)		
	Total Number of Buildings	Total Estimated Building Value (\$)	Number of Buildings	Building Value (\$)	Percent of Building Value Exposed	Number of Buildings	Building Value (\$)	Percent of Building Value Exposed	Number of Buildings	Building Value (\$)	Percent of Building Value Exposed	Number of Buildings	Building Value (\$)	Percent of Building Value Exposed	Number of Buildings	Building Value (\$)	Percent of Building Value Exposed
Community																	
Unincorporated County (rural)	10,027	665,168	382	38,463	5.8%	726	62,363	9.4%	1,198	93,914	14%	1,996	137,504	21%	2,290	161,881	24%
Harbor	3,556	227,074	98	14,775	6.5%	155	19,719	8.7%	356	39,943	18%	999	73,893	33%	1,270	90,172	40%
Nesika Beach	399	19,602	5	238	1.2%	20	1,344	6.9%	73	4,309	22%	273	14,509	74%	322	15,932	81%
Total Unincorp. County	13,982	911,844	485	53,476	5.9%	901	83,426	9.1%	1,627	138,166	15%	3,268	225,907	25%	3,882	267,985	29%
Brookings	3,949	462,342	18	4,754	1.0%	43	10,274	2.2%	69	14,691	3.2%	181	30,283	6.5%	427	64,680	14%
Gold Beach	1,912	189,329	463	38,576	20%	774	68,015	36%	1,179	130,542	69%	1,507	153,078	81%	1,560	157,204	83%
Port Orford	924	73,077	12	2,935	4.0%	37	7,013	9.6%	271	23,459	32%	698	51,262	70%	732	52,957	73%
Total Curry County	20,767	1,636,592	978	99,741	6.1%	1,755	168,728	10%	3,146	306,858	19%	5,654	460,530	28%	6,601	542,826	33%

Source: Williams & Anthony, 2020.

Risk Reduction Recommendations

The science of risk reduction is an emerging field. These potential tsunami mitigation actions are listed along with the hazard description so that readers understand the type of mitigation actions being considered or that might be considered current best practices.

- Consider local regulations in the high tsunami hazard zone, such as some restrictions to future development.
- Consider relocating fire, police, and emergency response facilities that are vulnerable to tsunami hazard.
- Use the DLCD guide on preparing for the CSZ tsunami:
<http://www.oregon.gov/LCD/OCMP/docs/Publications/TsunamiGuide20170130.pdf>
- Consider relocating or retrofitting structures with vulnerable populations (e.g., schools, hospitals, and nursing homes) that are within high tsunami hazard zones.
- Evaluate the community evacuation plan, including consideration for viable vertical evacuation options.
- Build “tsunami evacuation towers” in developed coastal areas that have insufficient evacuation times due to distance from elevated areas or inability of a population to walk or run to safety (modeled in the “Beat the Wave” mapping).
- Expand tsunami evacuation infrastructure.

Figure I-45. Tsunami Evacuation Tower Concept



Source: <https://www.thedailyworld.com/news/design-work-underway-for-shoalwater-tsunami-evacuation-tower/>

7. Wildfire

Wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures (FEMA, 2008). It becomes a natural hazard when this uncontrolled burning threatens lives, buildings, infrastructure, cultural, or natural resources, or spreads despite attempts to extinguish it.

Types of Wildfires

Fires can be started by lightning, equipment, electric powerlines, human error, and arson. Fire suppression tools include water, digging, fire retardant chemicals, creating fire breaks, and even burning areas where the fire is expected to go to eliminate fuels. Wildfire events that have a significant impact on the landscape and human communities can be divided into four categories: interface fires, wildland fires, firestorms, and prescribed fires.

Interface Fires

An interface fire occurs where wildland and developed areas come together with both vegetation and structural development combining to provide fuel. The lands where community development spreads into forested areas is considered the Wildfire-Urban Interface zone. This area is at high risk of fire and often difficult to protect. The areas of greatest concern are forested rural residential developments with only one entrance/exit, and or steep, narrow roads. The timely evacuation of these areas is problematic and is compounded by restricted access for firefighting equipment and limited water supplies for controlling a major fire.

The Wildland Urban Interface (WUI) 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 exurban 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.

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.

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.

Many lands in federal ownership in Curry County are subject to wildland fire. These areas are often remote, served only by gravel roads, or sometimes just trails, and offer unique recreational experiences which draw in the general public who may not understand the lack of services in these areas. Besides human caused wildfire, lightning is the primary cause of wildland fire.

The Rogue-Siskiyou National Forest is actively pursuing vegetation management projects on forests in Curry County. These projects reduce fuels that allow fire to move from the forest floor to the canopy and they also create breaks in the forest along roads and in natural ecosystems exist that thrive on greater openings in the forest—such as oak habitats.

Conflagrations, Firestorms, and Mega-Fires:

In the event of a major wildland fire that exceeds the resources of the local fire services, the Oregon Fire Service Mobilization Plan will be implemented, and the Governor will be asked to invoke the provisions of the Emergency Conflagration Act. In conditions of low moisture and east winds, these fire events can become so large that they extend beyond traditional fire breaks and across various fuel types. When wildfires become so large, they make their own weather, they are known as firestorms. As large fires distribute embers across the landscape, additional fires begin and the event becomes a complex of fires, or a mega-fire.

Prescribed Fires:

Prescribed fires are intentionally set or are select natural fires that are allowed to burn for beneficial purposes. Before humans suppressed forest fires, small, low intensity fires cleaned the underbrush and fallen plant material from the forest floor while allowing the larger plants and trees to live through the blaze. These fires were only a few inches to two feet tall and burned slowly. Forest managers now realize that a hundred years of prevention and suppression has contributed to the unnatural buildup of plant material that can contribute to wildfires becoming disasters.

Wildfire Characteristics

Wildfire risk is influenced by an array of factors including fuel, topography, weather, drought, and development.

- Fuel is the material that feeds a fire. Fuel is classified by volume and type. Forested lands provide a larger fuel source to wildfires than other vegetated lands due to the presence of large amounts of timber and other dense vegetation in these areas. However, invasive plants like gorse and even homes can be fuel.
- Topography influences the movement of air and directs the path a fire takes. Slope and hillsides are key factors in fire behavior as heat rises—so slopes can foster rapid spread of a wildfire or burn larger areas in a shorter period of time, especially, if the fire starts at the bottom of a slope and migrates uphill as it burns.
- 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.
- Drought adds to this risk as the landscape holds even less moisture and is even more vulnerable to dry, east winds during periods of drought.

- Finally, the increase in residential development in interface areas contributes to 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 urban areas, they have left behind readily available fire services providing structural protection. Rural locations may be more difficult to access and or simply take more time for fire protection services to get there.

Fire is a natural process many of Oregon’s ecosystems that periodically reduces fuel. This type of process is a “disturbance”—which is key to all ecosystems—just like floods bring fresh gravels for spawning and new soil for farming. All known methods of controlling vegetation also play the role of disturbance—mowing, brush cutting, logging, grazing, sheet mulch, and even herbicide use. There is no one solution to addressing wildfire as the site topography, vegetation type, moisture, and land use all play a role in fuel establishment or suppression.

However, when fires are suppressed for many years, fuels can build up which can present catastrophic risks—from the loss of life to the loss of buildings, assets, and lifelines. Beyond loss of residential and commercial structures, wildfire impacted communities can lose workforce housing, economic value in natural and built resources, and suffer trauma. Large wildfires also pose a serious threat to regional air quality, agricultural production, and economic resilience, especially in rural communities.

Reduced Air Quality

The risk of reduced air quality from wildfire smoke is increasing across Oregon. Wildfire-derived fine particulates are measured by an air quality index that rates air quality based on the density and duration of particulates in the air. Reduced air quality presents a danger to at-risk populations in the community (children, elderly, people with asthma, etc.) before the rest of the population; however, the health of the entire population exposed to air particulates can be negatively impacted in both short and long term ways.

Future Climate Conditions: Wildfire

Changing climate dynamics are expected to cause variability in the strength and frequency of wildfire events. Human activities have modified fire dynamics in the western United States through clearance of native vegetation for agriculture and urbanization, fragmentation and exploitation of forests and other natural land-cover types, human population growth and increased recreational activities, and replacement of indigenous or no fire management by extensive fire suppression and vegetation management. From 1985 through 2017, the annual area burned by high-severity fires across forests in the western United States increased eightfold (Dalton et al., 2022).

Over the last several decades, warmer and drier conditions during summer have contributed to an increase in vegetation dryness and enabled more frequent large wildfires, an increase in the total area burned, and a longer wildfire season across the western United States, particularly in forested ecosystems. The lengthening of the wildfire season is largely due to declining mountain snowpack and earlier spring snowmelt (Dalton et al., 2022).

In the Future Conditions Report for Curry County, the future change in wildfire risk is expressed as the increase in the average annual number of days on which fire danger is very high and vapor pressure deficit (VPD) or atmospheric aridity, is extreme. High temperatures contribute to the drying of dead

vegetation, but high VPD reduces moisture in live vegetation (e.g., the tree canopy), increasing the likelihood that any source of ignition will create a wildfire. The interaction between continued development in areas with flammable vegetation and increases in VPD suggests that projections of changing wildfire risk in the western United States may be conservative (Rao et al., 2022), especially given that over 80% of all ignitions in the United States are now human caused and that human activities have extended both the temporal and geographic extent of the fire season. Furthermore, extreme wildfires may correspond to concurrent extreme weather, including high temperatures, aridity, and wind speeds, that is becoming more common.

Fire danger is generally evaluated on the basis of daytime conditions that may cause wildfires to spread. Historically, wildfires were less active overnight. However, nights have become hotter and drier, and the temperature and duration of wildfires is expected to increase as a result. In the western United States, the number of nights during which atmospheric conditions are conducive to burning has increased by 45% since 1979. Vegetation can also amplify or dampen the effect of aridity on wildfires (Dalton et al., 2022).

Hazard History

The following table provides information on the previous occurrences of wildfire. Two new wildfire events occurred since 2016 and no new historic events have been added for the 2022 update.

Table I-41. Historic Wildfire Events

Date(s)	Name	Location	Magnitude	Description
2018*	Klondike Fire; Wildfire Smoke	Curry County	175,258 acres	The Klondike Fire reached 175,258 acres. Partial EOC activation. Curry County was also impacted with heavy smoke that affected the health of residents in the county.
2017*	Chetco Bar Fire	Curry County	191,125 acres	The Chetco Bar Fire burned 191,125 acres, destroying 6 homes. EOC activated
Aug. 2015	Collier Butte Fire	Curry County	12,230 acres	Collier Butte Fire burned 12,230 acres 10-miles east of Gold Beach.
June 2015 (6/10/2015- 6/30/2015)	Buckskin Fire	East Curry County	5,345 acres	Buckskin Fire burned 5,345 acres eight miles north of Cave Junction. The Buckskin fire was initiated by lightning on 06/10/2015. As of 06/18/2015, the fire was 2400 acres and was 5% contained. 3.4 million dollars had been spent in firefighting efforts.
June 2014	Euchre Creek Fire	Curry County	56 acres	The Euchre Creek Fire burned 56 acres 12 miles north of Gold Beach.
2002	Biscuit Fire	Curry County	500,000	The Biscuit Fire burned roughly 500,000 acres and cost \$150 million in damages.
Sept. 1936	Bandon Fire	Bandon		Bandon nearly destroyed; \$1,000,000 in damages. The wildfire was fueled primarily by the large amount of gorse that surrounded the community.
Sept. 1936	n/a	Coos and Curry Counties	146,000 acres.	Temperatures reached 90 degrees and humidity dropped to 6% sparking wildfires throughout the two counties.
1868	Elliott State Forest Fire	Coos and Curry Counties	Wildfire	90% of Elliott State Forest burns. Fire is stopped when it reaches the ocean after burning through 296,000 acres.

Note: * indicates newly listed event for the 2022 NHMP update. Source: 2016 Curry NHMP; NOAA.

Biscuit Fire

Recent significant fire history in Curry County begins with the 2002 Biscuit Fire. This fire defines catastrophic or mega-fires for the region to this day with its 500,000 acres burned. The momentum of that event resulted in the formation of a collaborative team of local and federal resources that ultimately produced the 2008 Curry County Community Wildfire Protection Plan that identifies extensive action items and coordination opportunities for wildfire mitigation.

Chetco Bar Fire

The Chetco Bar Fire of 2017 that burned 191,258 acres, began 17 mi W of Selma, OR in the Rogue-Siskiyou National Forest. It ultimately cost \$72 million dollars, spanning July 12th to November 2nd, 2017. The Chetco Bar Fire destroyed 6 homes, including 3 homes on Cate Road in the Gardner Ridge area that were reported lost on Aug. 21st, 2017 (NWCC, 2018).

Klondike Fire

The largest incident in the 2018 Oregon wildfire season occurred in southwest Oregon. The Klondike incident started on July 15th in the Kalmiopsis Wilderness Area on the Rogue River-Siskiyou NF, nine miles NW of Selma, Oregon. It was a lightning caused fire in a timber fuel type and proved active throughout the summer burning up to the Taylor Creek incident to the northeast, as well as to the west into the previous year's Chetco Bar burn scar. The Klondike in total had 13 IMT's assigned to it before it was contained at 175,258 acres on November 28th, making it also the longest duration incident of the year (NWCC, 2019). While much of the fire burned in Josephine County, there were significant wildfire smoke impacts in Coos and Curry counties throughout the event.

Figure I-46 Chetco Bar Fire Aerial Image Aug. 17, 2017



Source: Rogue River-Siskiyou National Forest, KPIC news. <https://kpic.com/news/local/gallery/level-3-go-evacuation-in-effect-for-residents-near-chetco-bar-fire?photo=4>

Figure I-47. Klondike Fire August 20, 2018



Source: NWCC, 2019.

Wildfire Vulnerability

There is potential for losses due to wildland-urban interface fires in Curry County. Forests cover a large percentage of Curry County. Forests play an important role in the local economy but also surround homes and businesses.

- Many residential areas of the county within the wildfire-urban interface have fuel loading near structures. Capacity is needed to assist seniors, people with gorse infestations, and those who live on steep slopes with fuel reduction projects.
- Curry Communications Towers are at risk of wildfire.
- Most fire districts are staffed entirely by volunteers; resources for equipment may also be an issue.
- The Chetco Bar Fire Recovery Council recommended the establishment of air quality shelters and/or methods to assist health care facilities with mitigating indoor air pollution from very severe fire impacts.
- Vulnerability by Community

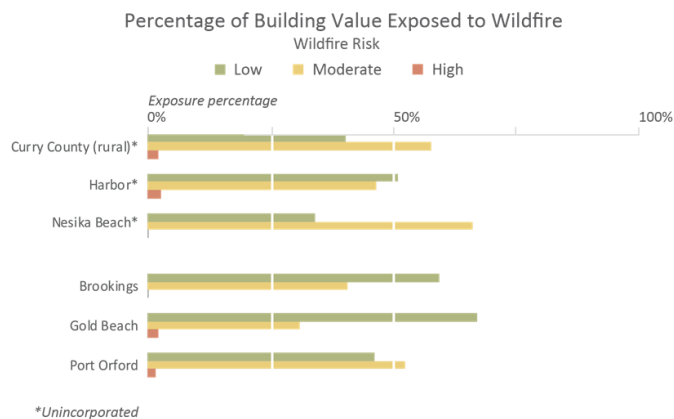
According to the DOGAMI Risk Report, wildfire risk is high for many homes in the forested areas in the heavily forested portions of unincorporated Curry County (rural). The high hazard category was chosen as the primary scenario for this report because that category represents areas that have the highest potential for losses.

Curry countywide wildfire exposure (High hazard):

- Number of buildings: 303
- Exposure value: \$25,118,000
- Percentage of exposure value: 1.5%
- Critical facilities exposed: 1
- Potentially displaced population: 271

Source: Williams & Anthony, 2020.

Figure I-48. Wildfire hazard exposure by Curry County community



Source: Williams & Anthony, 2020.

Table I-42. Wildfire Exposure

Community	Total Number of Buildings	Total Estimated Building Value (\$)	(All dollar amounts in thousands)					
			High Hazard			Moderate Hazard		
			Number of Buildings	Building Value (\$)	Ratio of Exposure Value	Number of Buildings	Building Value (\$)	Ratio of Exposure Value
Unincorp. County (rural)	10,027	665,168	178	14,076	2.1%	5,567	383,344	58%
Harbor	3,556	227,074	63	5,885	2.6%	1,389	105,511	47%
Nesika Beach	399	19,602	0	0	0%	272	12,952	66%
Total Unincorp. County	13,982	911,844	241	19,961	2.2%	7,228	501,807	55%
Brookings	3,949	462,342	0	0	0%	1,387	187,791	41%
Gold Beach	1,912	189,329	44	3,992	2.1%	767	58,386	31%
Port Orford	924	73,077	18	1,165	1.6%	480	38,210	52%
Total Curry County	20,767	1,636,592	303	25,118	1.5%	9,862	786,194	48%

Source: Williams & Anthony, 2020.

Vulnerability by Fire District

Wildfire risk is quantified in detail in the outdated but relevant, 2008 Curry County Community Wildfire Protection Plan. Fuel reduction priorities include vulnerable infrastructure and structures.

Table I-43. Vulnerability to Wildfire

Table 6.10 Community ranking based on overall risk, structural vulnerability and hazard.

Community	Mean of Various Ratings by Community			Estimated # High Risk Homes	Overall Priority Score	
	Overall Risk (5 Factors)	SVA	Hazard			
North						
PORT ORFORD RFPD	2.97	2.23	1.32	342	6	
LANGLOIS RFPD	2.58	2.00	1.47	33	6	
SIXES RFPD	2.09	2.23	1.38	9	4	
Central						
CEDAR VALLEY RFPD	3.10	2.39	1.71	143	9	
GOLD BEACH-WEDDERBURN FD/RFD	2.97	2.15	1.08	1167	8	
AGNESS ILLAHE VOL FD	2.64	3.01	2.01	39	9	
OPHIR RFPD	1.92	2.44	1.65	6	6	
South						
HARBOR RFPD	3.59	2.44	1.45	793	9	
CAPE FERRELO RFPD	3.49	2.57	1.85	614	12	
UPPER CHETCO RFPD	3.47	2.95	1.84	130	11	
WINCHUCK RFPD	2.94	2.53	1.79	82	10	
BROOKINGS FD/RFD	2.52	2.69	1.79	1163	9	
PISTOL RIVER RFPD	2.25	2.44	1.60	43	7	
County-No Structure Protection	2.55	2.50	1.80	935	10	

Source: CWPP, 2008

Vulnerable Infrastructure

Table I-44. Priority fuels projects near communications

Table 6.11 Priority fuels projects adjacent to critical communications infrastructure.

Name	Mean Risk Rating (4 Factors)	Land Owner	County 911	Priority
North				
Edson Butte	3.18	BLM	N	
Stone Butte	2.88	PV	N	
Blanco	1.40	State	Y	
Central				
Grizzly Mountain	3.61	BLM	Y	Very High
Agnes	2.70	USFS	Y	High
Iron Mountain	2.37	USFS	N	
South				
Red Mound	3.24	PV	N	
Bosley Butte	3.18	BLM	Y	High
Black Mound	2.61	BLM	Y	Moderate
Palmer Butte	2.44	BLM	N	

Source: CWPP, 2008

Vulnerable Structures

Table I-45. Communities with vulnerable structures

Table 6.13 Priority fuels reduction projects to communities with vulnerable structures.

Name	Jurisdiction	Priority
NORTH		
Floras Lake	Langlois RFPD	High
Humbug/101	County Unprotected	Low
Langlois Mountain Road	County Unprotected	Low
Elk River	Port Orford RFPD	
Cedar Terrace	Port Orford RFPD	High
Knapp Road	Port Orford RFPD, None	High
Sixes River	Sixes RFPD	
CENTRAL		
Agness/Oak Flat	Agness Illahe Vol FD	High
Illahe/Billings Rd	Agness Illahe Vol FD	High
Agness/Walters Cr	Agness Illahe Vol FD	High
Cedar Valley	Cedar Valley, Ophir RFPD	High
Agness Rd Corridor	County Unprotected	High
Homestead Rd	County Unprotected	Low
Grizzly Mountain RD	County Unprotected	
Hunter Creek	County Unprotected	
SOUTH		
Mt. View	Brookings RFPD	High
Red/Black Mound	Brookings RFPD/Cape Ferrelo RFPD	
Harbor Hills	Harbor RFPD	High
Wilderness Retreat	County Unprotected	
Cate Rd	County Unprotected	
Carpenterville Rd	None, Pistol River and Cape Ferrelo RFPD	
South Bank Chetco/Mt. Emily	Upper Chetco RFPD, County Unprotected	High
Gardner Ridge	Upper Chetco RFPD/Brookings FD	
Winchuck River	Winchuck RFPD	

Source: CWPP, 2008

Figure I-49. High Priority Sites for Fuels Reduction

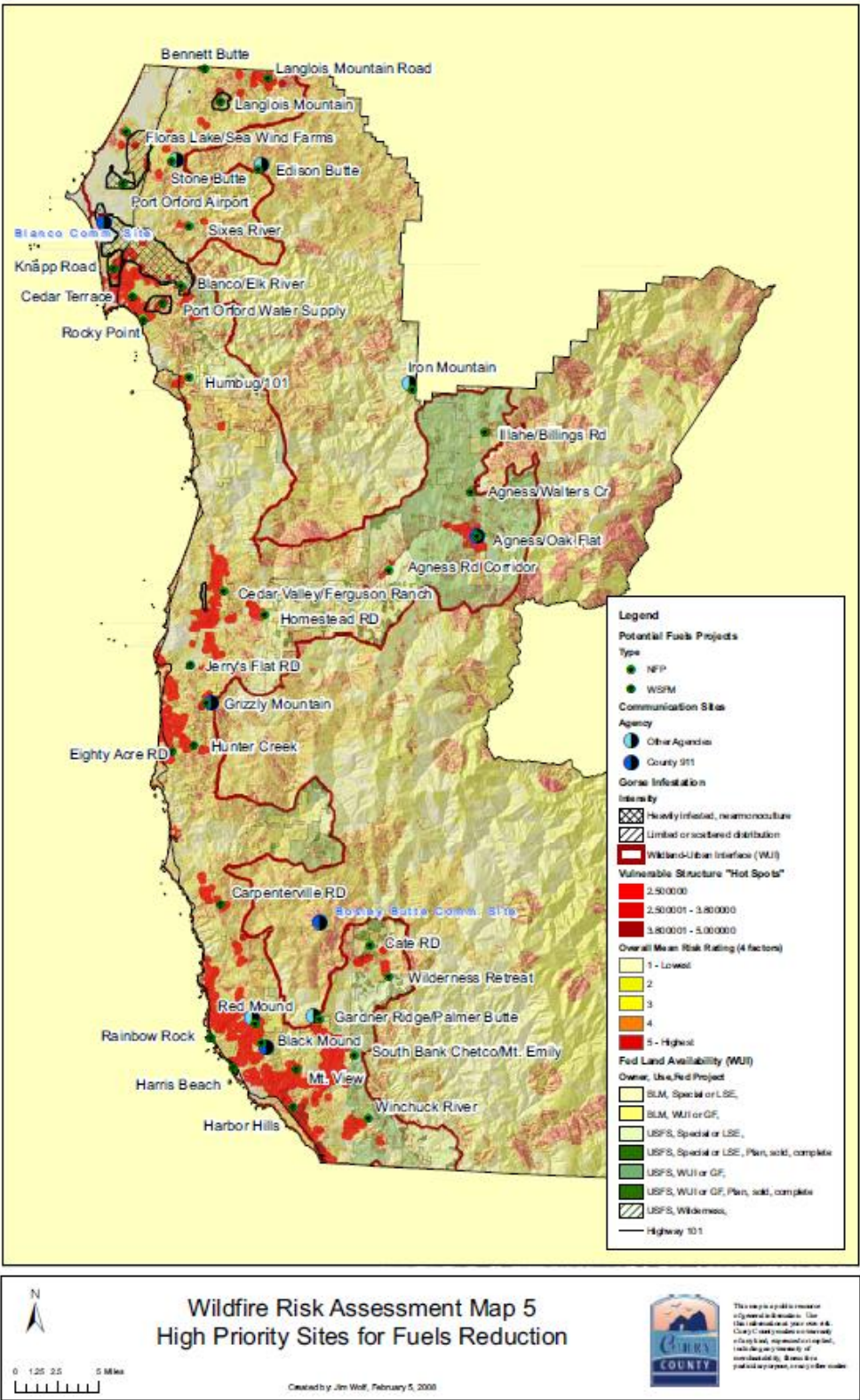
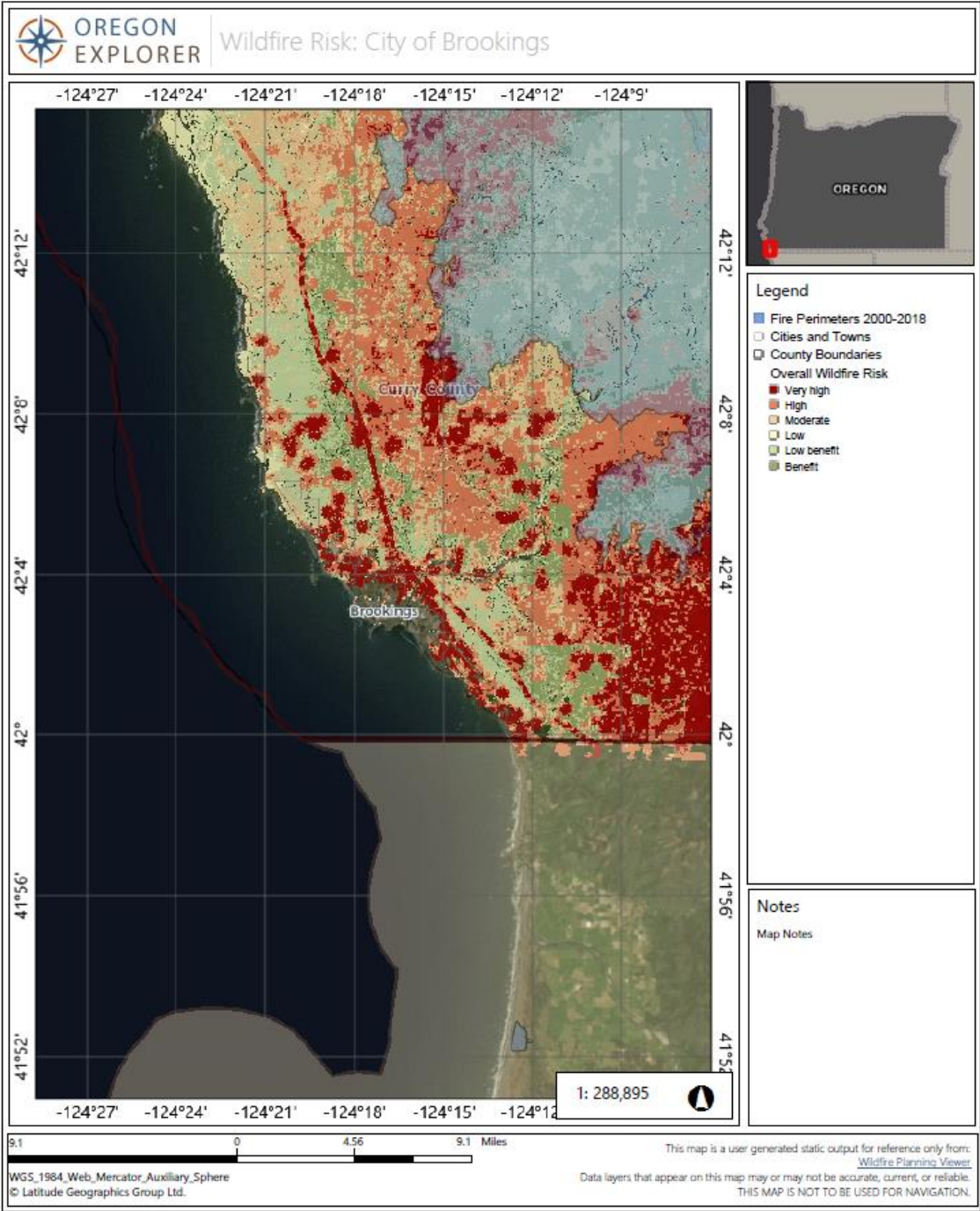


Figure I-50. Map of Wildfire Risk: Brookings



Wildfire Mitigation

Regulation

Recently, with the advancement of rulemaking under Oregon Senate bill 762, Oregon Department of Forestry led stakeholders through a decision-making process that included defining the area of risk of wildfire near human settlements, to address the regulation of development as an important vulnerability that Oregon communities face. As of August 2021, staff recommended the following definition:

“Wildland-Urban Interface means a geographical area where structures and other human development meets or intermingles with wildland or vegetative fuels.”

Programs like the Curry County Firewise Program provide education and land use guidance to citizens about fire-resistant materials, creating fire breaks around structures, and ensuring that firefighters and their large vehicles have access to properties. Local fire marshals also provide this guidance through their regulatory review of structures.

Gorse

Gorse is highly invasive plant with dense growth, waxy foliage, and sharp, long thorns. A non-native from the British Isles, it grows very well on the Oregon Coast and is undaunted by steep cliffs. It is both extremely difficult to control and is extremely flammable due to high amounts of oil that occur naturally in the plant. Gorse ignites easily and burns hot, so wildfires that involve gorse can move very quickly.

The regional Gorse Action Group <https://gorseactiongroup.org/> has developed an array of strategies and best practice guidance for gorse. Port Orford has volunteers that are monitoring and removing gorse. As of November 2021, Curry Watersheds Partnership was working with Oregon Department of Forestry to implement gorse management activities that both address new patches of gorse and sizable infestations near Port Orford/ Elk River in addition to fuel treatments in other priority areas.

Figure I-51. Gorse Fuel Reduction Projects

Table 6.12 Priority fuels reduction projects that target gorse infestations.

Name	Intensity	Approx. Acres	Mean Risk Rating (5 factors)	Priority
North				
Blanco/Elk River	2	7,368	2.45	High
Port Orford Airport	2	705	1.84	Moderate
Rocky Point	1	65	4.03	Moderate
Port Orford Water Supply	1	870	3.71	High
Knapp Road	1	936	3.42	High
Langlois Mountain Road	1	544	2.67	
Sea Wind Farms	1	2,205	2.65	Low
Bennett Butte	1	44	2.15	High
Langlois Mountain RD - West	1	0	1.50	Mod./High
Central				
Eighty Acre RD	1	17	4.25	
Ferguson Ranch	1	240	2.28	Moderate
Jerry's Flat RD	1	40	1.97	High
South				
Harris Beach	1	144	2.87	High
Rainbow Rock	1	121	2.55	Mod./High

Source: CWPP, 2008.

Risk Reduction Recommendations

The science of risk reduction is an emerging field. These potential wildfire mitigation actions are listed along with the hazard description so that readers understand the type of mitigation actions being considered or that might be considered current best practices. Source: DLCD, DOGAMI, Gorse Action Group, Curry Watersheds Partnership.

Vegetation Management

- Reduce fuel loads and ignition points, and enhance natural and managed fire breaks, to decrease the occurrence and intensity of wildfire; particularly in the wildland-urban interface
- Enhance and expand natural meadows as fire breaks by removing encroaching trees and planting native grasses
- Reduce fuel loads on forestlands by removing ladder fuels, and by thinning established stands to develop larger trees
- Use prescribed burns to maintain natural meadows and prevent ladder fuel regrowth
- Suppress and eradicate highly flammable invasive weeds, such as gorse, that create unnatural fuel loads and ignition points
- Reduce fuel loads within public and private road corridors

Residential Areas

- Make sure residential buildings are surrounded by at least 30 feet of space. For more information and helpful tools, check out the Gorse Action Group's Control and Management page: <https://gorseactiongroup.org/control-management/>
- Conduct regular fuel management on your property and near your home to maintain 'defensible space': Defensible Space is creating a green landscape, with minimal fuels, creating a low fire danger circumference around your home and other outbuildings for the prevention of wildfire and the slowing of the spread of wildfire.
- Maintain buffer areas around buildings from trees, brush, and other flammable objects (fences, mulch, etc.)
- Annually clear roofs and gutters of vegetative debris in buffer areas;
- Create and maintain fire breaks such as clearing along roads and other areas that can act as firebreaks in a wildfire event.
- plants like gorse that contain resins, oils and waxes that burn readily.
- Restore oak and prairie habitats to their natural state of minimal fuels and regular disturbance—many techniques achieve the same goal but have times and places when they are best ecologically: fire, mowing, grazing, brush cutting, and herbicide. The lowest cost and most efficient approach to fuels management is to achieve and maintain healthy, low-fuel habitats where appropriate (shallow soils, drier areas).

All Buildings

- Reduce fuel loads near buildings in the fire-prone wildland-urban interface areas (WUI). Use flame-resistant building materials for new projects and construction (decks, e.g.).
- Consider regulating development in wildfire urban interface areas to require flame-resistant materials, sufficient egress for fire equipment, evacuation plans, sufficient on-site water storage for firefighting, etc.

- Establish code provisions that allow the community to quickly respond to a wildfire disaster, such as those that address temporary housing, rebuilding, and readiness for infrastructure upgrade opportunities; as well as considering post-wildfire geologic hazards such as flood, debris flows, and landslides.

Remember, fire risk can change unexpectedly based on weather conditions. Check the Coos Forest Protective Association's website at <http://www.coosfpa.net/> or download their mobile app for up-to-date information about fire risk. If you are concerned or have questions, the fire professionals at Coos Forest Protective Association can help. You can reach them at [\(541\) 267-3161](tel:5412673161).

Figure I-52. Firewise Home Strategies

SURVIVABLE SPACE

Do you have at least 30 ft of space surrounding your home that is **Lean, Clean and Green**?

The objective of Survivable Space is to reduce the wildfire threat to your home by changing the characteristics of the flammable vegetation.

Lean – Prune shrubs and cut back tree branches, especially within 15 feet of your chimney.

Clean – Remove all dead plant material from around your home; this includes dead leaves, dry vegetation and even stacked firewood.

Green – Plant fire-resistant vegetation that is healthy and green throughout the year.

 Survivable space provides a safety zone around your home.

FIRE-RESISTANT ATTACHMENTS

Attachments include any structure connected to your home, such as decks, porches or fences. If an attachment to a home is *not* fire-resistant, then the home as a whole is *not* firewise.

A DISASTER PLAN

The time to plan for any emergency is prior to the event. Take a few minutes to discuss with your family what actions you will take.

- Post local emergency telephone numbers in a visible place.
- Leave before it's too late. Decide where you will go and how you will get there. With fire, you may only have a moments notice. Two escape routes out of your home and out of your neighborhood are preferable.
- Have tools available: shovel, rake, axe, handsaw or chainsaw
- Maintain an emergency water source
- Have a plan for your pets
- Practice family fire drills

 Evacuations for a wildfire can occur without notice; When wildfire conditions exist, be ready to take action..

A FIREWISE HOME HAS...



LEAN, CLEAN AND GREEN LANDSCAPING

With firewise landscaping, you can create survivable space around your home that reduces your wildfire threat. Large trees should be pruned so that the lowest branches are at least 6 to 10 ft high to prevent a fire on the ground from spreading to the tree tops. Within the survivable space, remove flammable plants that contain resins, oils and waxes that burn readily: ornamental junipers, yaupon holly, red cedar, and young pine. A list of *less-flammable* plants can be obtained from your local state forester, forestry office, county extension office or landscape specialist.



Although mulch helps retain soil moisture, when dry, it can become flammable. Mulch as well as all landscaping should be kept well watered to prevent it from becoming fire fuel.

FIRE-RESISTANT ROOF CONSTRUCTION

Firewise construction materials include Class-A asphalt shingles, metal, tile and concrete products. Additionally, the inclusion of a fire-resistant sub-roof adds protection.



Something as simple as making sure that your gutters, eaves and roof are clear of debris will reduce your fire threat.

FIRE-RESISTANT EXTERIOR CONSTRUCTION

Wall materials that resist heat and flames include brick, cement, plaster, stucco and concrete masonry. Tempered and double pane glass windows can make a home more resistant to wildfire heat and flames.



Although some vinyl will not burn, some vinyl soffits can melt, allowing embers into the attic space.

EMERGENCY ACCESS

Identify your home and neighborhood with legible and clearly marked street names and numbers so response vehicles can rapidly find the location of the emergency. Include a driveway that is at least 12 feet wide with a vertical clearance of 15 feet – to provide access to emergency apparatus.

Source: Lane County Firewise,

https://lanecounty.hosted.civicleve.com/UserFiles/Servers/Server_3585797/File/Government/County%20Departments/Public%20Works/Land%20Management%20Division/Firewise/Firewise_Home_Diagram.pdf

8. *Windstorm and Winter Storm*

Windstorms are a common, chronic hazard in Curry County. Wind is a part of life on the coast—for example, average wind speed at the Brookings Airport ranges from 4-17 mph daily November through March. A wind storm is generally a short duration event involving straight-line winds and gusts more than 50 mph. Coastal wind gusts in the Cape Blanco area can reach up to 145 miles per hour—the recorded wind speed of the 1962 Columbus Day storm. While typhoons occur in warmer ocean water than normally occurs in the Pacific Northwest, windstorms may result from remnants of these storms. Large amounts of precipitation may be delivered via atmospheric rivers, also known as a “pineapple express” when originating from warmer regions where a large amount of water is held in the atmosphere. The “great coastal gale of 2007” resulted when the remnants of two typhoons (Mitag and Hagibis) were pushed towards the West Coast in a pineapple express. Days of wind and heavy rain resulted in downed trees, flooding, mudslides, slope failures, and sinkholes (Curry Coastal Pilot, 2019).

Although windstorms can affect the entirety of Curry County, they are especially dangerous along the beaches, headlands and coastal bluffs as well as in developed areas with large trees or tree stands. A windstorm will frequently knock down trees and power lines, damage homes, businesses, public facilities, and create tons of storm related debris. High winds resulting in heavy surf pose a major risk to coastal infrastructure such as the three ports in Curry County. In October 2014, a restaurant and several small outbuildings were destroyed at the Port of Port Orford—in addition to about 60 feet of the boulder jetty that juts out into the bay.

Figure I-53. Windstorm damage at the Port of Port Orford



Source: Melissa Campbell, Curry Pilot, Oct. 25, 2014

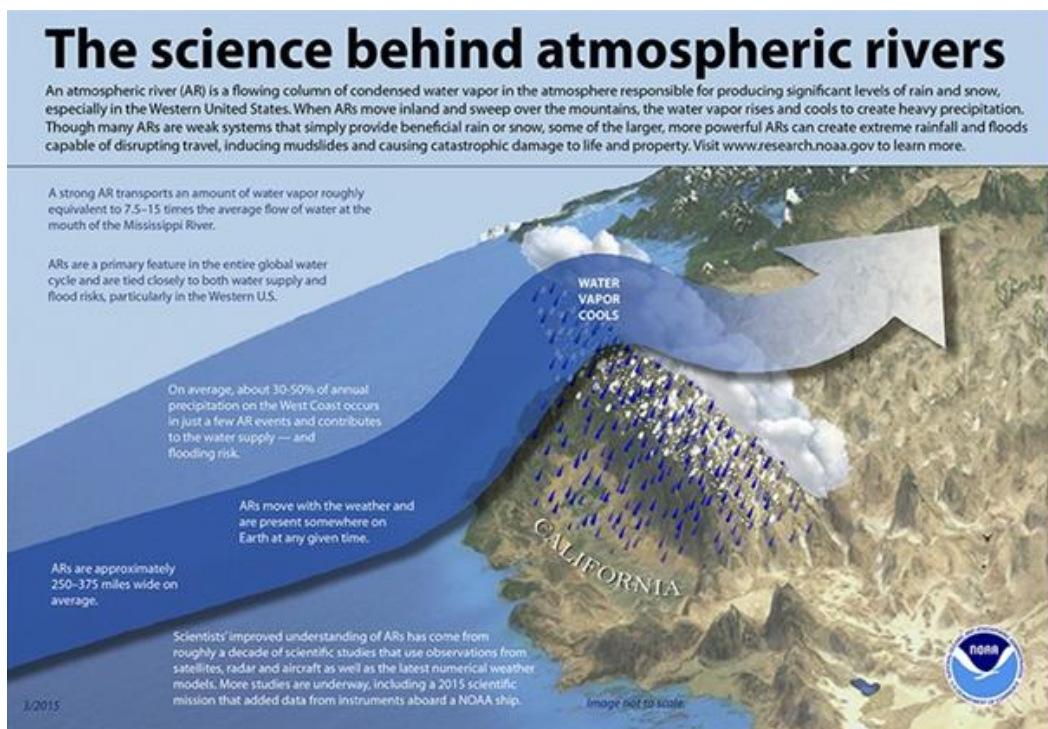
Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms, while possible, do not normally affect Curry County.

Figure I-54. Residential Windstorm Damage Brookings, 2019



Source: Curry Pilot, Lynette McGonagle

Figure I-55. Science of Atmospheric Rivers



Source: NOAA.

Hazard History

The following table provides information on the previous occurrences of wind storms. Five new windstorm and winter storm events have occurred since 2016 and nine historic events have been added for the 2022 update.

Table I-46. Historic Windstorm and Winter Storm Events

Date	Location	Event Type	Event Size	Description
Dec. 2021-Jan. 2022* (12/30/2021-01/10/2022)	Curry County +	Severe Winter Storm	\$3.5 million in ODOT repairs statewide	These severe storms resulted in heavy rain, high winds, flooding, landslides, and erosion at various locations within these counties, leading to critical transportation failures and disruption to energy and communications infrastructure. This storm system damaged state highways throughout these counties with scour, washouts, debris flows and mudslides..
Nov. 2020* (11/13/2020-11/14/2020)	S. Oregon Coast	High Wind	69 mph	One of a series of fronts brought high winds to the southern Oregon coast and south-central Oregon.
Jan. 2020* (01/15/2020)	S. Oregon Coast	High Wind	74 mph	An incoming front brought high winds to the southern Oregon coast and the Siskiyou Mountains. Cape Blanco also recorded very strong winds, the peak gust there was 95 mph at 15/1300 PST.
Feb. 2019* (02/8/2019-02/10/2019)	Curry County	Heavy Snow	10.3"	Several storms in February brought heavy snow to unusually low elevations, making a great impact in some areas. This was the first of the storms. A spotter 6E Gold Beach at elevation 2627 feet reported snow beginning overnight on the morning of the 8th. An estimated 2.0 inches was on the ground the morning of the 9th. The spotter then reported a measured 10.3 inches on the ground at 10/0800 PST.
Oct. 2017* (10/19/2017)	Gold Beach	High Surf	One Fatality	A Gold Beach resident walking on the south jetty at the mouth of the Rogue River was swept into the water by a large wave. She was last seen alive on the jetty at 6:15 PM PDT Thursday, and her body was recovered near the sand spit at the mouth of the river Friday afternoon.
Apr. 2017* (04/06/2017)	S. Oregon Coast	High Wind	70 mph	A strong developing low off the coast brought high winds to several locations across southwest and south-central Oregon. Pacific Power reported the loss of one high voltage line, one major substation and five satellite substations. Many trees were down, including a number onto power lines. Schools were closed across Coos and Curry counties.
Mar. 2017* (03/04/2017-03/05/2017)	Curry County	Heavy Snow	4.0" at Nesika Beach	A late season winter storm brought snow to unusually low elevations for this time of year.

Date	Location	Event Type	Event Size	Description
Jan. 2017* (01/01/2017-01/03/2017)	S. Oregon Coast	Winter Storm	8.5"-13" of snow reported in Gold Beach	Two fronts combined with a cold air mass to bring heavy snow to many portions of southwest Oregon. This storm had a severe impact due to the low snow levels and some areas that usually only get a few inches of snow in a season got as much as two feet over several days. There were numerous power outages, tree damage, and traffic accidents.
Dec. 2015* (12/06/2015-12/23/2015)	S. Oregon Coast	High Wind, Heavy Rain, Flooding, Landslides	69 mph	Another in a series of storms brought high winds to portions of southwest and south-central Oregon. Port Orford reported a gust to 69 mph at 06/0212 PST.
Oct. 2014 (10/25/2014)	Port Orford	High Wind, Heavy Surf		Strong winds and storm surge damaged the Port of Port Orford dock, several buildings, and the jetty resulting in damages totaling \$450,000.
Dec. 2012 (12/19/2012-12/20/2012)	S. Oregon Coast	High Wind	74 mph	The stormy pattern continued as another cold front brought high winds to portions of southern Oregon. Port Orford recorded numerous gusts exceeding 57 mph during this interval.
Mar. 2012	S. Oregon Coast	High Wind, Heavy Rain, Flooding, Mudslides, Landslides	75 mph	A strong cold front brought strong winds and heavy rain that caused flooding, mudslides, and landslides in twelve counties. Damage to state highways estimated at \$5,856,881. The Port Orford station reported numerous gusts in excess of 57 mph.
Apr. 2010* (04/04/2010)	S. Oregon Coast	High Wind	75 mph	Strong south winds occurred ahead of a strong cold front which brought severe winds to the south Oregon coast.
Jan. 2010* (01/24/2010)	S. Oregon Coast	High Wind	84 mph	A cold front brought strong winds to the Oregon coast.
Dec. 2007 (12/01/2007-12/03/2007)	S. Oregon Coast	High Wind, Heavy Rain, Mudslides	3 days	The strongest winds since the Columbus Day storm resulted from a series of powerful Pacific storms Dec. 1-3, 2007 that brought straight-line winds, rain, and mudslides. Presidential Disaster Declaration, 5 deaths, \$180 million in damage statewide. Widespread power and communication outages.
Nov. 2007* (11/12/2007)	S. Oregon Coast	High Wind	57 mph	A strong cold front brought high winds to the coast. Cape Blanco met High Wind Warning criteria nearly continuously for 10 hours.
Dec. 2006	S. Oregon Coast	High Wind	90 mph	Windstorms with winds over 90 mph caused \$225,000 for Curry, Coos, and Douglas counties.
Nov. 2006	Curry County	High Wind	70 mph	Storms with winds measured at 70 mph created a total of \$10,000 in damages.
Nov. 2002	Curry County	Tornado	n/a	Tornado touched down in Brookings causing \$500,000 in damage.
Feb. 2002	S. Oregon Coast	Wind Storm	88 mph	Windstorm with 88 mph winds recorded in Bandon. Severe damage to utilities and roads caused by falling trees. State of Emergency declared for Coos, Curry, Douglas, Lane and Linn Counties.

Date	Location	Event Type	Event Size	Description
Dec. 1999* (12/08/1999)	S. Oregon Coast	High Wind	80 mph	Strong winds at Cape Blanco; high wind warning issued.
Nov. 1996 - Dec. 1996	Five Western States	Heavy Rain, Freezing Rain/Heavy Wet Snow	6-18" West of the Cascades; 8" in 24 hrs. in Coast Range	Heavy rain in Curry County. During the period from mid-November to mid-December 1996, many areas received above-normal precipitation, greatly increasing the snowpack over mid and high elevations. Three sequential storms brought moderate to heavy rain, with the last creating a rain-on-snow event which resulted in incredible amounts of runoff.
Dec. 1995	Statewide	High Wind	Over 100 mph	Wind gusts of over 100 mph. The storm followed the path of Columbus Day Storm (Dec. 1962) and resulted in four fatalities, many injuries, and widespread damage (FEMA-1107-DR-Oregon).
Jan. 1990* (01/24/1990)	Statewide	Wind Storm	100 mph wind gusts	One fatality; damaged buildings; falling trees resulted in a disaster declaration in Oregon (FEMA-853-DR-Oregon).
Mar. 1983	Curry County	Tornado	n/a	Tornado touched down in Brookings, causing \$25,000 in damage.
Oct. 1967	Oregon Coast	Wind Storm	100–110 mph	Severe wind damage along the coast, winds 100 to 110 mph.
Dec. 1964* (12/24/1964)	Oregon	Floods, Heavy Rain, Winter Storm	100-year flood event; 15" rain in 1 day	The Christmas flood of 1964 was an atmospheric river or "pineapple express" event that battered the region producing as much as 15 inches of rain in 24 hours at some locations. The combination of heavy rain, melting snow, and frozen ground caused extreme runoff, erosion and flooding.
Oct. 1962 (10/12/1962)	Curry County; Statewide	Wind Storm	131 mph	Oregon's most destructive storm, the Columbus Day Windstorm Event, produced a barometric pressure low of 960 mb and resulted in wind speeds of 131 mph on the Oregon coast resulting in 23 fatalities and \$170 million in damages.
Feb. 1961	Curry County	Wind Storm	n/a	Heavy gusts and significant rain caused widespread damage.
Nov. 1958	Western Oregon	Wind Storm	80-100 mph	Wind Storm with gusts between 80 and 100 mph; damage to buildings and utility lines; power lines and trees down across a widespread area.
Jan. 1950	Curry County	Severe winter weather	6" snow in Brookings and 3" in Gold Beach	Heaviest snow statewide since record keeping started. Severe winter weather with snow, sleet, and freezing rain closed highways and power lines.
Jan. 1921	Oregon Coast	High Wind	n/a	Hurricane-force winds along the entire coast.

Note: * indicates newly listed event for the 2022 NHMP update. Sources: NOAA Storm Events Database, <https://www.ncdc.noaa.gov/stormevents/>, accessed 9/22/21. FEMA http://www.fema.gov/news/disasters_state.fema?id=41, accessed 4/20/21, Curry NHMP 2016.

Future Climate Conditions: Windstorm and Winter Storms

Climate change has the potential to alter surface winds through changes in the global free atmospheric circulation and storm systems, and through changes in the connection between the free atmosphere and Earth's surface. Future projections indicate a slight northward shift in the jet stream and extratropical cyclone activity in the North Pacific. Future projections indicate a slight northward shift in the jet stream and extratropical cyclone activity in the North Pacific. However, limited research and a lack of scientific consensus suggests little if any change in the frequency and intensity of windstorms as a result of climate change (Dalton et al., 2022).

Vulnerability Assessment

- The proximity of the population and infrastructure to the Pacific Coast is the primary driver of vulnerability to windstorm and winter storm events in Curry County.
- Curry County has a high percentage of people (20-25%) who are at risk from winter weather and wind events from age-related, mobility, or poverty issues.
- Mobile homes and other non-permanent residential structures of housing comprise more than 25% of housing in Curry County. These structures are at greater risk to damage from wind or snow load than other building types.

Risk Reduction Recommendations

The science of risk reduction is an emerging field. These potential storm mitigation actions are listed along with the hazard description so that readers understand the type of mitigation actions being considered or that might be considered current best practices.

- Develop and implement hazard tree and vegetation management programs.
- When conducting tree planting projects use the 'right tree, right place' method to select the type of tree and location.
- Use tie downs for metal roofs and metal sheds to make them resistant to wind gusts.
- Develop plans for major transportation routes at risk of a major winter storm event.
- Implement Oregon Building Code sets standards for structures to withstand 80 mph winds, with additional requirements to address high exposure areas.
- Assess high exposure areas near developable lands or existing structures to determine the wind load standards necessary for resilient buildings and infrastructure.

D. References

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II. MITIGATION STRATEGY

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A. Mission and Goals

The mitigation strategy outlines how Curry County, and the participating jurisdictions, will reduce or avoid long-term vulnerabilities to the nine hazards.

Mission

The Plan mission states the purpose and defines the primary functions of Curry County's NHMP. It is **Create a disaster resilient Curry County.**

intended to be adaptable to any future changes made to the plan and need not change unless the community's environment or priorities change. The mission can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the county towards building a safer, more disaster resilient community. This is the exact wording that was present in the 2010 plan.

The Curry Planning Team reviewed the mission and goals in July and August 2021 and affirmed the 2015 Steering Committee decision that the 2010 original mission is concise and allows for a comprehensive approach to mitigation planning. The team revised the mitigation plan goals to reflect a focus on current, more specific priorities reducing the number of goals from ten to five. These proposed revisions to the goals and the original mission were affirmed at the October 7, 2021 meeting of the 2022 NHMP Steering Committee.

Goals

Mitigation plan goals are statements of direction or intent that reflect the current priorities of Curry County to reduce the county's risk from natural hazards. These statements form a bridge between the broad mission statement and particular action items. The goals listed here serve as checkpoints to be used over the next five years as agencies and organizations begin implementing mitigation action items.

2022-2026 Curry County Natural Hazard Mitigation Plan Goals:

Goal 1: Save lives and reduce injuries.

Goal 2: Minimize and prevent damage to public and private services, buildings and infrastructure, protect natural and cultural resources as a part of these efforts.

Goal 3: Reduce economic losses by improving lifelines to Curry County from Interstate 5 (communications, supply, and evacuation routes).

Goal 4: Increase public and private sector involvement, including the whole community, in natural hazard mitigation and critical facilities planning, with increased education, outreach, awareness, and collaboration.

Goal 5: Increase cooperation and coordination among private entities, Tribal Nations, and local, state, and federal agencies.

B. 2016 Mitigation Action Status Tables

Four jurisdictions participated in the 2016 NHMP update. Their mitigation action status tables are below. They were updated with support of the DLCD project manager and the Curry County Emergency Manager in individual meetings October-December 2021.

Curry County

Action Item # 2016/ 2021	Status	2016 Mitigation Action	Project Lead(s)	Notes: Partners, Funding, 2022action item location	Hazard
16-MH-01	Complete	Utilize the final multi-hazard risk report and assessment currently being developed by DOGAMI through FEMA's Risk Map program to update the Curry County Hazard Analysis.	Curry County Emergency Management	The risk analysis occurs annually as a part of EMPG.	Multi-Hazard
16-MH-02/ 22-MH-15	Ongoing	Utilize the final multi-hazard risk report and assessment currently being developed by DOGAMI through FEMA's Risk Map program to update the Goal 7 Section of the Curry County Comprehensive Plan.	Curry County Planning Dept.	Curry County Comprehensive Plan and zoning updates incorporate the best available data.	Multi-Hazard
16-EQ-01/ 22-EQ-01	Not started/ Revised	Conduct non-structural seismic retrofit workshops with government agencies, businesses, and residents to prevent damage from earthquakes.	Curry County Emergency Management	22-EQ-01: Online seismic info.	Earthquake
16-CE-01	Discontinued	Continue to monitor the progression of coastal erosion in conjunction with sea level rise.	Curry County Planning Dept.	OSU or another researcher would need to conduct this activity.	Coastal Erosion
16-DR-01/ 22-DR-01	Ongoing	Continue to enforce existing water requirement codes for rural residents through Oregon Water Resources Dept.	Curry County Planning Dept.	All Planning Clearances require identification/coordination with Water Resources Department.	Drought
16-DR-02	Not Started/ Discontinued	Identify and evaluate alternative water sources.	Curry County	See Brookings 22-MH-01 Safe Drinking Water Resiliency Project for a continuation of this work.	Drought
16-FL-01	Completed	Continue to review and assess the county's floodplain ordinance to determine whether it meets National Flood Insurance Program (NFIP) requirements.	Curry County Planning Dept.	Completed in 2018 when FEMA flood maps became effective.	Flood
16-FL-02	Discontinued	Take steps for the county to qualify for the National Flood Insurance Program's (NFIP) Community Rating System.	Curry County Planning Dept.	This action item requires a high level of staff capacity.	Flood

Action Item # 2016/ 2021	Status	2016 Mitigation Action	Project Lead(s)	Notes: Partners, Funding, 2022action item location	Hazard
16-FL-03	Completed	Maintain the county's Flood Insurance Rate Maps (FIRMs) when new data becomes available.	Curry County Planning Dept.	Maps are online.	Flood
16-LS-01/ 22-LS-04	Ongoing	Continue to track landslide events alongside major roadways and develop appropriate mitigation measures.	Curry County Road Dept.		Landslide
16-TS-01/ 22-TS-09	Ongoing	Seek funding to relocate critical services outside of the tsunami inundation zone.	Curry County	Ongoing #22-TS-09 in addition to #22-TS-13 Curry Road Dept. #22-TS-14 Curry Sheriff EOC, etc.	Tsunami
16-WF-01/ 22-WF-15	Ongoing	Review and update the 2008 Curry County Wildfire Protection Plan.	Curry County Emergency Management	Curry Fire Defense Board	Wildfire
16-WF-02/ 22-WF-09	Ongoing	Encourage new development to incorporate wildfire mitigation measures and ensure adequate emergency access.	Curry County Planning Dept.	Recommended fire mitigation measures on all new Planning Clearances in Rural Areas	Wildfire
16-MH-03/ 22-MH-19	Ongoing	Ensure that all critical facilities have backup power and emergency plans in place to deal with power outages.	Curry County Emergency Management	Hospitals, Fire Departments, Schools	Multi-Hazard
16-MH-04/ 22-MH-03	Revised	Identify and disseminate information about alternative transportation routes.	Curry County Road Dept.	22-MH-03 Develop a Curry County Road Resiliency Plan	Multi-Hazard
16-MH-05/ 22-MH--27	Ongoing	Further develop risk assessment maps to show areas at risk for all hazards.	Curry County Emergency Management	DOGAMI, DLCD	Multi-Hazard
16-MH-06/ 22-MH-12	Ongoing	Establish mutual aid agreements between government agencies and commercial businesses in the event of an emergency (fuel, heavy equipment, food, etc.)	Curry County Emergency Management & Road Dept.		Multi-Hazard
16-MH-07/ 22-MH-18	Started/ Revised	Encourage citizens to prepare and maintain provisions for a minimum of one week without services.	Curry County Emergency Management	22-MH-18: Two weeks ready based on 16-MH-07 and 16-MH-14 combined.	Multi-Hazard
16-MH-08/ 21-MH-04	Not started/ Revised	Adopt the 2012 post-disaster framework for Curry County.	Curry County Emergency Management	21-MH-22: Recovery Plan development	Multi-Hazard
16-MH-09/ 21-MH--26	Not started/ Continued	Educate and encourage businesses, schools, and governmental organizations to develop continuity of operations plans.	Curry County Emergency Management		Multi-Hazard

Action Item # 2016/ 2021	Status	2016 Mitigation Action	Project Lead(s)	Notes: Partners, Funding, 2022action item location	Hazard
16-MH-10/ 21-MH-23	Started/ Continued	Develop backup systems for county records.	Curry County	Ongoing for Planning/Building, 75% records online. Assessor data is online.	Multi- Hazard
16-MH-11/ 21-MH-22	Started/ Continued	Encourage special districts (including ports) to develop addenda to the Curry County Natural Hazards Mitigation Plan.	Curry County Emergency Management	Required by FEMA, supported by DLCD.	Multi- Hazard
16-MH-12/ 21-MH-02	Not started/ Revised	Identify Red Cross Shelters that are seismically sound and retrofit existing shelters.	Curry County Emergency Management	21-MH-02: Mass care plan	Multi- Hazard
16-MH-13/ 21-MH-25	Ongoing	Explore developing a redundant utility system to supply Curry County with continuous service.	Curry County		Multi- Hazard
16-MH-14/ 21-MH-18	Started/ Continued	Develop a multi-hazard public education campaign targeted to residents and tourists about the natural hazards Curry County is vulnerable to and mitigation measures they can implement.	Curry County Emergency Management		Multi- Hazard
16-MH-15	Complete	Complete a risk analysis for the hazards addressed in this plan when information is available, to estimate the potential loss of life and damage to property.	Curry County Emergency Management	This is the purpose of the DOGAMI 2018 Curry County Natural Hazard Risk Report.	Multi- Hazard
16-MH-16/ 21-MH-25	Ongoing	Outsource an engineering analysis/study for each Coos-Curry Electric substation in Curry County (8) to identify necessary work to harden and improve each facility's reliability and structural integrity.	Curry County		Multi- Hazard
16-MH-17/ 21-MH-25	Ongoing	Coos-Curry Electric needs to replace critical overhead distribution feeders with underground to facilitate power restoration work and lessen power outage duration after major weather events.	Curry County		Multi- Hazard

City of Brookings

Action Item # 2016/ 2021	Status:	2016 Mitigation Action	Project Lead(s)	Notes: Description, Partners, Funding, etc.	Hazard
16-MH-01/ Brookings 21-MH-01	Ongoing	Safe Drinking Water Resiliency Project	City of Brookings	Add a second drinking water supply source for Brookings & Harbor that is not susceptible to saltwater intrusion. This action was based upon the Redundant Water Supply Plan of 2015 which provided recommendations, preliminary concepts, schematic drawings and cost estimates for capital improvement projects. 2016 HUD Resilience Competition Project.	Multi-Hazard
16-MH-02	Complete	Critical Healthcare Resiliency Project	Curry Health Network	HUD Resilience Competition Project intended to expand the medical clinic and emergency department in Brookings to address the lack of Emergency Department there—the largest city in the state of Oregon without emergency medical services (in 2015).	Multi-Hazard
16-MH-03/ Brookings 21-MH-02	Ongoing	Storm Sewer Disaster Repairs Project	City of Brookings	In process of requesting \$21 million grant for this. HUD Resilience Competition Project intended to address the infiltration and intrusion problems in the city sewer system. The ability of surface water to flow into the city sewer system could result in combined sewer overflows and system risk.	Multi-Hazard
16-MH-04	Discontinued	Multifamily LMI and Tsunami-Safe Housing Program	City of Brookings	HUD Resilience Competition Project The statewide housing crisis also affects Brookings; more affordable, safe housing is needed outside of the flood and tsunami zone.	Multi-Hazard
16-MH-05	Ongoing for CCEC; Discontinued for City	Electricity Reliability Project	Coos Curry Electric Coop	This HUD Resilience Competition Project sought to address the BPA power transmission lines serving the county/city.	Multi-Hazard

Action Item # 2016/ 2021	Status:	2016 Mitigation Action	Project Lead(s)	Notes: Description, Partners, Funding, etc.	Hazard
16-MH-06	Complete	Utilize the final multi-hazard risk report and assessment currently being developed by DOGAMI through FEMA's Risk Map program to update the Goal 7 Section of the Brookings Comprehensive Plan.	City of Brookings	Best available hazard data is incorporated into the regulatory framework of Oregon cities and counties via implementation of Goal 7 by the jurisdictions.	Multi-Hazard
16-TS-01/ Brookings 21-TS-01	Not started	Adopt a Tsunami Land Use Overlay Zone.	City of Brookings	Department of Land Conservation and Development; Curry County Economic Development; Department of Geology and Mineral Industries; Oregon Regional Solutions.	Tsunami
10-MH-07	Discontinued	Analyze the Port Jetty's and storm water system in Brookings for stability during floods and severe storms and identify mitigation options	City of Brookings Public Works	Port of Brookings- Harbor, City of Brookings. Survey maintenance needs of Port Jetty's and storm water system for stability Implement the Brookings 2008 Storm Water Master Plan. Action item continued from 2010.	Multi-Hazard
16-WS-01	Ongoing for CCEC; Discontinued for City	Convert existing distribution facilities to underground at the Port of Brookings/Harbor	Coos-Curry Electric Coop	Coos Curry Electric Cooperative has completed converting existing overhead distribution facilities to underground at the Port of Port Orford. Distribution facilities at the Port of Gold Beach are also underground. This proposed action item is to convert existing distribution facilities to underground at the Port of Brookings/Harbor.	Wind Storm
City of Brookings Mitigation Action "Pool" (lower priority)					
10-FL-01	Complete	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.	City of Brookings	FEMA, DLCD Action item continued from 2010.	Flood
16-FL-01/ Brookings 21-MH-01	Duplicate	Develop Alternate Water Sources.	City of Brookings	16-MH-01 addressed this issue. The one source for the water system is the Chetco River. Discussion of putting Ferry Creek Reservoir back on line.	Flood

Action Item # 2016/ 2021	Status:	2016 Mitigation Action	Project Lead(s)	Notes: Description, Partners, Funding, etc.	Hazard
10-EQ-01	Complete	Upgrade/retrofit critical facilities to reduce potential of earthquake collapse	City of Brookings Public Works	Brookings-Harbor High School and Upper Chetco Charter School at "high" seismic risk. Brookings-Harbor School District Action item continued from 2010.	Earthquake
10-EQ-02	Complete	Seek funding to study the seismic vulnerability of buildings in the City of Brookings and retrofit those that are vulnerable to seismic hazards.	City of Brookings Public Works		Earthquake
10-WF-01/ Brookings 21-MH-03	Ongoing	Continue to implement and enhance public education programs regarding wildfires, earthquakes, and tsunamis.	City of Brookings, Curry County, ODF, USFS	Provide fire safety and fire prevention information pamphlets in easy to read and understandable format. Target areas frequented by tourists such as motels, RV parks, community and state parks, restaurants, real estate offices, and chamber of commerce for local cities. Establish weekly fire prevention articles in local print media during fire season.	Wildfire
10-LS-01/ Brookings 21-LS-01	Ongoing	Continue to identify and map high risk slide areas to create an accurate logistical assessment.	City of Brookings Public Works	Oregon Department of Transportation Private Timber Industries	Landslide
10-MH-08/ Brookings 21-MH-04	Ongoing	Review of county and community comprehensive plans for the need to update hazard specific sections to reflect the latest information on seismic hazards in each community.	City of Brookings Planning	Revise to be specific to Brookings. Action item continued from 2010.	Multi-Hazard
16-MH-09	Ongoing for CCEC; Discontinued for City	Coos-Curry Electric needs to install additional fuel storage at its Brookings and Port Orford offices to fuel existing generators in case of emergency.	Coos-Curry Electric Coop		Multi-Hazard

City of Gold Beach

Action Item # 2016/ 2021	Status: Complete Not started Started Ongoing Discontinued	2016 Mitigation Action	Project Lead(s)	Notes: Description, Partners, Funding, etc.	Hazard
16-MH-01	Discontinued	Utilize the final multi-hazard risk report and assessment currently being developed by DOGAMI through FEMA's Risk Map program to update the Goal 7 Section of the Gold Beach Comprehensive Plan.	City Manager, City of Gold Beach	This is not a salient action item until the city is able to make their next Comprehensive Plan revision—the last one was in 1982. During the last plan update, the Planning Department was contracted to Curry County but planning work is now conducted by the City Manager.	Multi-Hazard
16-TS-01	Discontinued	Adopt a Tsunami Land Use Overlay Zone.	City of Gold Beach	Partners: Department of Land Conservation and Development; Department of Geology and Mineral Industries	Tsunami
City of Gold Beach Mitigation Action "Pool" (lower priority).					
10-MH-02/ Gold Beach 21-MH-01	Ongoing	Continue to implement public education programs regarding natural hazards.	Gold Beach Fire & Police Departments	Annually in September, the city co-leads a local preparedness event. Education goes out via the water bill, e.g., this year it was about wildfire preparedness. Partners: Curry County OSU Extension Office, Rotary, others.	Multi-Hazard
10-EQ-01/ Gold Beach 21-EQ-01	Ongoing	Seek funding to retrofit buildings and/or infrastructure at risk of damage in a high magnitude earthquake.	Gold Beach Public Works Department, City Manager	City Hall is within the tsunami zone, so it doesn't qualify for state seismic retrofit funding. Discussions have occurred about relocation but there is no clear direction about where to move due to the lack of level ground and landslide risk. School district conducted seismic retrofits with this funding.	Earthquake
16-FL-01/ Gold Beach 21-FL-01	Ongoing	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.	City of Gold Beach, City Manager	The city adopted the updated maps in 2018. Partners: FEMA, DLCD.	Flood

Action Item # 2016/ 2021	Status: Complete Not started Started Ongoing Discontinued	2016 Mitigation Action	Project Lead(s)	Notes: Description, Partners, Funding, etc.	Hazard
16-MH-03	Discontinued	Analyze the Port Jetty in Gold Beach for stability and identify mitigation options. Analyze stability of community airport due to the inundation of floodwaters from storm surge.	Port of Gold Beach & Community Airport	This mitigation action is specific to the Port of Gold Beach. Partners: Port of Brookings, Army Corps of Engineers	Multi-Hazard
16-LS-01/ Gold Beach 21-LS-01	Ongoing	Continue to identify and map high risk slide areas to create an accurate logistical assessment.	City Manager, City of Gold Beach	Partners: DOGAMI, Curry County Road Department, ODOT, private industry (logging)	Landslide
16-LS-02	Discontinued	Evaluate current and high hazard slides for prioritization and explore mitigation possibilities.	Gold Beach Public Works Department	16-LS-02 is being replaced by/combined with countywide landslide mitigation actions; see new Curry County action 21-LS-04. Partners: ODOT, Private Industry (logging)	Landslide
16-WF-01/ Gold Beach 21-WF-01	Ongoing	Through multi-agency coordination, develop an abatement plan for control of noxious weeds, specifically Gorse, Scotch Broom, Butterfly Brush, and pampas grass.	City of Gold Beach	Curry Watersheds Partnership has a noxious weed management program that serves Gold Beach. For Gold Beach, their priority invasive plant species is <i>Cortaderia selloana</i> is a species of flowering plant in the grass family often referred to by the common name pampas grass. It is native to South America. Partners: Gold Beach Fire Department, Public Works, Curry Wildfire Protection Team	Wildfire
16-WF-02/ Gold Beach 21-MH-02	Ongoing	Identify and map all roads, private drives, logging trails to increase the ability of firefighters to locate and gain access to provide services and/or evacuations.	City of Gold Beach	Lead: Gold Beach Fire Department, Public Works, Police, Planning. Partners: Coos Forest Protective Association, U.S. Forest Service, Industrial Partners (logging companies), BLM, Curry Wildfire Protection Team, Curry County Road Department, ODOT.	Wildfire

City of Port Orford

Action Item # 2016/ 2021	Status: Complete Not started Started Ongoing Discontinued	2016 Mitigation Action	Project Lead(s)	Notes: Description, Partners, Funding, etc.	Hazard
16-MH-01/ Port Orford 21-MH-03	Ongoing/ Revised	Implement Port Orford Comprehensive Plan, Goal 7 Section, Policy 5: Port Orford Hazard Policy 5 states: <i>“Work with Curry County to maintain and implement the updated Emergency Operations Plan and the Natural Hazard Mitigation Plan including systems for disaster warnings, and procedures for the protection of citizens in the case of earthquakes, tsunamis and other natural disasters.”</i> 2022 Revised: Develop and implement an Emergency Operations Plan (EOP).	City of Port Orford	Action components: - Regularly brief the City Council and Planning commission regarding the EOP and NHMP. - Meet with Curry County Emergency Management on at least a quarterly basis. - Request input, support and technical assistance from Oregon Regional Solutions. Partners: Curry County Emergency Management. Source: Port Orford Comprehensive Plan, Goal 7 Section, Policy 5.	Multi- Hazard
16-TS-01/ Port Orford 21-TS-01	Not started/ Revised	Implement Port Orford Comprehensive Plan, Goal 7 Section, Policy 7 Port Orford Hazard Policy 7 states: <i>“Work with other agencies and community organizations to develop natural disaster shelters outside the tsunami inundation zone.”</i>	City of Port Orford	Status: Disaster cache work has begun, shelters have not. Partners: Curry County Emergency Management, Dept. of Geology and Mineral Industries, Oregon Emergency Management, FEMA, NANOOS http://nvs.nanoos.org/TsunamiEvac Source: Port Orford Comprehensive Plan, Goal 7 Section, Hazard Policy 7.	Tsunami

Action Item # 2016/ 2021	Status: Complete Not started Started Ongoing Discontinued	2016 Mitigation Action	Project Lead(s)	Notes: Description, Partners, Funding, etc.	Hazard
16-MH-02	Discontinued	Implement Port Orford Comprehensive Plan, Goal 7 Section, Policy 8 Port Orford Hazard Policy 8 states: <i>“Work with Curry County and state agencies including, but not limited to the Department of Geology and Mineral Industries (DOGAMI) to develop and implement tsunami and other emergency preparedness plans including the Port Orford Natural Hazards Mitigation Plan, the Emergency Operations Plan, the Continuity of Operations Plan and other plans, with the objective of incorporating and coordinating facilities and personnel to be capable of conducting emergency operations. Upgrade emergency operations and facilities as funding becomes available.”</i>	City of Port Orford	Ideas for implementation: - Utilize the Department of Land Conservation and Development’s  Tsunami Land Use Guide - Utilize the final multi-hazard risk report and assessment currently being developed by DOGAMI through FEMA's RiskMap program to update the Goal 7 Section of the Port Orford Comprehensive Plan.	Multi-Hazard
10-MH-03/ Port Orford 21-MH-02	Not Started/ Revised	Implement Port Orford Comprehensive Plan, Goal 7 Section, Policy 9 Port Orford Hazard Policy 9 states: <i>“Prepare a post-tsunami redevelopment plan for the City of Port Orford as opportunities for funding such a plan become available.”</i>	City of Port Orford	Curry County Emergency Management, Dept. of Geology and Mineral Industries, Oregon Emergency Management, Dept. of Land Conservation and Development Continued from 2010 plan.	Multi-Hazard
16-TS-02	Complete	Adopt a Tsunami Land Use Overlay Zone.	City of Port Orford	Dept. of Land Conservation and Development, Curry County Emergency Management, Dept. of Geology and Mineral Industries.	Tsunami
City of Port Orford Mitigation Action “Pool” (lower priority)					

Action Item # 2016/ 2021	Status: Complete Not started Started Ongoing Discontinued	2016 Mitigation Action	Project Lead(s)	Notes: Description, Partners, Funding, etc.	Hazard
16-FL-01	Complete	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.	City of Port Orford	Curry County Planning Department, FEMA, OEM, DLCD	Flood
10-EQ-01/ Port Orford 21-EQ-01	Ongoing	Upgrade/Retrofit Critical facilities to reduce potential of earthquake collapse.	City of Port Orford	Schools done, verify others. City of Port Orford: Planning, Finance, Port Orford School District, Business Oregon, Curry County Emergency Management, DOGAMI	Earthquake
16-WF-01/ Port Orford 21-WF-01	Ongoing	Through multi-agency coordination, develop an abatement plan for control of noxious weeds, specifically Gorse, Scotch Broom and Butterfly Brush.	City of Port Orford	Planning for gorse at watershed level, Port Orford Watershed Committee. Private Land Owners within the City Curry County, Weed Board	Wildfire
16-LS-01/ Port Orford 21-LS-01	Ongoing/ Combined 16-LS-02	Continue to identify and map high risk slide areas to create an accurate logistical assessment.	City of Port Orford	City of Port Orford Public Works, DOGAMI, Oregon Department of Transportation	Landslide
16-LS-02/ Port Orford 21-LS-01	Started/ Combined 16-LS-01	Evaluate current and high hazard slides for mitigation possibilities and funding sources.	City of Port Orford	City of Port Orford Public Works Coos County Highways, Oregon Department of Transportation	Landslide
16-MH-04/ Port Orford 21-MH-04	Ongoing	Continue to implement and enhance public education program regarding earthquakes and tsunamis.	City of Port Orford	City of Port Orford Police and Fire Port Orford Schools, DOGAMI, OEM	Multi-Hazard
16-MH-05/ Port Orford 21-MH-05	Ongoing	Continue to review the City of Port Orford Comprehensive Plan for the need to update hazard specific section to reflect the latest information on seismic and tsunami hazards.	City of Port Orford	DOGAMI, City of Port Orford Planning, Public Works	Multi-Hazard

Action Item # 2016/ 2021	Status: Complete Not started Started Ongoing Discontinued	2016 Mitigation Action	Project Lead(s)	Notes: Description, Partners, Funding, etc.	Hazard
16-MH-06/ Port Orford 21-MH-08	Ongoing	Identify and map all roads, logging trails, and private drives to access during a catastrophic event.	Port Orford Police & Fire	City of Port Orford Planning Dept., Curry County Emergency Services, Private Logging Companies, USFS, BLM.	Multi-Hazard
16-WF-02	Discontinued	Continue wildfire public education programs.		Duplicates 16-WF-03	Wildfire
16-WF-03/ Port Orford 21-WF-02	Ongoing	Continue wildfire prevention through public education programs to target residents, tourist, and companies in the area.	City of Port Orford	City of Port Orford Fire Department, Oregon Department of Forestry, Coos Forest Protection Association	Wildfire
16-MH-07	Discontinued	Evaluate water and sewer lines for limited extension to new areas.			Multi-Hazard

C. Mitigation Success

Since the last plan update in 2016, the following progress was made on the implementation and advancement of mitigation measures in Curry County.

Curry County

- Secured federal funding for Fire Training Center (site acquisition, permitting, other).

Curry County Road Department

- Flood Mitigation at Cedar Valley and McKinnon Roads: The culvert located at the intersection of McKinnon and Cedar Valley Drive was damaged during a storm event last winter and needed to be replaced. The replacement culvert had to meet fish passage design requirements.
- Landslide Mitigation: Gardner Ridge Road Improvement, a FEMA Project was completed.
- Landslide Mitigation: Langlois Mountain Road at MP 5.7 was completed.
- Multi-Hazard: Install resilient backup power by replacing old generator with a new propane generator and tank at Cape Blanco Tower was completed in August 2021.

City of Brookings

- Seismic Retrofits of Schools: Brookings-Harbor High School cafeteria and Gibney Center constructed as an essential facility.
- Ferry Creek Assessment

City of Gold Beach

- Curry County Fire Training Center concept was initiated by the Gold Beach Fire Department.
- Gold Beach secured funding for Water Main Replacement (landslide).
- Seismic Retrofits of Schools (Gold Beach both campuses)
- Landslide Mitigation: a 2022 project at the intersection of Jerry's Flat Road and Hwy 101 will stabilize the bank and replace a section of the water main line.

City of Port Orford

- Port Orford Hubbard Creek Dam Repair (see drought action item).
- Tsunami Evacuation Analysis and Planning in Port Orford (tsunami overlay zone).
- Seismic Retrofits of Schools (see critical facility list)
- Gorse removal by the City of Port Orford and Curry Watersheds Partnership.

Port of Gold Beach

- Evaluation of condition of piles, other infrastructure.

Port of Port Orford

- Interim repair of the breakwater, Port of Port Orford

D. Funding Sources

There are numerous local, state, and federal funding sources available to support natural hazard mitigation projects and planning. The following section includes an abbreviated list of the most common funding sources utilized by local jurisdictions in Oregon. Because grant programs often change, it is important to periodically review available funding sources for current guidelines, program descriptions, and updated deadlines.

Federal Funding: Pre-/Post-Disaster

Hazard Mitigation Assistance (HMA)

https://www.fema.gov/media-library-data/1424983165449-38f5dfc69c0bd4ea8a161e8bb7b79553/HMA_Guidance_022715_508.pdf

Detailed program and application information for federal post-disaster and pre-disaster programs can be found in the Hazard Mitigation Assistance Guidance, dated February 27, 2015, note that guidance regularly changes. Verify that you have the most recent edition. Flood mitigation assistance is usually offered annually; applications are submitted online. Applicants need a user profile approved by the State Hazard Mitigation Officer (SHMO), which should be garnered well before the application period opens.

For Oregon Department of Emergency Management (OEM) grant guidance on Federal Hazard Mitigation Assistance, visit: <https://www.oregon.gov/OEM/emresources/Grants/Pages/HMA.aspx>

Contact: Anna Feigum, State Hazard Mitigation Officer (SHMO), anna.feigum@oem.oregon.gov

Hazard Mitigation Grant Program

<http://www.fema.gov/hazard-mitigation-grant-program>

The Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The HMGP involves a paper application which is first offered to the counties with presidentially declared disasters within the past year, then becomes available statewide if funding is still available. The grant is administered by FEMA.

Building Resilient Infrastructure and Communities (BRIC) Grant Program

<http://www.fema.gov/pre-disaster-mitigation-grant-program>

The Building Resilient Infrastructure and Communities (BRIC) Grant Program provides funds to states, territories, 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. BRIC grants are available on an annual basis. Applicants need to submit a

letter of interest to the State Hazard Mitigation Officer, annually in September. The grant is administered by FEMA.

Flood Mitigation Assistance Program

<http://www.fema.gov/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.

High Hazard Potential Dams Grant Program

https://www.fema.gov/sites/default/files/2020-08/fema_hhpd_grant-guidance.pdf

HUD Disaster Resources

<https://www.hud.gov/info/disasterresources>

HUD provides a variety of disaster resources listed below. We also partner with Federal and state agencies to help implement disaster recovery assistance. Under the National Response Framework, the Federal Emergency Management Agency (FEMA) and the Small Business Administration (SBA) offer initial recovery assistance.

Community Development Block Grant (CDBG) Program

http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs

The Community Development Block Development Grant Program is administered by the U.S. Department of Housing and Urban Development. The Community Development Block Grant Program promotes viable communities by providing: 1) decent housing; 2) quality living environments; and 3) economic opportunities, especially for low- and moderate-income persons. Eligible activities most relevant to natural hazards mitigation include: acquisition of property for public purposes; construction/reconstruction of public infrastructure; community planning activities.

Rural Development Assistance – Utilities, USDA

<https://www.rd.usda.gov/about-rd/agencies/rural-utilities-service>

Direct and guaranteed rural economic loans and business enterprise grants to address utility issues and development needs.

Rural Development Assistance – Housing, USDA<https://www.rd.usda.gov/programs-services>

The RDA program provides grants, loans, and technical assistance in addressing rehabilitation, health and safety needs in primarily low-income rural areas. Declaration of major disaster is necessary.

HOME Investments Partnerships Program, HUDhttps://www.hud.gov/program_offices/comm_planning/affordablehousing/programs/home/

The HOME IPP provides grants to states, local government and consortia for permanent and transitional housing (including support for property acquisition and rehabilitation) for low-income persons.

*Federal Funding: Fire Resources*National Fire Plan (DOI – USDA)<http://www.forestsandrangelands.gov/>

The NFP provides technical, financial, and resource guidance and support for wildland fire management across the United States. This plan addresses five key points: firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability.

Assistance to Firefighters Grant Program, FEMA<http://www.fema.gov/welcome-assistance-firefighters-grant-program>

FEMA AFGM grants are awarded to fire departments to enhance their ability to protect the public and fire service personnel from fire and related hazards. Three types of grants are available: Assistance to Firefighters Grant (AFG), Fire Prevention and Safety (FP&S), and Staffing for Adequate Fire and Emergency Response (SAFER).

*Federal Funding—Hazard Mapping and Technical Support*Coastal Zone Management Program, NOAA.<https://coast.noaa.gov/czm/>

Provides grants for planning and implementation of non-structural coastal flood and hurricane hazard mitigation projects and coastal wetlands restoration.

Cooperating Technical Partners<https://www.fema.gov/flood-maps/guidance-partners/cooperating-technical-partners>

The purpose of the CTP Program is to provide, through a Cooperative Agreement, funds to ensure that partners can perform program management and technical mapping-related activities.

Emergency Watershed Protection Program, USDA-NRCS<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp>

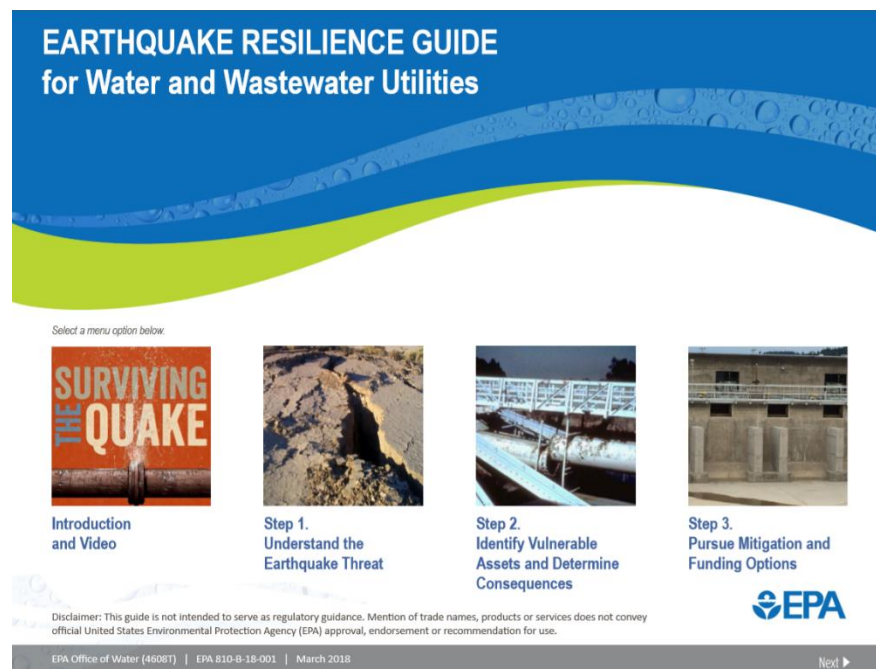
Provides technical and financial assistance for relief from imminent hazards in small watersheds, and to reduce vulnerability of life and property in small watershed areas damaged by severe natural hazard events.

EPA Recommendations for Seismic Resilience for Water Systems

<https://www.epa.gov/sites/production/files/2018-02/documents/180112-earthquakeresilienceguide.pdf>

There are three steps in this guide: Step 1 - Understand the Earthquake Threat. Step 2 - Identify Vulnerable Assets and Determine Consequences. Step 3 - Pursue Mitigation and Funding Options.

Figure II-1. Earthquake Resilience Guide



Federal Funding for Water and Wastewater Utilities in National Disasters (Fed FUNDS)

<https://www.epa.gov/fedfunds>

This website gives utilities information about federal disaster funding programs. Although Fed FUNDS focuses on major disasters, you can use the information for any incident that disrupts water or wastewater services or damages critical infrastructure.

Federal Land Transfer / Federal Land to Parks Program, DOI-NPS

<http://www.nps.gov/ncrc/programs/flp/index.htm>

Identifies, assesses, and transfers available federal real property for acquisition for state and local parks and recreation, such as open space.

National Earthquake Hazard Reduction Program (NEHRP), National Science Foundation

<http://www.nehrp.gov/>

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.

National Flood Insurance Program, FEMA

<http://www.fema.gov/national-flood-insurance-program>

The NFIP makes available flood insurance to residents of communities that adopt and enforce minimum floodplain management requirements.

National Flood Insurance Program: Flood Mapping; FEMA

<http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping>

Flood insurance rate maps and floodplain management maps for all NFIP communities.

National Tsunami Hazard Mitigation Program

<https://nws.weather.gov/nthmp/index.html>

A coordinated U.S. national effort to mitigate the impact of tsunamis through public education, community response planning, hazard assessment, and warning coordination.

USGS Natural Hazards

http://www.usgs.gov/natural_hazards/y

The USGS Natural Hazards Mission Area includes six science programs: Coastal & Marine Geology, Earthquake Hazards, Geomagnetism, Global Seismographic Network, Landslide Hazards, and Volcano Hazards. Through these programs, the USGS provides alerts and warnings of geologic hazards and interactive maps and data.

State Funding

Seismic Rehabilitation Grant Program

<http://www.orinfrastructure.org/Infrastructure-Programs/Seismic-Rehab/>

The Seismic Rehabilitation Grant Program (SRGP) provides state funds to strengthen public schools and emergency services buildings so they will be less damaged during an earthquake. Reducing property damage, injuries, and casualties caused by earthquakes is the goal of the SRGP.

Department of Land Conservation and Development

<https://www.oregon.gov/lcd/About/Pages/Grants.aspx>

Oregon Department of Land Conservation and Development (DLCD) offers grants to empower local and tribal governments to improve planning. The grants can be used to update comprehensive plans, modernize land use ordinances, or augment other planning activities. Good hazard mitigation work is based upon modern data, code, and policy. For example, these funds might be used to update a Transportation System Plan that would form the basis for an effective Evacuation Plan; or funding might be used to update a comprehensive plan with guidance for development in geohazard areas.

Oregon Watershed Enhancement Board

<http://www.oregon.gov/OWEB/Pages/index.aspx>

While OWEB's primary responsibilities are implementing projects addressing coastal salmon restoration and improving water quality statewide, these projects can benefit efforts to reduce flood and landslide hazards. 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.

Local Funding

Local funding depends on the funding mechanisms your jurisdiction has authority to use. A few common types of funding for hazard mitigation projects include:

Capital Improvement Project (CIP):

Many jurisdictions put together a set of their long-term investment projects into a budget package called a CIP budget or 'Capital Projects' budget. These are usually projects that have been on the organizational 'to do' list for some time or have gained priority status through another mechanism such as a planning, design, or strategic planning process. Once a project moves into this status, an array of budget tools can be used.

General Obligation Bond:

A general obligation bond (GO bond) is a municipal bond backed solely by the credit and taxing power of the issuing jurisdiction rather than the revenue from a given project. General obligation bonds are issued with the belief that a municipality will be able to repay its debt obligation through taxation or revenue from projects. No assets are used as collateral. In Oregon Revised Statutes, it appears that the rules for issuing GO Bonds is regulated by type of entity. For example, sanitary and water districts have a discrete set of rules specific to their authorities in 2020 ORS, Vol. 12, Chapter 450:

<https://www.oregonlaws.org/ors/chapter/450>

Road Fund:

A "county road fund" means a separate fund in the county treasury designated to receive deposit of revenues that are dedicated to roads or road improvements. The county road fund must be used in establishing, laying out, opening, surveying, altering, improving, constructing, maintaining and repairing county roads and bridges on county roads (with exceptions).

See 2020 ORS, Vol. 10, Ch.238, Section 238.705: <https://www.oregonlaws.org/ors/368.705>

Special Tax District:

Some districts, like Ports, may have authority to create special tax levies, such as a “bond sinking fund”, that is “a special tax upon all taxable real and personal property situated within the port, Such annual levy shall not exceed one-tenth of one percent.”

See 2020 ORS, Vol. 19, Ch. 777, Section 777.520. <https://www.oregonlaws.org/ors/777.520>)

Deferred and Lifetime Maintenance Funding

Other considerations about how to use lines of funding essentially amount to either a future line of funding or a deficit (such as an unfunded mandate or deferred maintenance). Lifetime Maintenance funding is a component of a project that can be included in a CIP or other project budget. This includes the expected operations and maintenance (O&M) costs of the project, and it rolls those costs into the upfront costs so there is a budget available for them. The alternative to this is a piece of equipment or other asset that does not receive the maintenance it needs due to budget cuts, which then has a shorter life and thus a higher annual cost to the jurisdiction and its customers.

*Foundation Funding*Meyer Memorial Trust

<https://mmt.org/>

Since 1982, Meyer has awarded grants and program-related investments totaling more than \$814 million to more than 3,380 organizations around the Pacific Northwest. Today, Meyer focuses on work in Oregon in four areas Oregonians have identified as crucial to making the state better for all its residents: housing, education, the environment and building stronger communities.

Oregon Community Foundation

<https://oregoncf.org/>

OCF provides grants and scholarships across Oregon. As a statewide community foundation, they work alongside donors, stewarding their priorities into strategic giving to support diverse communities across Oregon, creating lasting, transformative change. They have five offices and professional advisors to assist donors in setting up advised funds to serve seven areas of impact.

E. Economic Analysis of Hazard Mitigation Projects

- This summary was originally developed by the Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon’s Community Service Center (now the Institute for Policy Research and Engagement or IPRE) and included in the 2016 Curry County NHMP. It has been reviewed and accepted by the Federal Emergency Management Agency (FEMA) as a means of documenting how the prioritization of mitigation actions includes a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and associated costs.

This appendix outlines three approaches for conducting economic analyses of natural hazard mitigation projects:

- Benefit/Cost Analysis,
- Cost-Effectiveness Analysis
- STAPLE/E Approach

The appendix 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 Oregon Interagency Hazard Mitigation Team, Oregon Natural Hazard Mitigation Plan (Oregon Department of Land Conservation & Development, 2020), and FEMA Publication 331, Report on Costs and Benefits of Natural Hazard Mitigation. The Economic Analysis 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. 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 such as these three:

- Natural disasters affect all segments of the communities they strike, including individuals, businesses, and public services such as fire, police, utilities, and schools.
- 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.
- 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 in assessing the positive and negative impacts from mitigation activities and obtaining an instructive benefit/cost comparison.

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.

Benefit/Cost Analysis

Benefit/cost analysis is a key mechanism used by OEM, FEMA, and other state and federal agencies in evaluating hazard mitigation projects and is required by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended.

Benefit/cost analysis is used in natural hazards mitigation to show if the benefits to life and property protected through the mitigation action exceed the cost of the mitigation action. A Benefit/Cost Analysis (BCA), also known as a Benefit/Cost Ratio (BCR), for a mitigation action is an output from a computer program that can assist communities in determining whether a project is worth undertaking now to avoid disaster-related damages later. It is a required part of a FEMA mitigation grant application.

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 (the net benefits will exceed the net costs) to be eligible for FEMA funding. FEMA's BCA help line: 1-855-540-6744 or email bchelp@fema.gov

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:

- Request cost sharing from public agencies;
- Dispose of the building or land either by sale or demolition;
- Change the designated use of the building or land and change the hazard mitigation compliance requirement; or
- 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 action could be time consuming and impractical. There are approaches for conducting a quick evaluation of the proposed mitigation actions which could be used to identify those that merit more detailed assessment. One of those methods is the STAPLE/E approach.

Using STAPLE/E criteria, mitigation actions can be evaluated quickly. This set of criteria requires the assessment of the mitigation actions based on the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLE/E) constraints and opportunities of implementing the particular mitigation action 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: 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.

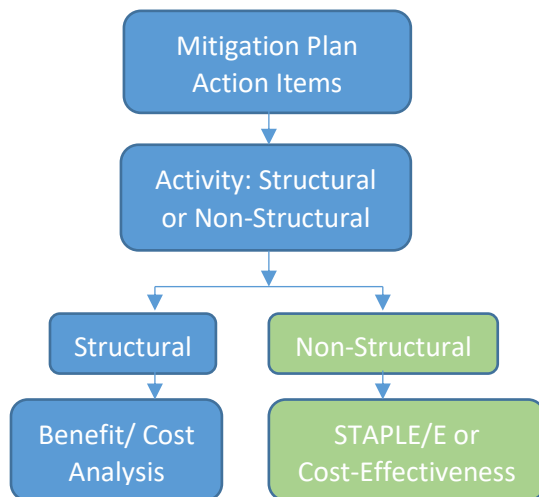
- How will the action impact the environment?
- Will the action need environmental regulatory approvals?
- Will it meet local and state regulatory requirements?
- Are endangered or threatened species likely to be affected?

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 II-2. Economic Analysis Flowchart



Source: Oregon Partnership for Disaster Resilience at the University of Oregon's Community Service Center, 2005.

Implementing the Approaches

Below is a framework that could be used in further analyzing the feasibility of implementing prioritized mitigation actions after determining – through the use of one of the economic analyses approaches described above – whether or not to implement the mitigation action.

A. **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.

B. 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.

C. 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

These items support the development and funding of hazard mitigation actions:

Federal Emergency Management Agency. (Mar. 2007). *Appendix D: Determining Cost Effectiveness*; From FEMA Publication 551, *Selecting Appropriate Mitigation Measures for Floodprone Structures*. Available at: https://www.fema.gov/sites/default/files/2020-08/fema_551.pdf

Federal Emergency Management Agency. (Jan. 2017). Benefit Cost Toolkit Version 6.0 Available at: <https://www.fema.gov/grants/guidance-tools/benefit-cost-analysis>

Federal Emergency Management Agency. (Dec. 2018). DRR - Section 1215 Management Costs FAQs. <https://www.fema.gov/drra-1215-faq>

Federal Emergency Management Agency. (2015). FY 2015 Hazard Mitigation Assistance Guidance and Addendum. <https://www.fema.gov/media-library/assets/documents/103279>

Goettel, K. (Nov. 2016). *Benefit-Cost Analysis of the Proposed Seismic Retrofit Ordinance*. Goettel and Associates for the City of Portland, Oregon.

Lehman, D. and S. Loper. (1996). *Report on the Costs and Benefits of Natural Hazards Mitigation*. Prepared by Woodward-Clyde Federal Services for FEMA. Available at https://www.fema.gov/media-library-data/20130726-1511-20490-6222/haz_cost.pdf

Rose, A., K. Porter, N. Dash, J. Bouabid, et al. (2007). *Benefit-Cost Analysis of FEMA Hazard Mitigation Grants*. Natural Hazards Review. 8. 97-111. 10.1061/(ASCE)1527-6988(2007)8:4(97). https://www.researchgate.net/publication/4729207_Benefit-Cost_Analysis_of_FEMA_Hazard_Mitigation_Grants Accessed January 23, 2020.

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. <https://www.fema.gov/media-library/assets/documents/96200>

F. 2022-2027 Mitigation Action Tables

Six jurisdictions participated in the 2021-2022 NHMP update. Their continued and new mitigation actions are listed in the table below. These actions were developed in weekly standing meetings August-October 2021 with support of the DLCDC project manager, and in individual meetings with the Curry County Emergency Manager October-December 2021. The highest priority actions are supported by the detailed mitigation action descriptions that follow this table.

Curry County 2022-2027 Mitigation Actions

Curry County's 2022-2027 Mitigation Actions begin on the next page. The goals are restated below.

2022-2026 Curry County Natural Hazard Mitigation Plan Goals:

Goal 1: Save lives and reduce injuries.

Goal 2: Minimize and prevent damage to public and private services, buildings and infrastructure, protect natural and cultural resources as a part of these efforts.

Goal 3: Reduce economic losses by improving lifelines to Curry County from Interstate 5 (communications, supply, and evacuation routes).

Goal 4: Increase public and private sector involvement, including the whole community, in natural hazard mitigation and critical facilities planning, with increased education, outreach, awareness, and collaboration.

Goal 5: Increase cooperation and coordination among private entities, Tribal Nations, and local, state, and federal agencies.

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
22-MH-01	Curry County Emergency Management & Road Department	Multi-Hazard	Develop a reliable, redundant, and resilient communications network in Curry County that mitigates risks from all-hazards. Improve resiliency of local internet data communications. Improve resiliency of local internet data communications.	PS: Inability to communicate with state and federal response system in the event of a Cascadia Subduction Zone event. Funding: HMGP sub-application submitted; application for Grizzly Tower seismic retrofit. Partners: See list in action item description.	High	5-10 years/ \$10 million+	1,2,3,4,5	X	X	X	X	X	X	X
22-MH-02	Curry County Emergency Management	Multi-Hazard	Develop Curry County Mass Care and Evacuation Plans.	Revised 2016 Action #16-MH-12: Identify Red Cross Shelters that are seismically sound and retrofit existing shelters. Plan will cover evacuation, mass care, emergency assistance, temporary housing, human services; details of each function are provided in the FEMA Emergency Support Function #6 – Annex. Partners: Red Cross, OEM, FEMA	High	2-5 years/ \$125k	1,2,3,4,5	X	X	X	X	X	X	X
22-MH-03	Curry County Emergency Management & Road Department	Multi-Hazard	Develop a Curry County Road Resiliency Plan for resilient evacuation routes, alternate roads to Highway 101 in Curry County, and Interstate 5 corridor that mitigate risks from all-hazards. Develop and maintain key lifeline infrastructure; ensure alternate roads are useable in a CSZ event.	Ongoing 2016 Action #16-MH-04 PS: Inability to evacuate in the event of a Cascadia Subduction Zone event; Inability to receive supplies via land in the event of a Cascadia Subduction Zone event.	High	3-5 years/ \$150k	1,2,3,4,5	X	X	X	X			X
22-MH-04	Curry County Emergency Management	Multi-Hazard	Develop a Curry County Recovery Plan.	Revised 2016 Action #16-MH-08: Adopt the 2012 post-disaster framework for Curry County. Partners: OEM	High	3-6 years/ \$200k	1,2,3,4,5	X	X	X	X	X	X	X
22-MH-05	Curry County Emergency Management & Road Department	Multi-Hazard	Work with Ports to ensure the County can receive recovery supplies via water in the event of a Cascadia Subduction Zone disaster.	Tabletop is planned with ports June 2022. PS: Lack of access via land for response/ recovery after a Cascadia event.	High	0-6 months/ staff time	1,2,4,5	X				X	X	
22-MH-06	Curry County Road Department	Multi-Hazard	Develop and begin implementation of a Curry County Communications Tower Master Plan.	Project starting early 2022. PS: System is at end of life, doesn't provide coverage to all areas of the county (dead zones), no connectivity to the I-5 corridor, and has little funding. Countywide communications will not function with backup power if the communication towers and equipment cannot withstand a seismic or wind event. Develop designs for seismic and wind upgrades including alternatives, permitting documentation, etc.	High	1-2 years/ \$100k	1,2,3,4,5	X	X	X	X			X
22-MH-07	Curry County Board of Commissioners	Multi-Hazard	Curry County Rogue-Siskiyou Regional Fire and Emergency Training Center.	Intent is to conduct trainings regionally, statewide, nationally. Partners: City of Gold Beach, Gold Beach Fire.	High	5-10 years/ \$10 million+	1,2,3,4,5	X	X	X	X	X	X	X

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
22-MH-08	Curry County Emergency Management	Multi-Hazard	Ensure the community is connected to emergency notifications on their electronic devices. The effectiveness of this action item is determined by the implementation of the Curry County Communication Tower Master Plan due to the general lack of cell coverage in the county.	This service needs to be provided consistently, without interruption. Social media and electronic devices are priority communication avenues as radio and tv are not produced locally anymore. PS: Inability to have advance warning about disasters and what to do increases injury and loss.	High	1-3 years/ \$75k	1,2,3,4,5	X	X	X	X	X	X	X
22-MH-09	Curry County	Multi-Hazard	Conduct community outreach and training for triage and first aid in partnership with Curry General Hospital.	Develop training materials, trainers, program coordination. CERT teams do outreach to churches and other groups. PS: The public and volunteers are not trained in triage and first aid. These populations may be the only resource immediately available in neighborhoods and communities following a catastrophic event.	High	1-3 years/ \$25k	1,4,5	X	X	X	X			X
22-MH-10	Curry County Emergency Management & Road Department	Multi-Hazard	Install resilient backup power by replacing old generators with a new propane generator and tank at three communication towers: Black Mound, Grizzly Mountain, and Agness Guard Station.	PS: Loss of power/power grid goes down in a hazard event that requires the use of backup power for COMMUNICATIONS. Funding: Road Fund	High	1-3 years/ \$200k	1,2,4,5	X						
22-MH-11	Curry County Planning & Road Departments	Multi-Hazard	Designate 34-acre County property site for emergency use.	Development of County property for multiple emergency operation activities, to include land for road department equipment staging, fueling and debris removal; infrastructure for temporary and emergency housing placement, development of sewer, water, and electrical systems to support site use for emergency operations.	High	2-5 years/ \$250k	1,2,4,5	X		X	X		X	
22-MH-12	Curry County Emergency Management & Road Departments	Multi-Hazard	Establish mutual aid agreements between government agencies and commercial businesses in the event of an emergency (fuel, heavy equipment, food, etc.)	Ongoing 2016 Action #16-MH-06 Road Dept. is moving forward some agreements with the Board of Commissioners in Sept. 2021.	High	6-12 months/ Staff time	1,2,3,5	X	X	X	X	X	X	X
22-MH-13	Curry County Emergency Management & Road Department	Multi-Hazard	Relocate these Road Department facilities out of the local (not distant) tsunami zone with seismic upgrades: Curry County Road Department and Equipment at Hunter Creek Road location.	PS: Curry County cannot respond to or recovery from disasters if key staff do not survive the event. Consider creating a unified campus with Curry County Road Dept, ODOT, OSP. State Highway Patrol AND ODOT including fuel storage	Medium	5-10 years/ \$20 million	1,2,4,5	X						
22-MH-14	Curry County Emergency Management & Road Department	Multi-Hazard	Relocate these Sheriff's Office facilities out of local (not distant) tsunami zone with seismic upgrades: Curry County EOC, Courthouse, Jail + Sheriff's Dept. with dispatch in basement (one building at 29808 Colvin St.)	PS: Curry County cannot respond to or recovery from disasters if key staff do not survive the event.	Medium	5-10 years/ \$20 million	1,2,4,5	X						

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
22-MH-15	Curry County Road Department & Emergency Management	Multi-Hazard	Secure funding for installation of fuel storage tanks.	PS: ODOT owns and maintains the four fuel storage tanks withing Curry County. The current fuel storage capacity cannot sustain operations for multiple agencies in the event of a large-scale emergency or disaster. Augmenting ODOT fuel storage capabilities is necessary to sustain lifesaving operations.	Medium	5-10 years/ \$750k	1,2,4,5	X	X	X	X	X	X	X
22-MH-16	Curry County Planning Department	Multi-Hazard	Utilize the final multi-hazard risk report and assessment currently being developed by DOGAMI through FEMA's Risk Map program to update the Goal 7 Section of the Curry County Comprehensive Plan.	Revised 2016 Action #16-MH-02: Curry County Comprehensive Plan and zoning updates incorporate the best available data. Partners: Curry County Emergency Management	Medium	2-5 years/ staff time	1,2,5	X						
22-MH-17	Curry County Road Department	Multi-Hazard	Secure funding to develop a Curry County Bridge Resiliency Plan.	PS: To address the ODOT bridge seismic and tsunami retrofits which have requested local information/ data analysis and not offered capacity to address those requests.	Medium	2-5 years/ \$150k	1,2,3,4,5	X		X	X		X	
22-MH-18	Curry County Emergency Management	Multi-Hazard	Develop a multi-hazard public education campaign targeted to residents and tourists about the natural hazards Curry County is vulnerable to and mitigation measures they can implement. Encourage citizens to prepare for a minimum of two weeks without services and maintain provisions for four weeks for coastal communities.	Ongoing 2016 Action #16-MH-14 and revised 2016 Action #16-MH-07: increased readiness period. Gold Beach has a webpage and Fb page that can link to the County NHMP page. Partners: OEM	Medium	6-12 months/ Staff time	1,2,4	X	X	X	X	X	X	X
22-MH-19	Curry County Road Department	Multi-Hazard	Secure funding and implement seismic upgrades for the bridges listed in the Curry County 6-Year Road Capital Improvement Plan.	PS: Countywide emergency response will not function if transportation lifelines fail. Roads and bridges are managed by multiple agencies who must coordinate expensive long-term improvements for them to be effective. The bridges listed in the Curry County 6-Year Road Capital Improvement Plan need funding to support seismic retrofits and/or construction to the necessary design level.	Medium	5-20 years/ \$100 million	1,2,3,4,5	X	X	X	X			
22-MH-20	Curry County Emergency Management	Multi-Hazard	Ensure that all critical facilities have backup power and emergency plans in place to deal with power outages.	Ongoing 2016 Action #16-MH-03 Many of these have backup power as of this update. Partners: Hospitals, Fire Departments, Schools.	Medium	2-5 years/ \$75k	1,2,3,4,5	X	X	X	X	X	X	X
22-MH-21	Curry County	Multi-Hazard	Obtain additional backup power/generators in partnership with Curry General Hospital and the medical centers.	PS: The generators currently utilized by the medical facilities are large and vulnerable to hazards. Obtaining additional generators which can be placed out of hazardous areas will mitigate loss of power while promoting lifesaving operations during power outages.	Medium	2-5 years/ \$75k	1,2,5	X	X	X	X			

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
22-MH-22	Curry County Emergency Management	Multi-Hazard	Support regional emergency readiness, response, and mitigation by developing strategic plans and funded programs that address future resiliency and recovery planning priorities.	The county must coordinate with all local, state, and federal partners to ensure that potential recovery assets and locations are resilient and accessible (e.g., Cape Blanco State Airport, etc.) This action item is primarily intended to assist in securing resources to support state and federal recovery/ resilience efforts. Partners: Board of Commissioners	Medium	1-3 years/ \$75k	1,2,3,4,5	X	X	X	X	X	X	X
22-MH-23	Curry County Emergency Management	Multi-Hazard	Encourage special districts (including ports) to develop addenda to the Curry County Natural Hazards Mitigation Plan.	Ongoing 2016 Action #16-MH-11 Required by FEMA, supported by DLCD.	Medium	1-3 years / Staff time	1,2,3,4,5	X						
22-MH-24	Curry County	Multi-Hazard	Develop backup systems for county records.	Ongoing 2016 Action #16-MH-10 Ongoing for Planning/Building, 75% records online. Assessor data is online.	Medium	2-5 years / Staff time	2	X						
22-MH-25	Curry County on behalf of Harbor Water District PUD	Multi-Hazard	Relocate or retrofit the Harbor Water District PUD drinking water system's Ranney collector to an area that is not subject to saltwater intrusion.	PS: The Harbor Water District's intake is upriver 2 miles from the sea and extracts water from the aquifer below the riverbed through a Ranney collector well down 35 feet into the south bank of the Chetco River from the aquifer zone of water-saturated rock, sand, and gravel; and Low Chetco River flows in the late summer of 2014, coupled with high tides and an intake placement two miles upstream, caused significant saltwater intrusion into the Harbor Water District's municipal system, threatening the health of Harbor residents, the elderly, animals, and agriculture production.	Medium	5-10 years/ high	2,5	X	X					
22-MH-26	Curry County on behalf of Coos-Curry Electric Coop	Multi-Hazard	Create and maintain a resilient power infrastructure.	Ongoing 2016 Action #16-MH-13: Explore developing a redundant utility system to supply Curry County with continuous service. Ongoing 2016 Action #16-MH-16: Outsource an engineering analysis/study for each Coos-Curry Electric substation in Curry County (8) to identify necessary work to harden and improve each facility's reliability and structural integrity. Ongoing 2016 Action #16-MH-17: Coos-Curry Electric needs to replace critical overhead distribution feeders with underground to facilitate power restoration work and lessen power outage duration after major weather events.	Medium	5-10 years/ high	1,2,4,5	X	X	X	X	X	X	X
22-MH-27	Curry County	Multi-Hazard	Coordinate with critical facilities to identify and lease parcels for equipment, supply, and emergency storage.	This action item is intended to support agencies that need storage, with preference to sites out of the tsunami zone.	Medium	1-3 years / Staff time	1,2,4,5	X		X				X

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
22-MH-27	Curry County Emergency Management	Multi-Hazard	Educate and encourage businesses, schools, and governmental organizations to develop continuity of operations plans (COOPs).	Ongoing 2016 Action #16-MH-09 Step one is to identify and train staff members on COOP development.	Low	6-12 months/ Staff time	1,2,4	X	X	X	X	X	X	
22-MH-28	Curry County Emergency Management	Multi-Hazard	Further develop risk assessment maps to show areas at risk for all hazards.	Ongoing 2016 Action #16-MH-05 These are current as of the plan update. Partners: DOGAMI, DLCD	Low	1-3 years / \$75k	1,2,3,4,5	X	X	X	X	X	X	
22-MH-29	Curry County Emergency Management	Multi-Hazard	Support buyouts for structures at risk of severe damage or total loss.	Dept. of Land Conservation and Development; Oregon Parks and Recreation Dept.	Low	5-10 years	1,2,4,5	X	X	X	X	X	X	X
22-DR-01	Curry County Planning Department	Drought	Continue to enforce existing water requirement codes for rural residents through Oregon Water Resources Dept.	Ongoing 2016 Action #16-DR-01 All Planning Clearances require identification/coordination with Water Resources Department.	Low	0-6 months/ Staff time	2	X			X			
22-DR-02	Curry County on behalf of Curry Soil & Water Conservation District	Drought	Support agricultural producers with water provisioning, low interest financing or grants, water conservation equipment, and technical assistance to mitigate low flow conditions and to plan for future seasons.	PS: 197 Agricultural producers, covering 63,342 acres with \$33,782,000 in annual gross agricultural sales rely upon stream flows that are at record low levels in 2021. Partners: Curry Soil & Water Conservation District	Medium	1-3 years/ medium	2,5	X						
22-EQ-01	Curry County Emergency Management	Earthquake	Provide online seismic retrofit information (structural and non-structural) to the Curry County and City websites and work with government agencies, businesses, and residents to prevent damage from earthquakes.	Revised 2016 Action #16-EQ-01 Conduct non-structural seismic retrofit workshops Partners: Curry County Planning Dept., OEM, DOGAMI	Low	6-12 months/ Staff time	1,2,4	X	X	X	X	X	X	
22-FL-01	Curry County Road Department	Flood	Mitigate roadway flooding on approximately ½ mile of Hunter Creek Road between State Police Facility and Freeman Marine by elevating the road section by 3 feet.	PS: Chronic annual roadway flooding occurs on approximately ½ mile of Hunter Creek Road between State Police Facility and Freeman Marine near multiple critical facilities (OSP, ODOT, Curry Road Dept) during high tide and heavy rain events. Partners: Oregon State Police, OR Dept of Transportation	Medium	5-10 years/ \$1.2 million	1,2,5	X		X				
22-FL-02	Curry County Road Department	Flood	Lower Harbor Road Drainage Project: Mitigate culvert failure during high flow events by installing a headwall with a trash rack and sediment basin.	Status: Pending completion of the Curry County Stormwater Master Plan projected for Spring 2022. PS: The existing 36” CMP culvert was determined to have nearly full flow capacity, but this can be impeded by debris. PS: The culvert condition needs to be evaluated during low flow, if it is bad it would need to be retrofit.	Medium	5-10 years/ \$1 million	2,5	X						

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
22-LS-01	Curry County Road Department	Landslide	Mitigate landslide on Jerry's Flat Road—soldier pile wall. Install a retaining wall with structural support to protect the road and the main water transmission line for the City of Gold Beach.	A half-mile section of road slides annually puts the line at risk. If the water main breaks it will take out the road. This is an access road for 1,000 homes but there is not an alternate route for non-4x4. (A leak occurred two years ago in the ductile pipe.) Partners: 2021-2022 Federal Lands Access Program (FLAP) Grant Program (applied for \$20 million in federal funds); USFS letter of support, Gold Beach.	High	5-10 years /\$20 million	1,2,5	X		X		X		X
22-LS-02	Curry County Road Department	Landslide	Coordinate to secure a new DOGAMI Landslide Study using new LiDAR data.	New data anticipated in December 2021. PS: Data gaps in landslide data for lifeline route planning. 2014 study is detailed, but limited to the coastal communities: https://www.oregongeology.org/pubs/ofr/p-O-14-10.htm Partners: DOGAMI, OEM	High	2-5 years/ Staff time	1,2,5	X	X	X	X	X	X	
22-LS-03	Curry County Emergency Management	Landslide	Educate the community about the value of flood insurance for coverage of mudslide and debris flow events.	PS: Communities with insurance in force have 10 times the financial resources available to rebuild after a disaster than the uninsured. It is the difference in receiving \$10k instead of \$100k. Partners: CERT Gold Beach educates about debris flow in their annual preparedness education.	Medium	6-12 months/ Staff time	2,3,4	X	X	X	X		X	
22-LS-04	Curry County Road Department	Landslide	Continue to track landslide events alongside major roadways and develop appropriate mitigation measures.	Ongoing 2016 Action #16-LS-01	Medium	0-6 months/ Staff time	1,2,5	X	X	X	X		X	
22-LS-05	Curry County	Landslide	Identify and coordinate with state and local partners around landslide risk areas along major corridors and development areas.	Arizona Ranch, Hooskanaden	Low	Long/ High	1,2,5	X	X	X				X
22-TS-01	Curry County Emergency Management & Road Department	Tsunami	Clearly identify tsunami evacuation routes through signage upgrade/ replacement and adopting way finder methods for all populations. Conduct annual inspections of evacuation routes and signage.	Problem Statement: Tsunami evacuation signs are small and not eye-catching, and few signs are found when leaving U.S Highway 101. Signage should be placed along entirety of evacuation route. Assembly area signage should be installed at all assembly areas.	High	1-3 years/ \$200k	1,2,4,5	X	X	X	X	X	X	
22-TS-02	Curry County Emergency Management & Road Department	Tsunami	Identify new evacuation routes for areas of the County that are rapidly developing; coordinate with DOGAMI/NANOOS.	Problem Statement: Need to identify alternate or additional routes. Some tsunami evacuation routes have been identified and recently published for Port Orford, Gold Beach, Brookings, and Harbor. There is a need for updated or new maps for remaining County communities. Problem Statement: Inability to evacuate the population from Harbor area along Oceanview Drive—the most rapidly developing area in Curry County.	High	1-3 years/ \$250k	1,2,4,5	X	X	X	X			

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
22-TS-03	Curry County Emergency Management	Tsunami	Develop a trail system that can support a funded, maintained evacuation route.	Add tsunami evacuation signage to existing trails where relevant and support long term funding for these trails. Problem Statement: It is nearly impossible to coordinate maintenance of evacuation routes on private property.	High	2-5 years/ \$250k	1,2,3,4,5	X	X	X	X		X	
22-TS-04	Curry County Emergency Management & Road Department	Tsunami	Tsunami evacuation route drills: Educate the community about where to evacuate and when. Practice evacuation drills with neighborhoods and community organizations.	PS: Many areas of Curry County have a very short time to evacuate after a Cascadia event before the first tsunami waves arrive. It is critical that everyone know where the closest evacuation routes are located from home, work, and school if those locations are in the tsunami zone. PS: A distant tsunami may also require evacuation, which could test local emergency responders' and public officials' coordination abilities/ knowledge (ICS, etc.) if key response activities have not been practiced.	High	1-3 years/ \$100k	1,2,4,5	X	X	X	X		X	
22-TS-05	Curry County	Tsunami	Secure funding for vertical evacuation structures in high-risk areas.	Consider adding an evacuation area to the new Gold Beach High School. OSU now has a tsunami evacuation structure in Newport. PS: High-risk areas have little time to evacuate in the event of a local tsunami, some areas must travel too great a distance to reach an assembly/evacuation point. Vertical evacuation facilities provide a safe and nearby assembly area. Partners/Funding: OEM, FEMA.	High	5-20 years/ \$3 million	1,4,5	X		X	X	X		
22-TS-06	Curry County on behalf of Curry General Hospital	Tsunami	Engineer assessment of reinforcing and/or protecting the Curry General Hospital generator and fuel supply from a tsunami event.	PS: The power supply is on the ocean side of the hospital and in the tsunami zone. Seismic upgrades have been done when the hospital was rebuilt.	Medium	1-3 years/ \$75k	1,2,4,5	X						
22-TS-07	Curry County Emergency Management	Tsunami	Post DOGAMI and other tsunami evacuation maps on the website.	Ongoing mitigation action	Medium	0-6 months/ staff time	1,2,4,5	X	X	X	X	X	X	
22-TS-08	Curry County Emergency Management & Road Department	Tsunami	Upgrade the tsunami emergency alert system to modern standards, including sirens. ODOT informational signs that come in/out of Curry County (such as Hwy101 closed) could be used as a part of a notification system.	PS: Tourists and the local community without Everbridge may not know to evacuate a distant tsunami. PS: Cell service is not available in most of the County.	Medium	2-5 years/ High	1,2,4,5	X	X	X	X	X	X	
22-TS-09	Curry County Emergency Management	Tsunami	Seek funding to relocate critical services outside of the tsunami inundation zone.	Ongoing 2016 Action #16-TS-01	Medium	Long/High	1,2,3,4,5	X		X	X			X

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
22-TS-10	Curry County	Tsunami	Educate about the tsunami risk—educate the buyer, educate about the tsunami routes. Include evacuation route information in land title disclosure information. Provide educational materials for residential evacuations to include modular homes.	PS: New development applications do not take the tsunami zone into consideration due to a BCC decision ~2017. It is nearly impossible to restrict hotel development as all the tourists want to stay on the beach. PS: Residents living within the tsunami zone must be educated and trained on quick evacuation and how to exit structures that have partially to fully collapsed.	Medium	1-3 years/ staff time	1,2,4,5	X	X	X	X			
22-TS-11	Curry County Emergency Management	Tsunami	Educate about the tsunami risk—hotel brochures, signage, tourist areas, such as those in Newport.	PS: Tourists have no idea when, how, or where to evacuate to in the event of a tsunami.	Low	2-5 years/ \$150k	1,2,4,5	X	X	X	X		X	
22-TS-12	Curry County	Tsunami	Develop a Tsunami Evacuation Facilities Improvement Plan.	PS: New development in the tsunami zone can add people to a hazard zone who are unable to or unaware of how to evacuate. Description: New development in the tsunami zone could be subject to requirements like installing tsunami evacuation routes.	Low	5-10 years/ \$100k	1,2,4,5	X	X	X	X	X	X	
22-WF-01	Curry County on behalf of Curry Fire Defense Board	Wildfire	Identify high-risk areas and actions residents can take to reduce their risk.	County Planning uses Oregon Explorer to identify high risk areas of the county. This approach could be used to prioritize high-risk areas. Partners: ODF, Coos Forest Protective Association, Wild Rivers Foundation, Curry Watersheds Partnership.	High	1-3 years/ \$75k	1,2,4,5	X	X	X	X			X
22-WF-02	Curry County on behalf of Curry Fire Defense Board	Wildfire	Promote public awareness campaigns for individual property owners living in the Wildland/Urban Interface (WUI).	Partners: Fire Districts, Coos Forest Protective Assoc., Rogue-Siskiyou National Forest, ODF.	High	0-6 months/ staff time	1,2,4,5	X	X	X	X			X
22-WF-03	Curry County on behalf of Curry Fire Defense Board	Wildfire	Promote wildfire mitigation through public education, fuels reductions, and improvement of transportation corridors.	Partners: Multiple County departments, Fire Districts, Coos Forest Protective Association, BLM, Rogue-Siskiyou National Forest, ODF.	High	1-3 years/ \$75k	1,2,4,5	X	X	X	X			X
22-WF-04	Curry County Planning Dept.	Wildfire	Promote wildfire education and awareness via the Firewise program.	Partners: Curry County Emergency Management, ODF.	High	0-6 months/ staff time	1,2,4,5	X	X	X	X			X
22-WF-05	Curry County Planning Dept.	Wildfire	Continue to provide vegetation management recommendations for unincorporated areas of the county as a part of Firewise and permit applications.		High	0-6 months/ staff time	1,2,4,5	X	X	X	X			X
22-WF-06	Curry County on behalf of Curry Fire Defense Board	Wildfire	Hazard fuel reduction on county-owned forest land adjacent to communities at risk.	Partners: Fire Districts, Coos Forest Protective Association, Rogue-Siskiyou National Forest, ODF.	High	2-5 years/ \$100k	1,2,4,5	X	X	X	X			X

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
22-WF-07	Curry County on behalf of Curry Fire Defense Board	Wildfire	Develop/Maintain Mutual Aid Agreement and Memorandums of Understanding with: County Chiefs Coos County Del Norte County Coos Forest Protective Association Rogue River-Siskiyou National Forest	Partners: Fire Districts, Coos Forest Protective Association, Del Norte County, Rogue-Siskiyou National Forest, ODF.	High	0-6 months/ staff time	1,2,4,5	X	X	X	X			X
22-WF-08	Curry County on behalf of Curry Fire Defense Board	Wildfire	Work with local fire districts to ensure coordinated preparedness and response.	Outcomes include code language and enforcement. Partners: 14 fire districts	High	1-2 years/ \$250K	1,2,4,5	X	X	X	X			X
22-WF-09	Curry County Planning Department	Wildfire	Enforce new development to incorporate wildfire mitigation measures and ensure adequate emergency access, when required by zoning ordinance.	Revised 2016 Action #16-WF-02: Recommended fire mitigation measures on all new Planning Clearances in Rural Areas.	High	2-5 years/ Staff time	1,2,4,5	X	X	X	X			X
22-WF-10	Curry County on behalf of Curry Fire Defense Board	Wildfire	Develop a wildfire coalition that brings everyone together to make efficient risk-based wildfire management decisions.	Partners: Residents, businesses, Fire Districts, Cities, County.	Medium	5-10 years/ moderate	1,2,4,5	X	X	X	X			X
22-WF-11	Curry County on behalf of Curry Fire Defense Board	Wildfire	Secure funding for fire personnel training and exercises to test and build skillsets.	Mass casualty and fire training/exercises. Partners: Fire Districts, Coos Forest Protective Association.	Medium	1-3 years/ \$500k	1,2,4,5	X	X	X	X			X
22-WF-12	Curry County on behalf of Curry Fire Defense Board	Wildfire	Conduct fuel treatments in and near communities to provide buffer zones to protect structures, important community assets, and evacuation routes.	Partners: Rogue-Siskiyou NF, ODF, Firewise	Medium	2-5 years/ high	1,2,4,5	X	X	X	X			X
22-WF-13	Curry County on behalf of Curry Fire Defense Board	Wildfire	Restore and maintain wildland fire resilient landscapes across all jurisdictions.	PS: 97% of Curry County is forested and approx. 66% is National Forest land (OFRI). Partners: Rogue-Siskiyou National Forest, Bureau of Land Management, Coos Forest Protective Assoc.	Medium	5-10 years/ high	1,2,4,5	X	X	X	X			X
22-WF-14	Curry County on behalf of Curry Fire Defense Board	Wildfire	Acquire and install fire detection cameras.	Consider partnering with Coos Forest Protective Association to conduct monitoring at select locations. Port Orford is dealing with Sudden Oak Death so it could be a good candidate.	Low	2-5 years/ \$100k	1,2,4,5	X	X	X	X			X

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
22-WF-15	Curry County Emergency Management, Commissioners, Planning Department	Wildfire	Review and update the 2008 Curry County Wildfire Protection Plan.	Ongoing 2016 Action #16-WF-01 Partners: Coos Forest Protective Association, Curry Fire Defense Board, ODF.	Low	2-5 years/ \$125k	1,2,4,5	X	X	X	X	X	X	X

Cities 2022-2027 Mitigation Actions

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
CITY MITIGATION ACTIONS														
Brookings 22-MH-01	City of Brookings	Multi-Hazard	Safe Drinking Water Resiliency Project: Add a second drinking water supply source for Brookings & Harbor that is not susceptible to saltwater intrusion.	This action is based upon the Redundant Water Supply Plan of 2015 which provided recommendations, preliminary concepts, schematic drawings and cost estimates for capital improvement projects. Partners: Harbor Water District PUD	High	2-5 years/ \$500k	1,2,5	X	X					
Brookings 22-MH-02	City of Brookings	Multi-Hazard	Storm and Sanitary Sewer Disaster Repairs Project	Annual projects to address the infiltration and intrusion problems in the city sewer system. The ability of surface water to flow into the city sewer system could result in combined sewer overflows and system risk. Total projects cost ~\$20 million.	High	Annually \$200k	2,4	X	X					
Brookings 22-MH-03	City of Brookings	Multi-Hazard	Continue to implement and enhance public education programs regarding wildfires, earthquakes, and tsunamis.	Ongoing 2016 Brookings Action 10-WF-01. Provide fire safety and fire prevention information pamphlets in easy to read and understandable format. Target areas frequented by tourists such as motels, RV parks, community and state parks, restaurants, real estate offices, and chamber of commerce for local cities. Establish weekly fire prevention articles in local print media during fire season. Partners: ODF, USFS	High	1-3 years/ staff time	1,2,4,5	X	X					
Brookings 22-MH-04	City of Brookings	Multi-Hazard	Review the City of Brookings comprehensive plan for updates to hazard specific sections to reflect the latest information on seismic hazards in each community.	Check in with Meg Reed on this, possibly complete or started.	Medium	1-4 years/ staff time	1,2,4,5	X						
Brookings 22-DF-01	City of Brookings; OWRD	Dam Failure	Remove or rehabilitate Ferry Creek Dam pending feasibility study review.	See the High Hazard Potential Dam annex in the Appendices.	High	2-5 years	1,2,4,5	X	X					
Brookings 22-LS-01	City of Brookings	Landslide	Continue to identify and map high risk slide areas to create an accurate logistical assessment.	Ongoing 2010 Brookings Action 10-LS-01	High	Long/ High	1,2,5	X	X					
Brookings 22-TS-01	City of Brookings	Tsunami	Adopt a Tsunami Land Use Overlay Zone.	Discuss with Meg; Brookings only has very specific lots.	Medium	1-3 years/ staff time	1,2,4,5	X	X					

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
Brookings 22-WF-01	City of Brookings on behalf of Curry Fire Defense Board	Wildfire	Address fuels on vacant lots via local wildfire regulations.	This is implemented within Brookings’s city limits.	Medium	2-5 years/ high	1,2,4,5	X	X					
Gold Beach 22-MH-01	City of Gold Beach Fire & Police Departments	Multi-Hazard	Continue to implement public education programs regarding natural hazards.	Ongoing 2016 Action #10-MH-02	High	6-12 months/ Staff time	1,2,4	X		X				
Gold Beach 22-MH-02	City of Gold Beach	Multi-Hazard	Identify and map all roads, private drives, logging trails to increase the ability of firefighters to locate and gain access to provide services and/or evacuations.	Ongoing 2016 Action 16-WF-02 Lead: Gold Beach Fire Department, Public Works, Police, Planning. Partners: Coos Forest Protective Association, U.S. Forest Service, Industrial Partners (logging companies), BLM, Curry Wildfire Protection Team, Curry County Road Department, ODOT.	High	6-12 months/ Staff time	1,2,4,5	X		X				
Gold Beach 22-MH-03	City of Gold Beach Public Works Department, City Manager	Multi-Hazard	Relocate Gold Beach facilities out of the local (not distant) tsunami zone with seismic upgrades: City of Gold Beach City Hall, Police, Fire Depts at 29592 Ellensburg Ave	The current viable alternatives retain a tsunami risk. Moving the facilities may still require tsunami resilient construction methods. Discussions have occurred about relocation but there is no clear direction about where to move due to the lack of level ground and landslide risk.	Low	Long/ High	1,2	X		X				
Gold Beach 22-EQ-01	City of Gold Beach	Earthquake	Seek funding to retrofit buildings and/or infrastructure at risk of damage in a high magnitude earthquake.	Ongoing 2016 Action 10-EQ-01 School district conducted seismic retrofits with this funding. Partners: Curry County Emergency Management & Road Department	Low	Long/ High	1,2	X		X				
Gold Beach 22-FL-01	City of Gold Beach	Flood	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.	Ongoing 2016 Action #10-FL-01 The city adopted the updated maps in 2018. Partners: FEMA, DLCD.	High	6-12 months/ Staff time	1,2,5	X		X				
Gold Beach 22-LS-01	City of Gold Beach	Landslide	Continue to identify and map high risk slide areas to create an accurate logistical assessment.	Ongoing 2016 Action Gold Beach 16-LS-01	High	Long/ High	1,2	X		X				

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
Gold Beach 22-WF-01	City of Gold Beach	Wildfire	Through multi-agency coordination, develop an abatement plan for control of noxious weeds, specifically Gorse, Scotch Broom, Butterfly Brush, and pampas grass.	Ongoing 2016 Action 16-WF-01 Curry Watersheds Partnership has a noxious weed management program that serves Gold Beach. For Gold Beach, their priority invasive plant species is <i>Cortaderia selloana</i> is a species of flowering plant in the grass family often referred to by the common name pampas grass. It is native to South America. Partners: Gold Beach Fire Department, Public Works, Curry Wildfire Protection Team	Medium	2-5 years/ \$25k	1,2,4,5	X		X				
Port Orford 22-MH-01	City of Port Orford	Multi-Hazard	Relocate Port Orford facilities out of the local (not distant) tsunami zone with seismic upgrades: City of Port Orford City Hall, Police, Fire Depts at 555 20th Street	Partners: Curry County Emergency Management & Road Department	High	2-5 years/ \$2.5 million	1,2,3,4,5	X			X			
Port Orford 22-MH-02	City of Port Orford	Multi-Hazard	Prepare a post-tsunami redevelopment plan for the City of Port Orford as opportunities for funding such a plan become available.	Status: This work will likely be done in conjunction with Curry County Recovery Plan efforts. Not started/revised 2016 action #16-MH-03; continued from 2010 plan. Partners: Curry County Emergency Management, Dept. of Geology and Mineral Industries, Oregon Emergency Management, Dept. of Land Conservation and Development	Medium	2-5 years/ \$125k	1,2,3,4,5	X			X			
Port Orford 22-MH-03	City of Port Orford	Multi-Hazard	Develop and implement an Emergency Operations Plan (EOP).	Status: From discontinued 2016 Action #16-MH-02. The City's EOP would follow the County's update. Partners: Curry County Emergency Management, Oregon Emergency Management.	Medium	2-5 years/ \$75k	1,2,3,4,5	X			X			
Port Orford 22-MH-04	City of Port Orford	Multi-Hazard	Continue to implement and enhance public education program regarding earthquakes and tsunamis.	New signage, pamphlets, staff time. Status: Ongoing 2016 Action #16-MH-04. Partners: City of Port Orford Police and Fire Port Orford School District, DOGAMI, OEM.	Medium	2-5 years/ \$50k	1,2,4,5	X			X			
Port Orford 22-MH-05	City of Port Orford	Multi-Hazard	Continue to review the City of Port Orford Comprehensive Plan for the need to update hazard specific section to reflect the latest information on all hazards.	Status: Revised 2016 Action #16-MH-05. Partners: DOGAMI, City of Port Orford Planning, Public Works.	Medium	2-5 years/ \$25k	1,2,4,5	X			X			

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
Port Orford 22-MH-06	City of Port Orford	Multi-Hazard	Work with Curry County to update emergency management plans, upon release of updated reports, including systems for disaster warnings, and procedures for the protection of citizens in the case of earthquakes, tsunamis and other natural disasters.	Status: Ongoing/ revised 2016 Action #16-MH-01 Action components: Regularly brief the City Council and Planning commission regarding new reports and plan updates. Meet with Curry County Emergency Management on at least a quarterly basis. Partners: Curry County Emergency Management. Source: Port Orford Comprehensive Plan, Goal 7 Section, Policy 5.	Medium	2-5 years/ \$125k	1,2,3,4,5	X			X			
Port Orford 22-MH-07	City of Port Orford	Multi-Hazard	Develop and implement a Continuity of Operations Plan (COOP).	Status: From discontinued 2016 Action #16-MH-02. The city is working with high school volunteers to assist with backup document scanning and other COOP implementation. The County is developing a strategy for training on COOP with FEMA EMI. Partners: Curry County Emergency Management, Oregon Emergency Management.	Low	3-5 years/ \$125k	1,2,3,4,5	X			X			
Port Orford 22-MH-08	City of Port Orford	Multi-Hazard	Identify and map all roads, logging trails, and private drives to access during a catastrophic event.	Status: Ongoing 2016 Action #16-MH-06. Partners: City of Port Orford Planning Dept., Curry County Emergency Services, Private Logging Companies, USFS, BLM.	Low	2-5 years/ \$25k	1,2,3,4,5	X			X			
Port Orford 22-DR-01	City of Port Orford	Drought	Develop and maintain a resilient water supply for Port Orford.	Very high priority. In 2014 a bond for \$42 million was requested of voters, but in 2021 this will only cover 60% of the costs. PS: The City of Port Orford issued a state of emergency on 9/1/2021 due to water supply issues related to the drought, impoundment structural issues, distribution system leaks, and demand. Partners: City of Port Orford, Curry County Emergency Services. PS: Water leaks result in loss of 40% of treated drinking water supply (per 9/21 County drought declaration); expensive repairs are needed to mitigate severe water losses.	High	2-5 years/ \$70 million	1,2,5	X			X			

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
Port Orford 22-DR-02	City of Port Orford	Drought	Repair or retrofit the Port Orford water storage to reduce or eliminate leaks.	High priority repairs to the dam are needed; the plan for the repairs should be ready in Dec. 2021. PS: Hubbard Creek and the water storage provided by the impoundment there is the sole drinking water supply source for Port Orford. PS: Water leaks result in loss of 40% of treated drinking water supply (per 9/21 County drought declaration); expensive repairs are needed to mitigate severe water losses.	High	5-10 years/ \$500k	1,2,5	X			X			
Port Orford 22-DR-03	City of Port Orford	Drought	Develop a backup water source other than Garrison Lake for the Port Orford municipal drinking water system.	Status: The City is reviewing their water rights. PS: Hubbard Creek and the water storage provided by the impoundment is the sole drinking water supply source for Port Orford.	High	2-5 years/ \$500k	1,2,5	X			X			
Port Orford 22-EQ-01	City of Port Orford	Earthquake	Upgrade/Retrofit Critical facilities to reduce potential of earthquake collapse.	Status: Schools done, verify others. Ongoing 2010 action #10-EQ-01. Partners: Port Orford School District, Business Oregon, Curry County Emergency Management, DOGAMI	Medium	5-10 years/ \$500k	1,2,3,4,5	X			X			
Port Orford 22-LS-01	City of Port Orford	Landslide	Continue to identify and map high risk slide areas to create an accurate logistical assessment. Evaluate current and high hazard slides for mitigation possibilities and funding sources	Status: Ongoing 2016 Action #16-LS-01. Status: Started 2016 Action #16-LS-02. Partners: City of Port Orford Public Works, DOGAMI, Oregon Department of Transportation	Medium	2-5 years/ \$125k	1,2,3,4,5	X			X			
Port Orford 22-TS-01	City of Port Orford	Tsunami	Work with other agencies and community organizations to develop natural disaster shelters outside the tsunami inundation zone.	Status: Disaster cache work has begun, shelters have not. Ongoing/revised 2016 Action #16-TS-01 Partners: Curry County Emergency Management, Dept. of Geology and Mineral Industries, Oregon Emergency Management, FEMA, NANOOS http://nvs.nanoos.org/TsunamiEvac Source: Port Orford Comprehensive Plan, Goal 7 Section, Hazard Policy 7.	High	2-5 years/ \$500k	1,2,3,4,5	X			X		X	
Port Orford 22-WF-01	City of Port Orford	Wildfire	Through multi-agency coordination, develop an abatement plan for control of noxious weeds, specifically Gorse, Scotch Broom and Butterfly Brush.	Status: In 2021, planning for gorse is happening at watershed level via the Port Orford Watershed Committee. Ongoing 2016 Action #16-WF-01. Partners: Private Landowners within the City, Curry County, Weed Board	Medium	2-5 years/ \$75k	1,2,4,5	X			X			
Port Orford 22-WF-02	City of Port Orford	Wildfire	Continue wildfire prevention through public education programs to target residents, tourist, and companies in the area.	Status: Ongoing 2016 Action #16-WF-03. Partners: City of Port Orford Fire Department, Oregon Department of Forestry, Coos Forest Protection Association.	Medium	2-5 years/ \$25k	1,2,4,5	X			X			

Ports 2022-2027 Mitigation Actions

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
PORT MITIGATION ACTIONS														
Port GB 22-MH-01	Port of Gold Beach	Multi-Hazard	Deepen/Dredge channels near high hazard zones.	Partners: U.S Army Corps of Engineers (USACE)	High	2-5 years/ \$20+ million	1,2,4,5	X				X		
Port GB 22-MH-02	Port of Gold Beach	Multi-Hazard	Replace, increase size and stability of, and install new dock piles	PS: Current piles and locations restricts size of boats. Piles may be compromised due to previous hazard impacts.	High	2-5 years/ \$750k	1,2,4,5	X				X		
Port GB 22-MH-03	Port of Gold Beach	Multi-Hazard	Secure funding to purchase equipment / assets (boats, cranes, hoist, dozer) to assist in response and recovery activities, expediting the re-establishment of the port. Equipment will be staged outside the tsunami inundation zone.	PS: The port does not have equipment to store outside the tsunami inundation zone, increasing the vulnerability of the port.	Medium	2-5 years/ \$500k	1,4,5	X				X		
Port GB 22-MH-03	Port of Gold Beach	Multi-Hazard	Develop plans to restrict traffic entering port and aid traffic evacuating	PS: Residents and visitors may not be aware of evacuations or intend to observe a tsunami or flood event from Port property. The Port plan should support local plans.	Medium	1-3 years/ Staff Time	1,4,5	X				X		
Port GB 22-EQ-01	Port of Gold Beach	Earthquake	Secure funding for High Dock seismic assessment and retrofit	PS: The High Docks was built in the 1960s and has not been through a retrofit.	High	2-5 years/ \$10 million	1,2,4,5	X				X		
Port PO 22-MH-01	Port of Port Orford	Multi-Hazard	Retrofit and maintain tsunami evacuation route from port, including identifying and installing alternate route.	PS: The port's tsunami evacuation route travels through a projected landslide zone, blocking the route for all port personnel.	High	5-10 years/ \$1 million	1,2,4,5	X					X	
Port PO 22-MH-02	Port of Port Orford	Multi-Hazard	Replace, increase size and stability of, and install new dock piles	PS: Current piles and locations restricts size of boats. Piles may be compromised due to previous hazard impacts.	High	1-3 years/ \$200k	1,2,4,5	X					X	
Port PO 22-MH-03	Port of Port Orford	Multi-Hazard	Secure funding for assessment of port dock and seismic upgrades.	PS: The sheet plate is underwater and may not withstand an earthquake. A compromised dock will inhibit the port re-establishment.	High	2-5 years/ \$100k	1,2,4,5	X					X	

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
Port PO 22-MH-04	Port of Port Orford	Multi-Hazard	Ensure new infrastructure components are adequately designed to minimize risk from natural hazards	The aging infrastructure of the port components causes concern of the port stability and resilience.	High	5-10 years/ \$3 million	1,2,4,5	X					X	
Port PO 22-MH-05	Port of Port Orford	Multi-Hazard	Reinforce/reconfigure harbor control structures	PS: Harbor controls will be impacted, degraded, or destroyed during a tsunami or flood event.	High	5-10 years/ \$500k	1,2,4,5	X					X	
Port PO 22-MH-06	Port of Port Orford	Multi-Hazard	Reinforce, elevate, retrofit commercial receiving docks for resilience.	Dock has received damage in previous high wave events.	Medium	10-15 years/ \$750k	1,2,4,5	X					X	
Port PO 22-MH-07	Port of Port Orford	Multi-Hazard	Stormwater drainage	Antiquated system needs an upgrade to necessitate new development.	Medium	5-10 years/ \$600k	1,2,4	X					X	
Port PO 22-MH-08	Port of Port Orford	Multi-Hazard	Upland Storage Area – Aboveground fuel storage, fuel, water, wastewater, electrical service line support structure	Reinforcement or relocation should be considered to protect the Upland Storage area.	Medium	5-10 years/ \$15k	1,2	X					X	
Port PO 22-MH-09	Port of Port Orford	Multi-Hazard	Inventory system infrastructure locations subject to flood damages, including scour/erosion.	There needs to be an inventory to prioritize projects and conduct assessments following a disaster.	Medium	1-3 years / Staff Time	1,2,4,5	X					X	
Port PO 22-MH-10	Port of Port Orford	Multi-Hazard	Purchase equipment / assets (boats, cranes, hoist, dozer) to assist in response and recovery activities, expediting the re-establishment of the port. Equipment will be staged outside the tsunami inundation zone.	PS: The port does not have equipment to store outside the tsunami inundation zone, increasing the vulnerability of the port.	Medium	5-10 years/ \$50k	1,4,5	X					X	
Port PO 22-MH-11	Port of Port Orford	Multi-Hazard	Fortify and armor breakwaters	PS: The breakwater has been damaged in the past. The breakwater is needed to protect the cove and dock.	Medium	10-15 years/ \$5 million	1,2,4,5	X					X	
Port PO 22-MH-12	Port of Port Orford	Multi-Hazard	Reduce exposure of petroleum/chemical facilities	Reinforce, protect, and/or relocate facilities to prevent exposure due to natural hazards.	Low	5-10 years/ \$250k	1,2	X					X	
Port PO 22-MH-13	Port of Port Orford	Multi-Hazard	Install debris deflection booms to protect dock / port	Excessive debris carried by king tides, floods, and tsunamis creates additional tasks for the port to complete before operations can re-establish.	Low	5-10 years/ \$100k	1,2,4,5	X					X	
Port PO 22-EQ-01	Port of Port Orford	Earthquake	Evaluate the seismic vulnerabilities of embankments and over structures, prioritize replacements with seismically designed stabilizing methods.	The port is exposed to increased cascading risks in the event of a large earthquake, to include nearby landslides and falling rock from Coast Guard Hill.	High	2-5 years/ \$20k	1,2,4,5	X					X	

Action Item #	Lead	Hazard	Mitigation Action	Status/ Description/Partners PS=Problem Statement	Priority	Timeline /Cost	Goals met by Action	Curry County	City of Brookings	City of Gold Beach	City of Port Orford	Port of Gold Beach	Port of Port Orford	Fire Defense Board
Port PO 22-LS-01	Port of Port Orford	Landslide	Embankment repair, via H-pile / concrete section stabilization	A landslide event will prevent port evacuation, current evacuation route will be blocked by the landslide. Landslide mitigation is necessary to protect port employees.	Medium	10-15 years/ \$500k	1,2,4,5	X					X	
Port PO 22-TS-01	Port of Port Orford	Tsunami	Install tsunami signage and tsunami education displays	Visitors and port employees must have awareness of the tsunami hazard and the evacuation routes, both of which are not currently available in the port area.	High	1-3 years/ \$10k	1,2,4,5	X					X	

G. 2022-2027 Mitigation Action Descriptions

Curry County

Unincorporated areas, All County Departments

Multi-Hazard Action 22-MH-01:

Develop a reliable and resilient communications network in Curry County that mitigates risks from all-hazards. Improve resiliency of local internet data communications

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$10 million+
Timeline	5-10 yrs.
Responsible Agency	Curry County Emergency Management & Road Department
Priority	High

Description

Development of a regional fiber network, Internet Access Exchange, and a Data Center with an equipment colocation space is needed to enhance the resiliency of local internet data communications. As many notification and alert systems rely on cell carrier service or internet, resilient internet data communications enhance outreach and communications with the public.

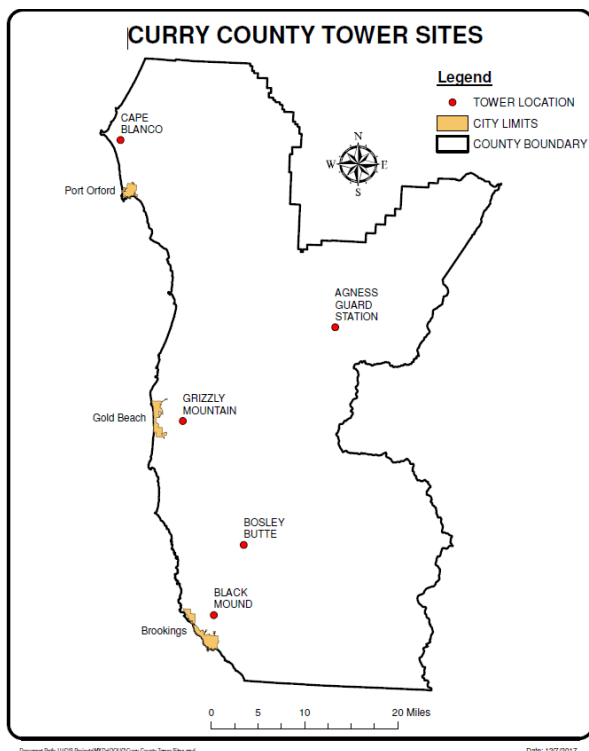
Modernize the local telecommunications networks by implementing a localized internet peering strategy to interconnecting all local telecommunication networks:

- Interconnect local internet users within all local networks in order to services/content closer to the user.
- Evaluate where critical services are hosted/delivered and move/replicate services within the local internet peered networks.
- Lower internet long haul cost by removing internet traffic that can remain local.
- Build a distributed (north/south) internet peering fabric to increase local telecommunication resiliency.
- In addition, it improves the quality of experience for end users since content is served closer to the consumer.
- Evaluate and further develop B2B IP peering to improve performance and resiliency of coast network telecommunication services.

Problem Statement: Inability to communicate with state and federal response system in the event of a Cascadia Subduction Zone event. The county maintains five communication towers which provide coverage for most of the county. Due to the geography of the county, cell phone service and radio communications are not accessible throughout the county. The current

communication towers may need seismic retrofit and updated technology to improve radio transmissions. Everbridge is the primary alert system which relies on cell phone service, the many cell phone service “dead zones” throughout the county create additional risk to residents and visitors; notifications and alerts cannot reach the public in cell phone service “dead zones”. Assessments should be conducted to identify solutions to the communication weaknesses throughout the county. To mitigate extended communication outages, redundant systems and platforms should be explored, such as deployable self-contained multi-purpose communications trailers and platforms.

Map/Image



Curry County Communication Tower Locations

Partners/Funding Source

Partners: State, Day Wireless, Beacon Broadband, City of Port Orford Police Dept., City of Gold Beach Police Dept., City of Brookings Police Dept., Langlois Rural Fire Department, Sixes Rural Fire Department, Port Orford Fire Department, Ophir Fire Department, Agness Illahe Fire / Agness Fire & Rescue, North Bank Rogue Cedar Valley Rural Fire Department, Pistol River Fire Department, Cal-Ore Ambulance, Port Orford Ambulance, US Forest Service, Bureau of Land Management, Curry County Sheriff's Department

Funding Source: 2021 HMGP sub-application submitted for Grizzly Tower seismic retrofit; Federal Grants, State Grants

References

Curry County Tower Facility and Capital Improvement Plan, projected publication in 2022.

Multi-Hazard Action 22-MH-02:

Develop a Curry County Mass Care Plan.

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$125k
Timeline	2-5 yrs.
Responsible Agency	Curry County Emergency Management
Priority	High

Description

Revised 2016 Action #16-MH-12: Identify Red Cross Shelters that are seismically sound and retrofit existing shelters. Mass Care and Mass Displacement services have been identified as a weakness in 2018 OSSPAC review of Mass Care and Mass Displacement after a Cascadia Subduction Zone Earthquake. The Mass Care Plan will improve coordination among partner agencies and provide the framework for transition from immediate shelter to semi-permanent housing. Mass Care Plans address disaster response needs beyond immediate mass shelters; this plan will address evacuation, mass care, emergency assistance, temporary housing and sheltering, human services; details of each function are provided in the FEMA Emergency Support Function #6 – Annex. The Mass Care Plan will be an extension of the County Emergency Operations Plan Mass Care Annex, establishing multiple courses of action and facilitating a rapid response.

Map/Image

None

Partners/Funding Source

Partners: Multiple Curry County Departments, Red Cross, OEM, FEMA, OHA

Funding Source: State Grants, Federal Grants

References

FEMA Emergency Support Function #6 – Annex; OSSPAC - Mass Care and Mass Displacement after a Cascadia Subduction Zone Earthquake, September 2018

Multi-Hazard Action 22-MH-03:

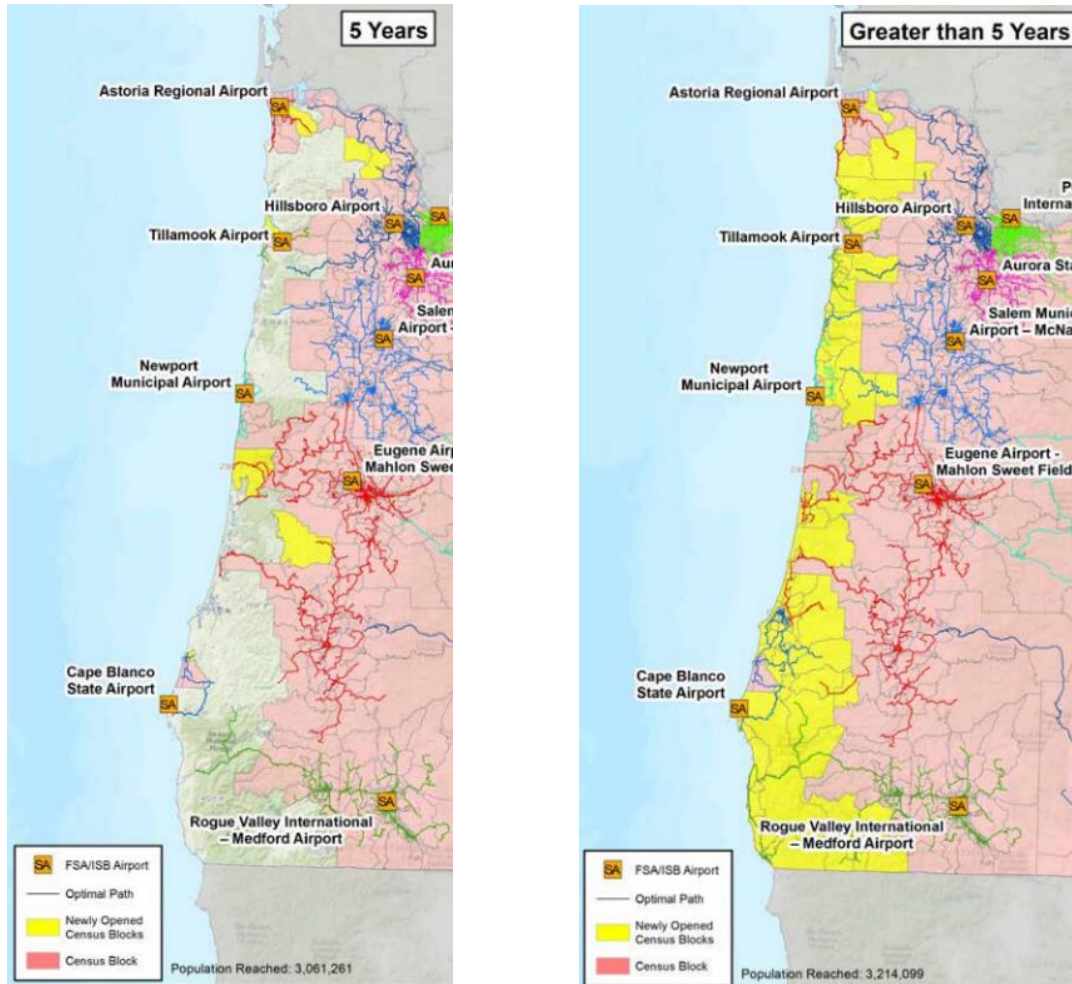
Develop a Curry County Road Resiliency Plan for resilient evacuation routes, alternate roads to Highway 101 in Curry County, and Interstate 5 corridor that mitigate risks from all-hazards. Develop and maintain key lifeline infrastructure; ensure alternate roads are useable in a CSZ event.

Mitigation Action #	Ongoing
Hazard	Multi-Hazard
Estimated Cost	\$150k
Timeline	3-5 yrs.
Responsible Agency	Curry County Emergency Management & Road Department
Priority	High

Description

Problem Statements: Inability to evacuate in the event of a Cascadia Subduction Zone event; Inability to receive supplies via land in the event of a Cascadia Subduction Zone event. Several areas along Highway 101 are at risk of landslides, some of which are repetitive, which would require the use of alternate routes. These routes must be developed and maintained to support the vehicles and traffic which typically use Highway 101. In the past, landslides have impacted fuel and resource delivery due to route restriction and congestion. Following a Cascadia event, the Oregon Transportation System Resiliency Assessment forecasts 5 or more years before routes can be established to Curry County; establishing routes to Interstate 5 before the event will expedite re-establishing the lifeline routes. This plan will establish a baseline for transportation routes and response in case of a crisis. Maintaining the transportation system is critical for emergency response, access to vital locations, restorations of utilities, and re-establishing industry.

Map/Image



2021 Oregon Transportation Systems Resiliency Assessment, Appendix B: Post-Earthquake Islanded Areas as a Function of Time

Partners/Funding Source

Partners: ODOT, U.S Forest Service, Bureau of Land Management

Funding Source: Road Fund, State Grant, Federal Grant

References

Curry County Road Department 6 Year Road Capital Improvement Plan, January 2021; 2021 Oregon Transportation Systems Resiliency Assessment.

Multi-Hazard Action 22-MH-04:

Develop a Curry County Recovery Plan.

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$200k
Timeline	3-6 yrs.
Responsible Agency	Curry County Emergency Management
Priority	High

Description

Revised 2016 Action #16-MH-08: Adopt the 2012 post-disaster framework for Curry County. Long term recovery goes beyond the initial relief and clean-up, extending to rebuilding homes and lives which may take months or years. Long-Term Community Recovery Plans are developed by committees representing the whole community, addressing the consequences of any emergency or disaster in which there is anticipated for a need for long-term recovery. Although recovery can be pursued with the intent to return to pre-disaster life, the Long-Term Community Recovery Plan should think beyond returning to normal and pursue and consider community improvements to build toward. The goal of these plans is to re-establish a healthy, functioning community that will sustain itself over time; establishing a recovery blueprint for the community to immediately begin working with following a disaster or emergency.

Map/Image

None

Partners/Funding Source

Partners: Multiple Curry County Departments, All Jurisdictions, Red Cross, OEM, FEMA, OHA
Funding Source: State Grants, Federal Grants

References

FEMA Long-Term Community Recovery Planning Process – A Self-Help Guide, December 2005

Multi-Hazard Action 22-MH-05:

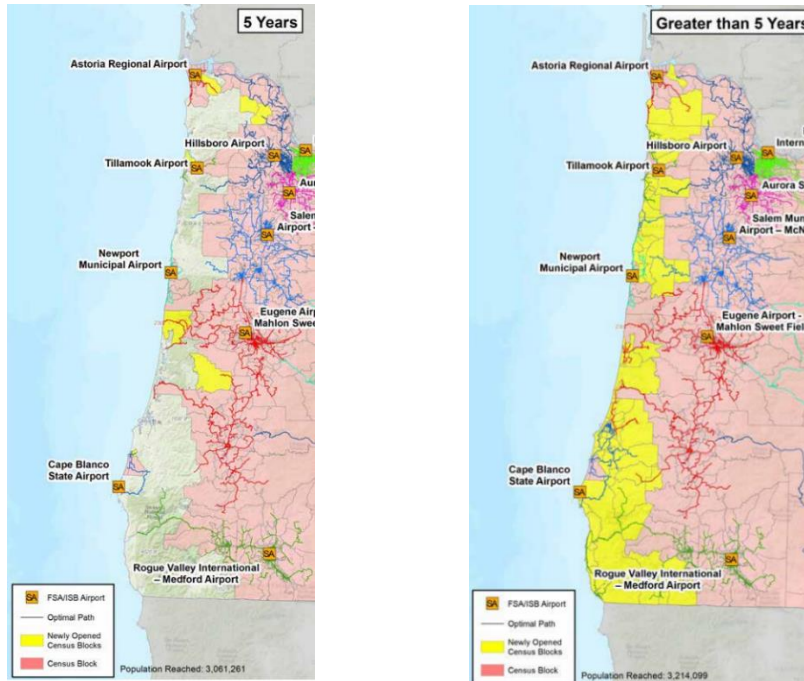
Work with Ports to ensure the County can receive recovery supplies via water in the event of a Cascadia Subduction Zone disaster.

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	Staff time
Timeline	1-3 yrs.
Responsible Agency	Curry County Emergency Management & Road Department
Priority	High

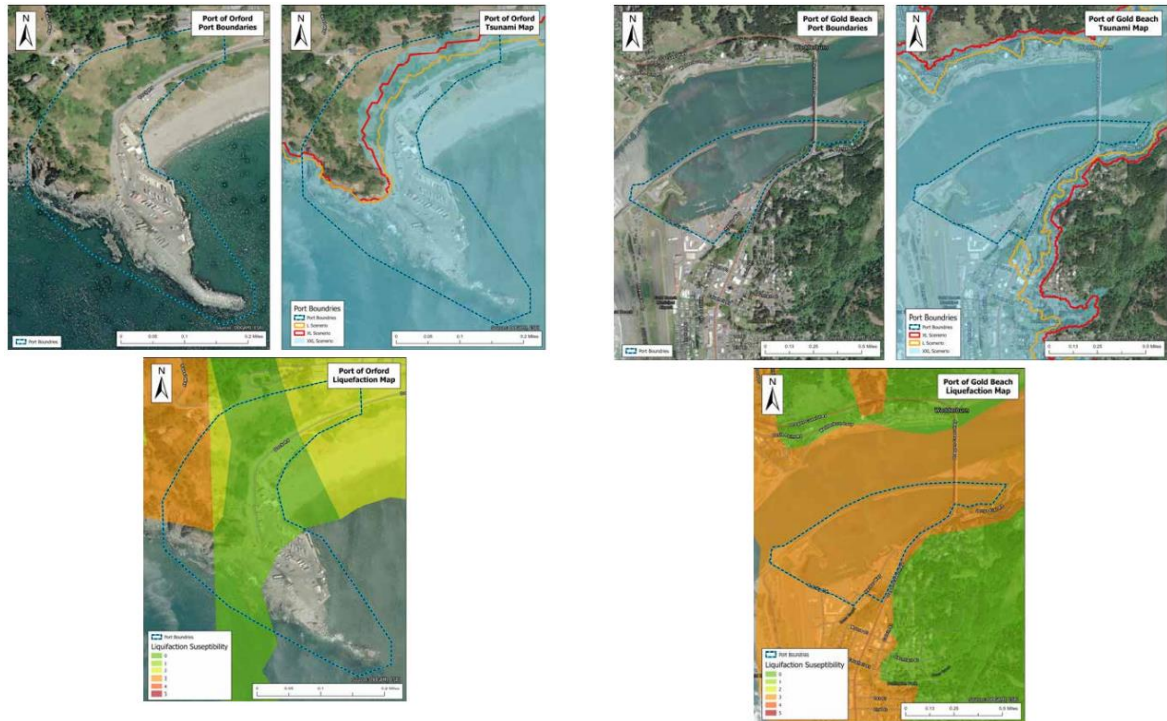
Description

Problem Statement: Curry County has a lack of access via land for response/ recovery after a Cascadia event. Although a Cascadia event is the worst-case scenario, disabling the use of most airports within the county, landslide events along U.S Highway 101 prevent the movement of resources by land into the county. The ports are exposed to many hazards due to location and soil consistency. Ports serve as a vital lifeline for the county, prioritizing port re-establishment for resource movement. The 2021 Oregon Transportation Systems Resiliency Assessment forecasts five to six years post Cascadia event before land transportation routes will be established to Curry County. The assessment also forecasts the use of Cape Blanco Airport in north Curry County as a regional airport, but earthquake damage will prevent resource transportation south of Port Orford. Curry County will be isolated for several years with few options for resource transportation. Curry County Emergency Management must work closely with the ports to establish re-establishment plans to include the necessary resources for re-establishment. A tabletop exercise is planned with ports June 2022 to cover re-establishment as well as alternate locations to establish port operations, facilitating the plan development.

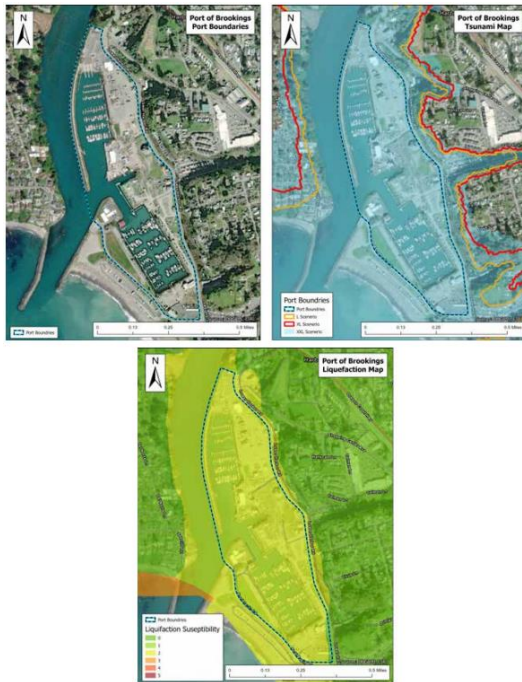
Map/Image



2021 Oregon Transportation Systems Resiliency Assessment, Appendix B: Post-Earthquake Islanded Areas as a Function of Time



2021 Oregon Transportation Systems Resiliency Assessment, Appendix E: Maritime Port Soil Liquefaction Susceptibility and Tsunami Inundation. (L)Port of Port Orford (R) Port of Gold Beach



2021 Oregon Transportation Systems Resiliency Assessment, Appendix E: Maritime Port Soil Liquefaction Susceptibility and Tsunami Inundation. Port of Brookings Harbor

Partners/Funding Source

Partners: Port of Gold Beach, Port of Port Orford, Port of Brookings Harbor

Funding Source: Staff Time

References

2021 Oregon Transportation Systems Resiliency Assessment

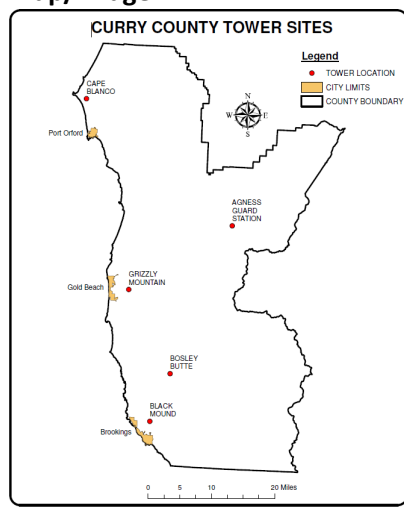
Multi-Hazard Action 22-MH-06:

Develop and begin implementation of a Curry County Communications Tower Master Plan.

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$100k
Timeline	1-2 yrs.
Responsible Agency	Curry County Road Department
Priority	High

Description

Problem Statement: System is at the end of life of the infrastructure. It doesn't provide coverage to all areas of the county (there are many cell phone dead zones), including no connectivity to the I-5 corridor, and it has little funding. Countywide communications will not function without backup power if the communication towers and equipment cannot withstand a seismic or wind event. Develop designs for seismic and wind upgrades including alternatives, permitting documentation, etc. The existing Curry County emergency communication towers are the backbone of the radio dispatch system of the Curry County Sheriff, City of Port Orford, City of Gold Beach and Coos Forest Patrol. There are five towers, of which four have onsite generators. The existing 2006 generators are having outages due to new biodiesel fuels gelling up. Changes in the radio frequencies used by the County do not fully reach the entire County. A new facility plan is needed to provide an analysis of how to address the lack of area coverage via new tower sites as well as updating the existing tower facilities. Project starting early 2022.

Map/Image

Curry County Communication Tower Locations

Partners/Funding Source

Partners: State, Day Wireless, City of Port Orford Police Dept., City of Gold Beach Police Dept., City of Brookings Police Dept., Langlois Rural Fire Department, Sixes Rural Fire Department, Port Orford Fire Department, Ophir Fire Department, Agness Illahe Fire / Agness Fire & Rescue, North Bank Rogue Cedar Valley Rural Fire Department, Pistol River Fire Department, Cal-Ore Ambulance, Port Orford Ambulance, US Forest Service, Bureau of Land Management, Curry County Sheriff's Department
Funding Source: Road Funds

Reference

Curry County Road Department 6 Year Road Capital Improvement Plan, January 2021.

Multi-Hazard Action 22-MH-07:

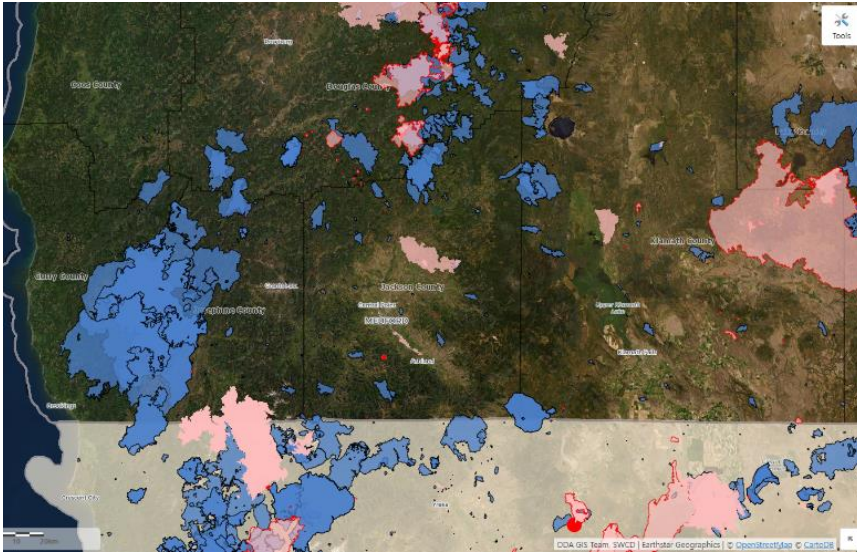
Curry County Rogue-Siskiyou Regional Fire and Emergency Training Center.

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$10 million+
Timeline	5-10 yrs.
Responsible Agency	Curry County Board of Commissioners
Priority	High

Description

Wildfires have been devastating to the heart of Southern Oregon's Coast. Recent disasters in Southern Oregon have stressed the need for an additional wildfire and emergency services training center that can provide needed specialized training for personnel from communities of Washington, Oregon, and California, as well as potentially reaching far beyond with desperately needed specialized training opportunities. The Rogue Siskiyou Regional Fire and Emergency Training Center (RSR) will fill a dramatic void in Southern Oregon for suitable training opportunities necessary to build a cadre of highly trained fire and emergency service providers to meet the rapidly increasing demand for local response to critical wildfire, structure fire, and other emergency scenarios. There will be two primary training structures built for critical program components: (1) Live Fire Training Burn Tower and Room; and (2) Law Enforcement Accommodations for certified shooting, active shooter, hostage and domestic training. Proper storage for all tools and equipment will also be provided on-site. Additional facilities include: classrooms, dormitory system housing, and a commercial kitchen to provide necessary support on-site for a range of 30-50 attendees; An additional meeting room will seat up to 75. The basic facilities detailed above will support the ability to offer comprehensive training programs to Law Enforcement, Fire, Search and Rescue, and Medical personnel. Overtime, the addition of numerous other training props and facilities will further augment the Center's capability over time to meet the emergency services training needs specific to small and rural communities throughout Southern Oregon and Northern California. Additionally, considering the changing climate, fuel loads, and future fire projections, the Southern Oregon Coast also needs a full-service Staging Area and facility support to fight wildfires and address natural disasters. As envisioned, the RSR FTC would also provide this staging area along with appropriate food services, first aid, and temporary quarters/full-service camping for our seasonal wildfire fighters. Project start-up funding has been awarded to the Gold Beach Fire Department by the Wild Rivers Coast Alliance (WRCA). Funds will be used to develop an interim operating structure that will perform all the planning and due-diligence necessary to build solid partnerships and secure the necessary funding and resources to design, construct, and operate a state-of-the-art wildfire and emergency services training facility.

Map/Image



Oregon Explorer – Wildfire Risk Explorer displaying Wildfires since 2000

Partners/Funding Source

Partners: City of Gold Beach, Gold Beach Fire Department, Curry County Commissioners, Wild Rivers Coast Alliance, U.S. Forest Service, Bureau of Land Management, Curry County Emergency Management, Curry County Economic Development, Coos Forest Patrol, Oregon Department of Forestry, Oregon Department of Public Safety Standards and Training (DPSST), Oregon State Fire Marshal's Office.

Funding Source: Wild Rivers Coast Alliance, State Grants, Federal Grants

References

Curry County RSR FTC Summary II; Curry County RSR FTC Proposal; Oregon Explorer – Wildfire Risk Explorer

Multi-Hazard Action 22-MH-08:

Ensure the community is connected to emergency notifications on their electronic devices. The effectiveness of this action item is determined by the implementation of the Curry County Communication Tower Master Plan due to the general lack of cell coverage in the county.

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$75k
Timeline	1-3 yrs.
Responsible Agency	Curry County Emergency Management
Priority	High

Description

Problem Statement: Inability to have advance warning about disasters and what to do increases injury and loss. This service needs to be provided consistently, without interruption. Social media and electronic devices are priority communication avenues as radio and tv are no longer produced locally. OR-Alert / Everbridge has been the primary alert notification system in Curry County, there are still residents unaware of this system. The county and city websites currently have links to Everbridge, additional actions are required to promote awareness of the system. Campaigns with jurisdictions should consider announcements from the schools, mailers, adding Everbridge sign up to utility bills, periodically posting the link to social media, and partnering with healthcare and private businesses. Ensuring the information is readily available in multiple formats will reach more populations within the county. A campaign targeting the tourist population should be considered to reduce risk to visitors. For Everbridge to be effective throughout the county cell phone coverage is required, the Curry County Communication Tower Master Plan should include Everbridge notification gaps.

Map/Image



Curry County Emergency Management Webpage with link to Everbridge



Curry County Everbridge Webpage; <https://member.everbridge.net/892807736723773/new>

Partners/Funding Source

Partners: None

Funding Source: State Grants, Federal Grants

References

Curry County Everbridge Webpage, <https://member.everbridge.net/892807736723773/new>

Multi-Hazard Action 22-MH-09:

Conduct community outreach and training for triage and first aid in partnership with Curry General Hospital.

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$25k
Timeline	1-3 yrs.
Responsible Agency	Curry County
Priority	High

Description

Problem Statement: The public and volunteers are not trained in triage and first aid. These populations may be the only resource immediately available in neighborhoods and communities following a catastrophic event. Due to the isolated geography of Curry County, there is potential of emergencies or disaster resulting in the stranding of injured residents and visitors. Training the public on triage and first aid techniques increases lifesaving awareness, understanding, and competence in the community. Curry General Hospital and Curry County will partner to provide triage and first aid training opportunities for the public by developing training materials, appointing and certifying trainers, and program coordination. The program should consider utilizing CERT teams to conduct outreach to churches and other groups.

Map/Image

None

Partners/Funding Source

Partners: Curry General Health

Funding Source: State Grants, Federal Grants

References

None

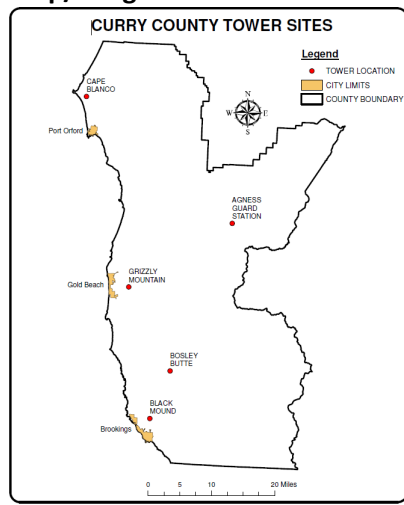
Multi-Hazard Action 22-MH-10:

Install resilient backup power by replacing old generators with a new propane generator and tank at three communication towers: Black Mound, Grizzly Mountain, and Agness Guard Station.

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$200k
Timeline	1-3 yrs.
Responsible Agency	Curry County Emergency Management & Road Departments
Priority	High

Description

Problem Statement: Loss of power/power grid goes down in a hazard event that requires the use of backup power for communications. The existing Curry County emergency communication towers are the backbone of the radio dispatch system of the Curry County Sheriff, City of Port Orford, City of Gold Beach and Coos Forest Patrol. The existing 2006 generators are having outages due to new biodiesel fuels gelling up. Generator maintenance and replacement rotations will be covered in the Curry County Tower Facility Plan.

Map/Image

Curry County Communication Tower Locations

Partners/Funding Source

Partners: None

Funding Source: Road Department Funds, State Grants, Federal Grants

References

Curry County Road Department 6 Year Road Capital Improvement Plan, January 2021

Multi-Hazard Action 22-MH-11:

Designate 34-acre County property site for emergency use.

Mitigation Action #	22-MH-01
Hazard	Multi-Hazard
Estimated Cost	\$250,000
Timeline	2-5 years
Responsible Agency	Curry County Planning Department; Curry County Road Department
Priority	High

Description: Development of County property for multiple emergency operation activities, to include land for road department equipment staging, fueling and debris removal; infrastructure for temporary and emergency housing placement, development of sewer, water, and electrical systems to support site use for emergency operations. Curry County will need a mass shelter site in the event of a large earthquake, tsunami, flood, or landslide. A Cascadia event places many structures and residences at risk of destruction in north Curry County; this site would be an additional site to shelter displaced populations. The debris management site would be located across the street, with equipment staged to immediately begin clearing lifesaving routes for responders to conduct rescues. The county has proposed to designate a 34-acre property located at 31-15-33 TL 122 as the County Emergency debris removal/management to the south and emergency/temporary housing site to the north. Airport Road separates the property into north and south segments, providing a separation between the debris management site and the emergency sheltering site.

Map/Image:

Map of the proposed site in north Curry County. Shelter site will be north of Airport Road, Debris site will be south of Airport Road

Partners/Funding Source:

Multiple partners: County Board of Commissioners, County Road Department, County Planning Department, and County Parks

References:

Board of Commissioners approved for initiation of project with a \$29,500 survey for the identified site located at T. 31, R.15, Section 33 TL 1200 (parcel is on both sides of Airport Road). Survey is to be completed October – December 2021.

Multi-Hazard Action 22-MH-12:

Establish mutual aid agreements between government agencies and commercial businesses in the event of an emergency (fuel, heavy equipment, food, etc.)

Mitigation Action #	Ongoing
Hazard	Multi-Hazard
Estimated Cost	Staff time
Timeline	6-12 months
Responsible Agency	Curry County Emergency Management & Road Departments
Priority	High

Description

Ongoing 2016 Action #16-MH-06

The geographical isolation of Curry County increases the importance and need for maintained Mutual Aid Agreements, which augment current capabilities and strengthen resource weaknesses. Rural counties possess fewer capabilities, requiring coordination between all sectors and surrounding counties to increase resources during high-demand emergencies. Mutual Aid Agreements currently exist between the county and outside organizations, these agreements need to be reviewed, updated, and renewed to ensure rapid support in the event of an emergency. Verbal agreements should be documented and signed to protect all parties involved. Tracking, version control, and document maintenance should be assigned to a single department to ensure agreements do not expire and the current version is referenced during an emergency. Copies of current agreements should be filed with the Emergency Operations Center for quick reference during an emergency. When developing Mutual Aid Agreements, the county must consider private organizations, landowners (for equipment and land/road use), military, federal agencies, volunteer organizations, etc. These agreements need to be considered for all hazards and event size as well as nonemergency events.

Map/Image: None

Partners/Funding Source

Partners: All jurisdictions, all jurisdiction and county responders, public health entities, large medical providers, special districts, surrounding counties and their jurisdictions and responders, state organizations, private organizations, and public entities

Funding Source: Staff time

References: None

Landslide Action 22-LS-01

Mitigate landslide on Jerry's Flat Road – Soldier pile wall. Install a retaining wall with structural support to protect the road and the main water transmission line for the City of Gold Beach.

Mitigation Action #	New
Hazard	Landslide
Estimated Cost	\$20 Million
Timeline	5-10 yrs.
Responsible Agency	Curry County Road Department
Priority	High

Description

A half-mile section of road slides annually and puts the water main at risk. If the water main leaks or breaks it will take out the entire road. This is an access road for approximately 1,000 homes but there is not an alternate route for non-4x4 motor vehicle. The water main is the primary water transmission line from the water treatment plant located further up Jerry's Flat Road the City of Gold Beach's water distribution system. A leak occurred two years ago in the ductile pipe. The landslide is occurring under the north portion of Jerry's Flat Road, requiring mitigation repairs along approximately ¼ mile of the road. The road has been repaved multiple times to repair issues caused by land movement beneath the road. During the landslide repair and mitigation project, the roadway must also go through repairs due to uneven asphalt caused by consistent land movement and repeat repairs. The Curry County Road Department has submitted two 2021-2022 Federal lands Access Program (FLAP) Grant Program applications totaling \$20 million. The projects scope is to repair a slide area along Jerry's Flat Road just east of Eagleview Drive, surface restoration will also be conducted in this area. The work includes: 800 lineal feet of soldier-pile tie-back walls (2-3 rows of tie-backs), remove and replace existing asphalt and rock subbase, and installation of 800 tons of asphalt, 1,100 tons of aggregate base, and replacement of the existing 18" culvert.

Map/Image

n/a

Partners/Funding Source

Partners: City of Gold Beach, U.S. Forest Service

Funding Source: 2021-2022 Federal Lands Access Program (FLAP) Grant Program (applied for \$20 million in federal funds)

References

2021 Oregon Federal Lands Access Program Application, Project Name: Jerry's Flat Road Slide Repair Project-MP 1.30 to 1.41, Submitted by: Curry County Road Department, Curry County, Oregon; 2021 Oregon Federal Lands Access Program Application, Project Name: Jerry's Flat Road Slide Repair Project-MP 1.24 to 1.28 & 1.43 to 1.46, Submitted by: Curry County Road Department, Curry County, Oregon

Landslide Action 22-LS-02

Coordinate to secure a new DOGAMI Landslide Study using new LiDAR data.

Mitigation Action #	New
Hazard	Landslide
Estimated Cost	Staff Time
Timeline	2-5 yrs.
Responsible Agency	Curry County Road Department & Curry County Emergency Management
Priority	High

Description

Problem Statement: Data gaps in landslide data for lifeline route planning. 2014 study is detailed but limited to the coastal communities: <https://www.oregongeology.org/pubs/ofr/p-O-14-10.htm>. Since the 2014 study, Curry County has experienced multiple landslides to include the Hooskanaden major slide in 2019. According to the 2014 Landslide inventory of Coastal Curry County, Oregon report by DOGAMI, 3,061 landslide deposits were identified within the 170 square mile study area; 322 of which were debris flow deposits, 723 were shallow landslides, and 2,010 were deep landslides. Although U.S Highway 101 is the primary transportation route for Curry County, outlying communities and alternate routes are affected by landslides which were not included in the 2014 report. An updated report which includes assessments of alternate routes and all communities within Curry County will facilitate improved mitigation efforts to protect the entire Curry County community. New data anticipated in December 2021

Map/Image

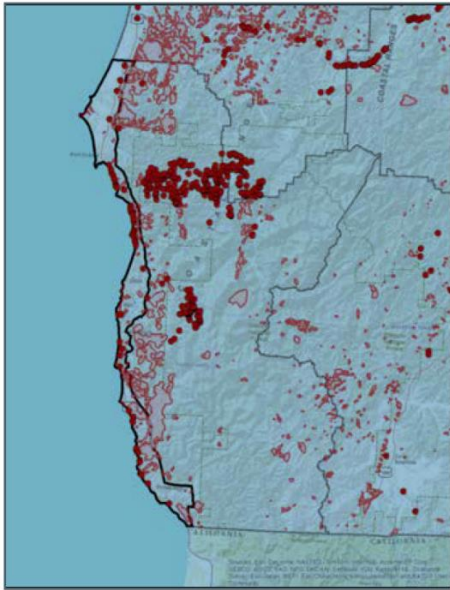
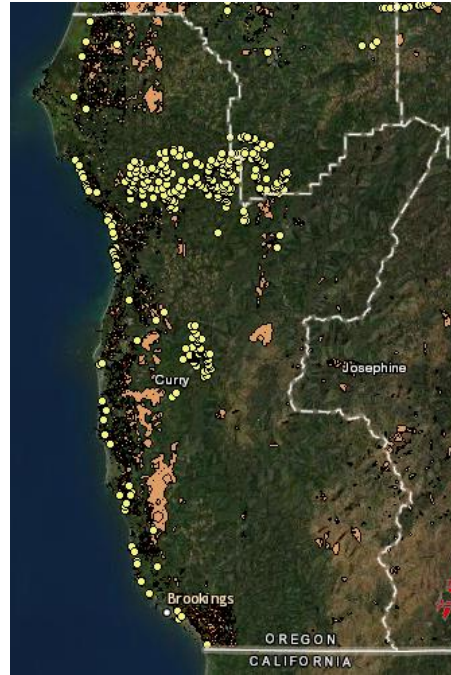


Figure 1. Map of the study extent (black outline), mapped landslides (red outlines with pink fill), and historic landslide locations (red dots) from SLIDO release 2 (Burns and others, 2011). Study area is approximately 170 square miles.



Left - Figure 1 from Open-File Report O-14-10 Landslide Inventory of Coastal Curry County, Oregon, 2014 – Oregon Department of Geology and Mineral Industries (DOGAMI). This figure displays many landslide events beyond coastal Curry County, reported by SLIDO. Right – Statewide Landslide Information Layer for Oregon (SLIDO) report displaying the following layers: Historic landslide records, scarp, head scarp, and deposits.

Partners/Funding Source

Partners: DOGAMI, OEM

Funding Source: Staff Time

References

Open-File Report O-14-10 Landslide Inventory of Coastal Curry County, Oregon, 2014 – Oregon Department of Geology and Mineral Industries (DOGAMI); Statewide Landslide Information Layer for Oregon (SLIDO).

Tsunami Action 22-TS-01:

Clearly identify tsunami evacuation routes through signage upgrade / replacement and adopting way finder methods for all populations. Conduct annual inspections of evacuation routes and signage.

Mitigation Action #	New
Hazard	Tsunami
Estimated Cost	\$200k
Timeline	1-3 yrs.
Responsible Agency	Curry County Emergency Management & Road Department
Priority	High

Description

Problem Statement: Tsunami evacuation signs are small and not eye-catching, and few signs are found when leaving U.S Highway 101. Signage should be placed along entirety of evacuation route with consistency in signage placement and use throughout the county. Assembly area signage should be installed at all assembly areas. Tsunami evacuation route signs within the cities are difficult to locate due to the abundance of signage in populated areas. The Emergency Management Department should work with the cities, identifying the best options to display the signs. In addition to updating the signage, additional signage must be installed to properly guide the public to assembly areas. Utilizing published studies and the Oregon Tsunami Evacuation Wayfinding Guidance will establish a variety of way finder options for communities to adopt. When developing new signage and way finder options, the county must consider the range of additional elements which may impact the public locating the way finders, such as evacuations at night or collapsed poles which the signs are displayed from. Conducting annual inspections of the routes and signage allows the county to quickly identify missing or damaged signs as well as potential issues with evacuation routes.

Map/Image

Downtown Gold Beach, December 2021. The tsunami signs used throughout the county do not stand out among the many signs in the downtown areas. No signs are easily identifiable although there are evacuation routes nearby.



Downtown Gold Beach, December 2021. Left - Evacuation sign is only visible for traffic traveling North and placement allows the sign to become lost among advertisements. Right – Evacuation sign is only visible for traffic traveling North, banner can block sight of the sign.



The Community of Harbor tsunami evacuation routes without signage, December 2021. Left – Oceanview Drive and Pedrioli Drive. Right – Oceanview Drive and Olsen Lane.



Port Orford, December 2021. Left, evacuation route signage identifying the route for north and southbound traffic. Center – evacuation route signage among additional signage. Right – evacuation signage at Jackson Street and 18th Street, sign is only easily identifiable for traffic evacuating from U.S Highway 101, additional signs should be placed on Jackson Street to direct evacuees onto 18th Street.

Partners/Funding Source

Partners: ODOT, all communities within the tsunami inundation zone

Funding Source: State Grants, Federal Grants

References

Oregon Tsunami Evacuation Wayfinding Guidance, OEM and DOGAMI; Oregon Tsunami Wayfinding Research Project Up and Out series, The Portland Urban Architecture Research Lab (PUARL) and OEM.

Tsunami Action 22-TS-02:

Identify new evacuation routes for areas of the County that are rapidly developing; coordinate with DOGAMI/NANOOS.

Mitigation Action #	New
Hazard	Tsunami
Estimated Cost	\$250k
Timeline	1-3 yrs.
Responsible Agency	Curry County Emergency Management & Road Department
Priority	High

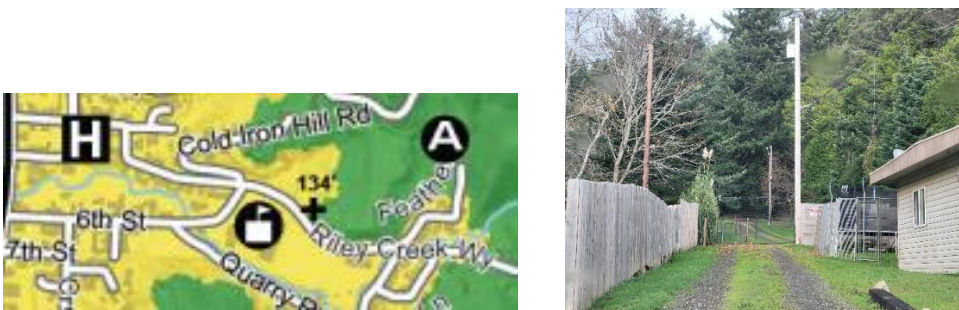
Description

Problem Statement: Need to identify alternate or additional routes. Some tsunami evacuation routes have been identified and recently published for Port Orford, Gold Beach, Nesika Beach, Ophir, Brookings, and Harbor. There is a need for updated or new maps for remaining County communities. Additional evacuation routes and assembly areas must be identified for Port Orford, Gold Beach, Ophir, Nesika Beach, and Harbor. The routes currently identified are not adequate for the population required to evacuation, with some routes requiring the public to travel a further distance when there are shorter routes available. Additional assembly areas will support the additional visitor population during the summer months. Problem Statement: Inability to evacuate the population from Harbor area along Oceanview Drive—the most rapidly developing area in Curry County. There are few identified evacuation routes for the Harbor community. The community no longer has access to a route identified as a private road which is no longer maintained. The county should pursue agreements with nearby property owners to establish additional evacuation routes.

Map/Image



Tsunami evacuation route in the Community of Harbor, previously listed as “Private Road”. No longer maintained, gates which are typically closed block the route due to livestock and resources in the surrounding fields. Top – aerial view of the private road. Bottom Left – ground view of private road from Oceanview Drive. Bottom Right – ground view of private road from U.S Highway 101



Left - A partial view the Gold Beach tsunami inundation zone with the assembly area located on Feather Way, DOGAMI Tsunami evacuation brochure/map for Gold Beach – 2020. Right – The Feather Way assembly area is located on private property; the route is blocked by a gate on private property.

Partners/Funding Source

Partners: DOGAMI/NANOOS,

Funding Source: State Grants, Federal Grants

References

Tsunami evacuation brochure/map for Brookings – 2020, Published by DOGAMI; Tsunami evacuation brochure/map for Gold Beach – 2020, Published by DOGAMI; Tsunami evacuation brochure/map for Port Orford – 2020, Published by DOGAMI; Tsunami evacuation brochure/map for Nesika Beach and Ophir – 2020, Published by DOGAMI

Tsunami Action 22-TS-03:

Develop a trail system that can support a funded and maintained evacuation route.

Mitigation Action #	New
Hazard	Tsunami
Estimated Cost	\$200k
Timeline	2-5 yrs.
Responsible Agency	Curry County Emergency Management
Priority	High

Description

Problem Statement: It is nearly impossible to coordinate maintenance of evacuation routes on private property. The county should pursue adding tsunami evacuation route signage to existing trails. Partnerships and long-term funding will be required to maintain the signage and trail maintenance. Several tsunami evacuation routes cross private property which are often blocked by gates or fencing, maintenance plans for tsunami evacuation routes crossing private property must be developed. The county should work with DOGAMI to identify alternate routes the county can maintain without interfering with private property. If alternate routes are not feasible, the county must work with landowners to develop agreements and maintenance plans.

Map/Image

Tsunami evacuation route in the Community of Harbor, previously listed as “Private Road”. No longer maintained, gates which are typically closed block the route due to livestock and resources in the surrounding fields. Above – aerial view of the private road. Below – ground view of private road from Oceanview Drive. Bottom Right – ground view of private road from U.S Highway 101



Left - A partial view the Gold Beach tsunami inundation zone with the assembly area located on Feather Way. Right – The Feather Way assembly area is located on private property; the route is blocked by a gate on private property.

Partners/Funding Source

Partners: all communities within the tsunami inundation zone, private landowners

Funding Source: State Grants, Federal Grants

References

Tsunami evacuation brochure/map for Brookings – 2020, Published by DOGAMI; Tsunami evacuation brochure/map for Gold Beach – 2020, Published by DOGAMI; Tsunami evacuation brochure/map for Port Orford – 2020, Published by DOGAMI; Tsunami evacuation brochure/map for Nesika Beach and Ophir – 2020, Published by DOGAMI

Tsunami Action 22-TS-04:

Tsunami evacuation route drills.

Mitigation Action #	New
Hazard	Tsunami
Estimated Cost	\$100k
Timeline	1-3 yrs.
Responsible Agency	Curry County Emergency Management & Road Department
Priority	High

Description

Problem Statement: Many areas of Curry County have a very short time to evacuate after a Cascadia event, before the first tsunami waves arrive. It is critical that everyone know where the closest evacuation routes are located from home, work, and school if those locations are in the tsunami zone. A distant tsunami may also require evacuation, which could test local emergency responders' and public officials' coordination abilities/ knowledge (ICS, etc.) if key response activities have not been practiced. Conducting drills will educate the community about where to evacuate and when, while providing opportunities for responders and Curry County Emergency Management to conduct assessments on bottleneck points and evacuation route weaknesses. The county should promote practicing evacuation drills with neighborhoods and community organizations, improving participation and providing better feedback for responders and Curry County Emergency Management. Curry County Emergency Management will coordinate with all jurisdictions to develop campaigns and events.

Map/Image

None

Partners/Funding Source

Partners: all communities within the tsunami inundation zone

Funding Source: State Grants, Federal Grants

References

Tsunami evacuation brochure/map for Brookings – 2020, Published by DOGAMI; Tsunami evacuation brochure/map for Gold Beach – 2020, Published by DOGAMI; Tsunami evacuation brochure/map for Port Orford – 2020, Published by DOGAMI; Tsunami evacuation brochure/map for Nesika Beach and Ophir – 2020, Published by DOGAMI

Tsunami Action 22-TS-05:

Secure funding for vertical evacuation structures in high-risk areas.

Mitigation Action #	New
Hazard	Tsunami
Estimated Cost	\$3 Million
Timeline	5-10 yrs.
Responsible Agency	Curry County
Priority	High

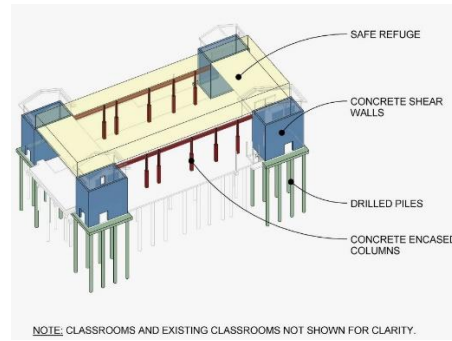
Description

Problem Statement: High-risk areas have little time to evacuate in the event of a local tsunami, some areas must travel too great a distance to reach an assembly/evacuation point. Vertical evacuation structures provide a safe and nearby assembly area. The Beat the Wave reports produced by DOGAMI identify several areas within the county which would benefit from the installation of vertical evacuation structures. A vertical evacuation structures design can range from towers and platforms to buildings specifically designed to survive the force of a tsunami. When exploring designs and options for these structures, the county and jurisdictions should consider structures already established along the Oregon and Washington coast as well as those in Japan and other countries. These structures can be designed to provide little to no interference with the current routines of the community.

Map/Image

A vertical evacuation structure in Japan which also contains a stage to host concerts.

<https://www.thedailyworld.com/news/design-phase-underway-for-westport-vertical-tsunami-evacuation-platform/>



Left - Ocosta Elementary School, Westport, WA. Gym serves at the Tsunami Vertical Evacuation Structure with a platform on the gym roof, https://www.weather.gov/jetstream/prep_com. Right - Diagram of the gym Vertical Evacuation Structure at the Ocosta Elementary School, Westport, WA <https://www.wired.com/2016/12/ordinary-looking-gym-thats-built-survive-tsunami/>



The OSU Marine Studies Initiative Building / Vertical Evacuation Structure located in Newport, OR. <https://gri.com/project-milestones/oregon-state-university-marine-studies-initiative-building-wins-acec-project-of-the-year/>

Partners/Funding Source

Partners: OEM, FEMA, DOGAMI

Funding Source: FEMA, State Grants, Federal Grants

References

Oregon Department of Geology and Mineral Industries (DOGAMI) Open File Report O-20-05, Tsunami Evacuation Analysis of Port Orford, Curry County, Oregon (Beat the Wave) – 2020;
Oregon Department of Geology and Mineral Industries (DOGAMI) Open File Report O-21-03, Tsunami Evacuation Analysis of Port Orford, Curry County, Oregon (Beat the Wave) – 2021

Curry County Wildfire

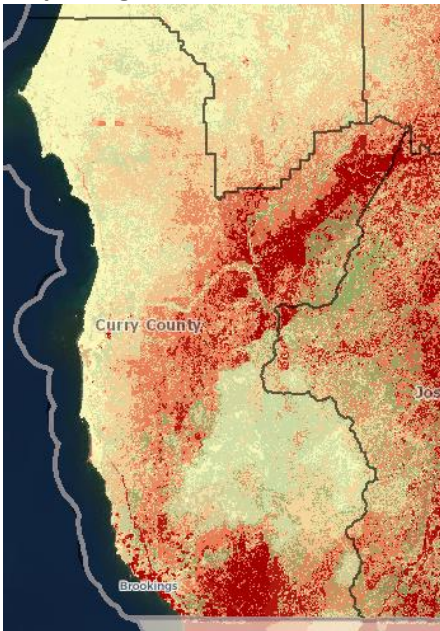
Wildfire Action 22-WF-01:

Identify high-risk areas and actions residents can take to reduce their risk.

Mitigation Action #	New
Hazard	Wildfire
Estimated Cost	\$75k
Timeline	1-3 yrs.
Responsible Agency	Curry County on behalf of Curry Fire Defense Board
Priority	High

Description: County Planning uses Oregon Explorer to identify high risk areas of the county. This approach could be used to prioritize high-risk areas. Once the high-risk areas have been identified, an educational campaign should be developed specifically for each area. Annual assessments should be conducted to include newly identified high risk areas.

Map/Image



https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning

Partners/Funding Source

Partners: ODF, Coos Forest Protective Association, Wild Rivers Foundation, Curry Watersheds Partnership.

Funding Sources: Federal Grants, State Grants

References

Oregon Explorer – Wildfire Risk Explorer

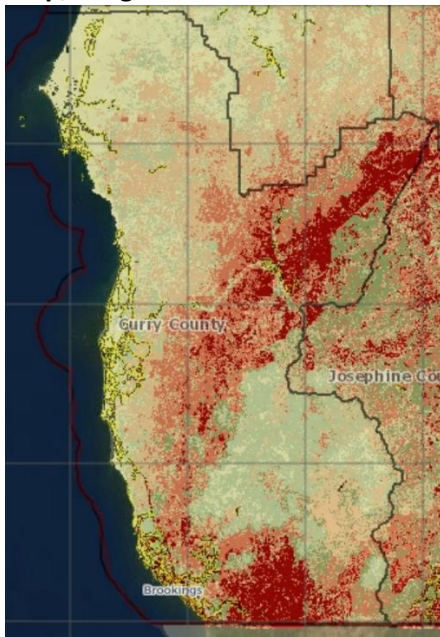
Wildfire Action 22-WF-02:

Promote public awareness campaigns for individual property owners living in the Wildland/Urban Interface (WUI).

Mitigation Action #	New
Hazard	Wildfire
Estimated Cost	Staff Time
Timeline	0-6 months
Responsible Agency	Curry County on behalf of Curry Fire Defense Board
Priority	High

Description

Property owners living within the Wildland/Urban Interface are at an increased risk due to location and distance from resources. Due to the remote locations, there is often a lack of hydrants for responders to access. The campaign will promote defensible space around homes and awareness on materials hardy to fire. Information will be provided on how fires tend to move and how to develop pre-plans for defensible space and evacuation. Property owners will be encouraged to maintain transportation routes and ensuring addresses are properly located, for example displaying the address at end of driveway and not only on house. Mailers should be sent prior to wildfire season to remind residents of defensible space, vegetation management, fire resistant landscaping, and the evacuation levels.

Map/Image

https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning

Partners/Funding Source

Partners: Fire Districts, Coos Forest Protective Association, Rogue River-Siskiyou National Forest, ODF

Funding Source: Staff Time

References

Oregon Explorer – Wildfire Risk Explorer

Wildfire Action 22-WF-03:

Promote wildfire mitigation through public education, fuels reductions, and improvement of transportation corridors.

Mitigation Action #	New
Hazard	Wildfire
Estimated Cost	\$75k
Timeline	1-3 yrs.
Responsible Agency	Curry County on behalf of Curry Fire Defense Board
Priority	High

Description

The geography of the county often restricts alternate and additional transportation routes. Many areas within the county do not have two ways into or out of the area, increasing risk to the public. It is important for the public to understand the evacuation levels and fuels reductions. It is encouraged that all District, City, and County website post educational links and information.

Map/Image

Deteriorating road access to a home located in the county on East Harris Heights, Brookings.



Curry County Emergency Management Preparedness Webpage

Partners/Funding Source

Partners: Multiple County departments, Fire Districts, Coos Forest Protective Association, BLM, Rogue-Siskiyou National Forest, ODF.

Funding Sources: Federal Grants, State Grants

References

National Fire Protection Association – Wildfire preparedness tips at

<https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Wildfire-safety-tips>;

Ready.gov – Wildfires at <https://www.ready.gov/wildfires>

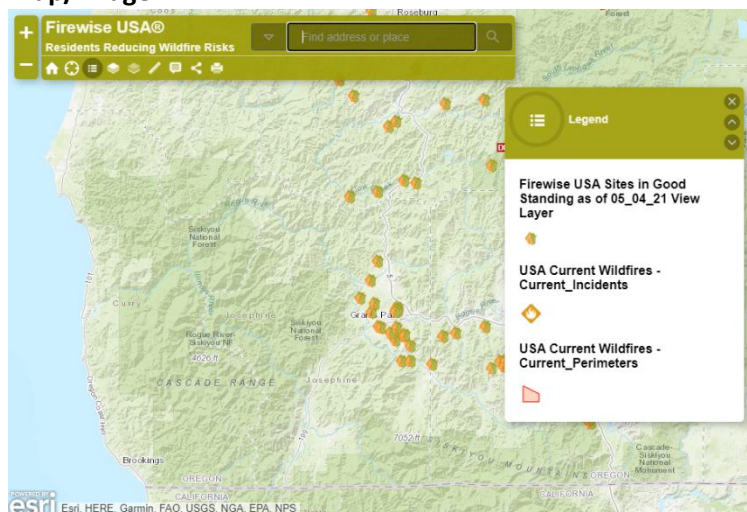
Wildfire Action 22-WF-04:

Promote wildfire education and awareness via the Firewise program.

Mitigation Action #	New
Hazard	Wildfire
Estimated Cost	Staff Time
Timeline	0-6 months
Responsible Agency	Curry County Planning Department
Priority	High

Description

As of May 4, 2021, Curry County does not have any communities in good standing as Firewise communities. Encourage the development of Firewise communities by promoting the Firewise program. Firewise communities receive resources to help homeowners learn how to adapt to living with wildfire and encourages neighbors to work together to act now to prevent losses. Educational materials should be made available at city and county facilities, and information should be posted on city and county websites. Promoting the Firewise program at community and county events such as establishing a booth at the county fair will expand public reach.

Map/Image

<https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA>

Partners/Funding Source

Partners: Curry County Emergency Management, Fire Defense Board, ODF

Funding Sources: Staff Time

References

National Fire Protection Association – Firewise USA

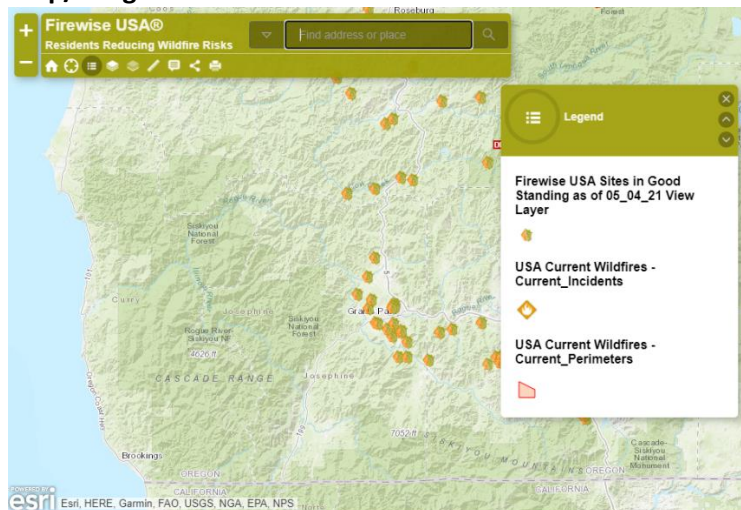
Wildfire Action 22-WF-05:

Continue to provide vegetation management recommendations for unincorporated areas of the county as a part of Firewise and permit applications.

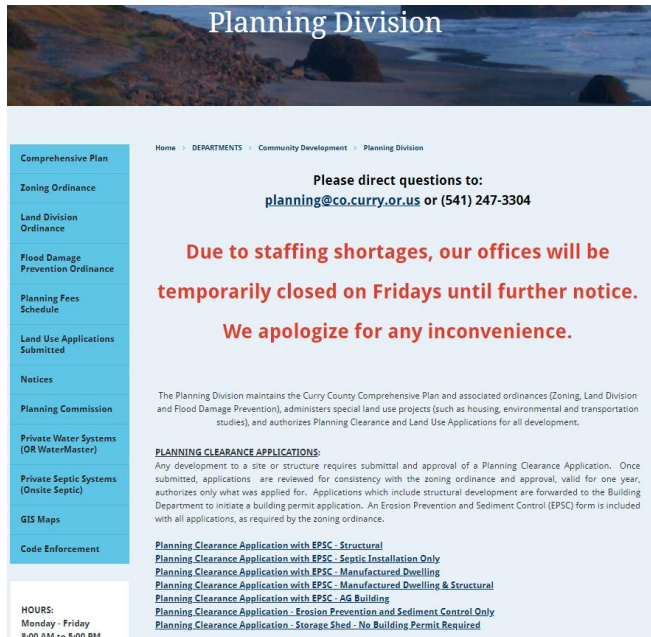
Mitigation Action #	New
Hazard	Wildfire
Estimated Cost	Staff Time
Timeline	0-6 mos.
Responsible Agency	Curry County Planning Department
Priority	High

Description

As of May 4, 2021, Curry County does not have any communities in good standing as Firewise communities. Encourage the development of Firewise communities by promoting the Firewise program. Firewise communities receive resources to help homeowners learn how to adapt to living with wildfire and encourages neighbors to work together to act now to prevent losses. Educational materials should be made available at city and county facilities, and information should be posted on city and county websites. Providing Firewise and vegetation management information on the Planning Department webpage in addition to making the information available with permit applications promotes risk reduction methods to the public.

Map/Image

<https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA>



Curry County Planning Division Webpage

Partners/Funding Source

Partners: Fire Defense Board, Curry County

Funding Sources: Staff Time

References

National Fire Protection Association – Firewise USA; Curry County Planning Division Webpage

Wildfire Action 22-WF-06:

Hazard fuel reduction on county-owned forest land adjacent to communities at risk.

Mitigation Action #	New
Hazard	Wildfire
Estimated Cost	\$100k
Timeline	2-5 yrs.
Responsible Agency	Curry County on behalf of Curry Fire Defense Board
Priority	High

Description

Lots outside the cities have consistently received complaints for overgrown vegetation and fire hazards. The cities do not have the authority to enforce fuel and vegetation management on these lots, which places communities at risk if left unattended. There are specific zones the county ordinance for fire prevention applies to. County officials should receive more training for proper education on the code, code enforcement would need additional personnel to enforce the code.

Map/Image

Series of photos from Secrest Lane at Brookings City Limits. Top Left: City property which is clear of fuels; Top Right: Residence being encroached upon by property in county; Bottom: Neighboring property in county.



Photos taken of East Harris Heights, Brookings displaying encroachment of Wildland/Urban Interface (WUI) onto a neighborhood within at the city limits.

Partners/Funding Source

Partners: Fire Districts, Coos Forest Protective Association, Rogue River-Siskiyou National Forest, ODF

Funding Source: Federal Grants, State Grants

References

Curry County Zoning Ordinance, Amended August 2018

Wildfire Action 22-WF-07:

Develop/Maintain Mutual Aid Agreement and Memorandums of Understanding with: County Chiefs, Coos County, Del Norte County, Coos Forest Protective Association, and Rogue River-Siskiyou National Forest.

Mitigation Action #	New
Hazard	Wildfire
Estimated Cost	Staff Time
Timeline	0-6 months
Responsible Agency	Curry County on behalf of Curry Fire Defense Board
Priority	High

Description

The districts need to conduct a review of current Mutual Aid Agreements and Memorandums of Understanding. Outdated documents must be updated, and new documents should be completed for all verbal and new agreements.

Map/Image

None

Partners/Funding Source

Partners: County Chiefs, Coos County, Del Norte County, Coos Forest Protective Association, Rogue River-Siskiyou National Forest, ODF

Funding Sources: Staff Time

References

None

Wildfire Action 22-WF-08:

Work with local fire districts to ensure coordinated preparedness and response.

Mitigation Action #	New
Hazard	Wildfire
Estimated Cost	\$250K
Timeline	1-2 yrs.
Responsible Agency	Curry County on behalf of Curry Fire Defense Board
Priority	High

Description

Through the Fire Defense Board, the districts will pursue the purchase of the same equipment for all departments within the county. The Fire Defense Board will submit a grant in December 2021 to complete the first equipment purchase. The Fire Defense Board meets quarterly, districts should continue to send representatives to this meeting to facilitate coordination and preparedness among the districts. There is a need for annual training with all district participation; schedules and a lack of funding and personnel have interfered with consistent participation in training.

Map/Image

None

Partners/Funding Source

Partners: 14 fire districts

Funding Sources: OSFM, Federal Grants, State Grants

References

None

Wildfire Action 22-WF-09:

Enforce new development to incorporate wildfire mitigation measures and ensure adequate emergency access, when required by zoning ordinance.

Mitigation Action #	Ongoing
Hazard	Wildfire
Estimated Cost	Staff Time
Timeline	2-5 yrs.
Responsible Agency	Curry County Planning Department
Priority	High

Description

Ongoing 2016 Action #16-WF-02. Recommended fire mitigation measures on all new Planning Clearances in Rural Areas.

Curry County Planning Department currently uses the Oregon Wildfire Risk Explorer to determine wildfire risk to properties. The Planning Department is aware of the requirements and changes outlined in Senate Bill 762. If necessary, code and ordinances will be updated to reflect rules published in Senate Bill 762.

Map/Image

None

Partners/Funding Source

Partners: District Chiefs, Coos Forest Protective Association, Curry County Code Enforcement
Funding Sources: Staff Time

References

State of Oregon Senate Bill 762

City of Brookings

Brookings Multi-Hazard Action 22-MH-01:

Safe Drinking Water Resiliency Project: Add a second drinking water supply source for Brookings & Harbor that is not susceptible to saltwater intrusion.

Mitigation Action #	Ongoing
Hazard	Multi-Hazard
Estimated Cost	\$500k
Timeline	2-5 yrs.
Responsible Agency	City of Brookings
Priority	High

Description

This action is based upon the Redundant Water Supply Plan of 2015 which provided recommendations, preliminary concepts, schematic drawings and cost estimates for capital improvement projects.

This existing water system draws from a single source on the north bank of the Chetco River, approximately 5.3 miles upstream from the Pacific Ocean, where the North Fork Chetco River and the Chetco River meet. While the river has been a reliable source of water, only having one source of supply for the system carries risks, such as if that source becomes contaminated.

The Harbor Water District (HWD) is an independent water district located immediately to the south of Brookings within the same Urban Growth Boundary (UGB). Like Brookings, the HWD relies on a single source for its water supply in the Chetco River. The intake station is located almost two miles downstream from the Brookings intake. In the summers of 2014 and 2015, the HWD intake experienced saltwater intrusion which contaminated the District's water supply and left the residents to rely on bottled water for their potable water needs until the saltwater intrusion had subsided. Drought and tsunami present saltwater intrusion and contamination threats to the current water supply. Low flows in the Chetco River due to the ongoing drought conditions intensify the saltwater intrusion problem. The city has conducted several studies to explore options for alternate water supply to include: Ferry Creek Reservoir, a desalination facility, and a Brookings-Harbor Intertie.

The Ferry Creek Reservoir was the original water supply for the residents of the Brookings area during the early years of the water system. It served the area for nearly 60 years but has been relatively unused since the 1960s. Since that time, the primary water source has been the Chetco River. The current capacity of Ferry Creek Reservoir is 29 million gallons, and it occupies approximately 5 acres. The City holds water rights that will allow for 55 million gallons (167.4 acre-feet) of storage at the reservoir location. In order to use Ferry Creek Reservoir as a reliable water supply option, additional transmission and distribution piping would have to be added to the system.

In 2015 and 2016, the Dam Safety Division of the Oregon Water Resource Department (OWRD) completed an inspection summary of Ferry Creek Dam. These reports can be found in Appendix A of the 2018 Ferry Creek Feasibility Study. In those reports the OWRD designated the dam as

‘unsatisfactory condition’. This designation states that the dam could fail under extreme load or operating conditions potentially resulting in loss of life or personal injury. Aware of both the need for a redundant water supply and the rehabilitation/or removal of the Ferry Creek Dam, the City has been evaluating alternatives that would address the known issues. In 2015 a study which examined redundant water supply alternatives determined that rehabilitation of the Ferry Creek Dam was the most cost-effective way of providing the City with a redundant water supply. In 2016 the City developed a preliminary geotechnical report which examined the soils within the dam structure.

In August of 2021, the City of Brookings received an award of \$4,175,000 from Business Oregon’s Safe Drinking Water Revolving Loan Fund (SDWRLF) for the design and construction of various water infrastructure projects in the City. The project includes the replacement of 6250 lineal feet of 8” diameter water line and related appurtenances on Alder Street, 7th Street, Dodge Avenue, Memory Lane, Eastwood Lane and Pacific View area. The project also includes the replacement of the Tidewater Reservoir and the interior painting of the Marine Drive Reservoir.

Map/Image



2018 Reservoir Seismic Valve Installation

Partners/Funding Source

Partners: Harbor Water District PUD / Funding Source: Business Oregon Water SRF, Federal Grants, State Grants

References

Civil West Engineering Services, INC Redundant Water Supply Plan for the City of Brookings, OR - August 2015; Civil West Engineering Services, INC City of Brookings Redundant Water Supply Schematic Plans – September 2015; The Dyer Partnership Engineers & Planners, Inc., Ferry Creek Feasibility Study - June 2018; Brookings and harbor Desalination Facility Design Project by Humboldt State University – Fall 2015.

Brookings Multi-Hazard Action 22-MH-02:

Storm and Sanitary Sewer Disaster Repairs Project.

Mitigation Action #	Ongoing
Hazard	Multi-Hazard
Estimated Cost	\$200k
Timeline	Annually
Responsible Agency	City of Brookings
Priority	High

Description

Most of the storm drain infrastructure for the city of Brookings is located along Highway 101 and in the downtown area. The infrastructure crossing Highway 101 is owned and maintained by ODOT. A large portion of storm drain infrastructure within city limits is on private property and is not maintained by the City. The ability of surface water to flow into the city sewer system could result in combined sewer overflows and system risk. The City has experienced several significant storm drain collapses during winter storm events. These collapses and resultant overland flooding have caused significant damage to both public and personal properties throughout the City. By having to complete emergency repairs during the winter months, the City has had to expend significant resources and funds. To outline a proactive solution to address the aging and deficient storm drain system, the City had several key storm drain systems televised and inspected to facilitate the development of the Storm Drainage Master Plan. See City of Brookings Storm Drainage Master Plan for more details.

The City funds up to \$200k annually for cast in place pipe (CIPP) lining and has identified various locations in the sanitary sewer master plan. The City is currently in the process of securing \$20 million in funding for sewer infrastructure upgrades set to be completed over the next 5-7 years. See City of Brookings Preliminary Engineering Report (PER) for detailed descriptions of projects developed to address I & I and other sanitary sewer master plan projects.

Map/Image

Mill Beach Sinkhole November 2012

Partners/Funding Source

Partners: ODOT

Funding Source: USDA, Wastewater SRF, Federal Grants, State Grants

References

The Dyer Partnership Engineers & Planners, Inc., City of Brookings Storm Drainage Master Plan - June 2016; The Dyer Partnership Engineers & Planners, Inc., City of Brookings Preliminary Engineering Report (Wastewater Facilities Plan)- February 2019

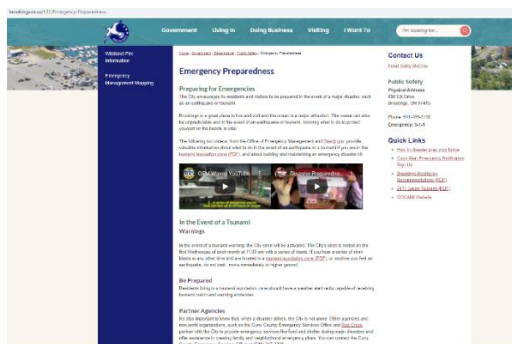
Brookings Multi-Hazard Action 22-MH-03:

Continue to implement and enhance public education programs regarding wildfires, earthquakes, and tsunamis.

Mitigation Action #	Ongoing
Hazard	Multi-Hazard
Estimated Cost	Staff Time
Timeline	1-3 yrs.
Responsible Agency	City of Brookings
Priority	High

Description

Provide fire safety and fire prevention information pamphlets in easy to read and understandable format. Target areas frequented by tourists such as motels, RV parks, community and state parks, restaurants, real estate offices, and chamber of commerce for local cities. Establish weekly fire prevention articles in local print media during fire season. The City's website includes a Public Safety – Emergency Preparedness webpage, providing information and additional links for emergency preparedness. Educational materials are also easily accessible at the visitor's center. The City's website and social media accounts will be consistently updated with educational materials and hazard information.

Map/Image

Left - City of Brookings Public Safety – Emergency Preparedness webpage. Right - Brookings Visitor's Center, December 2021

Partners/Funding Source

Partners: County Emergency Management

Funding Source:

References

The City of Brookings - Emergency Preparedness Webpage:

<https://www.brookings.or.us/131/Emergency-Preparedness>

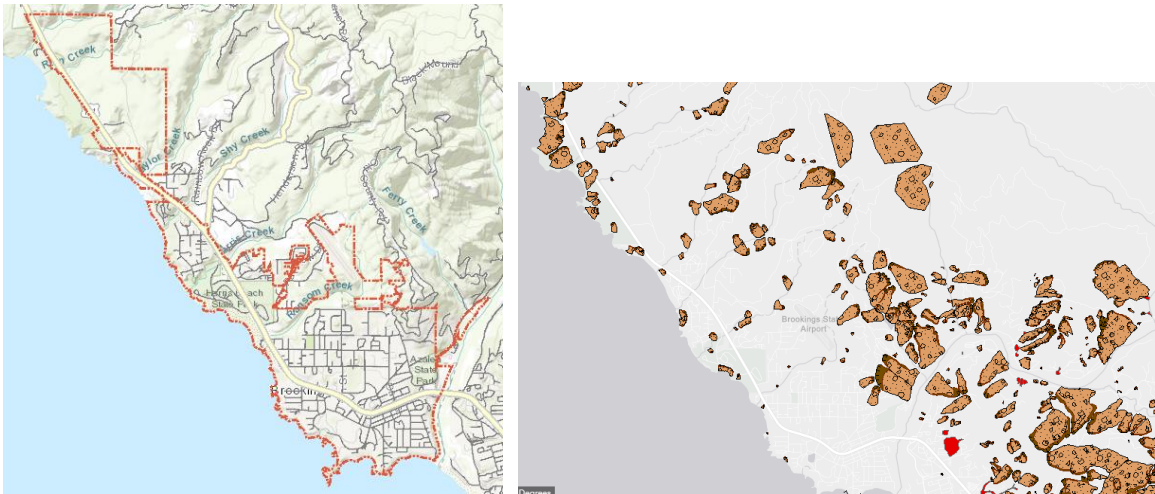
Brookings Landslide Action 22-LS-01:

Continue to identify and map high risk slide areas to create an accurate logistical assessment

Mitigation Action #	Ongoing
Hazard	Landslide
Estimated Cost	High
Timeline	Long
Responsible Agency	City of Brookings
Priority	High

Description

Ongoing 2010 Brookings Action 10-LS-01. Several areas within the City are at risk of landslides. These landslide areas impact U.S Highway 101, neighborhoods, and the alternate evacuation routes. The City must continue to assess the landslide risks to protect the public and assess potential impacts on infrastructure. The City will add the link for SLIDO, Statewide Landslide Information Layer for Oregon, to the City's Public Safety – Emergency Preparedness webpage.

Map/Image

Left – Brookings City Limits, Curry County GIS. Right – SLIDO report for Brookings

Partners/Funding Source

Partners: ODOT, County Emergency Management

Funding Source:

References

The City of Brookings - Emergency Preparedness Webpage:

<https://www.brookings.or.us/131/Emergency-Preparedness>; SLIDO

*City of Gold Beach***Gold Beach Multi-Hazard Action 22-MH-01:**

Continue to implement public education programs regarding natural hazards.

Mitigation Action #	Ongoing
Hazard	Multi-Hazard
Estimated Cost	Staff Time
Timeline	6-12 months
Responsible Agency	City of Gold Beach Fire & Police Departments
Priority	High

Description: Gold Beach has experienced an influx of new residents with no previous experience related to the natural hazard risks inherent to our region. The City is developing a collaborative effort to connect with the community through public workshops, media outreach, and educational materials to inform and encourage individual action.

Map/Image:

None

Partners/Funding Source

Partners: Gold Beach Public Works, Gold Beach Chamber of Commerce, Gold Beach Visitors Center, and Gold Beach Library.

Funding Source: Staff Time

References

None

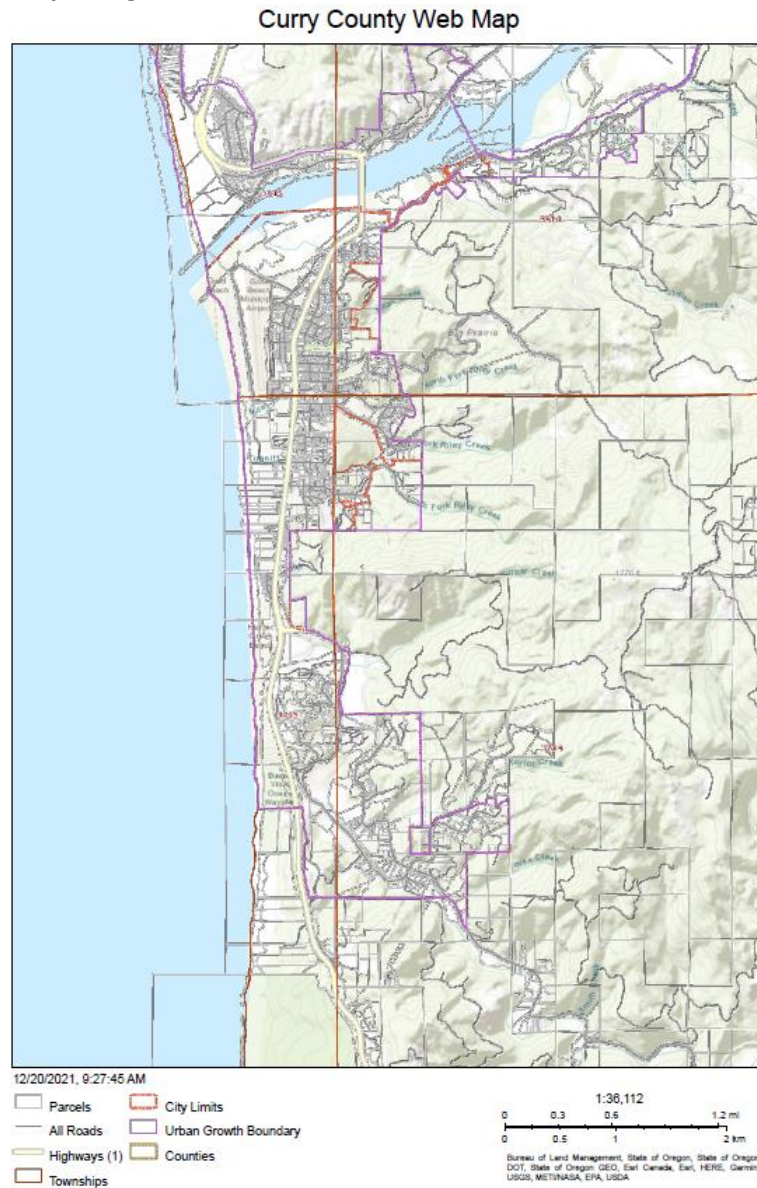
Gold Beach Multi-Hazard Action 22-MH-02:

Identify and map all roads, private drives, logging trails to increase the ability of firefighters to locate and gain access to provide services and/or evacuations.

Mitigation Action #	Ongoing
Hazard	Multi-Hazard
Estimated Cost	Staff Time
Timeline	6-12 months
Responsible Agency	City of Gold Beach
Priority	High

Description: The City of Gold Beach borders heavily wooded timberlands along the coastal range. The geography limits the use of buffer zones between the residential areas of Gold Beach and the wildfire risks associated with timberlands. Extreme weather and landslides also impact routes, requiring responders to identify alternate routes until the primary routes are cleared. The increased risk of a rapidly evolving emergency which could isolate residents requires a quick response to potential threats by first responders as well the expedited evacuation from these areas by citizens. Maintaining a map of all potential routes will expedite response time for responders and medical support, while also quickly identifying safe primary and alternate evacuation routes. The current detail of GIS mapping is insufficient to provide a comprehensive response without requiring responders to slow their approach to establish access. This project would identify high risk areas and access points while also deconflicting evacuation routes.

Map/Image:



Gold Beach city limits and urban growth boundaries, Curry County GIS mapping

Partners/Funding Source

Partners: Coos Forest Protective Association, U.S. Forest Service, Industrial Partners (logging companies), BLM, Curry Wildfire Protection Team, Curry County Road Department, ODOT.

Funding Source: Staff Time

References:

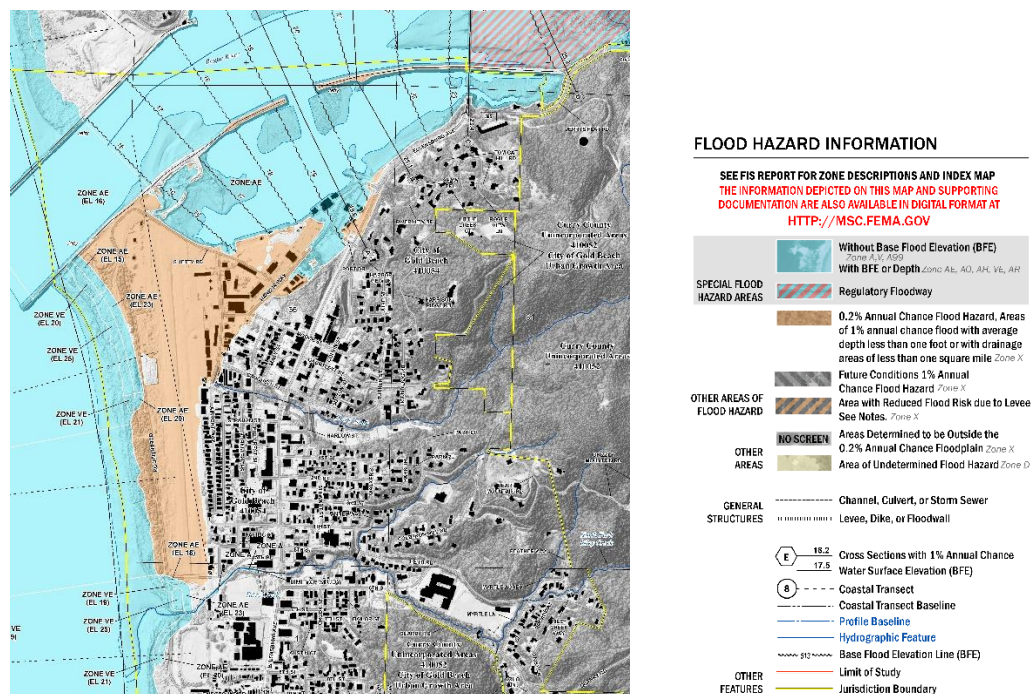
Curry County GIS mapping

Gold Beach Flood Action 22-FL-01:

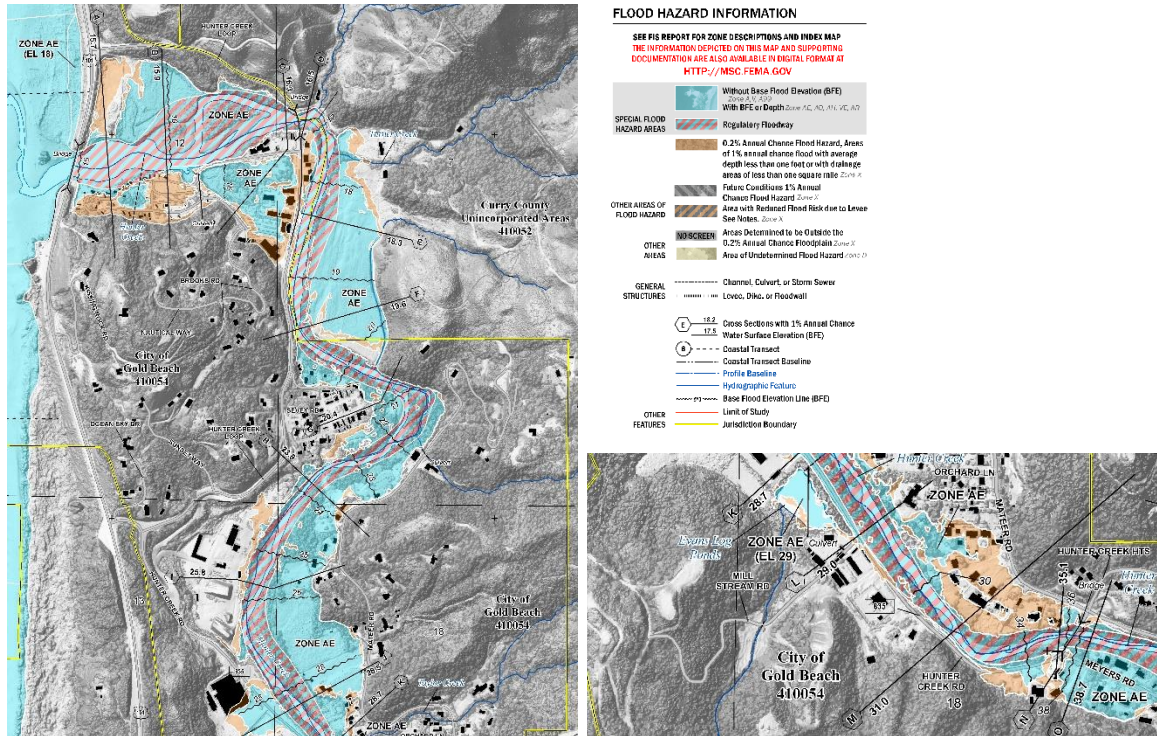
Ensure continued compliance in the national Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.

Mitigation Action #	Ongoing
Hazard	Flood
Estimated Cost	Staff Time
Timeline	6-12 months
Responsible Agency	City of Gold Beach
Priority	High

Description: The potential for flooding is a significant threat for the Gold Beach community with exposure to the Pacific Ocean, Rogue River, and Hunter Creek. Continued participation and compliance with the NFIP ensures residents and business owners have access to the most comprehensive protections available.

Map/Image:

Gold Beach Floodplains near Rogue River, FEMA's National Flood Hazard Layer (NFHL) Viewer



Gold Beach Floodplains along Hunter Creek, FEMA's National Flood Hazard Layer (NFHL) Viewer

Partners/Funding Source

Partners: FEMA, DLCD

Funding Source: Staff Time

References:

<https://www.fema.gov/flood-insurance>; FEMA's National Flood Hazard Layer (NFHL) Viewer

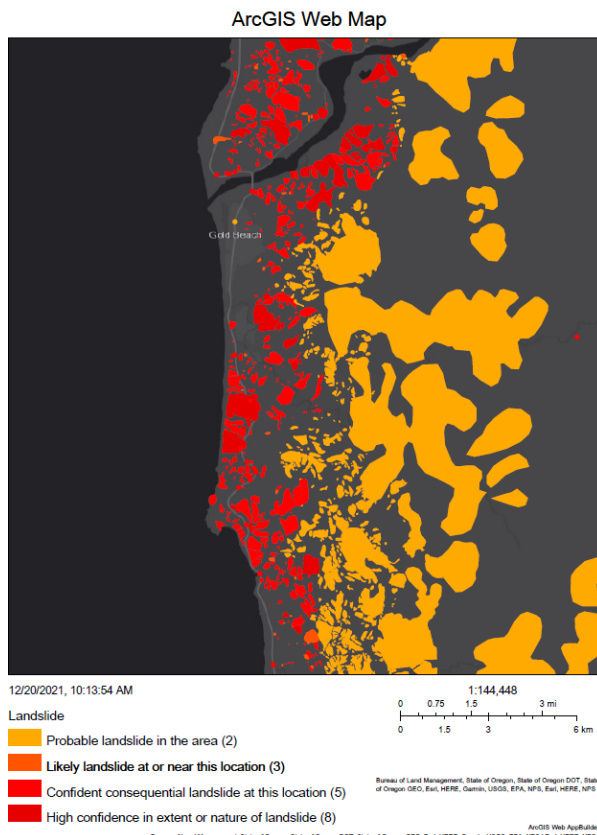
Gold Beach Landslide Action 22-LS-01:

Continue to identify and map high risk slide areas to create an accurate logistical assessment

Mitigation Action #	Ongoing
Hazard	Landslide
Estimated Cost	High
Timeline	Long
Responsible Agency	City of Gold Beach
Priority	High

Description: Gold Beach has been identified as a high-risk community for landslides and experiences landslides of varied severity on an annual basis. These landslides pose a risk to human life and often impacts public utilities for days, weeks, or months at a time. The City is in an ongoing effort to identify these areas of concern and mitigate risk through proactive planning and development.

Map/Image: See attached



Gold Beach Landslide Hazards, ArcGIS map with Landslide layers

Partners/Funding Source

Partners: US Geological Survey, Bureau of Land Management, Oregon DOT, Oregon GEO, DOGAMI

Funding Source: Federal Grants, State Grants

References:

<https://www.usgs.gov/faqs/what-landslide-hazard-map>

City of Port Orford

Port Orford Multi-Hazard 22-MH-01:

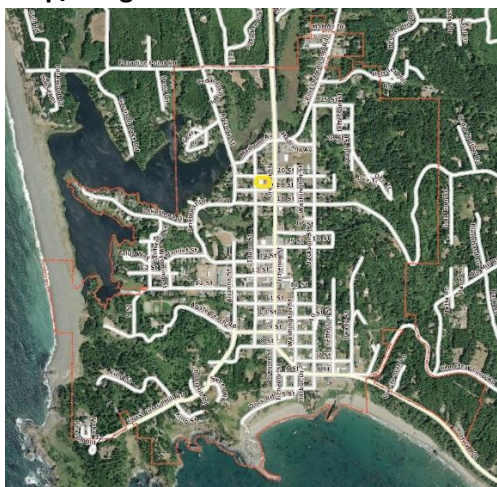
Relocate Port Orford facilities out of the local (not distant) tsunami zone with seismic upgrades: City of Port Orford City Hall, Police, Fire Department at 555 20th Street.

Mitigation Action #	New or Ongoing
Hazard	Multi-Hazard
Estimated Cost	\$2.5 million
Timeline	2-5 yrs.
Responsible Agency	City of Port Orford
Priority	High

Description

The city hall, fire department, and police department are critical facilities located within the same structures at 555 20th Street. This location is within the local tsunami inundation zone, critically reducing the response and recovery capabilities of the jurisdiction in the event of a local tsunami. Relocating the facilities and assets out of the local tsunami zone will place critical resources in a location to facilitate rapid lifesaving responses. Currently, there are no available locations within city limits and outside the inundation zone which are zoned for public facilities. There will be a need for an engineer assessment on the few available locations and an update to the zoning code for the identified building location(s).

Map/Image



Left - City of Port Orford Map, Red boundary is city limits, Yellow point is facility location.

Right - DOGAMI Tsunami evacuation brochure/map for Port Orford – 2020

Partners/Funding Source

Partners: Curry County Emergency Management and Road Department

Funding Sources: Federal Grants, State Grants

References

Tsunami evacuation brochure/map for Port Orford – 2020, Published by DOGAMI; Curry County GIS; City of Port Orford Tsunami Evacuation Facilities Improvement Plan

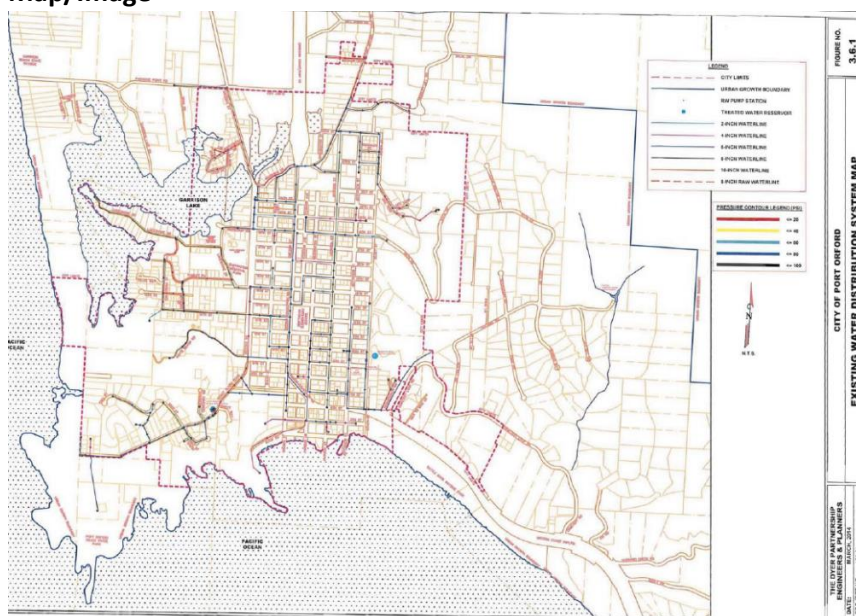
Port Orford Drought Action 22-DR-01:

Develop and maintain a resilient water supply for Port Orford.

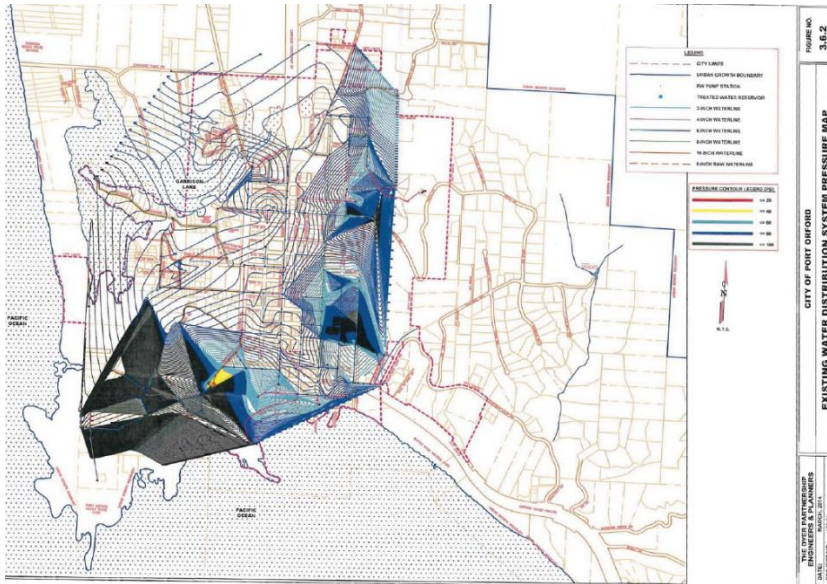
Mitigation Action #	New
Hazard	Drought
Estimated Cost	\$70 million
Timeline	2-5 yrs.
Responsible Agency	City of Port Orford
Priority	High

Description

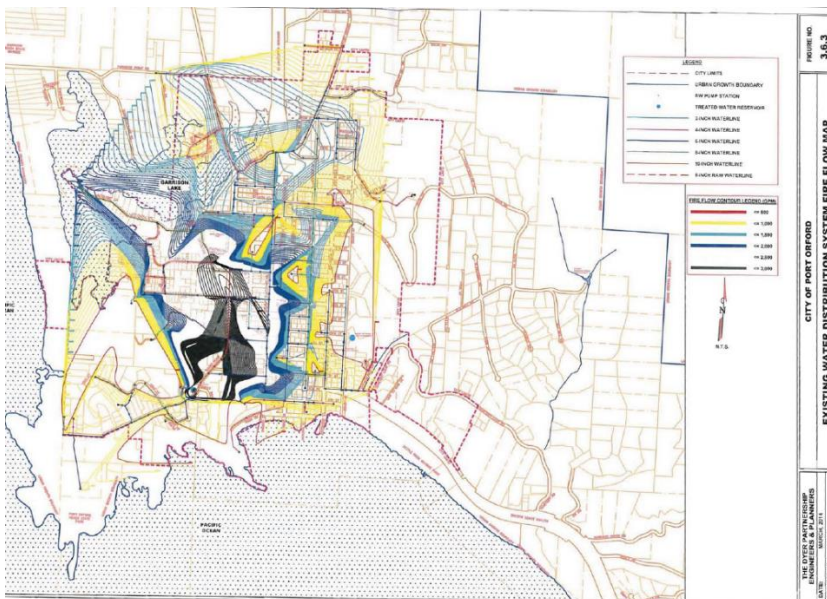
The City of Port Orford issued a state of emergency on 9/1/2021 due to water supply issues related to the drought, impoundment structural issues, distribution system leaks, and demand. The leaks between the tank and water delivery to a residence are resulting in an estimated loss of 40% of treated drinking water supply (per 9/21 County drought declaration); repairs are needed to mitigate severe water losses. In 2014 a bond for \$42 million was requested of voters, but in 2021 this will only cover 60% of the costs. There have been numerous leaks throughout the water delivery system, which is also experiencing additional strain due to new connections as the population grows within the city. There are ongoing water flow and pressure issues for residences as the elevation increases. The water delivery system was installed to meet prior fire codes, with the anticipated fire code updates the water delivery system must be upgraded to provide the required pressure and flow. Water infrastructure is not piped throughout the city, there are several residences within the city required to have a well. The city is pursuing updates to ordinances, quotes, and funding to replace the water meters and pumps.

Map/Image

Existing Water Distribution System Map, Figure No. 3.6.1, The City of Port Orford Water Master Plan, The Dyer Partnership Engineers and Planners, Inc., November 2014



Existing Water Distribution System Pressure Map, Figure No. 3.6.2, The City of Port Orford Water Master Plan, The Dyer Partnership Engineers and Planners, Inc., November 2014



Existing Water Distribution System Fire Flow Map, Figure No. 3.6.3, The City of Port Orford Water Master Plan, The Dyer Partnership Engineers and Planners, Inc., November 2014

Partners/Funding Source

Partners: City of Port Orford, Curry County Emergency Services, RCAC, Civil West Engineering
Funding Sources: COVID Relief Funds, BRIC, Hazard Mitigation Grants

References

City of Port Orford State of Emergency; City of Port Orford water restrictions; Curry County 2021 Drought Declaration; The City of Port Orford Water Master Plan, The Dyer Partnership Engineers and Planners, Inc., November 2014

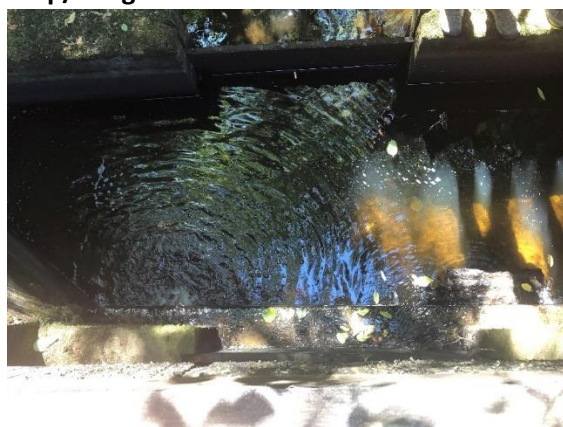
Port Orford Drought Action 22-DR-02:

Repair or retrofit the Port Orford water storage to reduce or eliminate leaks.

Mitigation Action #	New
Hazard	Drought
Estimated Cost	\$500k
Timeline	5-10 yrs.
Responsible Agency	City of Port Orford
Priority	High

Description

High priority repairs to the dam are needed; the plan for the repairs should be ready in Dec. 2021. Hubbard Creek and the water storage provided by the impoundment there is the sole drinking water supply source for Port Orford. Water leaks result in loss of 40% of treated drinking water supply (per 9/21 County drought declaration); expensive repairs are needed to mitigate severe water losses. The dam will receive a 10-year temporary repair in December 2021. There will be additional permanent repairs required for the dam to include possibly replacing the dam.

Map/Image

Hubbard Reservoir Dam leaking August 2021

Partners/Funding Source

Partners: City of Port Orford, Curry County Emergency Services, RCAC, Civil West Engineering
Funding Sources: COVID Relief Funds, BRIC, Hazard Mitigation Grants

References

City of Port Orford State of Emergency; City of Port Orford water restrictions; Curry County 2021 Drought Declaration; Structural Design Calculations Hubbard Reservoir Temporary Water Dam, Hubbard Reservoir, Port Orford, OR 97465, Civil West Engineering Services, Inc., November 4, 2021; City of Port Orford, Curry County Oregon, Hubbard Reservoir Temporary Water Dam Project Number 2510-003, Civil West Engineering Services, Inc., November 4, 2021

Port Orford Drought Action 22-DR-03:

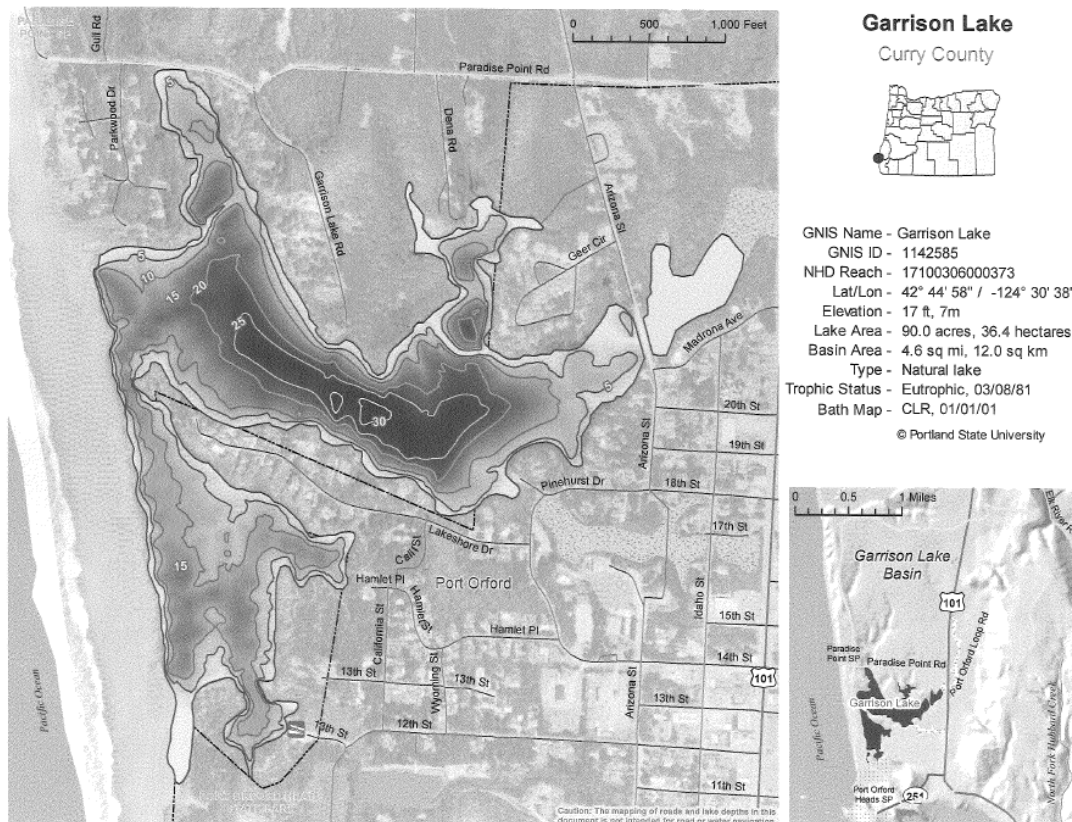
Develop a backup water source other than Garrison Lake for the Port Orford municipal drinking water system.

Mitigation Action #	New
Hazard	Drought
Estimated Cost	\$500k
Timeline	2-5 yrs.
Responsible Agency	City of Port Orford
Priority	High

Description

Hubbard Creek and the water storage provided by the impoundment is the sole drinking water supply source for Port Orford. The City has a raw water intake on Garrison Lake that has not been used since the winter of 1993 when it was improved to supplement the low quantity of water from the Hubbard Creek source. In the late 1990s the City constructed a new intake at the end of Pinehurst Dock in an attempt to improve water quality by drawing from a deeper point in the lake. This approach was not successful due to poor water quality (high salinity levels) causing taste and odor problems. In the past it has been proposed to move the existing raw intake to a location west of the Arizona Street bridge. This location receives fresh water from the lake's tributaries. This intake would serve as a secondary backup source since taste and odor issues have proven difficult to treat adequately. For several years there has been a persistent public aversion to Garrison Lake water due to taste and odor perception. Garrison Lake is continuously impacted by high salinity levels. The South Coast Watershed Council, Portland State University, and Oregon Lakes Association have studied the water quality of Garrison Lake and according to their reports, the large amount of salt water in the lake induced a very stable stratification in which the lower stratified layer is nearly as saline as the ocean. The upper layer is only slightly salty and does not mix with the lower layer due to the density difference. The Garrison Lake Rehabilitation Study prepared by EGR and Associates Inc. (2003) addressed alternatives for dune/shore stabilization. The Oregon State Parks Department developed a solution to lake breaching, which was implemented in 2006. Further outlet repair was done in 2013. Garrison Lake is accessible to the public for fishing, by boat or on the bank. Due to consistent issues ranging from water quality to wildlife within Garrison Lake, the City is reviewing water rights to explore alternate backup water sources.

Map/Image



Map of Garrison Lake, The City of Port Orford Water Rights Renewal, September 1, 2015

Partners/Funding Source

Partners: City of Port Orford, Curry County Emergency Services

Funding Sources: State Grants, Infrastructure Grants and Funding, Federal Grants

References

City of Port Orford State of Emergency; City of Port Orford water restrictions; Curry County 2021 Drought Declaration; The City of Port Orford Water Rights Renewal, September 1, 2015; The City of Port Orford Water Master Plan, Section 3 The Dyer Partnership Engineers and Planners, Inc., November 2014

Port Orford Tsunami Action 22-TS-01:

Work with other agencies and community organizations to develop natural disaster shelters outside the tsunami inundation zone.

Mitigation Action #	Ongoing
Hazard	Tsunami
Estimated Cost	\$500k
Timeline	2-5 yrs.
Responsible Agency	City of Port Orford
Priority	High

Description

Ongoing/revised 2016 Action #16-TS-01. Disaster cache work has begun, shelters have not. The city will explore different shelter options and recruit volunteers to train on shelter deployment. Due to land restrictions, the city will pursue deployable shelters instead of fixed shelters. There is a need for more caches and thoroughly stocked caches. Much of the city is within the local tsunami inundation zone, placing additional stress upon individual preparedness and placement of resource caches throughout the community.

Map/Image

DOGAM Tsunami evacuation brochure/map for Port Orford – 2020

Partners/Funding Source

Partners: Curry County Emergency Management, Dept. of Geology and Mineral Industries, Oregon Emergency Management, FEMA, NANOOS

Funding Sources: State Grants, Infrastructure Grants and Funding, Federal Grants

References

Port Orford Comprehensive Plan, Goal 7 Section, Hazard Policy 7; DOGAMI Tsunami evacuation brochure/map for Port Orford – 2020; <http://nvs.nanoos.org/TsunamiEvac>

Port of Gold Beach

Port of Port Gold Beach Multi-Hazard Action 22-MH-01:

Deepen/Dredge channels near high hazard zones

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$20+ Million
Timeline	2-5 yrs.
Responsible Agency	Port of Gold Beach
Priority	High

Description

The entrance of the Rogue River provides two jetties and a 13-foot-deep, 300-foot-wide channel from the ocean to a turning basin about one-quarter mile downstream of the state highway bridge. Construction of both jetties was completed in 1960. The north jetty was damaged in the 1964 flood and repaired in 1966. Three timber pile groins were constructed in 1984 as a five-year test of their ability to reduce shoaling of the small-boat basin access channel. In 1989, the test period was extended for five more years for two of the three test groins. The report concluded that relocation of the boat basin channel was cost effective, and in 1998, in cooperation with the Port of Gold beach, the boat basin channel was relocated approximately 1,000 feet upstream to a new opening in the breakwater provided by the Port of Gold Beach. The U.S Army Corps of Engineers has been responsible for maintenance dredging in the federal waters near the Port of Gold Beach. Sediment deposit continues to increase, resulting in shoal and gravel bar development which restricts craft movement into and around the port; boater safety is a concern as the shoals and gravel bars create additional hazards. Delayed dredging contracts have led to requests for emergency dredging operations. Due to limited resource transportation options, the port serves as a lifeline for central Curry County, increasing the priority for dredging operations. The Coast Guard is unable to station a boat at the mouth of the Rouge River due to the sediment deposits, creating additional safety concerns as the Coast Guard cannot conduct rescue efforts in the area. The restricted access to the port effects the economy of the surrounding areas which rely on tourism, river recreation, and fishing. There is concern the shoaling and changing river conditions will impact salmon populations which rely on the river.

Map/Image



Marina entrance during low tide, 2020



Marina entrance during low tide, June 2021

Partners/Funding Source

Partners: City of Gold Beach

Funding Source: State Grants, Federal Grants

References

US Army corps of Engineers, Portland District Website, Rogue River-Gold Beach

(<https://www.nwp.usace.army.mil/Locations/Oregon-Coast/Rogue-River-Gold-Beach/>)

Port of Gold Beach Multi-Hazard Action 22-MH-02:

Replace, increase size and stability of, and install new dock piles

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$750k
Timeline	2-5 yrs.
Responsible Agency	Port of Gold Beach
Priority	High

Description

Problem Statement: Current piles and locations restricts size of boats. Piles may be compromised due to previous hazard impacts. The port experienced damage during the 2011 tsunami, requiring replacement of approximately one third of the piles. The remaining piles have been in place for several decades; the wood is distressed and there is concern regarding the stability of the piles. Pile locations will be re-assessed to accommodate larger craft.

Map/Image

Port of Gold Beach piles, the wooden piles have been in place for several decades, December 1, 2021.

Partners/Funding Source

Partners: None

Funding Source: State Grants, Federal Grants

References

April 11, 2011 FEMA Project Worksheet for Declaration Number FEMA-1964-DR-OR

Port of Gold Beach Multi-Hazard Action 22-EQ-01:

Secure funding for High Dock seismic assessment and retrofit

Mitigation Action #	New
Hazard	Earthquake
Estimated Cost	\$10 Million
Timeline	2-5 yrs.
Responsible Agency	Port of Gold Beach
Priority	High

Description

Problem Statement: The High Dock was built in the 1960s and has not been through a retrofit. In 2009 Norwest Engineering conducted an assessment and submitted a proposal to replace the metal sheet pile wall and installing a new floating dock to meet ADA standards. The condition of the sheet pile wall raised concerns of catastrophic failure which would jeopardize the port offices and multiple businesses which set on the steel sheet pile sea wall. The sheet pile wall is in severe disrepair and has had several tie-back ground anchors pull through the sheet pile, particularly at the north end of the wall. Two areas of concern were mentioned in the 2009 assessment: fueling equipment pipes are hanging free where the lost fill was at behind the sheet pile, and the businesses are losing ground and are in peril of losing their foundations. It was proposed to rebuild the sheet pile wall to current standards using new sheet low environmental impact pile driving methods and updating all dock systems to current building codes. The deteriorating conditions of the sheet pile wall increases risks in the event of an earthquake as the sheet pile wall may experience a catastrophic failure. Conducting a new assessment and retrofitting the sheet pile wall will not only improve the safety of the port office, businesses, and high dock, but it will reduce the economic impact for the community.

Map/Image

Deteriorating condition of the sheet pile wall housing the high dock, December 2021



Deteriorating condition of the sheet pile wall housing the high dock, December 2021



Deteriorating condition of the sheet pile wall housing the high dock, December 2021



Two of the several structures located on the sheet pile sea wall

Partners/Funding Source

Partners: None

Funding Source: State Grants, Federal Grants

References

Port of Gold Beach High Dock Emergency Repair Project, prepared by Norwest Engineering, August 26, 2009

Port of Port Orford

Port of Port Orford Multi-Hazard Action 22-MH-01:

Retrofit and maintain tsunami evacuation route from port, including identifying and installing alternate route.

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$2-3 Million
Timeline	2-3 years
Responsible Agency	Port of Port Orford
Priority	High

Description

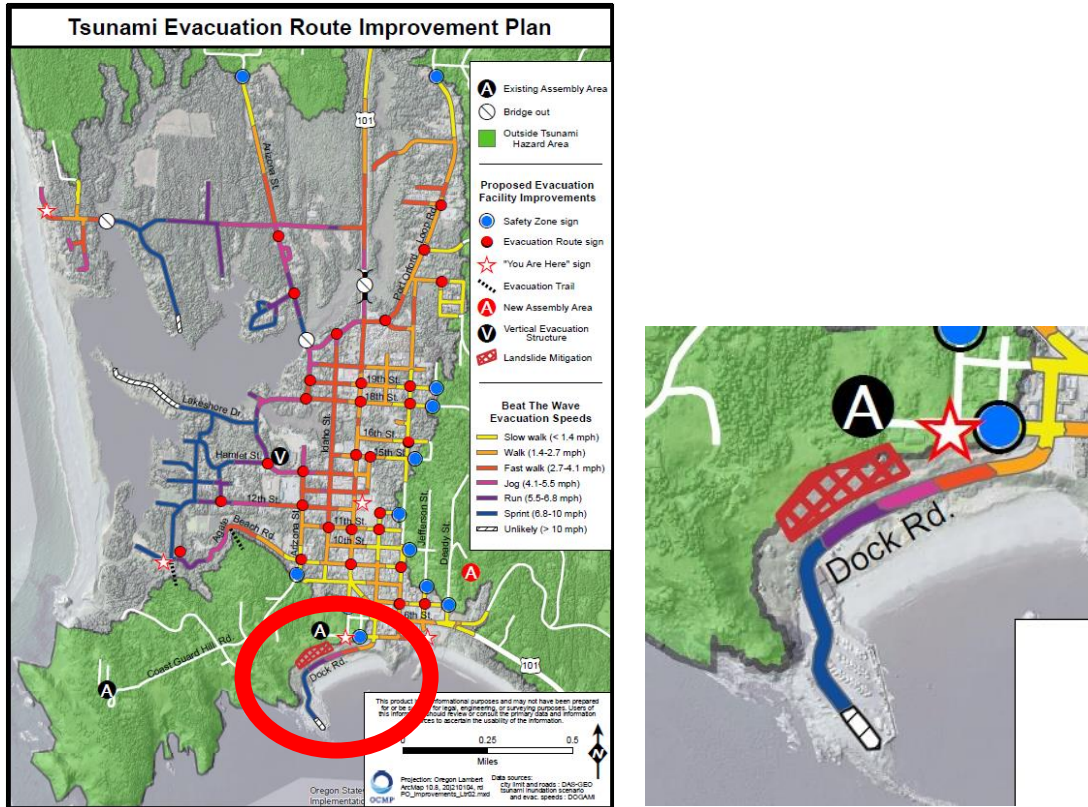
Personnel visiting and working at the port will have limited tsunami evacuation routes available in the event of a large Cascadia earthquake. According to the DOGAMI Beat the Wave Report, the port is forecasted to have less than 15 minutes to evacuate before a XXL wave arrives. In addition to the quick wave arrival, the 2021 Port Orford Tsunami Evacuation Facilities Improvement Plan (TEFIP) identifies the need for landslide mitigation along Dock Road and seismic retrofitting of the road itself, improving evacuation options for the port. The Port will also identify and install an alternate evacuation footpath north of the landslide zone along Dock Road.

Map/Image



View of the Port, Graveyard Point, Dock Road, and Tsunami Assembly Area.

photo: Manuela Durson



City of Port Orford, Oregon Tsunami Evacuation Facilities Improvement Plan (TEFIP) – January

Partners/Funding Source

Partners: City of Port Orford, Multiple County Departments, Oregon Department of Emergency Management (OEM), FEMA

Funding Source: County Grants, State Grants, Federal Grants

References

City of Port Orford, Oregon Tsunami Evacuation Facilities Improvement Plan (TEFIP) – January 2021; Oregon Department of Geology and Mineral Industries (DOGAMI) Open File Report O-20-05, Tsunami Evacuation Analysis of Port Orford, Curry County, Oregon (Beat the Wave) – 2020.

Port of Port Orford Multi-Hazard Action 22-MH-02:

Replace, increase size and stability of, and install new dock piles.

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$200k
Timeline	1-3 yrs.
Responsible Agency	Port of Port Orford
Priority	High

Description

Problem Statement: The current piles and locations restrict the size of boats. The piles may be compromised due to previous hazard impacts such as the 2011 tsunami, extreme waves, and severe storms. There are 37 piles which were last replaced in 2000. The piles have been repeatedly exposed to multiple hazards; requiring replacement to ensure pile stability. Due to the unique dolly dock, current pile placement would not meet the needs of large ships delivering resources following large scale disasters or emergencies. The Port of Port Orford serves as a vital lifeline for north Curry County, calling for the addition of piles that can support large ships delivering lifesaving resources.

Map/Image

Dock piling damaged during high seas event.

Partners/Funding Source

Partners: City of Port Orford

Funding Source: State Grants, Federal Grants

References: None

Port of Port Orford Multi-Hazard Action 22-MH-03:

Secure funding for assessment of port dock and seismic upgrades

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$100k
Timeline	2-5 yrs.
Responsible Agency	Port of Port Orford
Priority	High

Description

Problem Statement: The Port of Port Orford has a unique high dock construction, with sheet pile in place of typical pilings. This design was developed by PND Construction to enable the creation of the solid high dock in this natural deep-water harbor with no river mouth (see photo below). This construction method and the sheet pile component is integral to the dock structure and operations. The sheet pile was installed with the original dock in 2000 and may not withstand an earthquake. There has not been an assessment of the sheet pile since installation. The sheet pile extends underwater, making it difficult for a thorough assessment by port authorities. There is visual deterioration of the dock components, see images below. Excessive shoaling in the harbor requires regular dredging directly adjacent to the dock, allowing port operations to continue. The port has concerns about the stability of the sheet pile due to the potential undermining effects of annual dredging. The sheet pile has not been replaced since the construction of the dock in 2000, causing concern for the stability and resilience of the sheet pile. A compromised dock will inhibit re-establishment of the port after a catastrophic event. The Port serves as a lifeline for the City of Port Orford and Curry County. Following a disaster or emergency, it will be critical to re-establish port operations quickly, facilitating the movement of life saving resources.

Map/Image

Shoaling of the harbor as seen at minus tide, showing dock sheet pile construction and aging high-capacity cranes used to launch and retrieve vessels. June 2012

A large industrial facility, possibly a power plant or data center, featuring rows of tall, grey metal cabinets or racks. The cabinets have numerous drawers and doors, some with circular handles. The room has a high ceiling with exposed wooden beams and pipes. A large white container is visible on the right side, and a red fire extinguisher is on the floor. The floor is made of concrete.



Construction Remarks

The Contractor and sub-contractor shall at all times a construction manager who will maintain the overall progress. The survey and stationing required and easily accessible to be maintained by the Engineer upon request of the office of the construction.

In addition to visible survey of the location of the old wharf shall be maintained to provide the location of the old wharf shall remain permanent. When construction, use the old wharf. The survey and stationing required and easily accessible to be maintained by the Engineer upon request of the office of the construction.

The survey and stationing shall be maintained to provide the location of the old wharf shall remain permanent. When construction, use the old wharf. The survey and stationing required and easily accessible to be maintained by the Engineer upon request of the office of the construction.

As-Built Plans

Contractor shall maintain a set of as-built plans in the job office on the project site. The as-built plans shall be kept in the job office on the project site. The as-built plans shall be kept in the job office on the project site. The as-built plans shall be kept in the job office on the project site.

CONTROL POINT LIST

POINT NO.	DESCRIPTION	STATION	OFFSET
1	CENTER OF OLD #1	8414.5	233.10
2	CENTER OF OLD #2	1448.5	233.10
3	100' TO CORNER OF OLD #1 AT JETTY	8414.5	233.10
4	100' TO CORNER OF OLD #2 AT JETTY	8414.5	233.10
5	100' TO CORNER OF OLD #3 AT JETTY	8414.5	233.10
6	100' TO CORNER OF OLD #4 AT JETTY	8414.5	233.10
7	100' TO CORNER OF OLD #5 AT JETTY	8414.5	233.10
8	100' TO CORNER OF OLD #6 AT JETTY	8414.5	233.10
9	100' TO CORNER OF OLD #7 AT JETTY	8414.5	233.10
10	100' TO CORNER OF OLD #8 AT JETTY	8414.5	233.10
11	100' TO CORNER OF OLD #9 AT JETTY	8414.5	233.10
12	100' TO CORNER OF OLD #10 AT JETTY	8414.5	233.10
13	100' TO CORNER OF OLD #11 AT JETTY	8414.5	233.10
14	100' TO CORNER OF OLD #12 AT JETTY	8414.5	233.10
15	100' TO CORNER OF OLD #13 AT JETTY	8414.5	233.10

**PORT OF PORT ORFORD
PERMANENT DOCK STRUCTURE**

GENERAL SITE PLAN & SURVEY CONTROL

Scale: 1" = 100'

North Arrow

Legend

- As-Built
- Survey
- Control Point
- Property Line
- Water
- Land
- Structure
- Highway
- Railroad
- Utility
- Other

Notes

1. The survey and stationing shall be maintained to provide the location of the old wharf shall remain permanent. When construction, use the old wharf. The survey and stationing required and easily accessible to be maintained by the Engineer upon request of the office of the construction.

2. The survey and stationing shall be maintained to provide the location of the old wharf shall remain permanent. When construction, use the old wharf. The survey and stationing required and easily accessible to be maintained by the Engineer upon request of the office of the construction.

3. The survey and stationing shall be maintained to provide the location of the old wharf shall remain permanent. When construction, use the old wharf. The survey and stationing required and easily accessible to be maintained by the Engineer upon request of the office of the construction.

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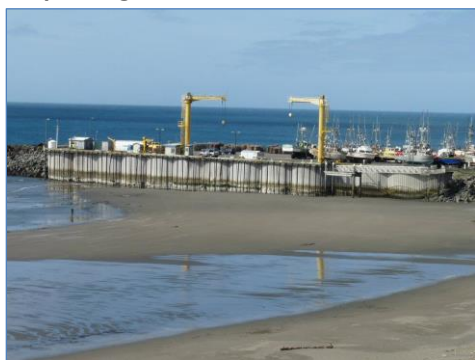
Port of Port Orford Multi-Hazard Action 22-MH-04:

Ensure new infrastructure components are adequately designed to minimize risk from natural hazards

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$3 Million
Timeline	5-10 yrs.
Responsible Agency	Port of Port Orford
Priority	High

Description

The aging infrastructure of port components is cause for concern regarding port stability and resilience. The electric facility is located at the base of an unstable bluff, and is at increased risk during earthquake, king tide, flooding, and tsunami events. There is a need for an assessment of the ability of the vessel hoists to withstand an earthquake and tsunami event. The vessel hoists also require the addition of a backup power generator to expedite re-establishment and operations following a disaster or emergency. This is necessary as the reestablishment of local power generation may not occur in time to resume vital port operations during recovery. The placement of the breakwater has resulted in excessive shoaling, impacting the current infrastructure, and requiring annual dredging. New infrastructure components should be disaster resilient; resilient infrastructure will facilitate rapid port operation re-establishment. As infrastructure components are updated, relocating, and reinforcing the new components will be necessary to ensure long term operations.

Map/Image

Shoaling of the harbor as seen at minus tide, June 2012

Partners/Funding Source

Partners: City of Port Orford, Multiple County Departments

Funding Source: State Grants, Federal Grants

References: None

Port of Port Orford Multi-Hazard Action 22-MH-05:

Relocate/reconfigure harbor control structures

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$5M
Timeline	5-10 yrs.
Responsible Agency	Port of Port Orford
Priority	High

Description

Problem Statement: Harbor controls will be damaged, degraded, or destroyed during a tsunami or flood event. The breakwater has been damaged multiple times, requiring repairs and negatively effecting port operations. Debris in the water poses additional risks to control structures, the dock, boats, and port facilities. Control structure relocation/reconfiguration and reinforcement is necessary to protect the port and reduce hazard impact on port operations.

Map/Image

October 2014 Breakwater Damage - https://theworldlink.com/bandon/news/damage-total-mounts-in-port-orford/article_d879c480-5ec9-11e4-8dbb-27ba0a28f349.html



Flooding and damage caused by +30-foot waves in October 2014, Port of Port Orford Strategic Business Plan – February 2016



November 2012 winter storm, USACE report Evaluating Opportunities to Reduce Shoaling within the Federal Navigation Channel at Port Orford: A Relative Comparison of Breakwater Repair Alternatives – April 2018



Interim repair of breakwater - October 2019

Partners/Funding Source

Partners: City of Port Orford, Multiple County Departments, USACE

Funding Source: State Grants, Federal Grants

References

USACE report Evaluating Opportunities to Reduce Shoaling within the Federal Navigation Channel at Port Orford: A Relative Comparison of Breakwater Repair Alternatives – April 2018;
Port of Port Orford Strategic Business Plan – February 2016
Letter from USACE to Port of Port Orford regarding breakwater modifications. August 31, 2018
Letter from Port of Port Orford to USACE regarding breakwater modifications. September 17, 2018

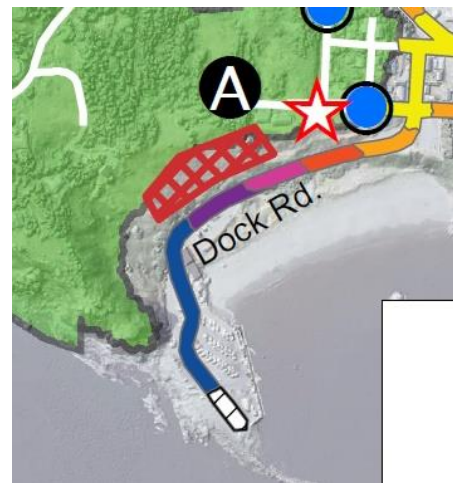
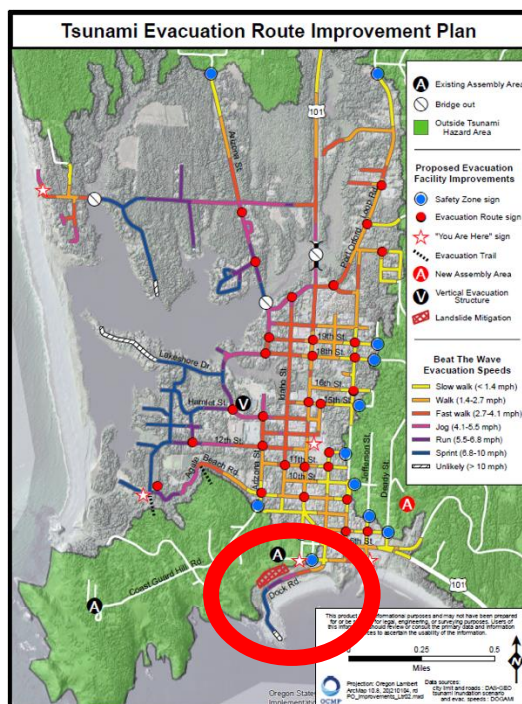
Port of Port Orford Earthquake Action 22-EQ-01:

Evaluate the seismic vulnerabilities of embankments and over structures, prioritize replacements with seismically designed stabilizing methods.

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$20k
Timeline	2-5 yrs.
Responsible Agency	Port of Port Orford
Priority	High

Description

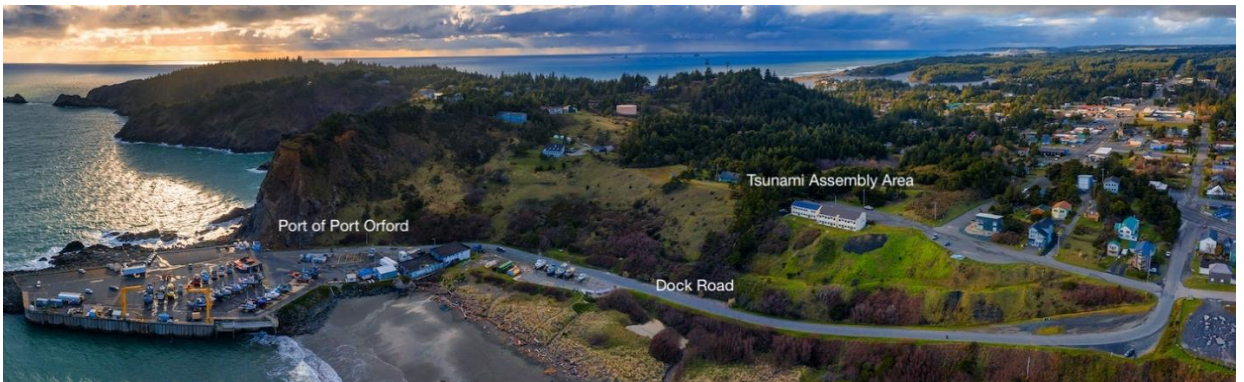
The port is exposed to increased cascading risks in the event of a large earthquake. Graveyard Point overlooks the port, posing a risk of boulders and rocks tumbling onto the port and potentially blocking evacuation routes. Directly north of the port has been identified in the 2021 Port Orford Tsunami Evacuation Facilities Improvement Plan (TEFIP) as a zone in need of landslide mitigation along Dock Road, and seismic retrofitting of the road itself (see Action 22-MH-01). Dock Road is the identified tsunami evacuation route for port personnel, tenants, and visitors. The port and evacuation routes are all at risk of liquefaction, calling for concern of port stability during a seismic event. Currently, the port facilities are not retrofitted for seismic events.

Map/Image

City of Port Orford, Oregon Tsunami Evacuation Facilities Improvement Plan (TEFIP) - Appendix 2



Graveyard Point overlooking the Port of Port Orford – November 2021



View of the Port, Graveyard Point, Dock Road, and Tsunami Assembly Area.
photo: Manuela Durson

Partners/Funding Source

Partners: City of Port Orford, Multiple County Departments,
Funding Source: State Grants, Federal Grants, FEMA

References

City of Port Orford, Oregon Tsunami Evacuation Facilities Improvement Plan (TEFIP) – January 2021

Port of Port Orford Tsunami Action 22-TS-01:

Install tsunami signage and tsunami education displays

Mitigation Action #	New
Hazard	Multi-Hazard
Estimated Cost	\$10k
Timeline	1-3 yrs.
Responsible Agency	Port of Port Orford
Priority	High

Description

Within the port area there is a need for tsunami zone educational signage. The port attracts many visitors due to the unique dolly dock, access to local seafood, ecotours, and coastal views. Installing tsunami educational signage decreases risk to visitors, tenants, and port employees while increasing awareness. There is a lack of tsunami evacuation route signage within the port and along the evacuation route from the port. Tsunami evacuation signage must be installed in the port area and along the route to the assembly area. Additional way finder techniques found in the Oregon Tsunami Evacuation Wayfinding Guidance and the Oregon Tsunami Wayfinding Research Project Up and Out series will be considered to improve evacuation route identification.

Map/Image

Aerial view of Port showing lack of tsunami evacuation wayfinding or signage. 2021



Left - Dock Road facing 5th Street, no tsunami evacuation or education displays present – December 9, 2021. Right - Dock Road entrance, “Tsunami Hazard Zone” sign is the only tsunami education sign present in the Port area – December 9, 2021

Partners/Funding Source

Partners: City of Port Orford, County Road Department, County Emergency Management

Funding Source: State Grants, Federal Grants

References

Oregon Tsunami Evacuation Wayfinding Guidance, OEM and DOGAMI; Oregon Tsunami Wayfinding Research Project Up and Out series, The Portland Urban Architecture Research Lab (PUARL) and OEM.

III. PLANNING PROCESS

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A. Plan Maintenance

The Plan Maintenance section details the formal process that will ensure that the Natural Hazard Mitigation Plan (NHMP) remains an active and relevant document. The plan maintenance program includes the responsibilities of the convener and steering committee, a meeting schedule and plan review checklist, a table for tracking changes, guidance for resuming the five-year update process, and best practices for public participation. The Steering Committee and local staff are responsible for implementing this process, which includes maintaining and updating the Plan through a series of meetings outlined in the maintenance schedule below.

Convener

The Curry County Emergency Manager will coordinate county plan maintenance by serving as Convener. In this role, the Curry County Emergency Manager will ensure that a committee is formed with current representatives of local jurisdictions. Their primary responsibility is to facilitate the Curry County Hazard Mitigation Steering Committee coming together for regular meetings and to foster communication with the rest of the members of the Steering Committee. Each of the participating cities and special districts (e.g., ports) will also identify local representatives responsible for coordinating with the county where appropriate. Plan implementation and evaluation will be a shared responsibility among all Hazard Mitigation Steering Committee members.

Convener responsibilities generally include:

- Scheduling meetings of the Curry County Hazard Mitigation Steering Committee and inviting key stakeholders to regular NHMP implementation meetings.
- Organizing Steering Committee meeting dates, times, locations, agendas, and member notification.
- Documenting the discussions and outcomes of committee meetings.
- Coordinating with elected officials on risk reduction policies and budget requests.
- Coordinating with fellow department heads (e.g., planning, economic development, public works, etc.) on the implementation of risk reduction actions, projects, and policies.
- Serving as a communication conduit between the Steering Committee, interested parties, and the public.
- Identifying FEMA funding sources for natural hazard mitigation projects.
- Utilizing risk assessment information in prioritizing natural hazard risk reduction projects.

Steering Committee

The Curry County Convener will engage the Curry County Hazard Mitigation Steering Committee to maintain, implement and update the NHMP. The Steering Committee responsibilities include:

- Attending each NHMP meeting (or designating a representative to serve in their place).
- Coordinating public involvement and internal engagement activities for their jurisdiction.
- Serving as the local evaluation committee for FEMA funding programs by prioritizing and recommending funding for natural hazard risk reduction projects.
- Evaluating and updating the NHMP in accordance with the prescribed maintenance schedule.
- Developing and coordinating ad hoc and/or standing subcommittees as needed.

Meeting Schedule

The Steering Committee will meet on an **annual basis** (1-4 times per year) to complete the following tasks. These meetings are an opportunity for the jurisdictions to report on progress that has been made on mitigation activities outlined in the NHMP or to identify gaps in data or new mitigation actions that need to be added.

The Convener or Steering Committee may develop the meeting agenda as is useful to the group for each meeting. The agenda may be informed by this list of possible agenda items and tasks to be addressed as a part of plan maintenance.

- Update the risk assessment with hazard events and disaster or drought declarations.
- Discuss priorities for coordinated hazard risk reduction education, outreach, and public involvement.
- Document successes and lessons learned during the year.
- Prioritize potential mitigation projects; Review existing action items to determine appropriateness for funding before the budget is approved in May.
- Identify opportunities to work together locally, such as exercises, preparedness, or plans.
- Update decision makers on progress of the plan implementation.

The Convener will be responsible for documenting the outcome of the semi-annual meetings. The Plan Update Checklist and the Record of Revision form allows the County and participating jurisdictions to review and track which plan sections need to be updated with new data as it becomes available. By meeting regularly, it is much easier to maintain a current NHMP and Steering Committee roster and to make progress on the implementation of natural hazard mitigation projects.

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 Curry County NHMP is due to be updated by June 30, 2027.** The convener will be responsible for organizing the committee to address plan update needs. The steering committee will be responsible for updating any deficiencies found in the plan, and for ultimately meeting the plan update requirements.

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

Update Checklist

Figure III-1. Natural Hazards Mitigation Plan Maintenance Checklist

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?			Document changes in vulnerability in the risk assessment section
Do future annexations include hazard prone areas?			Document changes in vulnerability in the risk assessment section
Are there new high risk populations?			Document changes in vulnerability in the risk assessment section
Are there completed mitigation actions that have decreased overall vulnerability?			Document changes in vulnerability in the risk assessment section
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 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 data limitations?			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 potential dollar losses for vulnerable structures?			Document any updates in the plan goal section
Are the plan goals still relevant?			Document whether each action is completed or pending. For those that remain pending explain why. For completed actions, provide a 'success' story.
What is the status of each mitigation action?			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.
Are there new actions that should be added?			If not, add this action to meet minimum NFIP planning requirements
Is there an action dealing with continued compliance with the National Flood Insurance Program?			
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.

Source: Oregon Partnership for Disaster Resilience.

Plan Adoption

The Curry County NHMP is developed and implemented through a collaborative process. After the Plan is locally reviewed and deemed complete, the Curry County Emergency Manager, or their designee/contractor, submits it to the State Hazard Mitigation Officer (SHMO) at the Oregon Department of Emergency Management (OEM). OEM submits the plan to 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 and participating cities will adopt the plan via resolution. Once the plan is formally adopted at the local level and formally approved by FEMA, the County and participating cities will acquire eligibility for the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds, and Flood Mitigation Assistance program funds.

Plan Maintenance: Record of Revisions Form

During semi-annual Steering Committee meetings, document plan progress by adding information to this table. This could include Mitigation Action progress or success, disaster event updates to the relevant hazard chapter, or ideas for new Special Districts to join the next update.

Table III-1. Record of Revisions

Date	Jurisdiction(s)	Revision
Example:	Curry County	Impacts from xx/xx/20xx flood event in X, Y, Z areas submitted for disaster declaration request.
XX/XX/2022		
XX/XX/2022		
XX/XX/2023		
XX/XX/2023		
XX/XX/2024		
XX/XX/2024		
XX/XX/2025		
XX/XX/2025		

Steering Committee Operating Protocol

Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan Steering Committee Operating Protocol

Basic Requirements:

- One representative from each jurisdiction will attend each full Steering Committee meeting. This representative will sign in and provide cost share documentation for their meeting attendance and preparation.
- Each jurisdiction will facilitate an internal planning process and engage the public/ their constituents. All meetings and public engagement efforts will be documented to the best of the ability of the participants.
- Each jurisdiction agrees to adopt the final plan.
- Completing the basic FEMA requirements is the responsibility of each jurisdiction.

Overall Process:

- Plan on approximately five meetings.
- Ask questions or ask for help if needed.
- Participate and share, helping to formulate a joint vision. Engage this opportunity for collaboration.

Decision-making Process: *Proposal—Discussion—Decision*

- Decisions will be associated primarily with written proposals, shared in advance, or with enough substantive presentation at the meeting that the proposal is clear, and the group can adequately discuss it prior to a decision. Many concepts and ideas will be discussed that will not require formal decisions, however, there will be specific proposals for how the plan is outlined, etc.
- We will strive for consensus but use a voting process to make decisions. **Each jurisdiction formally participating in the plan will receive one vote (yes or no).** The primary representative or the person in attendance will be the voting representative for the jurisdiction and is expected to wield voting authority. However, if the person wants to register their vote either as a ‘stand-aside’ due to a moral quandary or an ‘abstention’ due a lack of understanding of the question being called, that is acceptable.

Plan Update History

2010 Curry County Natural Hazard Mitigation Plan

The first Curry County Multi-Jurisdictional NHMP was approved by FEMA in 2010. In 2008, the Oregon Partnership for Disaster Resilience (OPDR/The Partnership) at the University of Oregon's Community Service Center partnered with Oregon Emergency Management (OEM) and Curry County to develop a Pre-Disaster Mitigation Planning Grant proposal. The Partnership, OEM, and the participating communities were awarded grant funding and local planning efforts in this region began in 2009.

The following jurisdictions, agencies, and/or organizations were represented and served on the Steering Committee during the development of the 2010 Curry County NHMP:

- Curry County Planning Department
- Curry County Emergency Management
- City of Brookings
- City of Gold Beach
- City of Port Orford
- Curry County Road Department
- Oregon Parks and Recreation Department
- Coquille Indian Tribe
- Coos-Curry Electric Cooperative

2016 Curry County Natural Hazard Mitigation Plan

The following jurisdictions, agencies, and/or organizations were represented and served on the Steering Committee during the development of the 2016 Curry County NHMP:

- Curry County Planning Department
- Curry County Emergency Management
- City of Brookings
- City of Gold Beach
- City of Port Orford
- Curry County Road Department
- Oregon Parks and Recreation Department
- Coquille Indian Tribe
- Coos-Curry Electric Cooperative

B. 2022 Plan Update

Curry County sent a letter of interest for a Pre-Disaster Mitigation (PDM) grant application the Oregon Department of Land Conservation and Development (DLCD) made to FEMA in 2018 to update the Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan (Curry NHMP). Pre-award coordination between DLCD and Curry County Emergency Management began in January 2019 with a review of the proposed Intergovernmental Agreement (IGA) and the associated Scope of Work for the Curry County multi-jurisdictional process. A robust Steering Committee recruitment process was also conducted that included updating the contact information for local partners.

The following jurisdictions, agencies, and/or organizations were represented and served on the Steering Committee during the development of the 2022 Curry County NHMP (for a list of individuals, see the Acknowledgements section of this NHMP):

- Curry County
- City of Brookings
- City of Gold Beach
- City of Port Orford
- Port of Gold Beach
- Port of Port Orford
- Port of Brookings-Harbor
- Curry Fire Defense Board
- Curry Watersheds Partnership
- Brookings-Harbor School District
- Central Curry School District
- U.S. Forest Service
- Coquille Indian Tribe
- Tolowa Dee-Ni' Nation
- Coos Curry Douglas Business Development Corporation
- Business Oregon
- Department of Geology and Mineral Industries
- Oregon Parks and Recreation Department
- Oregon Department of Land Conservation & Development
- Oregon Health Authority, Department of Health and Human Services

Pre-Award

In preparation for the 2022 NHMP Update, Curry County Emergency Management conducted outreach to port districts to expand the multi-jurisdictional partnership from four to six jurisdictions. During pre-award, the IGA and Scope of Work was shared and adopted by the participating plan jurisdictions.

Figure III-2. Steering Committee Roster



Curry County Natural Hazard Mitigation Plan 2021 Update Steering Committee Recruitment

August 5, 2021
Steering Committee Members

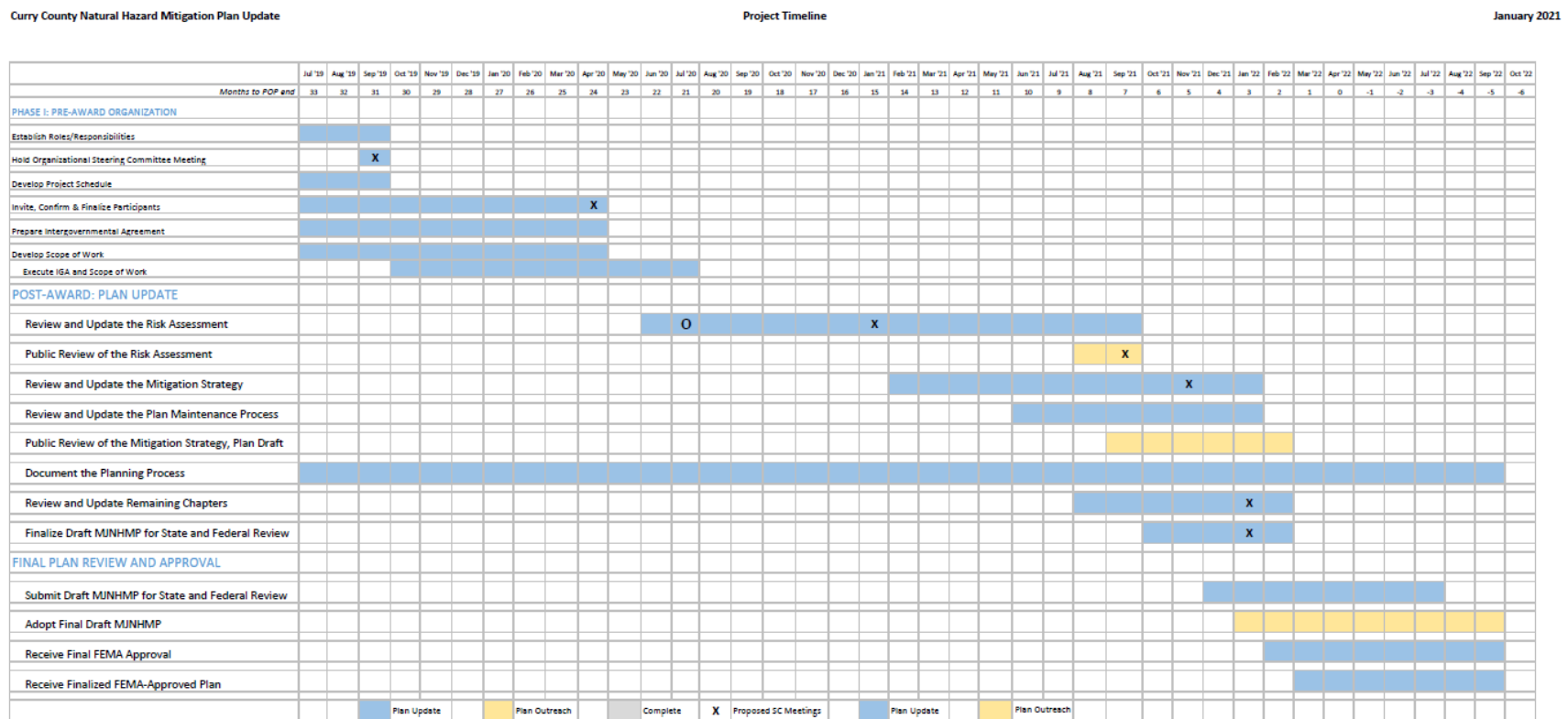


1. Monica Ward, Curry County Sheriff's Office Emergency Manager
2. Richard Christensen, Curry County Road Department
3. Becky Crockett, Curry County Community Development Department
4. Pat Cox, City of Port Orford, Mayor/ Port of Port Orford, Port Manager
5. Anthony Baron, City of Brookings Public Works
6. Jim Watson, City of Brookings Fire Department
7. Andy Wright, Port of Gold Beach, Port Manager
8. Jordan White, Curry County Sheriff's Office
9. Phil McDonald, Curry County Sheriff's Office
10. Summer Matteson, Curry County Economic Development
11. Nancy O'Dwyer, Curry County Community Development Department
12. Jessica Ginsburg, City of Port Orford, City Administrator
13. Patty Clark, City of Port Orford Planning Department
14. Crystal Shoji, City of Port Orford Planning Department/Shoji Consulting
15. John Isadore, City of Port Orford Public Works
16. Gary Burns, City of Port Orford City Council
17. Jodi Fritz-Matthey, City of Gold Beach Administration
18. Will Newdall, City of Gold Beach Public Works
19. Jenny Houck, Port of Port Orford, Office Manager
20. Janell Howard, City of Brookings Administration
21. Jessica Ginsburg, City of Port Orford Administration
22. Gary Dehlinger, Port of Brookings-Harbor, Port Manager
23. Tim Wilson, Central Curry School District
24. Krista Nieraeth, Port Orford-Langlois School District
25. Kelly Timchak, Rogue/ Curry Watersheds
26. Kelly Sparks, Rogue/ Curry Watersheds
27. Tracy Loomis, Coos-Curry-Douglas Business Development Corporation
28. Brian Cassoday, Controller, Coos-Curry Electric Cooperative, Inc.
29. Derek Mollier, Coquille Indian Tribe
30. Kassandra Rippee, Coquille Indian Tribe
31. Tessa LaFazio, Tolowa Dee-Ni Nation, Emergency Management
32. Kim Marie Hunter, US Forest Service
33. Wade McMaster, US Forest Service
34. Ericka Michelle Mason, Oregon Health Authority, Health Security, Preparedness and Response
35. Jessica McCormick, Oregon Health Authority, Healthcare Preparedness Program
36. Hui Rodomsky, South Coast Regional Representative, Oregon Dept. of Land Conservation & Development (DLCD)
37. Meg Reed, Coastal Shores Specialist, Oregon Dept. of Land Conservation & Development (DLCD)
38. Dori Lanni, Oregon Emergency Management
39. Althea Rizzo, Geological Hazards Program Coordinator, Oregon Emergency Management (OEM)
40. Dani Padilla, Park Manager, Oregon Parks and Recreation Department
41. Casey Nielsen, Park Manager, Oregon Parks and Recreation Department
42. Christina Appleby, Department of Geology and Mineral Industries
43. Jevra Brown, Department of State Lands

C. Project Schedule

The 2022 Curry County MJNHMP update project schedule experienced two major delays. DLCD received permission to start post-award work from FEMA nearly one year later than anticipated—the original start date anticipated was October 2019 and the actual start date was October 2020. Then from March 2021 until July 2021 Curry County experienced a transition in emergency management leadership.

Figure III-3. Project Schedule



D. Plan Update Changes

REQUIREMENT	FEMA REVIEW TOOL ELEMENT	Approved 2016 Curry County NHMP	Proposed 2022 Plan Update
Requirement: 44 CFR §201.6(c)(1)	<i>A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?</i>	Acknowledgements; Plan Summary p. i-2; p. 1-4; Process: Appendix B	Acknowledgements Mitigation Strategy: pp. 2, 3, 32, Planning Process
Requirement: 44 CFR §201.6(b)(2)	<i>A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process?</i>	Acknowledgements; Plan Summary p. i-2; p. 1-4	Acknowledgements Planning Process: Survey, meetings
Requirement: 44 CFR §201.6(b)(1)	<i>A3. Does the Plan document how the public was involved in the planning process during the drafting stage?</i>	Acknowledgements; Plan Summary: p. i-2; p. 1-4; Process: Appendix B	Planning Process: Survey, meetings, web postings
Requirement: 44 CFR §201.6(b)(3)	<i>A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information?</i>	Risk Assessment Vol. I, Sect. 2; Plan Implement. & Maint.: Vol. I, Sect. 4; Community Profile: Appendix C	Community Profile Hazard Chapters Existing Plans and Policies

REQUIREMENT	FEMA REVIEW TOOL ELEMENT	Approved 2016 Curry County NHMP	Proposed 2022 Plan Update
Requirement: 44 CFR §201.6(c)(4)(iii)	<i>A5. Is there discussion of how the communities will continue public participation in the plan maintenance process?</i>	Plan Implement. & Maint.: Vol. I, Sect. 4, 4-7 to 4-8	Planning Process: Plan Maintenance
Requirement: 44 CFR §201.6(c)(4)(i)	<i>A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)?</i>	Plan Implement. & Maint.: Vol. I, Sect. 4 pg. 4-1 to 4-2, 4-4, 4-8	Planning Process: Plan Maintenance
Requirement: 44 CFR §201.6(c)(2)(i)	<i>B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)?</i>	Risk Assessment: Vol. I, Sect. 2	Hazard Chapters Community Profile
Requirement: 44 CFR §201.6(c)(2)(i)	<i>B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction?</i>	Plan Summary: Vol. I, pg. i-3; Risk Assessment: Vol. I, Sect. 2	Hazard Chapters
Requirement: 44 CFR §201.6(c)(2)(ii)	<i>B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction?</i>	Risk Assessment: Vol. I, Sect. 2 pp. 2-13 on	Hazard Chapters Community Profile
Requirement: 44 CFR §201.6(c)(2)(ii)	<i>B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods?</i>	Risk Assessment: Vol. I, Sect. 2 pg. 2-17	Flood Hazard Chapter Community Profile
Requirement: 44 CFR §201.6(c)(3)	<i>C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?</i>	Mitigation Strategy: Vol. I, Sect. 3, Plan Implement. & Maint.: Vol. 1, Sect. 4, pg. 4-3	Planning Process: Plan Implementation and Maintenance Risk Assessment; Com Profile, RA; Mitigation Strategy

REQUIREMENT	FEMA REVIEW TOOL ELEMENT	Approved 2016 Curry County NHMP	Proposed 2022 Plan Update
Requirement: 44 CFR §201.6(c)(3)(ii)	<i>C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate?</i>	Risk Assessment: Vol. I, Sect. 2 pp. 17; Action Items: Vol. II, Appendix A	Flood Hazard Chapter Community Risk Profiles
Requirement: 44 CFR §201.6(c)(3)(i)	<i>C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?</i>	Plan Summary: Vol. I, pg. i-4; Mitigation Strategy: Vol. 1 Sect. 3 pg. 3-2	Mitigation Strategy
Requirement: 44 CFR §201.6(c)(3)(ii)	<i>C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?</i>	Mitigation Strategy: Vol. I, Sect. 3 pgs. 3-6 to 3-8; Action Items: Vol. II, Appendix A; Economic Analysis: Vol. II, Appendix D	Mitigation Strategy
Requirement: 44 CFR §201.6(c)(3)(iv)); Requirement: 44 CFR §201.6(c)(3)(iii)	<i>C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction?</i>	Mitigation Strategy: Vol. I, Sect. 3; Plan Implement. & Maint.: Vol. I, Sect. 4, pg. 4-5 to 4-6; Economic Analysis: Vol. II, Appendix D	Project Prioritization Econ Analysis of NHM Projects Mitigation Strategy
Requirement: 44 CFR §201.6(c)(4)(ii)	<i>C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate?</i>	Mitigation Strategy: Vol. I Sect. 3; Plan Implement. & Maint.: Vol. I Sect. 4 pg. 4-3	Plan Implementation and Maintenance, Mitigation Strategy
Requirement: 44 CFR §201.6(d)(3)	<i>D1. Was the plan revised to reflect changes in development?</i> a. The plan must describe changes in development that have occurred in hazard prone areas and	Community Profile: Vol. II, Appendix C	Community Profile

REQUIREMENT	FEMA REVIEW TOOL ELEMENT	Approved 2016 Curry County NHMP	Proposed 2022 Plan Update
	increased or decreased the vulnerability of each jurisdiction since the last plan was approved. If no changes in development impacted the jurisdiction's overall vulnerability, plan updates may validate the information in the previously approved plan. Changes in development means recent development, potential development, or conditions that may affect the risks and vulnerabilities of the jurisdictions (for example, climate variability, declining populations or projected increases in population, or foreclosures). Not all development will affect a jurisdiction's vulnerability.		
Requirement: 44 CFR §201.6(d)(3)	<i>D2. Was the plan revised to reflect progress in local mitigation efforts?</i> The plan must describe the status of hazard mitigation actions in the previous plan by identifying those that have been completed or not completed. For actions that have not been completed, the plan must either describe whether the action is no longer relevant or be included as part of the updated action plan.	Mitigation Strategy: Vol. I, Sect. 3; Action Items: Vol. II, Appendix A	Community Profile
Requirement: 44 CFR §201.6(d)(3)	<i>D3. Was the plan revised to reflect changes in priorities?</i> The plan must describe if and how any priorities changed since the plan was previously approved. If no changes in priorities are necessary, plan updates may validate the information in the previously approved plan.	Mitigation Strategy: Vol. I, Sect. 3; Process: Vol. II, Appendix B	Mitigation Strategy Planning Process

E. Plan Outreach

Table III-2. Public Engagement Plan Matrix

Curry County Natural Hazard Mitigation Plan Update Public Engagement Plan

October 2021

Outreach Strategy	Curry County	Brookings	Gold Beach	Port Orford	Port of Gold Beach	Port of Port Orford
Public Steering Committee Meetings 4-7 over the course of the project.	X	X	X	X	X	X
Public Meeting: Plan Adoption Proceedings The final plan must be formally adopted by all participating jurisdictions.	X	X	X	X	X	X
Plan Update Webpage Establish a website where citizens can review and comment on plan drafts, learn about how to prepare, and otherwise learn about natural hazards and the NHMP.	X	X	X	X	X	X
Social Media Posts about the Plan Update Jurisdiction will establish, or use established social media outlets (Facebook, Instagram, etc.) to convey meeting times, hazard information, and news about the plan update.	X					
Plan Update Survey Distribute NHMP survey via electronic or print methods.	X	X	X	X	X	X
Public Meeting: Draft Risk Assessment or Draft Plan Public Presentation An online or in-person event where mitigation information is shared, and public input is received.						
Plan Update Email List Jurisdiction will establish an email list where interested parties can receive news about the plan update.						
Other						

Websites

Over the course of the 2022 Curry plan update, the following websites were used as a primary method of outreach by Curry County, the three cities, and the two special districts who joined the mitigation planning process.

The 2022 Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan website is available here:

https://www.co.curry.or.us/government/county_sheriff/hazard_mitigation_plan.php

Curry County

https://www.co.curry.or.us/government/county_sheriff/emergency_management.php

Curry County Facebook post

<https://www.facebook.com/currycountyeconomicdevelopment>

City of Brookings

<https://www.brookings.or.us/131/Emergency-Preparedness>

City of Gold Beach

<https://www.goldbeachoregon.gov/>

City of Port Orford

<https://portorford.org/emergency-services/>

Port of Gold Beach

<https://portofgoldbeach.com/>

Port of Port Orford

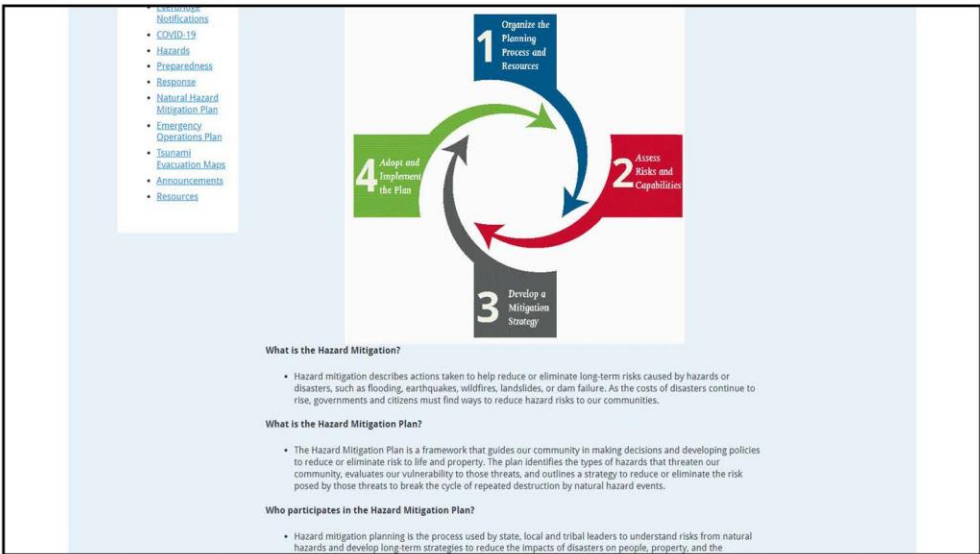
<https://portofportorford.org/home/natural-hazards-mitigation-plan/>

Outreach Documentation

Planning Process ➔ Outreach Documentation

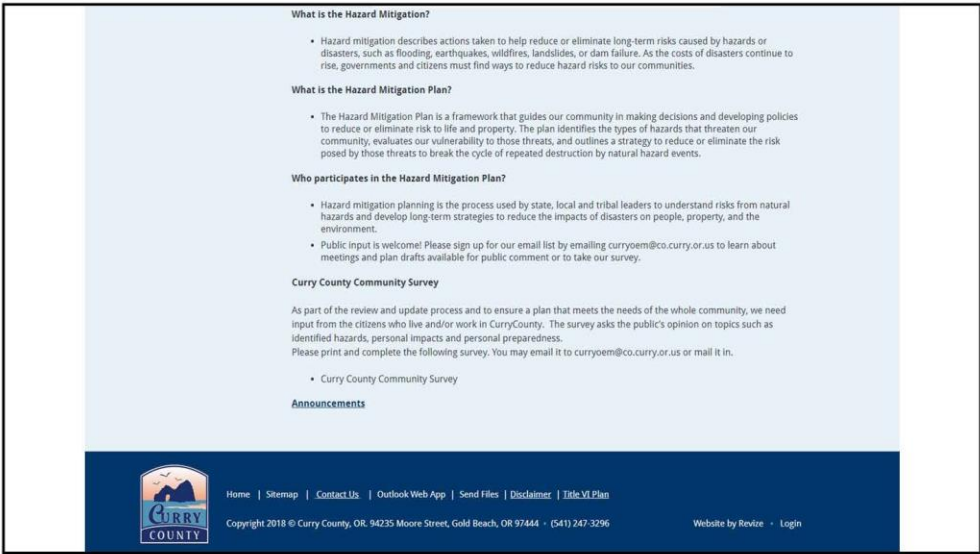


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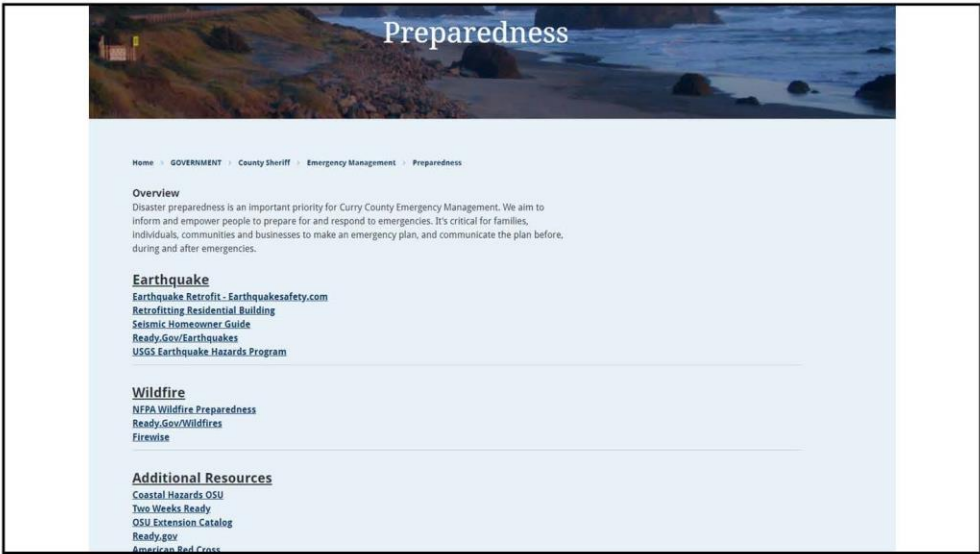
Planning Process ➔ Outreach Documentation



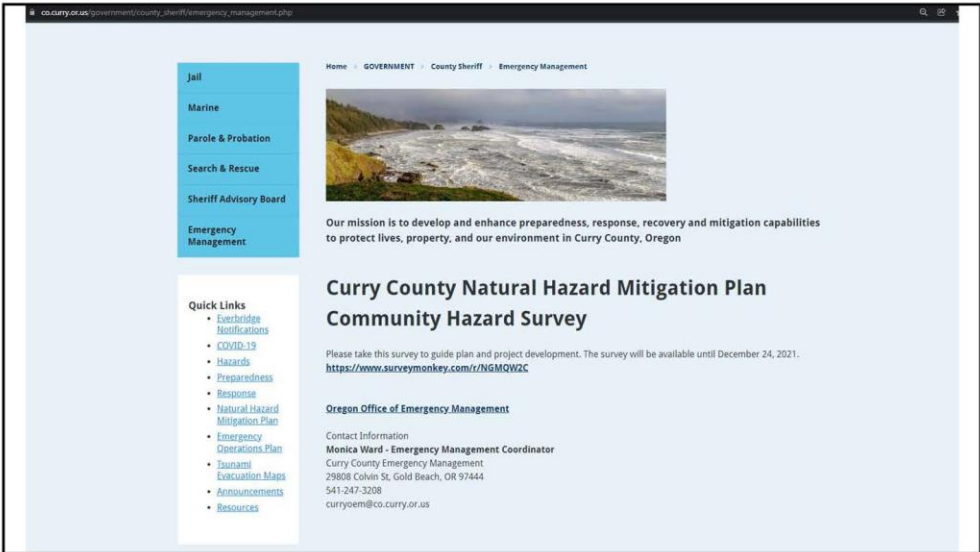
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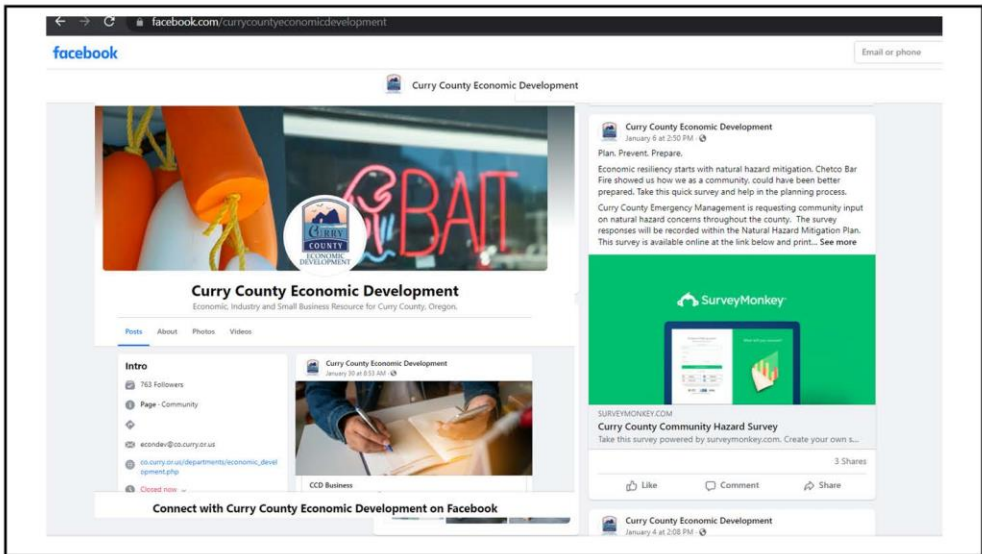


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Planning Process ➔ Outreach Documentation

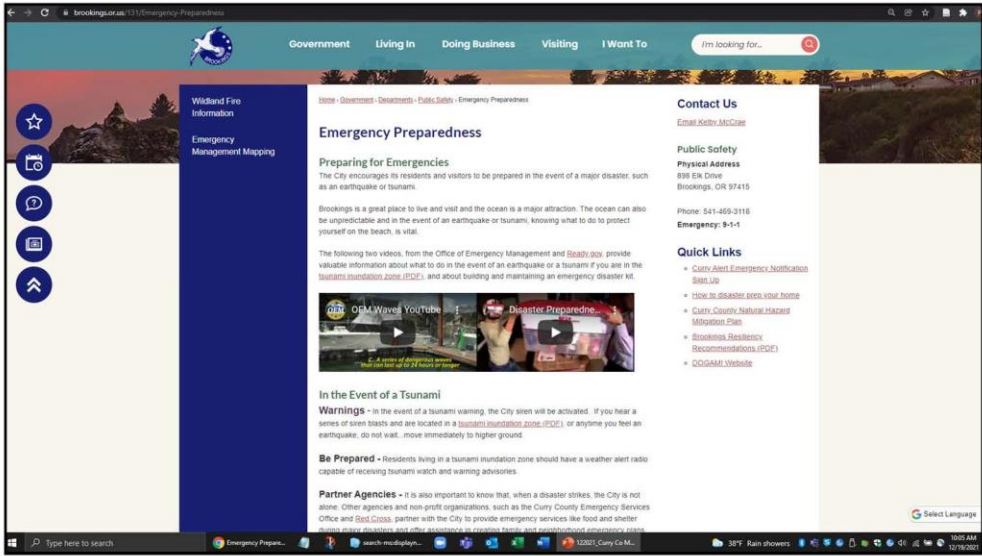


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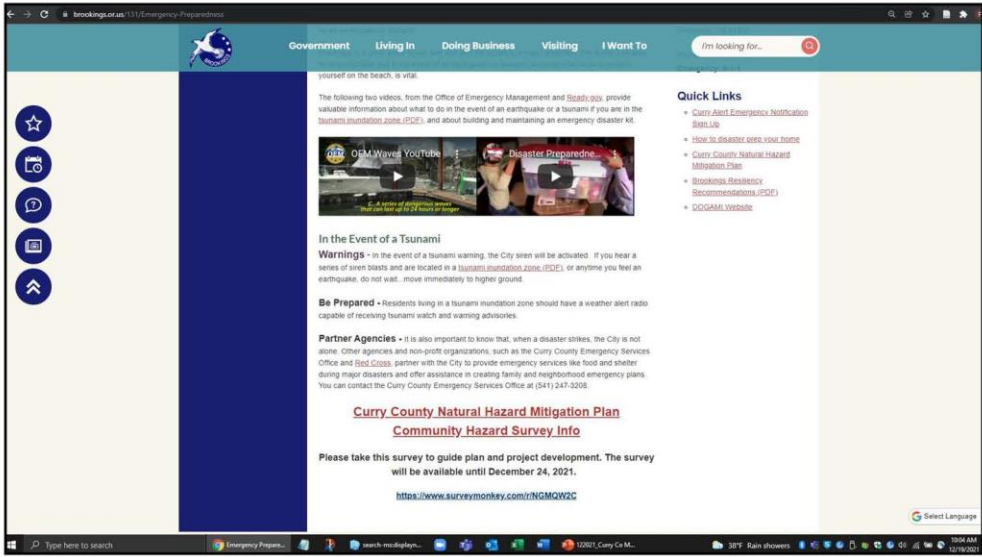


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Planning Process ➔ Outreach Documentation



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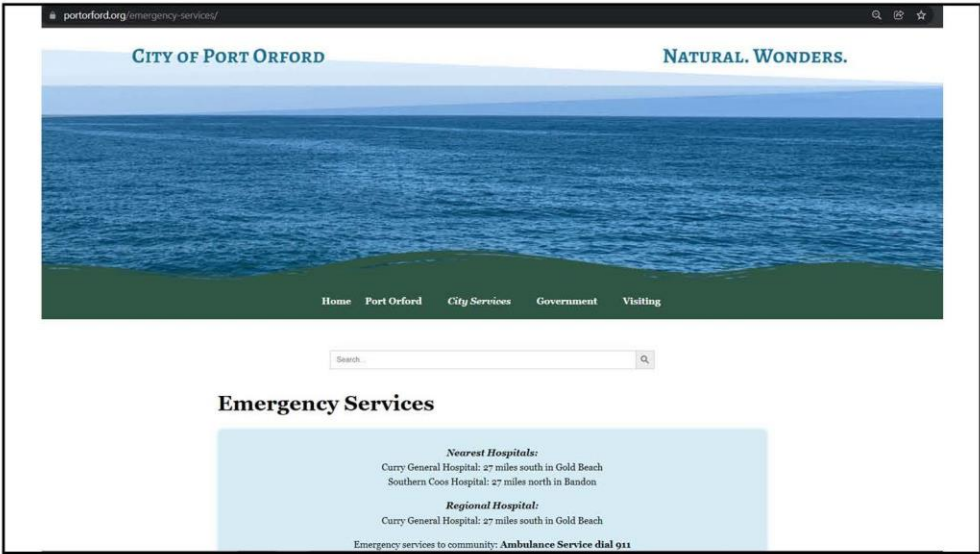
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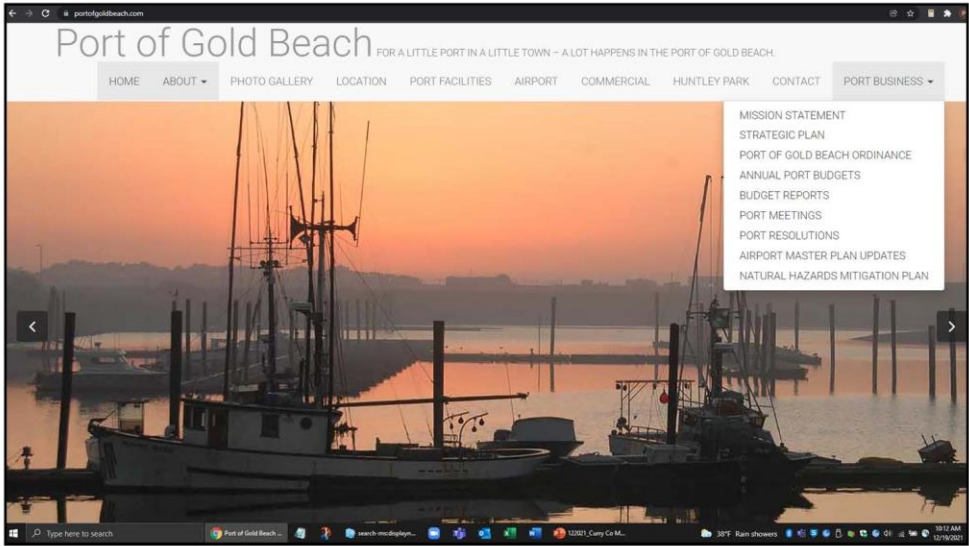
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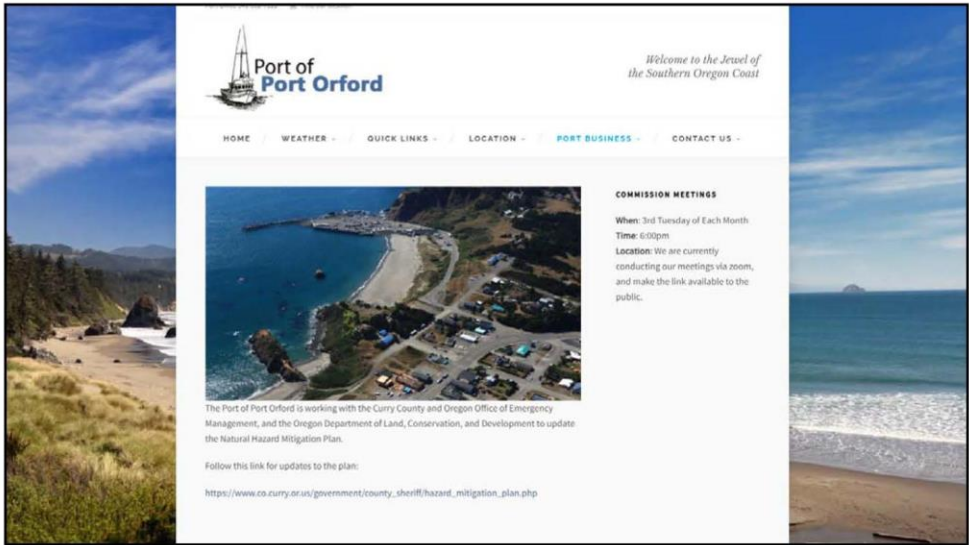
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14



15



16

F. Public Participation

The Steering Committee guides the plan updates, so their activities, since they are all public, provide the core of the public participation activities. The Steering Committee meetings held during the plan update were open to the public, advertised via public notice, and usually had good participation from an array of community organizations with interest or capabilities associated with hazard mitigation. Notice of these meetings, other public outreach, other public meetings, the plan update survey with comment sections, and specific plan input solicited from community organizations are the other primary components of outreach. Generally, the following best practices encourage public input.

- Post copies of the plan on corresponding websites.
- Place articles in the local newspaper directing the public where to view and provide feedback.
- Use existing avenues such as school newsletters and utility bills to inform the public where to view and provide feedback.
- Present new and relevant information at community events such as the Preparedness Fair.
- Announce upcoming meetings through press releases in the newspaper and on the local radio station.

In addition to the involvement activities listed above, Curry County will ensure continued public involvement by posting the Curry County NHMP on the County's website (<http://www.co.Curry.or.us/>).

Meetings: Steering Committee

September 26, 2019

The first pre-award plan update Steering Committee meeting was held September 26, 2019 at the Brookings EOC and was attended by fifteen people representing three plan holder jurisdictions. The DLCD project manager introduced the FEMA NHMP update process and DLCD IGA components after welcoming participants and fostering a discussion of participants' motivation for involvement in the plan update process. Road network resiliency, safety, infrastructure, port investments, and learning about the process were motivations shared by attendees.

April 16, 2020

Thirteen people representing two plan holder jurisdictions and five interested parties attended the second Steering Committee meeting held online on April 16, 2020. The group reviewed hazard data sources and suggested local plans and technical data to support the NHMP update effort. The public engagement program was reviewed and discussed, in addition to cost share.

January 21, 2021

The third meeting of the Curry County Natural Hazard Mitigation Plan update 2021 was attended by fourteen people representing three plan update jurisdictions, four local organizations, and two state agencies. The meeting which reassembled the group after a long delay, focused on review of the DOGAMI Risk Report, discussion of hazard risk perception in the community, and public engagement.

October 7, 2021

The fourth meeting of the Curry County Natural Hazard Mitigation Plan Update Steering Committee was attended by thirteen people representing three plan update jurisdictions, one interested party, and three state or federal agencies. The meeting which reassembled the group after a long delay,

focused on review of the draft Risk Assessment, discussion of information requests needed for the plan update, and timelines and outreach methods for public review.

December 2 and 9th, 2021

The fifth and sixth meeting of the Curry County Natural Hazard Mitigation Plan Steering Committee included Mitigation Action table review and discussion of survey distribution and posting. The fifth meeting was attended by Curry County, Brookings, and the Port of Port Orford, and the sixth meeting was attended by all six jurisdictions. The mitigation strategy components were reviewed, and mitigation success items were discussed and added to the chapter.

April 27, 2022

The seventh final meeting of the Curry County Natural Hazard Mitigation Plan Steering Committee included a review of the survey results and plan approval and adoption timeline, discussion of final plan changes, and formal approval of the final draft plan affirming the plan is ready for formal review by Oregon Emergency Management. The group approved a proposal by Monica Ward that the Steering Committee welcome Harbor Water Public Utility District into the plan at a later date if and when they complete an addendum to the plan.

Meetings: Curry Planning Team

Between July and December 2021, the Curry County Planning Team met 15 times to discuss plan revisions, develop mitigation actions, and shepherd the plan update process. The summaries below are an example of the progress that occurred at these meetings. In addition, Monica Ward held at least one meeting with each of the plan holder jurisdictions when she took on her role as emergency manager with Curry County starting July 2021. She also engaged the councils and boards of the jurisdictions to answer questions and raise awareness about hazards and the need for input on the public plan draft.

August 12, 2021

At this Curry Planning Team meeting, the group (M. Ward, R. Christensen, B. Crockett, DLCD P. Reber) discussed the status of LiDAR in the County and coordination with DOGAMI on a future landslide study for the county that goes beyond the coastal fringe and addresses needs of the county road system and resilience generally. In addition, they revised the preliminary/working list of mitigation actions and reviewed recommended action items from two reference documents (the Port of B-H plan and the Port Orford TEFIP).

August 26, 2021

At this meeting of the Curry NHMP Planning Committee, the group (M. Ward, R. Christensen, B. Crockett, DLCD P. Reber) reviewed the 2016 mitigation actions and critical facilities tables. The specific location of Curry departments in these buildings was discussed. In addition, the status of mitigation actions was reviewed and updated.

September 2, 2021

At this meeting of the Curry NHMP Planning Committee, the group (M. Ward, R. Christensen, DLCD P. Reber) reviewed and made extensive updates and revisions to the 2016 mitigation actions.

G. Community Hazards Survey

Public input on the plan update was conducted by posting the plan draft on public websites and requesting feedback and via the distribution of a community hazards survey that asks the public about their concern level about the plan hazards and allows for a public comment response in an easy online format. See the full survey and results below.

Figure III-4. Survey Cover Page

Curry County

Multi-Jurisdictional Natural Hazard Mitigation Plan: Community Hazard Survey



Evacuation
Routes

Mission:

To create a disaster-resilient Curry County.

Critical
Facilities

Lifelines

What is a NHMP?

A NHMP is a plan that outlines strategies for reducing the impacts of natural disasters on human lives, emergency response agencies, buildings, infrastructure, utilities, natural resources, and cultural resources.

Goal: Save Lives, Reduce Injuries		Goal: Reduce Economic Losses
- Tsunami Evacuation Routes or Structures - Tsunami warning systems - Utilize risk report recommendations - Integrate mitigation into capital projects		- Safe Drinking Water Resiliency - Critical Healthcare Resiliency - Storm water system resilience at Port of Brookings-Harbor - Seismic Workshops

Goal: Minimize Damage

- Tsunami land use overlay zone - Multi-family Tsunami-Safe Housing Program - Sewer Storm Disaster Repairs	- Goal 7 Updates - Implement Comp Plan - Implement Flood Ordinance
--	--

Curry County Community Hazard Survey

Curry County Emergency Management is leading the five-year update of the Natural Hazard Mitigation Plan. We want to hear from the community about your concerns regarding risks from natural hazards! Please answer the following survey questions and return the survey to the location where you received it or mail it to 94235 W Moore St. Suite 311, Gold Beach, OR 97444

1. Where do you live in Curry County? Please choose the location closest to your primary residence:

- | | |
|--------------------------------------|---|
| ☐ Agness | ☐ North Curry County (rural) |
| ☐ Brookings | ☐ Central Curry County (rural) |
| ☐ Gold Beach | ☐ South Curry County (rural) |
| ☐ Port Orford | |

2. Are you concerned about **Coastal Erosion** affecting your home, family, or livelihood?
Select one:

- ☐ Yes
☐ No
☐ Unsure

3. Are you concerned about **Drought** affecting your home, family, or livelihood?
Select one:

- ☐ Yes
☐ No
☐ Unsure

4. Are you concerned about an **Earthquake** affecting your home, family, or livelihood?
Select one:

- ☐ Yes
☐ No
☐ Unsure

5. Seismic standards were put into place in 1994. Have you considered seismic retrofits?
Select one:

- ☐ Yes
☐ No
☐ Unsure

6. How would you like local government agencies to prepare for the earthquake hazard? *Select all that apply:*

- ☐ *Strengthen and/or rebuild critical facilities to withstand earthquake shaking.*
- ☐ *Install automatic shut off valves for fuel and water supply to prevent explosions and leakage.*
- ☐ *Ensure that Curry County emergency responders can communicate with each other and the Interstate 5 corridor after the Cascadia Earthquake Event.*
- ☐ *Improve evacuation and supply routes to ensure access to Curry County from Interstate 5.*

7. Are you concerned about a **Flood** affecting your home, family, or livelihood?

Select one:

- ☐ *Yes*
- ☐ *No*
- ☐ *Unsure*

8. Are you concerned about a **Landslide** affecting your home, family, or livelihood?

Select one:

- ☐ *Yes*
- ☐ *No*
- ☐ *Unsure*

9. Are you concerned about a **Tsunami** affecting your home, family, or livelihood?

Select one:

- ☐ *Yes*
- ☐ *No*
- ☐ *Unsure*

10. Is your home in a tsunami evacuation zone?

Select one:

- ☐ *Yes*
- ☐ *No*
- ☐ *Unsure*

11. Would you be willing to practice walking the tsunami evacuation route near your school, work, or home?

Select one:

- ☐ *Yes*

- ☐ *No*
- ☐ *Unsure*

12. Are you concerned about a **Wildfire** affecting your home, family, or livelihood? *Select one:*

- ☐ *Yes*
- ☐ *No*
- ☐ *Unsure*

13. *What actions have you taken to reduce wildfire risk for your home?* Please select all that apply:

- ☐ *Purchased insurance: homeowners, renters, and/or flood insurance.*
- ☐ *Retrofit home for fire or earthquake—such as installing fire-resistant siding, securing water tanks, etc.*
- ☐ *Created a firebreak around your home by removing or reducing fuels—such as dead trees, overgrown vegetation, or cleaning debris from gutters and roof.*
- ☐ *Installed smoke detectors, carbon monoxide detectors, and/or fire extinguishers.*

14. Is your home address well-signed and clearly visible from the street? (For example, reflective numbers visible at night, without vegetation impeding visibility, etc.)

Select one:

- ☐ *Yes*
- ☐ *No*
- ☐ *Unsure*

15. Are you concerned about a **Windstorm or Winter Storm** affecting your home, family, or livelihood?

Select one:

- ☐ *Yes*
- ☐ *No*
- ☐ *Unsure*

16. Are you concerned about **Climate Change** affecting your home, family, or livelihood?

Select one:

- ☐ *Yes*
- ☐ *No*
- ☐ *Unsure*

17. Do you have any additional concerns or comments about hazards in your community? Please share them in the space below (200-word limit).

18. Provide your name if you would like it to appear with your comment.

19. Please provide your email if you would like to learn about future opportunities regarding hazards in Curry County.

Thank you for completing this survey! Please return completed surveys to the location where you received it or mail it to 94235 W Moore St, Gold Beach, OR 97444

Results Summary

The Curry County Community Hazard Survey was conducted as a part of the 2021 Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan (MJNHMP) update. The jurisdictions participating in the plan update distributed the survey starting December 7, 2021 and made it available electronically through March 30, 2022, securing 159 responses from across the county.

The Curry County Community Hazard Survey asked the public's opinion about the natural hazards most likely to impact the area, personal concerns about those hazard impacts and desired government response to the threat of natural hazards. The results of the survey are useful in providing public input and local knowledge necessary to update both the risk assessment and the mitigation strategy components of the plan update.

The survey was comprised of 19 questions of which 13 had yes-no-unsure responses including nine about the plan hazards in general. The first question requested one response that best reflected the respondent's primary residence location. Two questions asked respondents to check all mitigation actions that applied for them. Two of the nine general plan hazard questions had follow-on questions triggered by a yes or unsure response about hazard concern (earthquake and wildfire). The final three questions were: an open-ended general comment, an opportunity for the commenter's name to appear with their comment, and an opportunity to provide an email address to receive additional information. The survey questions were developed in a collaboration between the DLCD Project Manager and the Curry County Emergency Management. The final questions were entered into Survey Monkey electronic survey tool by DLCD administrative staff and after review by the Curry County MJNHP Steering Committee, the electronic survey link was distributed publicly via press releases and local websites.

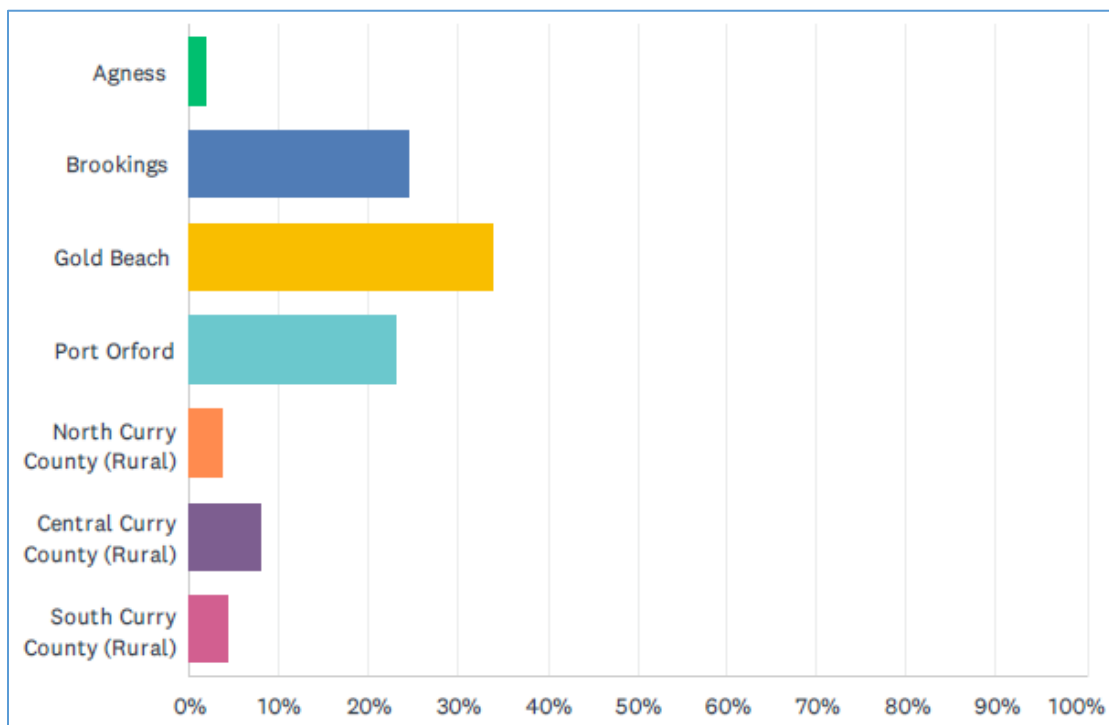
Table III-3. Hazards Ranked by Concern Level

Hazard	<i>Concern of hazard affecting home, family, or livelihood?</i>			Total Rank
	Yes	No	Unsure	
Earthquake	122	31	6	1
Wildfire	113	41	5	2
Wind/Winter Storm	109	47	3	3
Tsunami	106	44	9	4
Landslide	78	73	8	5
Drought	73	74	12	6
Coastal Erosion	61	71	27	7
Flood	47	97	15	8

Results by Question

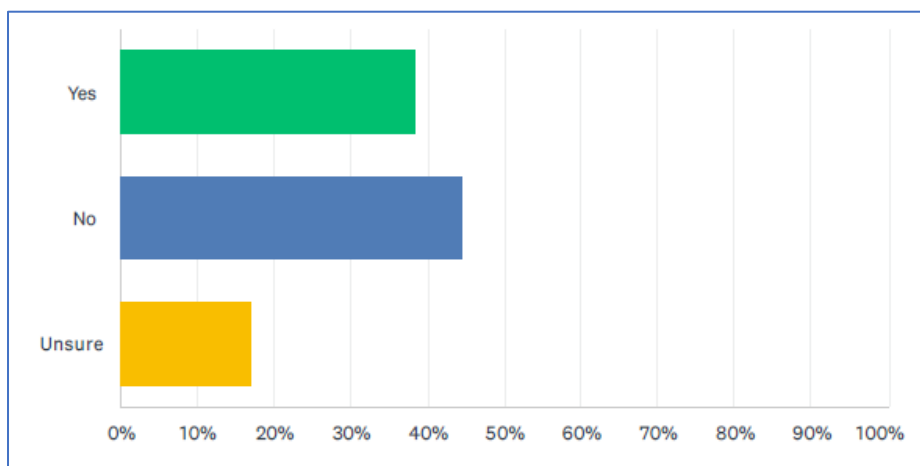
Nearly 82% (130) of survey respondents live in the incorporated communities of Brookings, Gold Beach, and Port Orford. The unincorporated communities of Agness and North, Central, and South Curry County provided the balance of the survey responses—nearly 18% (29). Earthquake, Wildfire, Windstorm/ Winter Storm, followed by Tsunami, are the hazards of greatest community concern in Curry County for impacts to home, family, or livelihood.

Question 1: Where do you live in Curry County? Please choose the location closest to your primary residence.



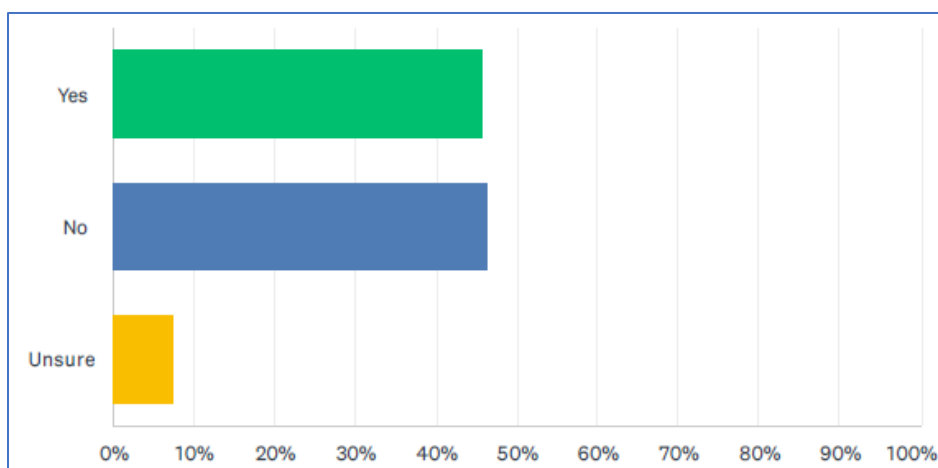
Location		
Answer Choices		Responses
Agness	1.89%	3
Brookings	25.53%	39
Gold Beach	33.96%	54
Port Orford	23.27%	37
North Curry County (rural)	3.77%	6
Central Curry County (rural)	8.18%	13
South Curry County (rural)	4.40%	7
Answered		159
Skipped		0

Question 2: Are you concerned about Coastal Erosion affecting your home, family, or livelihood?



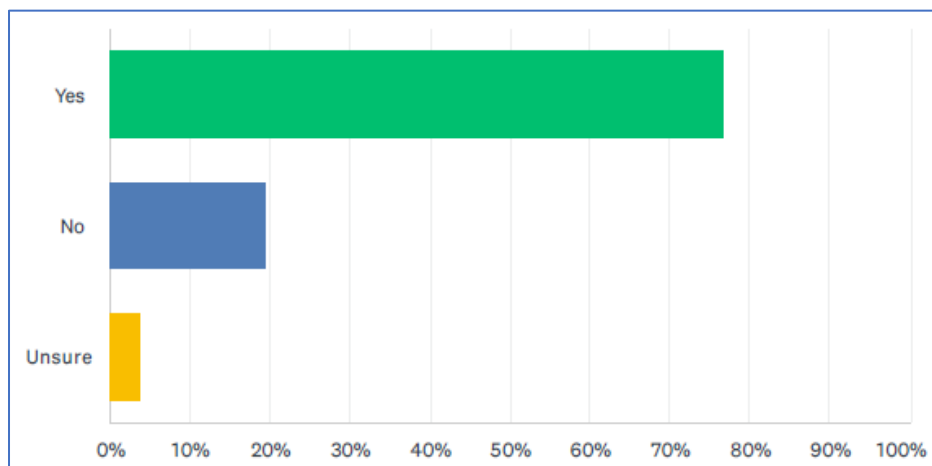
Coastal Erosion Concerns		
Answer Choices	Responses	
Yes	38.36%	61
No	44.65%	71
Unsure	16.98%	27
	Answered	159
	Skipped	0

Question 3: Are you concerned about Drought affecting your home, family, or livelihood?



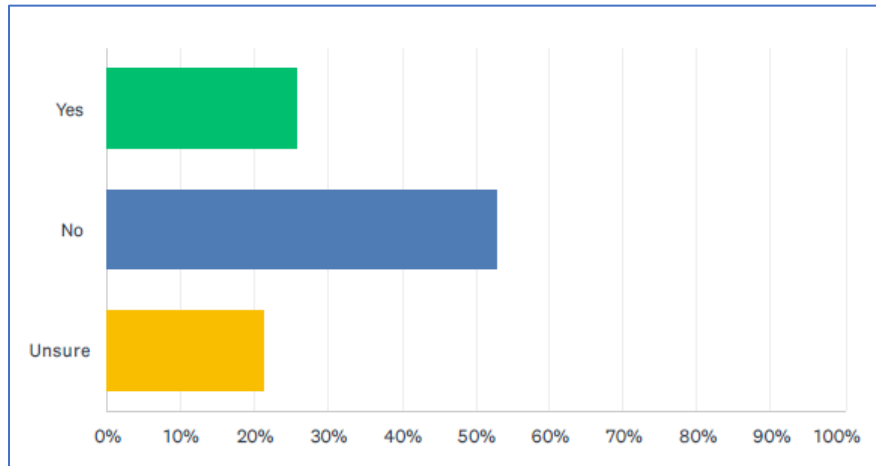
Drought Concerns		
Answer Choices	Responses	
Yes	45.91%	73
No	46.54%	74
Unsure	7.55%	12
	Answered	159
	Skipped	0

Question 4: Are you concerned about an Earthquake affecting your home, family, or livelihood?



Earthquake Concerns		
Answer Choices	Responses	
Yes	76.73%	122
No	19.50%	31
Unsure	3.77%	6
	Answered	159
	Skipped	0

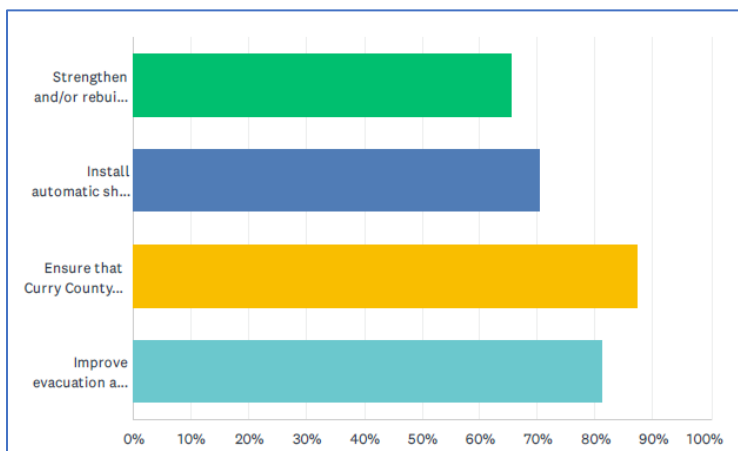
Question 5: Seismic standards were put into place in 1994. Have you considered seismic retrofits?



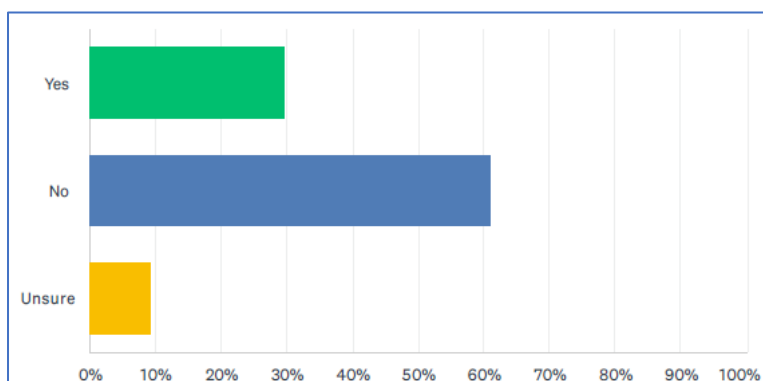
Earthquake Year Built Pre-1994		
Answer Choices	Responses	
Yes	25.79%	41
No	52.83%	84
Unsure	21.38%	34
	Answered	159
	Skipped	0

Question 6: How would you like local government agencies to prepare for the earthquake hazard?

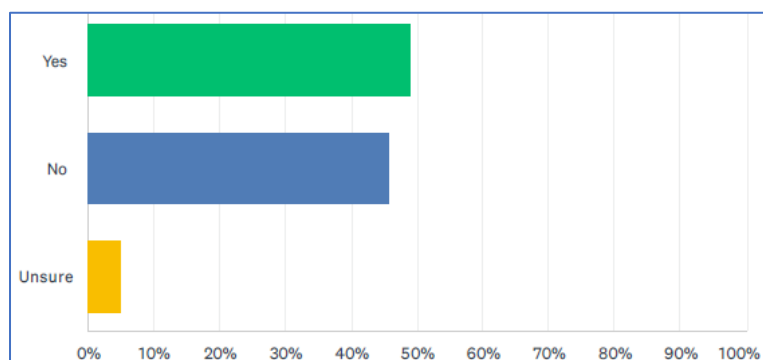
- *Strengthen and/or rebuild critical facilities to withstand earthquake shaking.*
- *Install automatic shut off valves for fuel and water supply to prevent explosions and leakage.*
- *Ensure that Curry County emergency responders can communicate with each other and the Interstate 5 corridor after the Cascadia Earthquake Event.*
- *Improve evacuation and supply routes to ensure access to the Curry County from Interstate 5.*



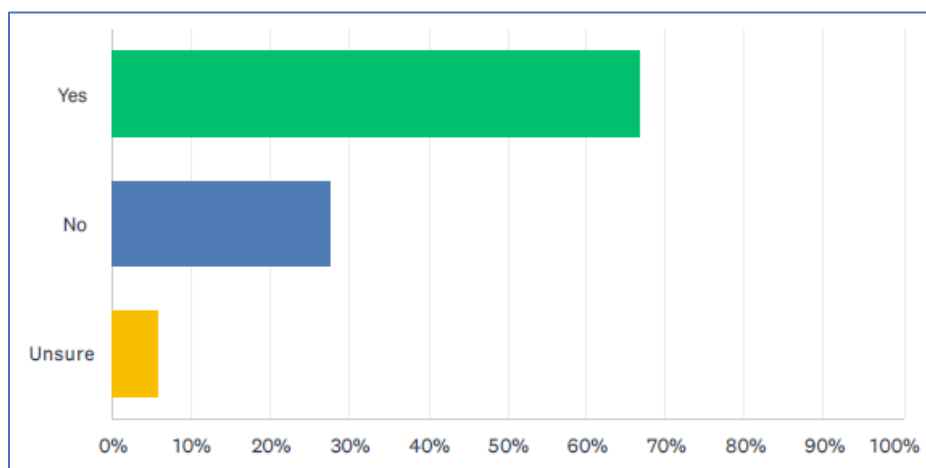
Earthquake Retrofits		
Answer Choices	Responses	
Strengthen and/or rebuild critical facilities to withstand earthquake shaking.	65.41%	104
Install automatic shut off valves for fuel and water supply to prevent explosions and leakage.	70.44%	112
Ensure that Curry County emergency responders can communicate with each other and the Interstate 5 corridor after the Cascadia Earthquake Event.	87.42%	139
Improve evacuation and supply routes to ensure access to Curry County from Interstate 5	81.13%	129
	Answered	#
	Skipped	#

Question 7: Are you concerned about a Flood affecting your home, family, or livelihood?

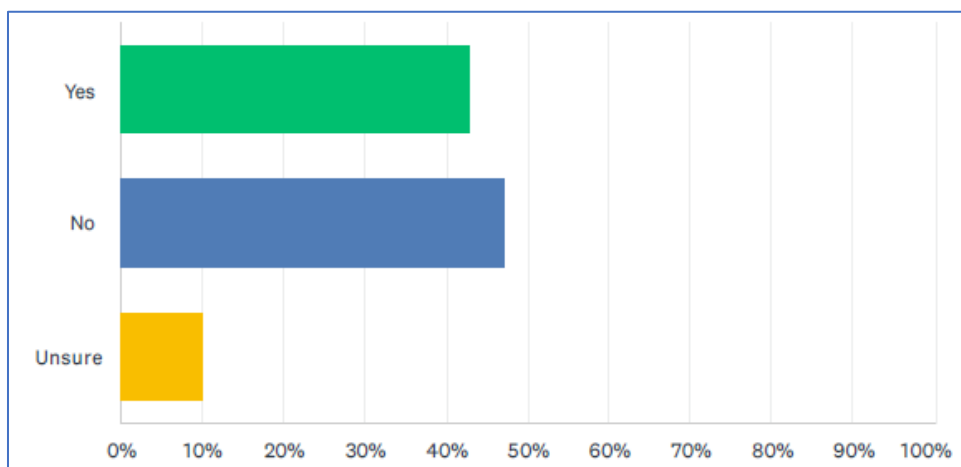
Flood Concerns		
Answer Choices	Responses	
Yes	29.56%	47
No	61.01%	97
Unsure	9.43%	15
	Answered	159
	Skipped	0

Question 8: Are you concerned about a Landslide affecting your home, family, or livelihood?

Landslide Concerns		
Answer Choices	Responses	
Yes	49.06%	78
No	45.91%	73
Unsure	5.03%	8
	Answered	159
	Skipped	0

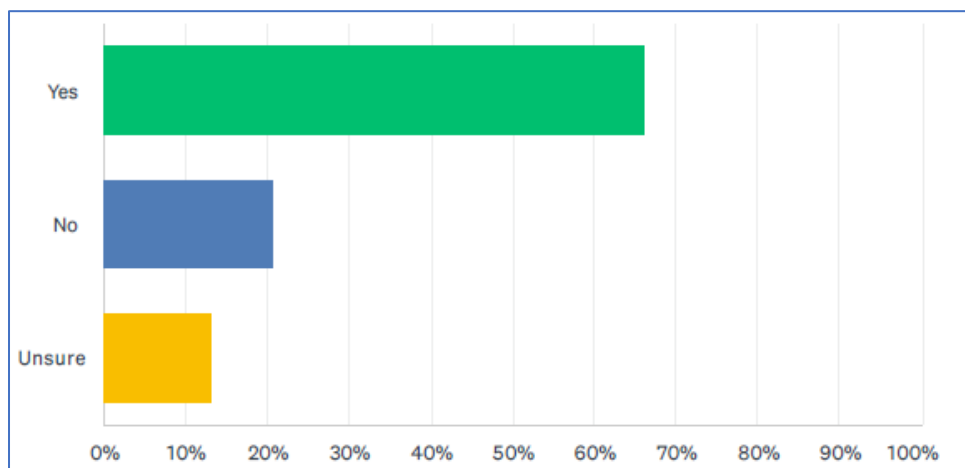
Question 9: Are you concerned about a Tsunami affecting your home, family, or livelihood?

Tsunami Concerns		
Answer Choices	Responses	
Yes	66.67%	106
No	27.67%	44
Unsure	5.66%	9
	Answered	159
	Skipped	0

Question 10: Is your home in a tsunami evacuation zone?

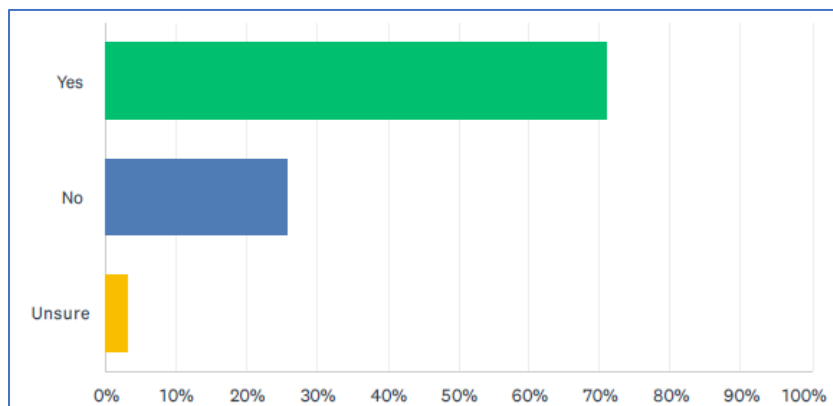
Home in tsunami zone		
Answer Choices	Responses	
Yes	42.77%	68
No	47.17%	75
Unsure	10.06%	16
	Answered	159
	Skipped	0

Question 11: Would you be willing to practice walking the tsunami evacuation route near your school, work, or home?



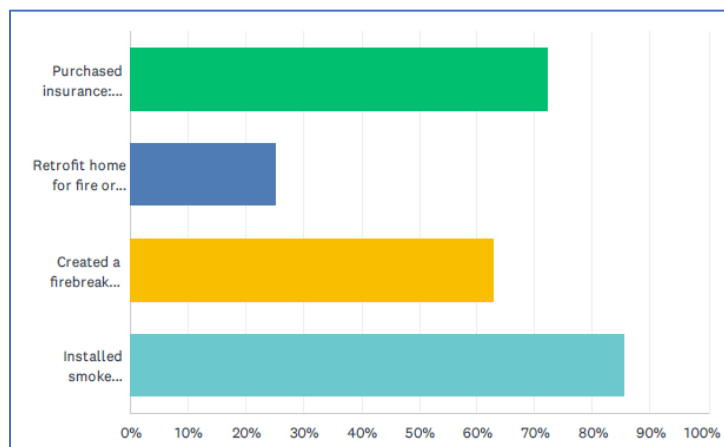
Willing to practice evacuation		
Answer Choices	Responses	
Yes	66.04%	105
No	20.75%	33
Unsure	13.21%	21
	Answered	159
	Skipped	0

Question 12: Are you concerned about a Wildfire affecting your home, family, or livelihood?



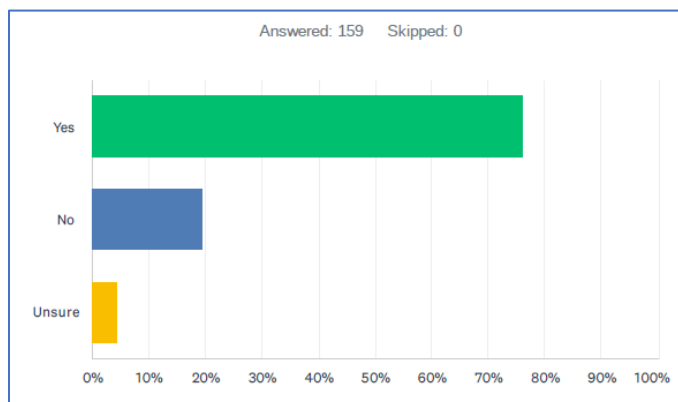
Wildfire Concerns		
Answer Choices	Responses	
Yes	71.07%	113
No	25.79%	41
Unsure	3.14%	5
	Answered	159
	Skipped	0

Question 13: What actions have you taken to reduce wildfire risk for your home? Please choose all that apply:



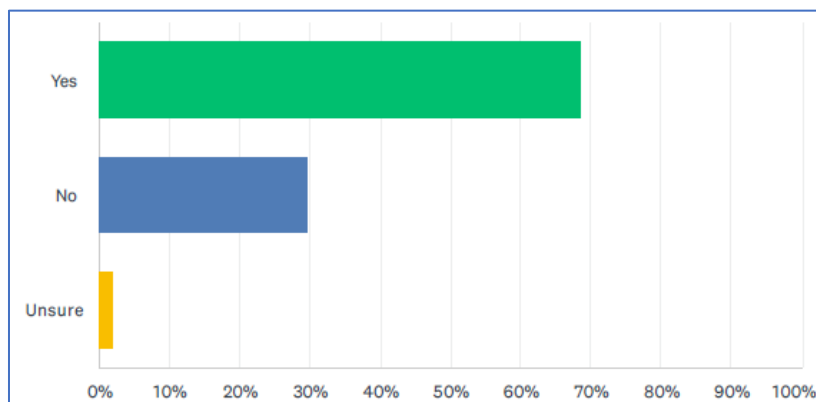
Wildfire Concerns		
Answer Choices	Responses	
Yes	71.07%	113
No	25.79%	41
Unsure	3.14%	5
	Answered	159
	Skipped	0

Question 14: Is your home address well-signed and clearly visible from the street? (For example, reflective numbers visible at night, without vegetation impeding visibility, etc.)



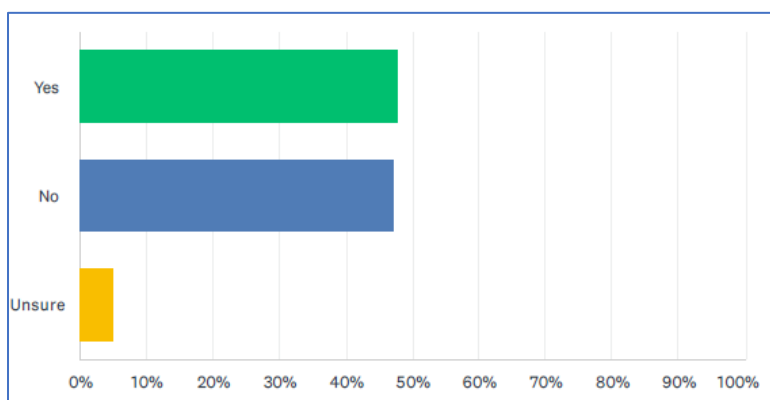
Visible Home Address		
Answer Choices	Responses	
Yes	76.10%	121
No	19.50%	31
Unsure	4.40%	7
	Answered	159
	Skipped	0

Question 15: Are you concerned about a Windstorm or Winter Storm affecting your home, family, or livelihood?



Wind/ Winter Storm Concern		
Answer Choices	Responses	
Yes	68.55%	109
No	29.56%	47
Unsure	1.89%	3
Answered		159
Skipped		0

Question 16: Are you concerned about Climate Change affecting your home, family, or livelihood?



Climate Change Concern		
Answer Choices	Responses	
Yes	47.80%	76
No	47.17%	75
Unsure	5.03%	8
Answered		159
Skipped		0

Question 17: Do you have any comments about the Curry County Natural Hazard Mitigation Plan or about hazards in your community?

See Section F, Public Comment Matrix for comments and responses.

	Answered	63
	Skipped	96

Question 18: Provide your name if you would like it to appear with your comment.

	Answered	38
	Skipped	121

Question 19: Please provide your email if you would like to learn about future opportunities regarding hazards in Curry County.

	Answered	61
	Skipped	98

H. Public Comment Matrix

The following comments were provided by the community as a part of the Curry County Community Hazards Survey available December 2021-February 2022.

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
1	Anonymous, Agness	Reduce carbon footprint.	Thank you for sharing your perspective, this is outside the scope of this plan.
2	Anonymous, Brookings	My one concern is that Curry County has a well-trained response team to handle emergencies. Often the perception is the county works against each city, the merchants, ports etc. Our commissioners are the voice of the county and they seem ill capable to handle major emergencies. Thank God for our actual workers, first responders, and county employees or we will be in real trouble.	Thank you for sharing your concern, this is outside the scope of this plan.
3	Jenna Kay Howe, Port Orford	Jim and I are volunteers for Emergency Preparedness & Response in Port Orford. We're documenting a lot of issues and possible mitigations. Too much to go into here.	Thank you for your feedback. The County Emergency Management Coordinator will contact you to follow up on your concerns.
4	Anonymous, Brookings	Would like the tsunami sirens to be reinstated	Thank you, upgrading the tsunami emergency alert system to modern standards, including sirens is included as a County action item.
5	Anonymous, Gold Beach	Reinstate the tsunami sirens	Thank you, upgrading the tsunami emergency alert system to modern standards, including sirens is included as a County action item.
6	Anonymous, Agness	I am concerned about reliable communications, especially to remote places, such as Agness.	Thank you for sharing your concern, developing a reliable and resilient communications network is a high priority action item for the County.
7	Beth Barker - Hidalgo, She/Her/Tawanda, Gold Beach	I am concerned about the lack of local hazard education for our tourists, lodging industry & visitor center(s) staff. I am also concerned that the tsunami assembly points have no infrastructure to support people who evacuate with	Thank you, improving hazard education for all populations within Curry County and developing a reliable and resilient communications network are action items in this plan. Adding an action item concerning community caches and sheltering options at the assembly areas is being considered. The Curry County Emergency Manager looks forward to working with volunteer organizations and improving the programs throughout the County.

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
		little or no supplies. I am the Vice Chair of the Curry County COAD (CCCOAD). The CCCOAD would like to work in collaboration with the Curry County Emergency Manager to develop mutually beneficial plans, procedures and protocols for Curry County donation and volunteer management. I am concerned about the lack of foundation to support reliable emergency communications in Curry County. I would like to see CERT (Community Emergency Response Team), and MRC (Medical Reserve Corps), stood up and supported in Curry County. Once we get there, Map Your Neighborhood is a program I'd like to see implemented. I would like to see the Fire Wise program implemented here in Curry County.	
8	Anonymous, Central Curry County (rural)	Concerned of the effects and evacuation of a earthquake prior to a tsunami.	Thank you, improving public education and awareness of evacuation routes is a priority for the County.
9	Anonymous, Gold Beach	I don't have additional concerns. I just want there to be a good plan for when the large natural disaster strikes.	Thank you for your feedback.
10	Anonymous, Brookings	I do not have faith that 3 commissioners. I feel we need 5 to make this county work more efficiently and reduce the ego problems with the current commission	Thank you for sharing your perspective.
11	Anonymous, Brookings	We are so remote. We need our road funds to increase and not be taken and used for other governmental purposes. Being cut off is a real possibility in our area	Thank you for sharing your perspective, this is outside the scope of this plan.

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
13	Anonymous, South Curry County (Rural)	Need plans in place to evacuate fragile and/or handicapped people from their homes or facilities quickly. Need to coordinate/contract with bus providers such as Curry Public Transit, Seaview and other care homes that have ADA equipped vehicles. Need ability for air/sea rescue for those cut off from main artery highways. Need to contract with buildings large enough to provide shelters for those unable to reach their homes after road closures - such as Activity Center, Grange, Seaview, etc.	Thank you for sharing your concerns. Developing a Mass Care Plan, identifying new evacuations routes, and establishing mutual aid agreements are action items in this plan.
14	Aaron H. Longton F/V Goldeneye, North Curry County (Rural)	I am a boat owner and commercial fisherman. I'm worried about storm overtopping at the dock. Seems to be more frequent even with smaller storms. We're overdue for a big one. Meanwhile the ocean rises.	Thank you for sharing your concern. The Ports of Gold Beach and Port Orford have been included in the development of this plan. The Ports have identified several action items to mitigate hazards to the docks and property located at the Ports. The Port of Brookings Harbor has a FEMA approved plan through April 9, 2023.
15	Joan Konzek, Brookings	My big concern is the power going down for an extended period of time and so few people in our area being prepared for this event by having enough water, food and meds on hand. They don't even get it that gas stations can't pump gas without electricity and if trucks can't get here (no gas) the shelves in the grocery stores will be empty. This could be a huge problem for our area particularly if the outage is due to an earthquake or severe winter storm. I do appreciate the warning I get on my email but I need to give the	Thank you, improving hazard education for all populations within Curry County is an action item for the County. Several plans focusing on response, mass care, and recovery are action items in the plan. Personal preparedness is very important. See this link for more information: www.ready.gov/kit Please visit this link or the Curry County Emergency Management website to sign up for the Curry County Emergency Mass Notification System (Everbridge): https://member.everbridge.net/892807736723773/new You can sign up for text, email, and call notifications. Everbridge also offers an application you can download to your phone.

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
		warning system my new phone number.	
16	Anonymous, Brookings	We live on a hill. Our home was built to earthquake standards in 1994. A creek to the east of us carries water away from our house. We just replaced 7 French drains after 27 years. What's left of the old growth forest to the east of us is stable. It has protected us from the high winds. We can walk to the schools for emergency services. We can walk uphill to the cemetery in case of tsunami (overkill, I think). We feel safe. We appreciate the services Brookings & Curry County offer. We will open our home to people in need.	Thank you for your feedback. For additional resources and updated Tsunami inundation and evacuation maps, please visit the Curry County Emergency Management webpage: https://www.co.curry.or.us/government/county_sheriff/emergency_management.php
17	Anonymous, Gold Beach	Just trees falling on 101	Thank you for sharing your concern. The Curry County Road Department works closely with the Oregon Department of Transportation to protect and clear our transportation routes.
18	Anonymous, Gold Beach	It would be nice to see some county roads receive fed money to improve them as detours in the event Hwy 101 goes out. We are isolated here to begin with and any given winter storm could disrupt our supply chain to receive fuel, groceries, and other basic necessities. It would also be nice for code enforcement to be pro active around our community to enforce the ordinance on brush and overgrown yards. The north wind blows like hell in the summer and we could see a serious fire here one day inside city limits. Another part of that is they need to also get better about making ppl clean up old cars and	Thank you, the Curry County Road Department has submitted action items for the development of a Curry County Road Resiliency Plan and a Curry County Bridge Resiliency Plan. Improving and maintaining lifelines and resource supply routes are a priority for the County. The Curry County Road Department and Emergency Management have submitted an action item for the installation of fuel storage tanks. On behalf of the Curry County Fire Defense Board, action items for hazard fuel reduction have been submitted to the plan.

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
		fuel tanks and tires and other rubbish they have laying around their yards as these are accelerants in the event of a fire.	
19	Anonymous, Port Orford	Not everyone is on the Curry County emergency alert system. The man I work for is 86, not able to walk at all. He would be alone, in the dark, unaware of any emergency. The little town of Port Orford is full of seniors, that I would imagine would be in the same dangerous situation.	Thank you for sharing your concern, we care about all populations in Curry County and are working to address all communication and alert gaps throughout our communities. If you have access to the internet, please visit this link or the Curry County Emergency Management website to sign up for the Curry County Emergency Mass Notification System (Everbridge): https://member.everbridge.net/892807736723773/new You can sign up for text, email, and call notifications. Everbridge also offers an application you can download to your phone. Please contact the County Emergency Management Coordinator to further discuss this situation.
20	Linda P., Central Curry County (Rural)	Obtaining needed supplies over the long term in the event of Patterson Bridge collapsing, along with routes up and down the coast.	Thank you, the Curry County Road Department has submitted action items for the development of a Curry County Road Resiliency Plan and a Curry County Bridge Resiliency Plan. Improving and maintaining lifelines and resource supply routes are a priority for the County.
21	Janet Hoffman, Gold Beach	I worry about climate change and the rising ocean levels as I live very close to the ocean. I pay for flood insurance on my condo but my HOA will not purchase insurance due to the cost. I worked as an urban planner for 15 years in Florida and did the CRS evaluation three times. I would like the county and cities to work together to do some of the very simple mapping and educational CRS items to lower our flood insurance in the County. This is NOT costly to do the simplest things and can help all county residents along the rivers and coast to lower the cost to insure their homes. I also wonder if the county	Thank you for sharing your perspective. The floodplain managers with the represented jurisdictions have been advised of your suggestion. This program would require consistent staffing and a base level of capacity exceeding that of what we have now. The County is currently working on the Emergency Operations Plan rewrite and has submitted action items for a Mass Care Plan and Recovery Plan. The Ports will participate in a Table Top Exercise in June 2022 to further develop response and recovery plans.

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
		or cities have a supply plan in case the bridges are damaged. Is there a plan for supplies being shipped to various harbors? Also, what about the industries that store hazardous materials regularly. I wonder are they mapped and have they mitigation plans? Thank you	
22	Anonymous, Brookings	You should reinstall tsunami sirens	Thank you, upgrading the tsunami emergency alert system to modern standards, including sirens is included as a County action item.
23	Anonymous, Gold Beach	I would like to see evacuation routes better marked and more apparent to local residents and visitors to our area.	Thank you for sharing your concern. The plan includes action items such as improving public hazard education, improving signage and evacuation route way finders, identifying additional evacuations routes, conducting evacuation drills, and exploring locations and funding for vertical evacuation structures. Additional tsunami resources can be found on the Curry County Emergency Management webpage: https://www.co.curry.or.us/government/county_sheriff/emergency_management.php
24	Anonymous, Brookings	It would be nice to have the tsunami sirens actually work.	Thank you, upgrading the tsunami emergency alert system to modern standards, including sirens is included as a County action item.
25	Anonymous, Central Curry County (Rural)	Thank you for caring about this and the direction you are working towards.	Thank you for your feedback.
26	Ruth Dixon, Central Curry County (Rural)	We need to provide basic education for our community members that is easy to understand and does not overwhelm them.	Thank you, improving hazard education for all populations within Curry County is an action item for the County.
27	Anonymous, Gold Beach	Burning yard debris as well as house hold trash is a major concern. The pollution and added fire hazard are a big issue. Offering chipping for yard debris and free household trash off loading at local dumping site would have a positive effect in my humble opinion	Thank you for sharing your concerns, burning household trash is beyond the scope of this plan. On behalf of the Curry County Fire Defense Board, action items for hazard fuel reduction have been submitted to the plan.
28	Anonymous, Port Orford	911 going out. No one can respond to emergency if I'm not in town and sheriff is on the other end of the county.	Thank you for sharing your concerns. Reliable and resilient communications and the Emergency Operations Plan development are a priority for the County. The Emergency Operations Plan will require

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
		Not enough first responders. Nowhere to get trauma care quick in an emergency, having to fly to pdx in a health emergency scares me. Hard to believe it works out. Seems like there are a lot of older and unhealthy people around considering lack of resources for healthcare	input from all jurisdictions, establishing the response framework for the County.
29	Anonymous, Gold Beach	Some of my major concerns are transportation routes in case of a major incident. Currently the County population depends upon Highway 101 for all transportation. If there are significant landslides the County could effectively be cut off from the rest of the state until a secondary access could be established. This access needs to be addressed.	Thank you, the Curry County Road Department has submitted action items for the development of a Curry County Road Resiliency Plan and a Curry County Bridge Resiliency Plan.
30	Anonymous, Brookings	Storage capacity and looping of the City of Brookings water system.	Thank you for sharing your concern. Action items addressing the water sources and infrastructure for the City of Brookings and the Community of Harbor have been included in the plan.
30	Becky Crockett, South Curry County (Rural)	There is not enough education for locals and visitors about the hazards risks and actions they should be taking prior to, during and after an event. Especially concerning is the large number of senior citizens that have mobility issues and rely on medications that may likely be disrupted and unavailable during an event. Most people do not realize that Curry County is designated as the last place in the state to receive state or federal assistance after a major earthquake. Education should be paramount in	Thank you, improving hazard education for all populations within Curry County is an action item for the County.

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
		making sure people are prepared to be self-sufficient after an event.	
31	Anonymous, Gold Beach	several road bridges at risk of being destroyed by natural hazards in Curry County leaving limited to no exit or entry points.	Thank you, the Curry County Road Department has submitted an action item for the development of a Curry County Bridge Resiliency Plan.
32	Anonymous, Gold Beach	While coastal erosion isn't a great concern, our home property does border a large creek which due to flooding and the creek changing direction, it has grossly eroded our property just within the last few years.	Thank you, you can explore the flood zones, maps, and insurance options at: https://www.floodsmart.gov/understanding-my-flood-zone
33	Anonymous, Gold Beach	Above anything, I would say my main concern is communications (911 - have you seen the mobile unit parked in the parking lot? It looks broken down!) and the very old tsunami sirens around the county. Most of which don't seem to work last I knew. If possible, focus on those, fix the sirens, improve on the 911 center and then focus on the other items. First response is a major concern in Curry County.	Thank you for sharing your concerns, developing a reliable and resilient communications network is a high priority action item for the County. Upgrading the tsunami emergency alert system to modern standards, including sirens is also included as a County action item.
34	Garrett Thomson, Brookings	I am concerned about tree diseases, tree killing bugs, pollution of the ocean, radiation from Fukushima drifting across the across the ocean, seals destroying the salmon population, and becoming an island if the bridges to either direction fail.	Thank you for sharing your concerns, most of your concerns are beyond the scope of this plan. The Curry County Road Department has submitted an action item for the development of a Curry County Bridge Resiliency Plan.
35	Travis McCleary, Brookings	Install tsunami sirens.	Thank you, upgrading the tsunami emergency alert system to modern standards, including sirens is included as a County action item.
36	Ms. Charlie Alexander, Port Orford	We live almost at the end of one of the ponds/springs that feed Lake Garrison and	Thank you, we understand living in the Tsunami zone creates additional concerns for residents. The plan includes action items such as improving public hazard education, improving signage and evacuation route

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
		do worry about being in the Tsunami zone.	wayfinders, identifying additional evacuations routes, conducting evacuation drills, and exploring locations and funding for vertical evacuation structures. Additional tsunami resources can be found on the Curry County Emergency Management webpage: https://www.co.curry.or.us/government/county_sheriff/emergency_management.php
37	Anonymous, Brookings	Not so much the hazard. More the staffing it will take to mitigate a major incident. Every one of the fire departments within the county rely strictly on volunteers for any response. In the event of a major incident, how many of those volunteers will or even be able to respond? This will be a major short fall with not only the 3 cities but the entire county.	Thank you for sharing your concern. Updating and exploring Mutual Aid Agreements to fill resource and personnel shortages is covered in several action items in the plan.
38	Susan Renbarger-Kelly, Brookings	I'm concerned about the availability of medical services, adequate emergency shelters, and food resources throughout Curry County in the event of a natural disaster where homes and apartments are no longer habitable.	Thank you, developing a Curry County Mass Care Plan is a priority action item. The plan will cover evacuation, mass care, emergency assistance, temporary housing, and human services.
39	Anonymous, Brookings	Excessive amount of potholes on Hall Way (in Harbor-unincorporated part of city of Brookings) have been in need of repair for several years now.	Thank you for sharing your concern, this is beyond the scope of this plan.
40	Anonymous, Port Orford	I'm worried about my city's water lines.	Thank you, Port Orford has several action items addressing the water infrastructure.
41	Stan/Debbie Davis, North Curry County (Rural)	We would like to see some emergency training classes for the whole community so that in case of tsunami/earthquake, there would be less confusion about what to do.	Thank you, improving hazard education for all populations within Curry County is an action item for the County.
42	J. Ritter, Port Orford	I'm concerned about the stability of the bridges along 101 in Curry County during an earthquake.	Thank you, the Curry County Road Department has submitted an action item for the development of a Curry County Bridge Resiliency Plan.

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
43	The Marmons, Port Orford	Would like an alert system in place that would notify us in the case of a pending disaster. I do not think the system in place is adequate.	Thank you for sharing your concern. Please visit this link or the Curry County Emergency Management website to sign up for the Curry County Emergency Mass Notification System (Everbridge): https://member.everbridge.net/892807736723773/new You can sign up for text, email, and call notifications. Everbridge also offers an application you can download to your phone. Upgrading and improving public notifications is a priority for the County.
44	Coy, Port Orford	Just want to be more prepared	Thank you for sharing your perspective—personal preparedness is very important. See this link for more information: www.ready.gov/kit
45	Harry Bryant, Port Orford	emergency manage needs to work with non-government organizations like Cert and ham radio.	Thank you. Improving collaboration and relationships with volunteer organizations is a priority for the County Emergency Manager.
46	Kim Foster, Port Orford	Would love to see greater education about natural disaster emergency preparedness (both on an individual level and a community level). For example, is there a local Emergency Operations Center (EOC) to centralize communication and disaster recovery efforts? It seems that many do not take natural disasters seriously, but having lived through many devastating hurricanes in the Gulf Coast community preparedness and cross-community coordination is EVERYTHING.	Thank you for sharing your concerns. Reliable and resilient communications and the Emergency Operations Plan development are a priority for the County. The Emergency Operations Plan will require input from all jurisdictions, establishing the response framework for the County.
47	Clark, Port Orford	Concerned about winter storms affecting the Port Orford dock, concerned about bridge infrastructure in the event of an earthquake, concerned about a shortage of fuel after an earthquake, concerned about older folks who may not have someone to check on them during a disaster.	Thank your for sharing your concerns. These issues are identified through several action items in the plan.

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
48	Mary Lou, Port Orford	I'm concerned about our drinking water infrastructure. I believe it needs a lot of fixing, from repairing the reservoir to replacing the city pipes.	Thank you, Port Orford has several action items addressing the water infrastructure.
49	Anonymous, North Curry County (Rural)	Supply chain for those that haven't bothered to prepare or take this seriously. Lack of concern for community strength in event of disaster	Thank you, lifeline and road resiliency are priorities for the County. Personal preparedness is very important. See this link for more information: www.ready.gov/kit .
50	Rosaria Williams, Port Orford	Many of us are elderly and may not be able to walk away safely to a safer area in case of a disaster. The city needs to have trained personnel at each street to help search and evacuate, perform first aid and help with transport.	Thank you for sharing your concern. The County and Port Orford have identified action items for developing and updating Emergency Operations Plans. The needs of all populations are considered during the plan development.
51	Anonymous, Port Orford	I think we should investigate LFTR (Thorium) reactors as a source of endless power and fresh water to the region.	Thank you for sharing your perspective.
52	Nancy Fraser, Port Orford	Some issues do not have a direct impact on me but definitely do impact the community which I consider my home.	Thank you for sharing your perspective.
53	Gary Burns, Port Orford	I would like to see the town of Port Orford be made more aware of our hazards through education in all forms to reach as many folks as possible in the community. I feel most citizens are unprepared for most disasters. Everyone needs a go bag, a plan, supplies, etc. The town needs emergency caches to support a disaster. And Port Orford's infrastructure is in dire need of upgrading for disasters as well.	Thank you, improving hazard education for all populations within Curry County is an action item for the County. Personal preparedness is very important. See this link for more information: www.ready.gov/kit. Port Orford has action items addressing critical infrastructure in the plan.
54	Cory Aschauer, Port Orford	I think we need to all think about the unthinkable and that is having an active shooter in public buildings.	Thank you for sharing your concern, this is beyond the scope of this plan.

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
		We should have some systems in place for our schools, city hall, etc. possibly training for public volunteers.	
55	Cynthia, Port Orford	It would be nice if this much effort was put into the corrupt police force in Port Orford.	Thank you for sharing your perspective.
56	Anonymous, Gold Beach	Upgrade volunteer / amateur radio VHF/UHF capabilities to provide enhanced communications capabilities.	Thank you for sharing your concerns, developing a reliable and resilient communications network is a high priority action item for the County. Improving collaboration and relationships with volunteer organizations is a priority for the County Emergency Manager.
57	Diane Troup, Gold Beach	I would be very interested in knowing how we plan recovering from a quake and/or tsunami immediately, after day one, and after week one? I'm also very concerned about a "firestorm" burning through Gold Beach. And I'm very concerned about helping slow climate change. For example, how can we convince people to stop burning yard waste, trash, etc.? Maybe making a wood chipper available to people? I am willing to make uncomfortable, inconvenient changes in my life for the good of the planet. How do we convince the more angry folks who are more concerned about their personal rights to band together for the good of our future? I would be interested in being involved with working toward solutions, so please let me know when you are looking for people for committees, meetings, etc.	Thank you for sharing your concerns. There are several wildfire mitigation action items for the county to include: fuel reduction, public education, and creating buffer zones to protect communities. A climate report will be included in this plan.

Open-Ended Response Comments			
Do you have any additional concerns or comments about hazards in your community?			
#	Commenter	Comment	Response
58	Kelly Timchak, Curry Watersheds Partnership	See full comment letter in figure below.	Thank you for taking the time to draft a robust comment. The work that Curry Watersheds Partnership (CWP) implements in Curry County is a benefit to everyone. In particular, the leadership of CWP in addressing the invasive gorse plant (<i>Ulex europaeus</i>) infestations that pose a grave fire risk is an important hazard mitigation effort. As a nonprofit organization, CWP may be able to access Hazard Mitigation Grant Program (HMGP) funds without being an NHMP plan holder. However, it may be beneficial for the Curry Soil & Water Conservation District to become a plan holder as a special district, and the inclusion of the District in becoming a plan holder is supported under Curry County Mitigation Action #22-MH-23: Encourage special districts (including ports) to develop addenda to the Curry County Natural Hazards Mitigation Plan. Curry County may also be able to apply for funds on behalf of CWP, and coordination on wildfire mitigation actions is welcome. In particular, CWP could consider coordination on the following mitigation actions: 22-WF-01: Identify high-risk areas and actions residents can take to reduce their risk. 22-WF-02: Promote public awareness campaigns for individual property owners living in the Wildland/Urban Interface (WUI). 22-WF-03: Promote wildfire mitigation through public education, fuels reductions, and improvement of transportation corridors. 22-WF-12: Conduct fuel treatments in and near communities to provide buffer zones to protect structures, important community assets, and evacuation routes. 22-WF-13: Restore and maintain wildland fire resilient landscapes across all jurisdictions. 22-WF-15: Review and update the 2008 Curry County Wildfire Protection Plan. Going forward, Curry County has a number of plans to update before it is likely to have the capacity to coordinate implementation of the types of projects articulated in the CWP comment that go beyond wildfire mitigation. However, there is overlap with work articulated in most Road Department projects, especially those that involve culverts, work in floodplains, or work in estuaries. CWP is encouraged to participate in plan maintenance meetings so that coordination on these issues is possible.

Figure III-1. Curry Watersheds Partnership Public Comment**Curry Watersheds Partnership (CWP)**

Curry Soil & Water Conservation District, Lower Rogue Watershed Council, South Coast Watershed Council, and Curry Watersheds Nonprofit

The CWP recommends adding watershed restoration actions to the Curry County Natural Hazard Mitigation Plan. Restoring watershed processes and natural habitats will make the landscape more resilient to natural disasters, and thus lessen the risk to human life, infrastructure, natural resources, and the environment. Following are specific restoration actions that can mitigate the natural hazards of drought, flooding, and wildfire:

- I. Drought - Restore watershed integrity and improve land management to increase water availability during the dry season. Prioritize municipal water sources: Brookings/Harbor – Chetco River (primary), Ferry Creek (secondary); Gold Beach – Rogue River; Port Orford – North Fork Hubbard Creek (primary), Garrison Lake (secondary); and Langlois – Floras Creek.
 - a. Reduce water withdraws by updating irrigation infrastructure and technology
 - b. Retain soil moisture by restoring native vegetation, improving grazing practices, and promoting forest management that retains woody debris on the forest floor
 - c. Increase groundwater recharge by protecting and expanding wetlands, constructing stormwater retention basins, increasing floodplain inundation (where appropriate), increasing instream roughness (log structures), and by dispersing road drainage
 - d. Reduce sedimentation in reservoir watersheds by improving or decommissioning roads, managing development, improving livestock and crop management, increasing stream buffers, and decreasing the risk of wildfire
- II. Flood – Restore watershed integrity and improve land management to reduce peak discharge, dissipate flood energy, stabilize streambanks, and reduce damage to infrastructure.
 - a. Enhance riparian buffers along stream and rivers by increasing buffer widths, eradicating invasive weeds, and restoring native riparian forests
 - b. Where appropriate, dissipate flood energy by reconnecting streams and rivers to their floodplains, restoring secondary channels and other natural storage areas, and enhancing the quality and acreage of wetlands
 - c. Decrease peak discharge by dispersing road drainage, decommissioning unnecessary roads, decreasing impervious surfaces, constructing retention basins, reforesting fallow land, and increasing floodplain inundation, where appropriate
 - d. In developed areas, reduce stormwater runoff by installing water catchments, bioswales, pervious surfaces, etc.
- III. Fire – Reduce fuel loads and ignition points, and enhance natural and managed fire breaks, to decrease the occurrence and intensity of wildfire; particularly in the wildland-urban interface
 - a. Enhance and expand natural meadows as fire breaks by removing encroaching trees and planting native grasses
 - b. Reduce fuel loads on forestlands by removing ladder fuels, and by thinning established stands to develop larger trees
 - c. Use prescribed burns to maintain natural meadows and prevent ladder fuel regrowth
 - d. Suppress and eradicate highly flammable invasive weeds, such as gorse, that create unnatural fuel loads and ignition points
 - e. Reduce fuel loads within public and private road corridors

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1. Curry County Critical Facilities

2022 Curry County Natural Hazard Mitigation Plan Jurisdictions

Type	Critical Facility Name	Infrastructure Owner	Point of Contact for NHMP	Location/Address	Website/Notes
Curry County					
Admin	Curry County Annex	Curry County	541-247-3296	94235 Moore Street, Suite 122/ Suite 113 Gold Beach, OR 97444	https://www.co.curry.or.us/index.php
Admin	Curry County Courthouse	Curry County	541-373-6894	29821 Ellensburg Ave. Gold Beach, OR 97444	https://www.courts.oregon.gov/courts/coos/Pages/default.aspx
Police/ EOC	Curry County Sheriff's Office	Curry County	Curry County Sheriff 541-247-3242	29808 Colvin St Gold Beach, OR 97444	https://www.co.curry.or.us/index.php
	Curry County Jail		541-247-3244		
	Curry Emergency Operations Center		541-247-3208	94235 W Moore St, Gold Beach, OR 97444	
Public Works	Curry County Road Department	Curry County	Curry County Road Dept. (541) 247-7097	28425 Hunter Creek Rd Gold Beach, OR 97444	Garages, shops, offices https://www.co.curry.or.us/departments/road/index.php
City of Brookings					
Admin	Brookings City Hall	City of Brookings	Public Works & Development Services Director 541-469-1159	898 Elk Dr Brookings, OR 97415	https://www.brookings.or.us/ Brookings Police and Fire Rescue Seismic Rehab Project #871-05 by the Oregon Seismic Rehabilitation Grant Program.
Police	Brookings Police Department		Public Safety Director / Chief of Police 541-469-3118		
Fire Station	Brookings Fire & Rescue		Fire Chief 541-469-3118		
EOC	Brookings Emergency Operations Center	City of Brookings	Public Safety Director / Chief of Police 541-469-3118	888 Elk Dr Brookings, OR 97415	Constructed in 2013; considered an essential facility.

Type	Critical Facility Name	Infrastructure Owner	Point of Contact for NHMP	Location/Address	Website/Notes
Airport	Brookings Airport	City of Brookings	Airport Manager 541-469-1138	17368 Parkview Dr Brookings, OR 97415	
Public Works	Brookings Public Works	City of Brookings	Public Works & Development Services Director 541-469-1159	905 Wharf Street Brookings, OR 97415	https://www.brookings.or.us/138/Public-Works-Development-Services
Utility	Wastewater Treatment Plant				
Utility	Water Treatment Facility	City of Brookings	Public Works & Development Services Director 541-469-1159	98115 North Bank Chetco River Rd Brookings, OR 97415	The city has been conducting seismic improvements to their water storage facilities, including seismic shut off valves on three tanks/ reservoirs.
Utility	Water Intake Facility	City of Brookings	Public Works & Development Services Director 541-469-1159	99232 North Bank Chetco River Rd Brookings, OR 97415	
City of Gold Beach					
Admin	Gold Beach City Hall	City of Gold Beach	City Administrator 541-247-7029	29592 Ellensburg Ave Gold Beach, OR 97444	https://www.goldbeachoregon.gov/
Fire	Gold Beach Fire Department		Fire Chief 541-247-7029		
Police	Gold Beach Police Department		Chief of Police 541-247-6671		
Public Works	Gold Beach Public Works	City of Gold Beach	Public Works Superintendent 541-247-7459	94100 5th Place Gold Beach, OR 97444	
City of Port Orford					
Admin	Port Orford City Hall	City of Port Orford	City Administrator 541-332-3681 / 541-366-4568	555 20th St Port Orford, OR 97465	https://portorford.org/
Police	Port Orford Police Department		Chief of Police 541-332-9013 / 541-332-3681 x280	552 19th St Port Orford, OR 97465 Same building, two addresses	
Fire	Port Orford Fire Department		Fire Chief 541-332-3681		

Type	Critical Facility Name	Infrastructure Owner	Point of Contact for NHMP	Location/Address	Website/Notes
Public Works	Public Works Shop	City of Port Orford	Public Works Director 541-253-8004	2848 Port Orford Loop Rd, Port Orford, OR 97465	
Utility	Water Plant	City of Port Orford	Public Works Director 541-253-8004	1635 Arizona St, Port Orford, OR 97465	
Utility	Wastewater Treatment Plant	City of Port Orford	Wastewater Operator 541-253-8004	915 W 12 th St, Port Orford, OR 97465	
Port of Gold Beach					
Port	Port of Gold Beach	Port of Gold Beach	Port Manager 541-247-6269 portoffice@portofgoldbeach.com	29891 Harbor Way Gold Beach, 97444	https://portofgoldbeach.com/
Airport	Gold Beach Municipal Airport	Port of Gold Beach	Port Manager 541-247-6269 portoffice@portofgoldbeach.com	29891 Harbor Way Gold Beach, OR 97444	https://portofgoldbeach.com/
Port of Port Orford					
Port	Port of Port Orford	Port of Port Orford	Port Manager 541-260-1926 / 541-332-7121	300 Dock Rd Port Orford, OR 97465	https://portofportorford.org/

Other Curry County Jurisdictions with Critical Facilities— Alphabetical by type, then name

Type	Critical Facility Name	Infrastructure Owner	Point of Contact for NHMP	Location/Address	Website/Notes
Airport	Calvert Peak Airport	Bureau of Land Management	Airport Manager 503-770-2242	Glendale, OR 123-44-02.2850W/ 42-46-46.4070N - 123.733968/42.778724 (Estimated)	Airstrip for use of BLM ONLY. https://www.airport-data.com/airport/OR73/
Airport	Cape Blanco State Airport	Oregon Department of Aviation	Airport Manager 503-378-4880	92200 Airport Road, Sixes, OR 97476	https://www.airnav.com/airport/5S6

Type	Critical Facility Name	Infrastructure Owner	Point of Contact for NHMP	Location/Address	Website/Notes
Airport	Winkle Bar	Private owner: Walter A Haas Jr	Airport Manager Pacific Flights Inc	Grants Pass, OR 42-42-05.4030N 123-48-18.2910W 42-42.090050N 123- 48.304850W 42.7015008, - 123.8050808 (estimated)	https://www.airnav.com/airport/OR74
Comm. Towers	Agness Communication Tower	US Forest Service	Curry County Road Dept. 541-247-7097		
Comm. Towers	Black Mound Communication Tower	Curry County	Curry County Road Dept. 541-247-7097		
Comm. Towers	Bosley Butte Communication Tower	Curry County	Curry County Road Dept. 541-247-7097		
Comm. Towers	Cape Blanco Communication Tower	Curry County	Curry County Road Dept. 541-247-7097		
Comm. Towers	Grizzly Peak Communication Tower	Curry County	Curry County Road Dept. 541-247-7097		
Hospital or Clinic	Curry General Hospital	Curry Health District	541-247-3000	94220 4th Street, Gold Beach, OR 97444	Replaced in 2017 with a state-of-the-art 62,000 square foot facility. https://www.curryhealthnetwork.com/CurryGeneralHospital?sub=Locations
Hospital or Clinic	Curry Family Medical	Curry Health District	541-332-3861	525 Madrona, Port Orford, OR 97465	https://www.curryhealthnetwork.com/CurryFamilyMedical?sub=Locations&left=Locations
Hospital or Clinic	Coast Community Health Center	Coast Community Health Center	541-332-1114	1332 Tichenor Ave Port Orford, OR 97465	https://www.coastcommunityhealth.org/

Type	Critical Facility Name	Infrastructure Owner	Point of Contact for NHMP	Location/Address	Website/Notes
Hospital or Clinic	Curry Medical Center	Curry Health District	541-412-2000	500 Fifth St Brookings, OR 97444	https://www.curryhealthnetwork.com/CurryMedicalCenter?sub=Locations&left=Locations
Hospital or Clinic	North Bend Medical Center—Gold Beach	Myrtle Ave Investment Co	541-247-7047	94180 2nd St, Gold Beach, OR 97444	https://www.nbmhealth.com/locations/gold-beach/
Hospital or Clinic	Oak Street Health Care Center	Oak Street Health Care Center	541-412-8898	446 Oak Street, Brookings, OR 97415	Brookings Harbor Medical Center is at the same location. http://bhmc-oak.com/ Hazards: EQ high, LS moderate risk.
Fire Station	Agness Illahee FD	Agness Illahee FD	Fire Chief 541-247-7987 agnessvolfire@gmail.com	3567 Sundown Rd Agness, OR 97406	https://www.oregon.gov/osp/Docs/FireAgencyListName.pdf
Fire Station	Cape Ferrelo RFPD	Cape Ferrelo RFPD	Fire Chief 541-469-5637	96349 Cape Ferrelo Rd Brookings, OR 97415	https://www.oregon.gov/osp/Docs/FireAgencyListName.pdf
Fire Station	Cedar Valley - North Bank RFPD	Cedar Valley - North Bank RFPD	Fire Chief	Cedar Valley Dr Gold Beach, OR 97444	
Fire Station	Coos Forest Protective Association – Brookings Station	Coos Forest Protective Association	541-469-2302	415 Redwood St Brookings, OR 97415	https://www.coosfpa.net/contact
Fire Station	Coos Forest Protective Association – Gold Beach Station	Coos Forest Protective Association	Fire Chief 541-247-6241	94276 Gauntlett St Gold Beach, OR 97444	https://www.coosfpa.net/contact
Fire Station	Harbor Rural Fire Protection District	Harbor RFPD	541-469-5301	98069 W Benham Ln Harbor, OR 97415	
Fire Station	Langlois RFPD	Langlois RFPD	Fire Chief	94322 First St Langlois, OR 97450	https://www.oregon.gov/osp/Docs/FireAgencyListName.pdf
Fire Station	Ophir RFPD	Ophir RFPD	Fire Chief 541-247-2452	32888 Nesika Rd Gold Beach, OR 97444	https://www.oregon.gov/osp/Docs/FireAgencyListName.pdf
Fire Station	Pistol River RFPD	Pistol River Fire District	Fire Chief 541-373-0844	24686 Pistol River Loop Gold Beach, OR 97444	https://www.oregon.gov/osp/Docs/FireAgencyListName.pdf
Fire Station	Sixes RFPD	Sixes RFPD	Fire Chief 541-332-9090	93343 S Crystal Creek Rd Sixes, OR 97476	https://www.oregon.gov/osp/Docs/FireAgencyListName.pdf

Type	Critical Facility Name	Infrastructure Owner	Point of Contact for NHMP	Location/Address	Website/Notes
Fire Station	Upper Chetco RFPD	Upper Chetco RFPD	Fire Chief 541-469-1140	17548 Gardner Ridge Rd Brookings, OR 97415	
Fire Station	Winchuck RFPD	Winchuck Volunteer Fire Department	Fire Chief 541-469-7751	363 Winchuck River Rd Brookings, OR 97415	https://www.oregon.gov/osp/Docs/FireAgencyListName.pdf
Military	US Coast Guard - Station Chetco River	US Coast Guard	541-469-3885	16133 Boat Basin Rd, Brookings, OR 97415	https://www.pacificarea.uscg.mil/Our-Organization/District-13/
Police	Gold Beach Ranger District	Rogue River-Siskiyou National Forest	541-247-3600 / 541-247-3605	29279 Ellensburg Ave, Gold Beach, OR 97444	https://www.fs.usda.gov/rogue-siskiyou/
Police	Oregon State Police	Oregon State Police	541-247-6641	28200 Hunter Creek Rd Gold Beach, OR	Not regularly staffed, limited phone availability https://www.oregon.gov/osp/Pages/officelist.aspx
Port	Port of Brookings-Harbor	Port of Brookings-Harbor	Port Manager 541-469-2218 info@portofbrookingsharbor.com	16330 Lower Harbor Rd Brookings, OR 97415	https://www.portofbrookingsharbor.com/
School	Azalea Middle School	Brookings-Harbor School District #17C	School Principal 541-469-7427	505 Pacific Avenue, Brookings, OR 97415	Brookings-Harbor School District 17C secured funding for Seismic Retrofit Projects #6165-02 and #6165-04 from the Oregon Seismic Rehabilitation Grant Program. Phase One was completed in the summer of 2018 with a \$1.5 million grant. A Phase Two retrofit of the gym was completed in 2020. https://ams.brookings.k12.or.us/
School	Brookings-Harbor High School	Brookings-Harbor School District 17C	School Principal 541- 469-2108	625 Pioneer Rd Brookings, OR 97415	https://bhhs.brookings.k12.or.us/ Seismic Retrofit Project #6165-03 of the Oregon Seismic Rehabilitation Grant Program. Jane Gibney Center is now an essential facility; cafeteria upgrades include a full kitchen and a backup generator.

Type	Critical Facility Name	Infrastructure Owner	Point of Contact for NHMP	Location/Address	Website/Notes
School	Kalmiopsis Elementary School	Brookings-Harbor School District 17C	School Principal 541-469-7417	650 Easy St Brookings, OR 97415	https://kes.brookings.k12.or.us/apps/maps/ Seismic Retrofit Project #6165-01 of the Oregon Seismic Rehabilitation Grant Program.
School	Gold Beach High School	Central Curry School District 1	Superintendent emilburn@ccsd.k12.or.us 541-247-2003 x224	29516 Ellensburg Ave Gold Beach, OR 97444	https://www.ccsd.k12.or.us/GBHS Seismic Rehab Projects #5939-02 and #5939-03 by the Oregon Seismic Rehabilitation Grant Program.
School	Riley Creek Elementary School	Central Curry School District 1	Superintendent emilburn@ccsd.k12.or.us 541-247-2003 x224	94350 Sixth St Gold Beach, OR 97444	https://www.ccsd.k12.or.us/RCS Seismic Rehab Project #5939-01 by the Oregon Seismic Rehabilitation Grant Program.
School	Driftwood Elementary School	Port Orford-Langlois School District 2CJ	Superintendent 541-332-2712 District Office 541-348-2455	1210 Oregon St Port Orford, OR 97465	https://www.2cj.com/ Seismic Retrofit Project #6185-01 by the Oregon Seismic Rehabilitation Grant Program.
School Admin	Pacific High School District Office	Port Orford-Langlois School District 2CJ	Superintendent 541-348-2293 District Office 541-348-2455	45525 US-101 Langlois, OR 97450	https://www.2cj.com/ https://www.facebook.com/Pacific-High-School-183908421811628/ Seismic Retrofit in 2019, Project #6185-02 by the Oregon Seismic Rehabilitation Grant Program.
Utility	Coos Curry Electric Cooperative	Coos Curry Electric Cooperative	Brookings Office 541-469-2103 Gold Beach Office 541-247-6638 Port Orford Office 541-332-3931	815 Railroad St Brookings, OR 97415 29439 Ellensburg Ave. Gold Beach, OR 97444 43050 US HWY 101 Port Orford, OR 97465	http://www.ccec.coop/
Utility	Harbor Water District Public Utility District	Harbor Water District PUD	541-469-3011	98069 W Benham Ln Harbor, OR 97415	http://harborwaterpud.net/

2. Curry County Hazard Analysis

The Curry County Hazard Analysis was conducted in September 2021 by the Curry County Sheriff's Office using the following methodology:

Oregon Department of Emergency Management. (2015, May). *Hazard Analysis Methodology*. Salem, OR: https://www.oregon.gov/lcd/NH/Documents/Apx_9.1.19_OEM_Hazard_Analysis_Methodology_OPT.pdf

Coastal Erosion

134 Points

Coastal erosion is a chronic hazard that occurs throughout the year in Curry County but is accelerated during the winter months when storm events may cause more severe episodic erosion. Coastal erosion is gradually eroding the Nesika Beach area, north of Gold Beach, threatening beachfront homes. Harris State Park experiences coastal erosion on a regular basis, and in 2004, erosion destroyed a hiking trail in Otter Point State Park. In the Dawson Tract Subdivision north of Brookings, a home had to be demolished due to coastal erosion. Finally, in February 1998, heavy surf damaged Port Orford's sewage treatment plant, causing approximately \$300,000 in damage and eroding the dune that separates the ocean from Garrison Lake, which is one of Port Orford's sources of water. The dune breach has since been repaired and is monitored regularly. Coastal erosion is limited to the area within the coastal fringe.

- February 1998: Port Orford- Heavy surf damaged Port Orford's sewage treatment plan, causing approximately \$300,000 in damage and eroding the dune that separates the ocean from Garrison Lake, one of Port Orford's sources of water.
- 2004: Otter Point State Park- Coastal erosion destroyed a hiking trail.

Dust Storm

24 Points

Curry County has not experienced a dust storm, but they are a future possibility in areas affected by drought and wildfire. Mitigation actions for drought and wildfire will mitigate dust storms.

Drought

172 Points

Drought conditions are not uncommon in Curry County. The environmental and economic consequences can be significant, especially for Curry County's agricultural sector. Drought also increases the probability of wildfires in Curry County. Two drought action items have been identified for the Curry County 2022 Natural Hazards Mitigation Plan: continue to enforce existing water requirement codes for rural residents through Oregon Water Resource Department, and identify and evaluate alternative water sources.

- 1961: Coos and Curry Counties- Abnormally high temperatures in the two counties.
- 1976-1981: Western Oregon- Intense drought. 1976-77 was the single driest year of the century.
- 1985-1997: Curry County- A general dry period throughout the state; the Governor issued a Drought Declaration for Curry County in 1992.
- 2000-2001: Statewide- the second most intense drought in Oregon's history.
- December 2002: Coos, Curry and Douglas Counties - Governor Declared State of Drought Emergency declared "due to conditions caused by drought and low water."
- 2004-2005: Coos, Curry, and Douglas Counties- Counties declared primary natural disaster area due to drought.

- August 2013: Curry County- Agricultural losses due to recent drought. Curry County designated as primary natural disaster area.
- July 2015: Formal Governor Declared Determination of State of Drought Emergency due to drought, low snowpack levels, and low water conditions.

Earthquake – Cascadia

208 Points

While Curry County has not experienced any significant earthquakes in recent memory, earthquakes in Oregon that have affected the county are listed below. A Cascadia earthquake will devastate most critical infrastructure within the county. Most bridges will require minor to major repairs before resources and personnel can move through the county. Mass care facilities and shelter locations have pursued seismic retrofit to mitigate damages during a Cascadia earthquake. Lifelines will become a priority to re-establish and repair in the aftermath of a large earthquake.

- January 1700: Offshore, Cascadia Subduction Zone- Approximately 9.0 earthquake generated a tsunami that struck Oregon, Washington, and Japan; destroyed Native American villages along the coast.
- November 1873: Brookings Area- Chimneys fell at Port Orford, Grants Pass, and Jacksonville. There were no aftershocks to the 7.3 magnitude earthquake. The origin was probably the Gorda block off the Juan de Fuca plate. Intraplate event.

Earthquake – Crustal

216 Points

While Curry County has not experienced any significant earthquakes in recent memory, earthquakes in Oregon that have affected the county are listed below. Mass care facilities and shelter locations have pursued seismic retrofit to mitigate damages during a crustal earthquake. A few bridges may require minor repairs following a crustal earthquake.

- October 2011: Oregon Coast- A 5.3 magnitude earthquake occurred off the Oregon coast. The earthquake was 172 miles northwest of Brookings.
- February 2012: Oregon Coast- A 6.0 magnitude earthquake occurred off the Oregon coast about 190 miles northwest of Brookings. There were no reported damages.
- April 2012: Oregon Coast- A 5.9 magnitude earthquake occurred off the Oregon coast. The earthquake was 196 miles away from Brookings. There were no reported damages.
- June 2021: Oregon Coast – A 5.9 magnitude earthquake occurred off the Oregon coast. The earthquake was 98 miles west of Gold Beach at a depth of 5.6 miles. There were no reported damages.

Extreme Heat Event

127 Points

Extreme heat events present a hazard to eastern Curry County. During the 2021 heat waves, temperatures increased in the eastern and southern portions of the county. Although there were increased temperatures, there was never a need for cooling stations or EOC activation as the communities had prepared for the excessive heat.

Flood – Riverine

216 Points

Regional and local flooding incidents may occur in several ways: (1) periodic overflow of the Chetco, Rogue, Elk, and Sixes Rivers; (2) flash flooding in the form of quickly rising streams after heavy rains and

or rapid snow melt; and (3) overflow of storm sewer systems due to drainage system failure or under capacity following heavy rain or rapid snow melt. Critical infrastructure located near the rivers are at risk of flooding during these events. In 1964, the Rogue River crest exceeded the height of the Lobster Creek Bridge, demonstrating the bridges are vulnerable to river flooding.

- October 1950: Curry County- Period of heavy rainfall with 10 to 12 inches recorded for the County.
- October 1953: Curry County- Period of heavy rain from a wet winter storm. Gold Beach had a storm total of 9.8 inches of rain, while Port Orford recorded 7.25 inches of rain.
- December-January 1964-65: Curry County- The December 1964 rainstorm was among the most severe in western Oregon since the late 1870s. Hundreds of miles of roads and highways were washed out or badly damaged, and thousands of people had to be evacuated due to ensuing floods. Rivers in Curry County were above the flood stage, and mudslides, bridge failures, and inundation closed several roads.
- February 1996: Curry County- Flooding occurred throughout Oregon and Curry County. Region-wide damage estimates exceeded \$1 billion.
- November-December 1996: Curry County- Oregon State of Emergency declared for Curry County due to flooding and landslides from heavy rains.
- January 1997: Statewide- Flooding widespread throughout Oregon, with many roads closed due to high water and landslides. The governor declared a State of Emergency in January due to heavy rains that began December 21, 1996 and caused flooding, landslides, and erosion in 18 counties, including Curry County.
- December 2005: Curry County- Heavy flooding in Curry County due to heavy rains. Damages occurred in Curry, Coos, Josephine, and Jackson Counties.
- December 2007: Oregon Coast- Strong storms along the entire Oregon Coast. Curry County was included in a Presidential Disaster Declaration for the Coast.
- January 2012: Coos and Curry Counties- A severe winter storm caused flooding along with landslides and mudslides in southern Oregon.
- March 2012: Coos and Curry Counties- Winds and heavy rain caused flooding, mudslides, and landslides in twelve counties. Damage to state highways estimated at \$5,856,881.
- November 2012: Curry County- Rain flooded the Chetco River and Hunter Creek, and 9.84 inches of rain were recorded at Harbor in a 24-hour period.
- November 2012: Curry and Josephine Counties- Heavy rain caused \$4 million in damages to infrastructure.

Flood – Tidal

63 Points

Tidal floods are possible along the coast in Curry County. During King tide events residential and critical infrastructure can experience flooding and damage. The Port of Port Orford has experienced flooding to the extent of pushing Conex containers from the dolly dock into the bay.

Landslide/Debris Flow

240 Points

Curry County is subject to landslide events. The severity or extent of landslides is typically a function of geology and the landslide triggering mechanism. Rainfall initiated landslides tend to be smaller, and earthquake induced landslides may be very large. Even small slides can cause property damage, result in injuries, or take lives. Landslides along U.S. 101 require the identification and use of alternate routes,

few of which exist or are feasible for large vehicles. Alternate routes may also be affected by the landslide, requiring repairs before traffic can move through the county. Developing resilient evacuation and alternate routes has been identified as an action item in the Curry County 2022 Natural Hazards Mitigation Plan.

- 1953: Curry County- Landslide near the Harbor Hills area (southeast of Brookings) damaged a home and closed Highway 101.
- 1993: Highway 101- the “Arizona Inn Slide” shut down Highway 101 for two weeks. ODOT has since installed new drainage systems. Previous slides occurred in 1938, 1954, 1978, and 1981.
- 1994-1995: Gold Beach- Hooskanaden slide closed Highway 101, 18 miles south of Gold Beach.
- Winter 1996-1997: Curry County- Significant landslide events occurred in Curry County as a result of intense rainfall from the February storms. The governor declared two State of Emergencies for Curry County during this period.
- 1999: Curry County- Landslide on Highway 101 at Reinhart Creek (MP 311.2-311.7) cost \$1,300,000 to repair. There was \$500,000 worth of repairs on Highway 101 and 80 Acres Road (MP 332.5-333).
- 2001: Curry County- Landslide on Highway 101 at Slide Creek (MP 310.6-310.8) cost \$1,100,000 to repair. A landslide at Humbug State Park near Bear Trap Creek (MP 307.06-307.16) cost \$175,000 to repair.
- January 2006: Curry County- Gregory Point landslide 2.2 miles south of Port Orford blocked Highway 101.
- 2008: Curry County- Heavy rains caused approximately 3,000 tons of mud and debris and covered Harbor Heights Road in the Harbor Hills area southeast of Brookings, blocking access to several homes.
- March 2011: Curry County and 12 other counties- Winds and heavy rains caused flooding, mudslides, and landslides in 13 counties. Damage to state highways estimated at \$5,856,881.
- January 2016: Community of Harbor experiences two earth movements, also known as sinkholes, one of which closed U.S. 101. Storm drain, sanitary sewer, local businesses, and homeowners were affected by the events.
- February 2019: Gold Beach – Hooskanaden slide closed U.S. 101 at mile point 344, 12 miles north of Brookings. All motorists had to use Carpenterville Road as an alternate route, large trucks were unable to use the alternate route causing an impact on resource movement.

Local Tsunami

222 Points

Local tsunamis pose the greatest risk to low lying communities and critical facilities within the tsunami inundation zone. Throughout the county, critical infrastructures are in the distant and local tsunami inundation zones. The 2016 and 2022 Natural Hazard Mitigation Plans contain action items to reinforce and/or move critical facilities from the tsunami zones. The ports are added as individual jurisdictions in the 2021; to bring awareness to vulnerabilities and develop mitigation action items.

- January 26, 1700: Oregon Coast- A magnitude 9 subduction zone earthquake generated a tsunami that caused damage along the entire Oregon Coast and as far away as Japan.
- November 1873: Port Orford- An earthquake in northern California generated a tsunami. Structures at the high tide line in Port Orford were damaged.

Distant Tsunami

184 Points

Many communities in Curry County are at risk of distant tsunamis. Throughout the county, critical infrastructures are in the distant and local tsunami inundation zones. The 2016 and 2022 Natural Hazard Mitigation Plans contain action items to reinforce and/or move critical facilities from the tsunami zones. The ports are added as individual jurisdictions in the 2021; to bring awareness to vulnerabilities and develop mitigation action items.

- 2004 – Indonesian Tsunami in December killing 100,000+
- 2005 – First ever Tsunami warning on West Coast on June 15th.
- 2006 – Tidal surge damaged docks in Crescent City in November.
- 2007 – CSZ 4.1 quake 52 miles W. of Gold Beach
- 2011 – Japan earthquake tsunami caused extensive damage to the Port of Brookings, \$1.2 Million. State of Emergency declared in Curry County.

Volcano

24 Points

Curry County is located on the Pacific Rim. Tectonic movement within the earth's crust can renew nearby dormant volcanoes resulting in ash fallout. Volcanic activity is possible from Mount Hood and Mount Saint Helens, Three Sisters, Mount Bachelor, and the Newberry Crater areas. Because the distance to these potentially active volcanic areas is so great, the only adverse effect that would impact areas of Curry County is ash fallout. The area affected by ash fallout depends upon the height attained by the eruption column and the atmospheric conditions at the time of the eruption. There is no recent geologic history of volcanic impacts in Curry County and the probability of future events is very low.

Wildfire

236 Points

This hazard involves the uncontrolled burning in residential, commercial, industrial, rural and unincorporated areas of structures or wild lands. Urban fire occurrences are common within the incorporated areas of the County. There is also a threat of wildland/urban interface fires from areas of undeveloped property adjacent to urban centers. The areas of greatest concern are forested rural residential developments with only one entrance/exit, and or steep, narrow roads. The timely evacuation of these areas is problematic and is compounded by restricted access for firefighting equipment, and limited or nonexistent water supplies sufficient for controlling a major fire. Most reported fires are handled easily through mutual aid without activation of this plan. In the event of a major wildland fire that exceeds the resources of the local fire services, the Oregon Fire Service Mobilization Plan will be implemented and the Governor will be asked to invoke the provisions of the Emergency Conflagration Act. The following wildland fires in recent years has impacted Curry County:

- 1868: Coos and Curry Counties- 90% of Elliott State Forest burns. Fire is stopped when it reaches the ocean after burning through 296,000 acres.
- September 1936: Coos and Curry Counties: Temperatures reached 90 degrees and humidity dropped to 6% sparking wildfires throughout the two counties.
- 1987: Southern Coast Range- The Silver Fire occurred in the Southern Coast Range and burned 97,000 acres.
- 2002: Curry County- The Biscuit Fire burned roughly 500,000 acres for a total cost of \$150 million in damages.
- June 2014: Curry County- the Euchre Creek Fire, 12 miles north of Gold Beach, burned 56 acres.

- June 2015: Buckskin Fire eight miles north of Cave Junction 5,345 acres
- August 2015: Collier Butte Fire 10-miles east of Gold Beach 12,230 acres
- 2017: The Chetco Bar Fire reached 191,125 acres, destroying 6 homes. EOC activated
- 2018: The Klondike Fire reached 175,258 acres. Partial EOC activation.

Windstorm / Winter Storm

226 Points

Although windstorms can affect the entirety of Curry County, they are especially dangerous along the beaches, headlands and coastal bluffs as well as in developed areas with large trees or tree stands. A windstorm will frequently knock down trees and power lines, damage homes, businesses, public facilities, and create tons of storm related debris. Coastal wind gusts in the Cape Blanco area can also reach up to 200 miles per hour. Windstorms are a common, chronic hazard in Curry County.

- January 1921: Oregon Coast- Hurricane-force winds along the entire coast.
- January 1950: Curry County- Severe winter weather with snow, sleet, and freezing rain closed highways and power lines.
- December 1951: Statewide- Large windstorm with coastal winds between 60 and 100 mph. Damage across the state.
- November 1958: Curry County- Wind Storm with gusts between 80 and 100 mph, over a billion board feet of timber fell, roads in Coos County largely blocked.
- February 1961: Curry County- Heavy gusts and significant rain caused widespread damage in Coos County.
- October 1962: Curry County- Columbus Day Storm. Most destructive wind storm in Oregon's history, and caused widespread damage in Coos County.
- October 1967: Oregon Coast- Severe wind damage along the coast, winds 100 to 110 mph.
- March 1983: Brookings- Tornado touched down in Brookings, causing \$25,000 in damage.
- December 1995: Western Oregon- State of Emergency declared throughout western Oregon due to a major windstorm.
- November 1996: Curry County- Heavy rain in Curry County.
- February 2002: Curry County: Windstorm with 88 mph winds recorded in Bandon. Severe damage to utilities and roads caused by falling trees. State of Emergency declared for Coos, Curry, Douglas, Lane and Linn Counties.
- November 2002: Brookings: Tornado touched down in Brookings causing \$500,000 in damage.
- November 2006: Curry County- Storms with winds measured at 70 mph created a total of \$10,000 in damages.
- December 2006: Coos, Curry, and Douglas Counties: Windstorms with winds over 90 mph caused \$225,000 for Coos, Curry, and Douglas counties.
- December 2007: Oregon and Washington- A relentless storm pummeled the Oregon and Washington Coasts for 3 days, bringing the strongest winds the area has seen since the Columbus Day storm.
- January 2012: Coos and Curry Counties- A severe winter storm caused flooding along with landslides and mudslides in southern Oregon.
- March 2012: Coos and 11 other counties- Damaging winds, heavy rains, flooding, mudslides, landslides, and erosion in Coos and 11 other counties cost nearly \$6 million in damages.
- October 2014: strong winds and ocean surge damaged Port Orford dock resulting in \$450,000.00 damage

Terrorism**39 Points**

As a rural community, Curry County has not experienced any terrorism related events. The potential of these events is low as there are limited targets or points of interest for terrorism events within the county. It is recognized throughout the world that incidents of terrorism are on the increase. While remote, we recognize that there is a potential for a terrorist attack on public officials or public buildings in Curry County.

Power Failure**192 Points**

Curry County has experienced power failure as a result of windstorms and/or winter storms. These events have typically been quickly resolved but pose a greater threat to facilities lacking backup power. Historically, some areas in the county have gone without power for two full weeks before being restored. Ensuring critical facilities maintain emergency plans and generators have been added as action items in the 2022 Natural Hazard Mitigation Plan.

Water Supply Disruption**168 Points**

Although Curry County has not experienced a water supply disruption, the hazard exists in conjunction with earthquake and human facilitated hazards. Ensuring critical facilities maintain emergency plans and generators have been added as action items in the 2022 Natural Hazard Mitigation Plan.

Communication System Failure**192 Points**

Curry County has experienced power and communication system failure as a result of windstorms and/or winter storms. These events have typically been quickly resolved but pose a greater threat to facilities lacking backup power. Historically, some areas in the county have gone without power for two full weeks before being restored. Ensuring critical facilities maintain emergency plans and generators have been added as action items in the 2022 Natural Hazard Mitigation Plan.

Sewer Treatment Failure**163 Points**

Although Curry County has not experienced a sewer treatment failure, the hazard exists in conjunction with flood, earthquake and human facilitated hazards. Ensuring critical facilities maintain emergency plans and generators have been added as action items in the 2022 Natural Hazard Mitigation Plan.

Dam Failure**24 Points**

While Curry County has no dams, we are downstream of dams located in Josephine County that have the potential to inundate portions of the county and cause damages should they fail. Flooding could likely cause disruption of utility services and transportation routes as well as hazardous materials spillage. There is no recorded history of dam failure affecting the County.

Airplane Crash**24 Points**

Three airports are located within Curry County, Cape Blanco State Airport, Gold Beach Airport, and City of Brookings Airport. High wind gusts along the coast can create a hazardous environment for landing and departing aircraft.

Liquid Fuel Supply Disruption**149 Points**

Following the 2019 Hooskanaden slide, there was a liquid fuel supply disruption due to the restriction of large truck passage on the alternate route. Fuel suppliers would be required to transport fuel in smaller trucks, which isn't always an option. Hazards affecting U.S 101 impact the transportation of liquid fuel

supply in Curry County because the limited alternate routes often cannot handle large trucks. Developing resilient evacuation and alternate routes has been identified as an action item in the Curry County 2022 Natural Hazards Mitigation Plan.

Information Technology Disruption **192 Points**

Curry County has experienced power failure and information technology disruption as a result of windstorms and/or winter storms. These events have typically been quickly resolved but pose a greater threat to facilities lacking backup power. Historically, some areas in the county have gone without power for two full weeks before being restored. Ensuring critical facilities maintain emergency plans and generators have been added as action items in the 2022 Natural Hazard Mitigation Plan.

Fire – Large Scale Urban Conflagration **227 Points**

Urban fire occurrences are common within the incorporated areas of the County. There is also a threat of wildland/urban interface fires from areas of undeveloped property adjacent to urban centers.

Hazmat Release -Transportation / Fixed Facility **142 Points**

The threat of a hazmat transportation accident is minimal due to the remote location of the county's main thoroughfare, US Highway 101. Medical grade radiation is the primary concern. It is a viable terrorism tool, but low radiation levels would likely result in minimal damage.

Public Health Emergency **222 Points**

The ongoing COVID 19 Pandemic has impacted Curry County through cases, deaths, and economic losses. The community economy relies heavily on tourism, which is limited during a public health emergency. Curry County also contains a large retired population which is more vulnerable to most public health emergencies.

Sports/Public Event Disturbance **54 Points**

There is no record of major occurrences of sports/public event disturbance in the County.

School Violence **34 Points**

There is no record of major occurrences of school violence in the County.

Sabotage **94 Points**

There is no record of major occurrences of sabotage in the County. Critical facilities are targets of sabotage.

Riot / Civil Disturbance / Protest / Demonstration **39 Points**

There is no record of major occurrences of civil disorder in the County. Because of Curry County's large volume of public forest lands, there is the potential for eco-terrorism or demonstrations based upon logging decisions and operations

Unscored Hazards

Curry County did not score fuel line explosion and train derailment because these hazards do not exist within the county.

3. DOGAMI O-20-15 Risk Report for Curry County

This report forms the basis of the risk assessment for the 2022 Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan Update.

Williams, M.C. and Anthony, L.H. (2020). *NATURAL HAZARD RISK REPORT FOR CURRY COUNTY including the Cities of Brookings, Gold Beach, Port Orford, and the Unincorporated Communities of Harbor and Nesika Beach*. (Open File Report O-20-15). Portland: Department of Geology of Mineral Industries.

This report is cited as Williams & Anthony, 2020.

What's in this report?

This report describes the methods and results of a natural hazard risk assessment for Curry County communities. The risk assessment can help communities better plan for disaster.

Report downloads:

- [Text report, including all appendices \(82 p., 23 MB PDF\)](#)
- [Appendix E. Map Plates \(7 plates; 20 MB PDF; view/download individual plates below\)](#)
- [GIS metadata bundle \(7 .xml files; 23 KB zip file\)](#)
- [Full GIS data bundle, with .xml metadata \(248 MB, zip file; view .xml metadata links below\)](#)
- [Complete publication bundle \(317 MB zip file\)](#)

Executive Summary (excerpt):

This report was prepared for the communities of Curry County, Oregon, with funding provided by the Federal Emergency Management Agency (FEMA). It describes the methods and results of the natural hazard risk assessment performed in 2016 by the Oregon Department of Geology and Mineral Industries (DOGAMI) within the study area. The purpose of this project was to provide communities with a detailed understanding of their risk from natural hazards, to give communities the ability to compare their risk across multiple hazards, and to prioritize and take actions that will reduce risk. The results of this study can also inform the natural hazard mitigation planning process.

The findings and conclusions of this report show the potential impacts of hazards in communities within Curry County.

Results were broken out for the following geographic areas:

- Unincorporated Curry County (rural)
- Community of Nesika Beach
- City of Gold Beach
- Community of Harbor
- City of Brookings
- City of Port Orford

4. OCCRI Future Climate Projections: Curry County

This report informs the consideration of hazards for the local risk assessment evaluations conducted for the 2022 Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan Update. The production of this report was contracted by the Oregon Department of Land Conservation and Development for the purpose of the plan update.

Dalton, Meghan, Erica Fleishman, and Dominique Bachelet. (2022, May.). *Future Climate Projections: Curry County*. Oregon Climate Change Research Institute. College of Earth, Ocean and Atmospheric Sciences, Oregon State University.

5. DOGAMI Earthquake and Tsunami Evacuation Analyses

Large-Extent Tsunami Evacuation Maps

These maps informed the consideration of earthquake and tsunami hazards for the local mitigation strategies developed or updated for the 2022 Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan Update.

Oregon Tsunami Clearinghouse. (2013). *Large-Extent Tsunami Evacuation Maps*. Newport, OR: Oregon Department of Geology and Mineral Industries.

<https://www.oregongeology.org/tsuclearinghouse/pubs-evacbro.htm>

Curry County

- [Port Orford](#)
- [Nesika Beach and Ophir](#)
- [Gold Beach & Hunter Creek area](#)
- [Brookings & Harbor](#)

6. DOGAMI O-20-03 Detailed CSZ impacts for Port Orford

This report informs the consideration of earthquake and tsunami hazards for the local risk assessment evaluations conducted for the 2022 Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan Update.

Bauer, John M., Jonathan C. Allan, Laura L. S. Gabel, Fletcher E. O'Brien, and Jed T. Roberts. (2020). *Analysis of earthquake and tsunami impacts for people and structures inside the tsunami zone for five Oregon coastal communities: Gearhart, Rockaway Beach, Lincoln City, Newport, and Port Orford* (Open-File Report O-20-03). Portland, OR: Oregon Department of Geology and Mineral Industries. <https://www.oregongeology.org/pubs/ofr/p-O-20-03.htm>

- This report is cited as Bauer et al, 2020.

7. DOGAMI O-21-03 Beat the Wave, Gold Beach

This report informed the consideration of earthquake and tsunami hazards for the local mitigation strategies developed or updated for the 2022 Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan Update.

Gabel, Laura L. S., Fletcher E. O'Brien, and Jonathan C. Allan. (2021). *Local tsunami evacuation analysis Gold Beach and unincorporated areas, Curry County, Oregon* [Beat the Wave] (Open-File Report O-21-03). Newport, OR: Oregon Department of Geology and Mineral Industries.
<https://www.oregongeology.org/pubs/ofr/p-O-21-03.htm>

8. DOGAMI O-20-05 Beat the Wave, Port Orford

This report informed the consideration of earthquake and tsunami hazards for the local mitigation strategies developed or updated for the 2022 Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan Update.

Gabel, Laura L. S., Jonathan C. Allan, and Fletcher E. O'Brien. (2020). *Local tsunami evacuation analysis Port Orford, Curry County, Oregon* [Beat the Wave] (Open-File Report O-20-05). Newport, OR: Oregon Department of Geology and Mineral Industries.
<https://www.oregongeology.org/pubs/ofr/p-O-20-05.htm>

9. DOGAMI Hospital Resilience Guidance

Wang, Yumei and K.L. Nourse. (2019.) *Resilience Guidance for Oregon Hospitals* (Open-File Report O-19-02). Portland, OR: Department of Geology and Mineral Industries.
https://www.oregongeology.org/pubs/ofr/O-19-02/O-19-02_report.pdf

The following guidance documents created by the Cascadia Region Earthquake Workgroup (CREW) provide basic information on the importance of preparing hospitals by addressing issues related to building structures and the power and water services required to operate the hospital. They are designed to be easy to understand, promote resilience action planning, and point to detailed reference documents.

- [Preparing Hospitals for Earthquakes: Structural and Nonstructural Issues](https://www.oregongeology.org/pubs/ofr/O-19-02/CREW_Fact_Sheet_9_Hosp_07-23-2018_final.pdf) (CREW Fact Sheet 9, 659 KB PDF) https://www.oregongeology.org/pubs/ofr/O-19-02/CREW_Fact_Sheet_9_Hosp_07-23-2018_final.pdf
- [Emergency Power for Hospitals: Preparing for Cascadia](#) (CREW Fact Sheet 10, 1,033 KB PDF)
- [Emergency Water for Hospitals: Preparing for Cascadia](#) (CREW Fact Sheet 11, 808 KB PDF)
- https://www.oregongeology.org/pubs/ofr/O-19-02/CREW_Fact_Sheet_10_Hosp_power_07-23-2018_final.pdf

10. 2020 Oregon NHMP: Region 1 Risk Assessment

The statewide Oregon Natural Hazard Mitigation Plan (NHMP) was updated in 2020 and includes a risk assessment for the Oregon Coast. This report informed the development of the critical facility inventory, vulnerable areas, and hazard history in the 2022 Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan Update.

State of Oregon. (2020). *Risk Assessment Region 1 – Oregon Coast, Oregon Natural Hazards Mitigation Plan*. Salem, OR: Department of Land Conservation and Development.
https://www.oregon.gov/lcd/NH/Documents/Approved_2020ORNHMP_07_RA1.pdf

For links to the full plan and other sections, see:

<https://www.oregon.gov/lcd/NH/Pages/Mitigation-Planning.aspx#NHMP>

11. Policy Framework for Natural Hazards in Oregon

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.

Statewide Land Use Planning Goals

<https://www.oregon.gov/lcd/OP/Pages/Goals.aspx>

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.

The comprehensive land use planning system in Oregon begins with a set of 19 Statewide Land Use Planning Goals. These goals address the local process of land use planning, direct the state's resource preservation, give guidance for urban development, and offer direction to cities and counties who need to plan for coastal assets. The outcome of the goals is as unique as each city and county of Oregon – each local government develops a comprehensive plan that addresses the resources, constraints and opportunities specific to the place.

The following land use planning goals are particularly relevant in the management of hazards by local communities. The Department of Land Conservation and Development (DLCD) supports communities in their implementation of these goals.

Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces

 [Read full text version of Goal 5](#)

Goal 5 is a broad statewide planning goal that covers more than a dozen resources. The resources range from wildlife habitat, to historic places, and gravel mines. To protect and plan for them, local

governments are asked to create a number of inventories. The inventories in a local plan may address only a portion of the resources included in Goal 5.

Goal 7: Areas Subject to Natural Hazards_  [Read full text version](#) of Goal 7

Goal 7 requires local comprehensive plans to address Oregon's natural hazards. Protecting people and property from natural hazards requires knowledge, planning, coordination, and education. Good planning does not put buildings or people in harm's way. Planning, especially for the location of essential services like schools, hospitals, fire and police stations, is done with sensitivity to the potential impact of nearby hazards.

A local government addresses natural hazards in its comprehensive land use plan. They do this by adopting a natural hazard inventory, overlay zones, hazard code, and supporting plans and policies.

DLCD works with the Oregon Department of Geology and Mineral Industries, the Federal Emergency Management Agency, and others to help communities plan for natural hazards. In most 2-year state legislative cycles, a limited amount of [planning grant money](#) is available through DLCD to help communities address these planning needs.

Goal 16: Estuarine Resources  [Read the full text version](#) of Goal 16

Statewide Planning Goal 16 provides the principal guidance for the planning and management of Oregon's estuaries. The overall objective of Goal 16 is to "to recognize and protect the unique environmental, economic and social values of each estuary and associated wetlands; and to protect, maintain, where appropriate develop, and where appropriate restore the long term environmental, economic and social values, diversity and benefits of Oregon's estuaries". To accomplish this, the goal establishes detailed requirements for the preparation of plans and for the review of individual development projects and calls for coordinated management by local, state and federal agencies that regulate or have an interest in activities in Oregon's estuaries.

Goal 17: Coastal Shorelands  [Read the full text version](#) of Goal 17

Statewide Planning Goal 17 outlines planning and management requirements for the lands bordering estuaries (as well lands bordering the ocean shore and coastal lakes). In general, the requirements of Goal 17 apply in combination with other planning goals to direct the appropriate use of shoreland areas. Provisions in Goal 17 specifically focus on the protection and management of resources unique to shoreland areas; examples of such resources include areas of significant shoreland habitat, lands especially suited for water dependent uses, lands providing public access to coastal waters, and potential restoration or mitigation sites.

The goal focuses on the management of shoreland areas and resources in a manner that is compatible with the characteristics of the adjacent coastal waters. Goal 17 requirements are implemented primarily through local comprehensive plans and zoning.

Water Dependent Shorelands Rule: Goal 17 use requirements direct that shorelands "especially suited for water dependent uses" be protected for such uses, and that local zoning regulations prevent the establishment of uses which would preempt the availability of such lands for water dependent development. In 1999 LCDC adopted an administrative rule to provide additional guidance for

implementing this Goal 17 requirement. Known as the water dependent shorelands rule, OAR 660, Division 37 establishes a methodology for calculating the minimum amount of shorelands to be protected for water dependent and also provides more detailed guidance on the qualifications of shorelands suitable for water dependent uses, as well as suggested land use regulations and standards appropriate for the protection of these shoreland sites.

Goal 18: Beaches and Dunes

 [Read the full text version](#) of Goal 18

Statewide Planning Goal 18 focuses on conserving and protecting Oregon's beach and dune resources, and on recognizing and reducing exposure to hazards in this dynamic, sometime quickly changing environment. Goal 18 is central to the work of coastal communities in addressing the impacts of coastal hazards and climate change in areas along the ocean shore.

Local governments are required to inventory beaches and dunes and describe the stability, movement, groundwater resources, hazards and values of the beach, dune, and interdune areas. Local governments must then apply appropriate beach and dune policies for use in these areas.

Goal 18 includes some requirements are of particular importance:

- Prohibition Areas
- Shoreline Armoring
- Dune Grading
- Ocean Shore Regulation

Goal 19 Ocean Resources

 [Read full text version](#) of Goal 19

Goal 19 deals with matters such as dumping dredge spoils and discharge of waste products into the open sea, and prioritizes the protection of renewable marine resources over the development of non-renewable resources. It outlines state interest in conserving resources within the [Ocean Stewardship Area](#), which includes Oregon's territorial sea out to 3 nautical miles as well as the continental margin seaward to the toe of the continental slope, and adjacent ocean areas.

Regulatory Agencies

Oregon Parks and Recreation Department (OPRD)

The Oregon Parks and Recreation Department (OPRD) is responsible for protecting the scenic, recreational, and natural resource values of the Oregon coast. OPRD accomplishes this through an extensive permitting program for shoreline protection under the authority of The Ocean Shores Statutes (ORS 390.605 - 390.770), also known as the Beach Bill. OPRD is the permitting authority for actions affecting the ocean shorelands up to the statutory vegetation line. The Ocean Shores Statutes require that a permit be obtained from the OPRD for all "beach improvements" seaward of the Statutory Vegetation Line or the actual vegetation line, whichever is farther inland. Permits for shoreline protective structures may be issued only for developments that existed prior to January 1, 1977.

OPRD approval is also required for dune management plans and subsequent dune management, resloping or other alterations of bluff slopes below the vegetation line, alteration of stream channels on the ocean shore, and other ocean shore alterations associated with hazard mitigation.

Oregon Department of Forestry

Oregon Department of Forestry was given legislative authority to develop landslide hazard mapping based on historical data and the new Lidar mapping system. New maps were printed in 2007.

Department of State Lands

The Department of State Lands (DSL) regulates removal and filling of the seabed (seaward of the extreme low tide line) and estuaries, including any dredged materials or seabed materials. DSL manages the state-owned seabed within three nautical miles of the low tide line. In some instances, a permit may also be required from the U.S. Army Corps of Engineers. When a Corps permit is required, the Oregon Department of Environmental Quality may also need to issue a water quality certification and the Department of Land Conservation and Development (DLCD) a coastal zone concurrence before the Corps can issue a final permit. The agency recently integrated Local Wetland Inventories (LWIs) into a statewide dataset available at: <https://www.oregon.gov/dsl/WW/Pages/SWI.aspx>

Oregon Water Resource Department

Oregon Revised Statute (ORS) Chapter 536 identifies authorities available during a drought. To trigger specific actions from the Water Resources Commission and the Governor, a “severe and continuing drought” must exist or be likely to exist. Oregon relies upon two inter-agency groups to evaluate water supply conditions, and to help assess and communicate potential drought-related impacts: Oregon Drought Readiness Council and the Water Supply Availability Committee.

Drought Resources:

Oregon Water Resources Department’s *2017 Integrated Water Resources Strategy*:

https://www.oregon.gov/OWRD/wrdpublications1/2017_IWRS_Final.pdf The *Drought Annex of the State of Oregon Emergency Operations Plan* was updated in January 2016 following the record drought of 2015: <https://www.oregon.gov/owrd/WRDPublications1/2016ORDroughtAnnex.pdf> Monitor the status of drought in Oregon at: <https://www.drought.gov/drought/states/oregon>

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers is responsible for the protection and development of the nation's water resources to ensure that they are used in the public interest (Figure CE-5). Any person, firm, or agency planning work in the waters of the United States must first obtain a permit from the Corps. Permits are required even when land next to or under the water is privately owned. Examples of activities in waters that may require a permit include construction of a pier, placement of intake and outfall pipes, dredging, excavation and depositing of fill. Permits are generally issued only if the activity is found to be in the public interest. DLCD reviews and certifies that Corps permits, and other federal activities are consistent with state and local requirements for protecting coastal resources.

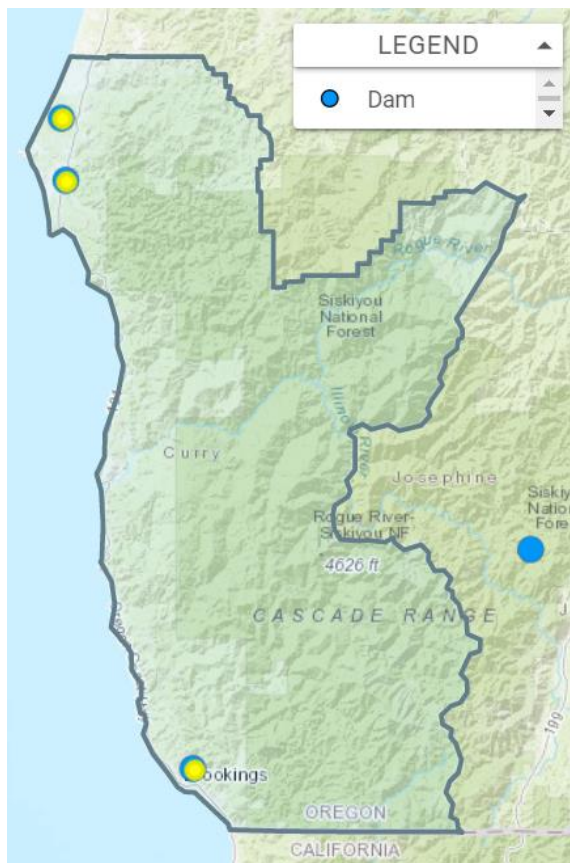
12. High Hazard Potential Dam Annex

Effective April 2023, FEMA has new plan update requirements that include additional considerations for high hazard potential dams (HHPDs). The Oregon Water Resources Department's (OWRD) Dam Safety Program is actively working to ensure that Oregonians do not face "unacceptable" risk from HHPDs, by developing action plans for dams that do not meet sufficient safety standards. Dams that pose a high risk to life safety in the event of a failure event are called high-hazard potential dams (HHPDs). In June 2020, FEMA released new grant program guidance for Rehabilitation of High Hazard Potential Dams¹ and new guidance for inclusion of HHPDs in Local Mitigation Planning Policy² that becomes effective April 19, 2023. The legal definition of high hazard in Oregon is ORS 540.443(5); "High hazard rating" means that the department expects loss of human life to occur if a dam fails.

Curry County Dams

The National Inventory of Dams lists three dams in Curry County (north to south): Shipler Reservoir, Camp Creek #2, and Ferry Creek.³ The county has eight dams in total: Ferry Creek, Big Creek, Shipler Reservoir, Camp Creek #2, and four additional structures on tributaries of Elk River and Floras Lake.

Figure IV-1. Dams in Curry County



¹ FEMA FP 104-008-7. https://www.fema.gov/sites/default/files/2020-08/fema_hhpd_grant-guidance.pdf

² https://www.fema.gov/sites/default/files/documents/fema_local-mitigation-planning-policy-guide_042022.pdf

³ USACE (2022). National Inventory of Dams. <https://nid.usace.army.mil/#/>

Table IV-1. Dams in Curry County (NID)

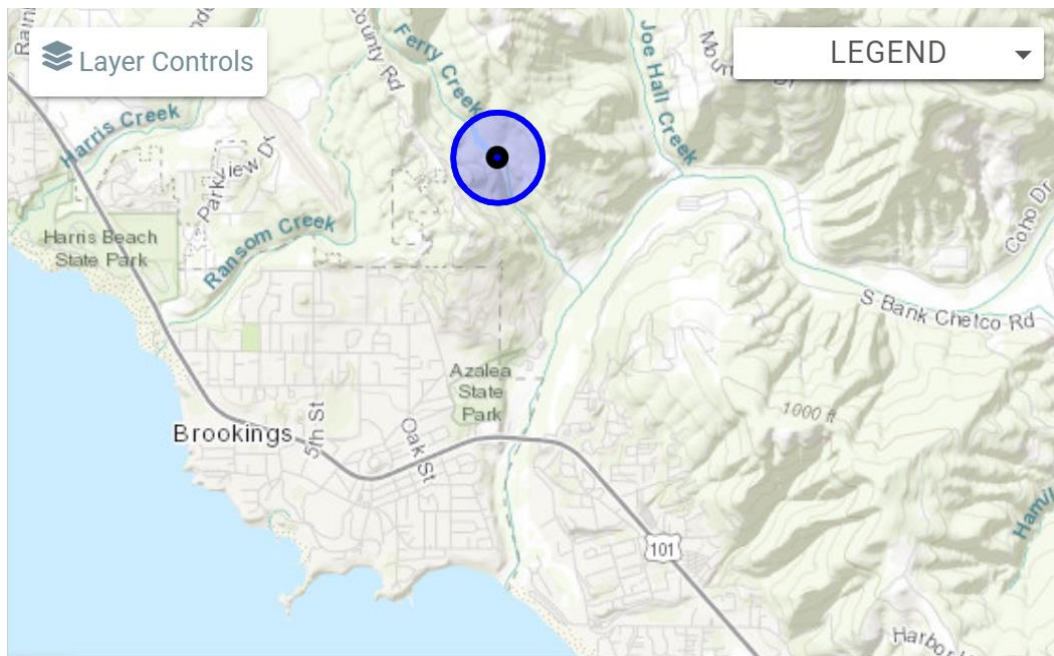
Name	Hazard Classification	Owner	Purpose
Ferry Creek Dam	High	City of Brookings	None
Camp Creek #2 (Curry)	Low	Mary Anne Puhl	Irrigation
Shipler Reservoir	Low	Sea Wind Farms, Inc.	Irrigation

Source: USACE (2022). National Inventory of Dams. <https://nid.usace.army.mil/#/>

As part of the 2022 plan update, the OWRD State Engineer for Water Resources/ Dam Safety Program Manager confirmed that Curry County has just one dam in poor or unsatisfactory condition that falls into the “high-hazard potential” category, the Ferry Creek Dam.

Oregon Water Resources Department regulates dams in Oregon. All of the dams that pose a significant or high hazard potential are regularly inspected. Ferry Creek dam is the only high hazard potential dam in Curry County. OWRD Dam Safety listed Ferry Creek dam as one of the eligible High Hazard Potential Dams eligible for this funding, and it is a program priority for funding. The Ferry Creek Dam owned by the City of Brookings. The following sections address the FEMA review tool requirements for this natural hazard mitigation plan in order for Brookings to receive Federal funds for dam removal or rehabilitation.

There are two other dams of sufficient size for OWRD regulation in the County, these are low hazard dams and pose a low risk to people and property, even if they were to fail catastrophically. OWRD has dam safety records information on a single dam failure in Curry County. That was a log pond at a sawmill, very close to Brookings, and that dam failure caused property damage in the late 1950’s.

Figure IV-2. Ferry Creek Dam Location

Source: National Inventory of Dams, 2022 <https://nid.usace.army.mil/#/dams/system/522730/structure>

Risk Assessment

Dams are assigned a hazard rating based on downstream hazard to people and property, not on the condition of the dam. Ferry Creek Dam is classified as a high hazard dam. Ferry Creek dam was reclassified from low hazard in high hazard less than 10 years ago, as this was the first review of development below the dam since it was first constructed. There are several homes below the dam and next to Ferry Creek and close to the Chetco River.

A recent engineering assessment of the dam was completed by two consulting engineering firms as part of a feasibility study. OWRD is currently doing a more formal assessment of the risk in terms of probable life loss on an annualized basis. Based on this initial review there is a reasonable possibility the dam could fail in a Cascadia Earthquake or a major flood (500-year recurrence or larger), with some but limited potential for failure in other high-water events. The City has been formally notified of the potential unsafe condition as per ORS 540.458. The dam has not been used for drinking water for several decades. The City would like to see it made safe, and removal appears to be the most economical solution. The dam is currently under OWRD dam safety funded engineering analysis and removal plan development. A new water tank in or above the City may be essential to improve resilience of emergency City Water supply, but OWRD would defer to City of Brookings Public Works on this issue. Such a tank, perhaps with an inter-tie to Harbor, would improve resiliency.

Inundation & HCOM Models

In 2015, OWRD developed a HEC-RAS inundation model using as-built plans, 500-year flood discharge estimates, and LiDAR data. This allowed the development of scenarios of risk and calculation of impacts to the downstream buildings, infrastructure, and populations downstream of the structure. HEC-RAS modeling allows for engineers to understand where the volume of water could be discharged in the event of a dam breach. By determining the area at risk from the destruction of Ferry Creek Dam using HEC-RAS, OWRD was able to model the homes and populations at risk of impact from a dam breach such as may result from a Cascadia Subduction Zone event. See the inundation map below.

On June 10, 2019, the National Center for Computational Hydroscience and Engineering (NCCHE), at the University of Mississippi, on behalf of FEMA, produced four runs of a model of the downstream impacts of a failure of Ferry Creek dam on downstream populations under various scenarios. The Executive Summary below outlines that the risk to human life will likely be a targeted area and population, but there is variability of risk, particularly due to the variation in human activities, such as summer recreation on the Chetco River. The total inundation area after 48 hours will be 857.65 acres containing 731 houses, and a population of 1,118.

Figure IV-3. Inundation Map, 2015

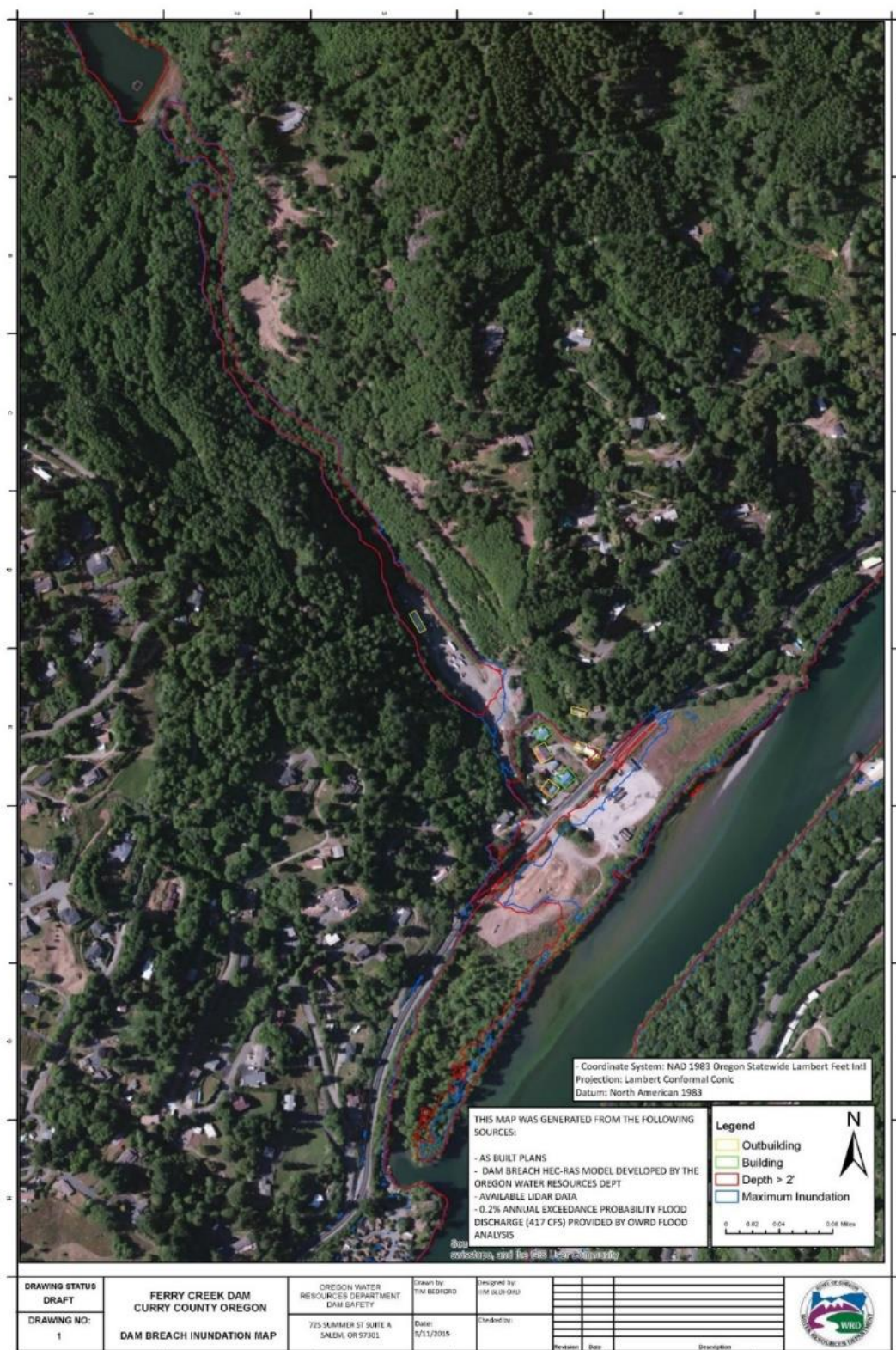


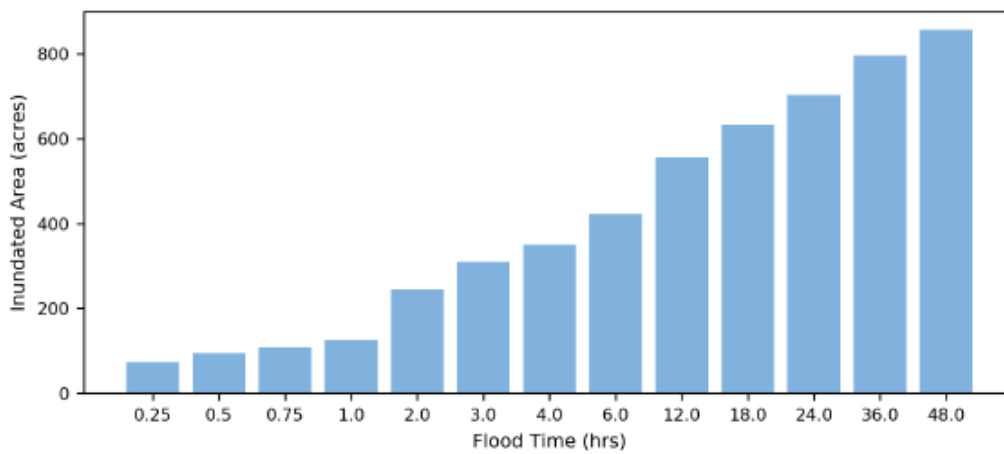
Figure IV-4. Executive Summary DSS-WISE HCOM ReportDSS-WISE HCOM Report**EXECUTIVE SUMMARY**

This document reports the human consequences assessment for the DSS-WISE Lite simulation ID: **18642**

INUNDATION EXTENT

Total inundated area (acres)(see [figure 1](#)):

857.65

**Figure 1. Evolution of total inundated area as a function of time.****ANALYSIS BASED ON CENSUS BLOCK DATA**

Population in completely or partially inundated census blocks:	1118
Housings in completely or partially inundated census blocks:	731
Number of states in inundated area:	1
Number of counties in inundated area:	1
Number of census blocks in inundated area:	66

ANALYSIS BASED ON GRIDDED LANDSCAN USA DATA

Total Nighttime PAR in inundated area (see figure 2):	25
Total Daytime PAR in inundated area (see figure 3):	84

Hazard Rating

High hazard dams are typically inspected every year. On March 3, 2022, the Water Resources Department conducted a routine inspection of the Ferry Creek dam's exterior surfaces to identify conditions that might affect the safety of the dam. The dam's condition was determined to be UNSATISFACTORY based on the findings below, supported by the photos and descriptions on the following pages of the condition of the reservoir, spillway, and conduit.

Table IV-2. OWRD Ferry Creek Dam Inspection March 3, 2022

Category	Inspected	Result
Access	☐	Adequate
Reservoir	☒	Adequate
Spillway	☒	Deficient
Seepage/Leakage	☒	None
Conduit	☒	Deficient
Embankment	☒	Deficient
Instrumentation/Monitoring	☒	None
Emergency Action Plan	☒	Adequate

Reservoir

In 2022, erosion gully formation was observed on the downstream side of the embankment, which appears to be the result of an overtopping event. Insufficient freeboard increases the chances of a dam overtopping which may result in damage to, or catastrophic failure of, the dam. Graded material can be added to the top of the dam to increase the available freeboard. The erosion was likely caused by dam overtopping in the past.

Figure IV-5. Erosion likely caused by dam overtopping in the past



Spillway

The concrete-lined spillway is deteriorating due to uphill slope movement, which may result in the blocking the spillway with debris during a slope failure. Also, the spillway approach channel is overgrown with Cattails which creates a barrier to outflow. Debris or vegetation in the spillway has the potential to obstruct the spillway and reduce its ability to handle flood flows.

Figure IV-6. Spillway approach channel overgrown with Cattails



Figure IV-7. Concrete-lined spillway deteriorating from uphill slope movement



Source: OWRD

Conduit

There are multiple conduits on the dam. There has been no operation of these conduits for many years. They may still function for drainage of the reservoir and would need to be operational for rehabilitation or removal of the dam.

Figure IV-8. Multiple conduits



Mitigation Strategy

Dam Failure Mitigation Action:

Remove or rehabilitate Ferry Creek Dam pending feasibility study review.

Table IV-3. Mitigation Action Description

Mitigation Action #	Brookings 22-DF-01
Hazard	Dam Failure
Estimated Cost	\$70,000
Timeline	2-5 years
Responsible Agencies	City of Brookings Public Works & Development Services; Oregon Water Resources Department, Dam Safety Program
Priority	High

Description

Ferry Creek Dam is a high hazard embankment dam in unsatisfactory condition. Reducing Unacceptable Risk: This dam meets the criteria of unacceptable risk to the public. This planning work will provide information for future removal work. As a result, the planning completed under this project will reduce the risk that these dams pose to public safety.

- HHPD Priorities: design and construction of dam removal or rehabilitation.
- HHPD Performance Goals: reduced consequences of dam failure on life safety; consistent with Goal 1 of the 2022 Curry County MJ-NHMP.

The dam is owned by the City of Brookings on the south coast. Based on geotechnical investigation, conducted as part of a feasibility study, the dam will experience severe deformation in a Cascadia subduction earthquake. The dam is rated high hazard, so loss of life is expected from dam failure during this earthquake event. Ferry Creek dam is no longer connected to the City's water supply system, and the City is considering removal as one of the options for this dam. This project will develop a plan for dam removal or rehabilitation for the City of Brookings consideration. Specifically, the plan will include the engineering analysis needed to remove the dam as defined in Oregon administrative rules.

Oregon Water Resources Department (OWRD) has advised the City of Brookings of the corrective actions to keep the dam in safe condition while actions are initiated to evaluate options, including dam removal. OWRD shared Oregon Revised Statute 540.467, which gives the City the opportunity to meet with OWRD to discuss the results of the 2021 inspection and the maintenance actions described. In

addition, OWRD will continue to work with the City and the engineers conducting the engineering analysis of options including removal.

Scope of Work

As of August 2022, OWRD was still negotiating the scope of work with the contractor for the following:

- Dam removal plan
- Drawings and specifications
- Draft permits
- Cost estimate to complete the removal
- Project Management and meetings

Deliverables

1. A plan to address the removal. The plan will be provided in report form and will include but may not be limited to:
 - Design of the breach to permanently empty the reservoir
 - Dimensions of the breach. The breach must be sufficiently large so that the 1 percent AEP is not restricted by any remaining embankment material
 - Determination of the embankment volume to be removed how the removal will occur
 - Identification of a suitable location for removed embankment materials. Information regarding how the materials will be stabilized must also be included. Stabilization must ensure the materials do not enter waters of the state or create loading that could destabilize hillslopes below the material. Embankment material will not be placed on actively moving landslides
 - Determination of the restored channel gradient through the removal location. The gradient must be no steeper than the channel gradients below the dam
 - A description of any permits required to complete the removal. Draft permit application must be included as attachments at the end of the report.
 - Safety aspects related to the removal including a description of how the reservoir will be safely emptied
 - All drawings and specification needed to complete the removal
 - Cost estimate to complete the removal based on the final design. The cost estimate should be itemized as follows:
 - Construction activity
 - Project management
 - Permits
2. Project Management and meetings

Project Budget

Estimated Total Cost: \$70,000

Federal Cost: \$45,500

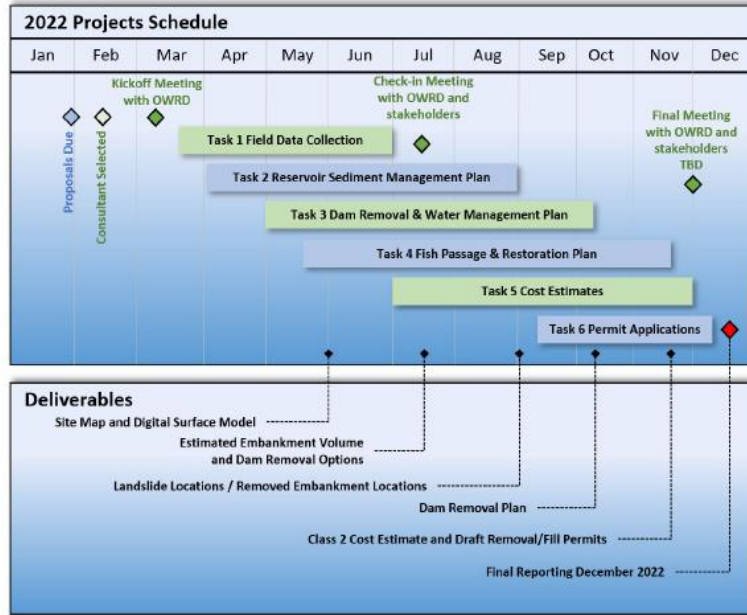
Non-Federal Cost: \$24,500

Proposed Project Schedule

Oregon Water Resources Department will coordinate with the contractor's project manager to monitor progress. The anticipated completion date for this project is February 2023. For more detail on timelines

see the proposed schedule below. OWRD has added 2 months to the contractor's proposed schedule to finalize the project. This is an estimated schedule. OWRD is still negotiating with the contractor as of August 2022.

Figure IV-9. Timeline



Planning Process

The City of Brookings (dam owner) staff and OWRD engineers have been working together over the past two years to address the vulnerabilities associated with the Ferry Creek Dam. Specific dates below highlight the coordination between the local dam owner and the state dam safety agency.

April 12th, 2021: Sent the dam owner formal notification that the dam is in unsatisfactory condition and Potentially Unsafe. The notification indicated that corrective actions were needed and provided options of rehabilitation or removal.

March 3rd, 2022: Met with dam owner onsite. We discussed the options to rehabilitate or remove the dam. The owner chose to pursue removal. Also discussed HHPD grant and the work that would be completed.

May 5th, 2022: Virtual meeting to coordinate with dam owner and engineering consultant developing the dam removal plan.

June 17, 2022: OWRD sent a letter to the City of Brookings outlining the March 3rd, 2022 findings.

September 1, 2022: Curry County Multi-Jurisdictional Natural Hazard Steering Committee met to review and approve this HHPD annex.

September 2022: Meeting with City of Brookings City Council to discuss removal plan. OWRD Dam Safety and the engineering consultant will be presenting the plan to the city council.

V. APPENDIX B: PLAN APPROVAL



FEMA

December 21, 2022

The Honorable John Herzog
Chair, Curry County Board of Commissioners
94235 Moore Street, Suite 122
Gold Beach, Oregon 97444

Dear Mr. John Herzog:

On November 9, 2022, the United States Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Curry County Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's Hazard Mitigation Assistance grants projects through November 8, 2027, through your state:

Curry County	City of Port Orford	Port of Port Orford	Port of Gold Beach
City of Brookings	City of Gold Beach		

The updated list of approved jurisdictions includes the City of Brookings and the City of Gold Beach that recently adopted the Curry County Hazard Mitigation Plan. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Joseph Murray, Planner with Oregon Department of Emergency Management, at 503-378-3929, who coordinates and administers these efforts for local entities.

Sincerely,

**KRISTEN C
MEYERS**

Kristen Meyers, Director
Mitigation Division

Digitally signed by KRISTEN C
MEYERS
Date: 2022.12.21 13:59:51 -08'00'

Enclosures

cc: Anna Feigum, Oregon Department of Emergency Management

**IN THE BOARD OF COUNTY COMMISSIONERS
IN AND FOR THE COUNTY OF CURRY, OREGON**

**In the Matter of a Resolution adopting)
the 2022 Curry County Multi-)
Jurisdictional Natural Hazards)
Mitigation Plan)**

RESOLUTION NO. 2022-21

WHEREAS, natural hazards threaten life, businesses, property, and environmental systems in and throughout Curry County;

WHEREAS, an understanding of the nature, extent, and potential impacts of natural hazards is the foundation for developing strategies to reduce or eliminate those impacts;

WHEREAS, natural hazards mitigation planning is the process through which such understanding and strategies are developed and a process for implementation is established in and throughout Curry County;

WHEREAS, it is in the interest of Curry County and the cities and special districts located therein to undertake natural hazards mitigation planning and implementation together as coordinated planning strengthens communities and better serves all;

WHEREAS, Curry County and the Cities of Brookings, Gold Beach, and Port Orford previously prepared, implemented, and updated multi-jurisdictional natural hazards mitigation plans in accordance with the Disaster Mitigation Act of 2000. These plans were each approved by the Federal Emergency Management Agency (FEMA) for a period of five years;

WHEREAS, the Port of Gold Beach and the Port of Port Orford, each participated updating the 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan in accordance with the Disaster Mitigation Act of 2000, thereby developing their first natural hazards mitigation plans;

WHEREAS, the 2016 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan is the most recent and expired on March 16, 2021;

WHEREAS, having a natural hazards mitigation plan developed in accordance with the Disaster Mitigation Act of 2000 and approved by FEMA is a prerequisite for local government eligibility for certain federal pre- and post-disaster mitigation funds;

WHEREAS, adoption of the updated 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan is required for FEMA approval of the 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan and restored eligibility for certain federal pre- and post-disaster mitigation funds; and

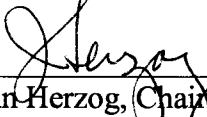
WHEREAS, adoption of the updated 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan demonstrates Curry County's commitment to reducing or eliminating the potential impacts of natural hazards and to achieving the Plan's goals.

NOW, THEREFORE, BE IT RESOLVED:

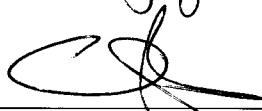
1. The Curry County Board of Commissioners hereby adopts the recitals above in support of this resolution.
2. The Curry County Board of Commissioners hereby adopts the Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan.

DATED this 5th day of October, 2022.

**CURRY COUNTY
BOARD OF COMMISSIONERS**

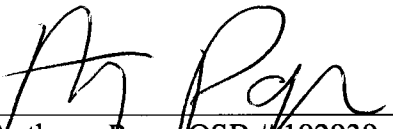


John Herzog, Chair

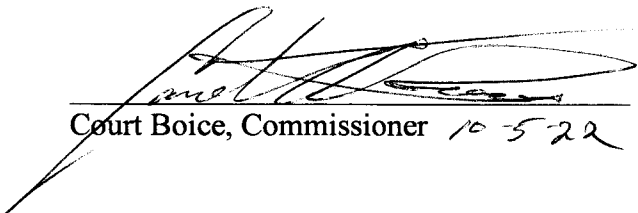


Christopher S Paasch, Vice Chair

Reviewed as to Form:



Anthony Pope, OSB # 192939
County Legal Counsel



Court Boice, Commissioner 10-5-22

**CITY OF BROOKINGS
STATE OF OREGON**

RESOLUTION 12-R-1235

A RESOLUTION OF THE CITY OF BROOKINGS ADOPTING THE 2022 CURRY COUNTY MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN

WHEREAS, natural hazards threaten life, businesses, property, and environmental systems in the City of Brookings and throughout Curry County;

WHEREAS, an understanding of the nature, extent, and potential impacts of natural hazards is the foundation for developing strategies to reduce or eliminate those impacts;

WHEREAS, natural hazards mitigation planning is the process through which such understanding and strategies are developed and a process for implementation is established in the City of Brookings and throughout Curry County;

WHEREAS, it is in the interest of Curry County and the cities and special districts located therein to undertake natural hazards mitigation planning and implementation together as coordinated planning strengthens communities and better serves all;

WHEREAS, Curry County and the Cities of Brookings, Gold Beach, and Port Orford previously prepared, implemented, and updated multi-jurisdictional natural hazards mitigation plans in accordance with the Disaster Mitigation Act of 2000. These plans were each approved by the Federal Emergency Management Agency (FEMA) for a period of five years;

WHEREAS, the Port of Gold Beach and the Port of Port Orford, each participated updating the 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan in accordance with the Disaster Mitigation Act of 2000, thereby developing their first natural hazards mitigation plans;

WHEREAS,, the 2016 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan is the most recent and expired on March 16, 2021;

WHEREAS, having a natural hazards mitigation plan developed in accordance with the Disaster Mitigation Act of 2000 and approved by FEMA is a prerequisite for local government eligibility for certain federal pre- and post-disaster mitigation funds;

WHEREAS, adoption of the updated 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan is required for FEMA approval of the 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan and restored eligibility for certain federal pre- and post-disaster mitigation funds;

WHEREAS, adoption of the updated 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan demonstrates the City of Brookings' commitment to reducing or

eliminating the potential impacts of natural hazards and to achieving the Plan's goals;

NOW THEREFORE BE IT RESOLVED, by the City Council of the City of Brookings, Curry County, Oregon, that

SECTION 1. The City of Brookings City Council hereby adopts the recitals above in support of this resolution.

SECTION 2. The City of Brookings City Council hereby adopts the Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan.

Passed by the City Council 12-12-2022, 2022; effective 12-12-2022.

Ron Hedenskog
Mayor Ron Hedenskog

Attest: Christy Wurster
City Recorder Pro Tem Christy Wurster

RESOLUTION R2223-04

A RESOLUTION ADOPTING THE GOLD BEACH PORTION OF THE 2022 CURRY COUNTY MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN

WHEREAS, natural hazards threaten life, businesses, property, and environmental systems in the City of Gold Beach and throughout Curry County.

WHEREAS, an understanding of the nature, extent, and potential impacts of natural hazards is the foundation for developing strategies to reduce or eliminate those impacts.

WHEREAS, natural hazards mitigation planning is the process through which such understanding and strategies are developed and a process for implementation is established in the City of Gold Beach and throughout Curry County.

WHEREAS, it is in the interest of Curry County and the cities and special districts located therein to undertake natural hazards mitigation planning and implementation together as coordinated planning strengthens communities and better serves all.

WHEREAS, Curry County and the Cities of Brookings, Gold Beach, and Port Orford previously prepared, implemented, and updated multi-jurisdictional natural hazards mitigation plans in accordance with the Disaster Mitigation Act of 2000. These plans were each approved by the Federal Emergency Management Agency (FEMA) for a period of five years.

WHEREAS, the City of Gold Beach participated in updating the 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan in accordance with the Disaster Mitigation Act of 2000, thereby developing their first natural hazards mitigation plans.

WHEREAS, the 2016 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan is the most recent and expired on March 16, 2021.

WHEREAS, having a natural hazards mitigation plan developed in accordance with the Disaster Mitigation Act of 2000 and approved by FEMA is a prerequisite for local government eligibility for certain federal pre and post-disaster mitigation funds.

WHEREAS, adoption of the updated 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan is required for FEMA approval of the 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan and restored eligibility for certain federal pre and post-disaster mitigation funds.

WHEREAS, adoption of the updated 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan demonstrates the City of Gold Beach's commitment to reducing or eliminating the potential impacts of natural hazards and to achieving the Plan's goals.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Gold Beach, Oregon, hereby adopts the City of Gold Beach portion of the Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan attached to this resolution as Exhibit A and hereby incorporated by reference.

Passed by the City Council of the City of Gold Beach, County of Curry, State of Oregon, this 5th day of December 2022



Tamie Kaufman, Mayor

ATTEST:



Anthony Pagano, Deputy City Administrator

RESOLUTION NO. 2023-01**A RESOLUTION ADOPTING THE 2022 CURRY COUNTY
MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN**

WHEREAS, natural hazards threaten life, businesses, property, and environmental systems in the City of Port Orford and throughout Curry County;

WHEREAS, an understanding of the nature, extent, and potential impacts of natural hazards is the foundation for developing strategies to reduce or eliminate those impacts;

WHEREAS, natural hazards mitigation planning is the process through which such understanding and strategies are developed and a process for implementation is established in the City of Port Orford and throughout Curry County;

WHEREAS, it is in the interest of Curry County and the cities and special districts located therein to undertake natural hazards mitigation planning and implementation together as coordinated planning strengthens communities and better serves all;

WHEREAS, Curry County and the Cities of Brookings, Gold Beach, and Port Orford previously prepared, implemented, and updated multi-jurisdictional natural hazards mitigation plans in accordance with the Disaster Mitigation Act of 2000. These plans were each approved by the Federal Emergency Management Agency (FEMA) for a period of five years;

WHEREAS, the Port of Gold Beach and the Port of Port Orford, each participated updating the 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan in accordance with the Disaster Mitigation Act of 2000, thereby developing their first natural hazards mitigation plans;

WHEREAS, the 2016 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan is the most recent and expired on March 16, 2021;

WHEREAS, having a natural hazards mitigation plan developed in accordance with the Disaster Mitigation Act of 2000 and approved by FEMA is a prerequisite for local government eligibility for certain federal pre- and post-disaster mitigation funds;

WHEREAS, adoption of the updated 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan is required for FEMA approval of the 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan and restored eligibility for certain federal pre- and post-disaster mitigation funds;

WHEREAS, adoption of the updated 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan demonstrates the City of Port Orford's commitment to reducing or eliminating the potential impacts of natural hazards and to achieving the Plan's goals;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY OF PORT ORFORD:

Section 1. The City of Port Orford City Council hereby adopts the recitals above in support of this resolution.

Section 2. The City of Port Orford City Council hereby adopts the Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan.

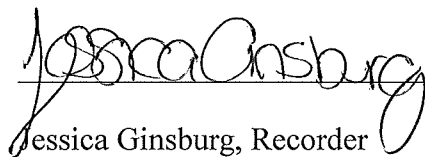
DATED this 20th day of October, 2022.

BY:

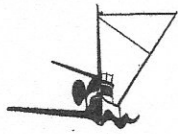
ATTEST:

A handwritten signature in dark ink, appearing to be 'Pat Cox', written over a horizontal line.

Pat Cox, Mayor

A handwritten signature in dark ink, appearing to be 'Jessica Ginsburg', written over a horizontal line.

Jessica Ginsburg, Recorder



PORT OF GOLD BEACH

P.O. Box 1126
29891 Harbor Way
Gold Beach OR 97444

PHONE:(541)247-6269
FAX:(541)247-6268
EMAIL: portoffice@portofgoldbeach.com

RESOLUTION NO. 2022-10-2

RESOLUTION OF THE BOARD OF COMMISSIONERS OF THE OREGON PORT OF GOLD BEACH ADOPTING THE 2022 CURRY COUNTY MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN

WHEREAS, natural hazards threaten life, businesses, property, and environmental systems in the Port of Gold Beach and throughout Curry County.

WHEREAS, an understanding of the nature, extent, and potential impacts of natural hazards is the foundation for developing strategies to reduce or eliminate those impacts.

WHEREAS, natural hazards mitigation planning is the process through which such understanding and strategies are developed and a process for implementation is established in the Port of Gold Beach and throughout Curry County.

WHEREAS, it is in the interest of Curry County and the cities and special districts located therein to undertake natural hazards mitigation planning and implementation together as coordinated planning strengthens communities and better serves all.

WHEREAS, Curry County and the Cities of Brookings, Gold Beach, and Port Orford previously prepared, implemented, and updated multi-jurisdictional natural hazards mitigation plans in accordance with the Disaster Mitigation Act of 2000. These plans were each approved by the Federal Emergency Management Agency (FEMA) for a period of five years.

WHEREAS, the Port of Gold Beach and the Port of Port Orford, each participated updating the 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan in accordance with the Disaster Mitigation Act of 2000, thereby developing their first natural hazards mitigation plans.

WHEREAS, the 2016 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan is the most recent and expired on March 16, 2021.

WHEREAS, having a natural hazards mitigation plan developed in accordance with the Disaster Mitigation Act of 2000 and approved by FEMA is a prerequisite for local government eligibility for certain federal pre- and post-disaster mitigation funds.

WHEREAS, adoption of the updated 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan is required for FEMA approval of the 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan and restored eligibility for certain federal pre- and post-disaster mitigation funds.

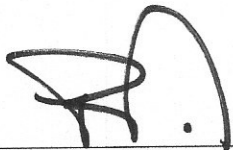
WHEREAS, adoption of the updated 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan demonstrates the Port of Gold Beach's commitment to reducing or eliminating the potential impacts of natural hazards and to achieving the Plan's goals.

NOW, THEREFORE, BE IT RESOLVED BY THE PORT OF GOLD BEACH:

Section 1. The Port of Gold Beach Board of Commissioners hereby adopts the recitals above in support of this resolution.

Section 2. The Port of Gold Beach Board of Commissioners hereby adopts the Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan.

DATED this 20th day of October 2022.

A handwritten signature in black ink, appearing to be 'Bill McNair', is written over a horizontal line.

Bill McNair, President – Port of Gold Beach

RESOLUTION NO. 2022-05

A RESOLUTION ADOPTING THE 2022 CURRY COUNTY MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN

WHEREAS, natural hazards threaten life, businesses, property, and environmental systems in the Port of Port Orford and throughout Curry County.

WHEREAS, an understanding of the nature, extent, and potential impacts of natural hazards is the foundation for developing strategies to reduce or eliminate those impacts.

WHEREAS, natural hazards mitigation planning is the process through which such understanding and strategies are developed and a process for implementation is established in the Port of Port Orford and throughout Curry County.

WHEREAS, it is in the interest of Curry County and the cities and special districts located therein to undertake natural hazards mitigation planning and implementation together as coordinated planning strengthens communities and better serves all.

WHEREAS, Curry County and the Cities of Brookings, Gold Beach, and Port Orford previously prepared, implemented, and updated multi-jurisdictional natural hazards mitigation plans in accordance with the Disaster Mitigation Act of 2000. These plans were each approved by the Federal Emergency Management Agency (FEMA) for a period of five years.

WHEREAS, the Port of Port Orford, participated in updating the 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan in accordance with the Disaster Mitigation Act of 2000, thereby developing its first natural hazards mitigation plans.

WHEREAS, the 2016 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan is the most recent and expired on March 16, 2021.

WHEREAS, having a natural hazards mitigation plan developed in accordance with the Disaster Mitigation Act of 2000 and approved by FEMA is a prerequisite for local government eligibility for certain federal pre- and post-disaster mitigation funds.

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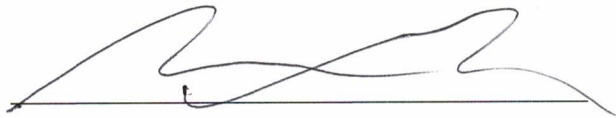
WHEREAS, adoption of the updated 2022 Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan demonstrates the Port of Port Orford's commitment to reducing or eliminating the potential impacts of natural hazards and to achieving the Plan's goals.

NOW, THEREFORE, BE IT RESOLVED BY THE PORT OF PORT ORFORD:

Section 1. The Port of Port Orford Board of Commissioners hereby adopts the recitals above in support of this resolution.

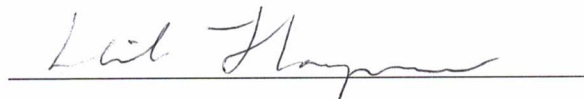
Section 2. The Port of Port Orford Board of Commissioners hereby adopts the Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan.

DATED 18th day of October, 2022.

A handwritten signature in black ink, appearing to read 'Aaron Ashdown', written over a horizontal line.

Aaron Ashdown, President, Port of Port Orford District Board of Commissioners

ATTEST:

A handwritten signature in black ink, appearing to read 'Leila Thompson', written over a horizontal line.

Leila Thompson, Secretary,
Port of Port Orford District
Board of Commissioners



FEMA

September 23, 2022

Ms. Anna Feigum
State Hazard Mitigation Officer
Oregon Military Department
Office of Emergency Management
P.O. Box 14370
Salem, Oregon 97309

Dear Ms. Feigum:

The Federal Emergency Management Agency (FEMA) Region 10 completed a pre-adoption review of the draft Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan. The attached Mitigation Plan Review Tool documents the Region's review and compliance with all required elements of 44 CFR Part 201.6, as well as identifies the jurisdictions participating in the planning process. This letter serves as Region 10's commitment to approve the plan upon receiving documentation of its adoption by participating jurisdictions.

Formal adoption documentation must be submitted to FEMA Region 10 by at least one jurisdiction within one calendar year of the date of this letter, or the entire plan must be updated and resubmitted for review. Once FEMA approves the plan, the jurisdictions are eligible to apply for FEMA Hazard Mitigation Assistance grants.

Please contact Erin Cooper, Regional Mitigation Planning Program Manager, at erin.cooper@fema.dhs.gov with any questions.

Sincerely,

WENDY L SHAW Digitally signed by WENDY L SHAW
Date: 2022.09.23 07:04:55 -07'00'

Wendy Shaw, P.E.
Risk Analysis Branch Chief
Mitigation Division

Enclosures

EG:v1

1. FEMA Review Tool

LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: Curry County, Oregon	Title of Plan: Curry County Multi-Jurisdictional Natural Hazards Mitigation Plan	Date of Plan: June 13, 2022
Local Point of Contact: Monica Ward	Address: Mailing: 94235 Moore Street, Suite 311 Gold Beach, OR 97444	Physical: 29808 Colvin Street Gold Beach, OR 97444
Title: Emergency Management Coordinator	Agency: Curry County Emergency Management	
Phone Number: (541) 247-3208	E-Mail: wardm@co.curry.or.us	

State Reviewer: Jason Gately	Title: Mitigation Planner & Program Rep.	Date: 7/20/2022
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FEMA Reviewer: Edgar Gomez	Title: Community Planner	Date: Date: 7/20/2022
Date Received in FEMA Region 10	7/20/2022	
Sent back for Revisions	8/22/2022	
Plan Not Approved		
Plan Approvable Pending Adoption	9/23/2022	
Plan Approved	11/9/2022	

SECTION 1: REGULATION CHECKLIST

INSTRUCTIONS: The second column of the Regulation Checklist is typically pre-completed by the local jurisdiction seeking FEMA approval; the third and fourth columns must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))		Acknowledgements p.3 Mitigation Strategy: pp. 2, 3, 32, Planning Process, Section III.B. 2022 Plan Update pp.270-272	X	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))		Acknowledgements p.3 Section 1.B. Com Profile Built Env pp 45-57; Section 1.B.Com.Orgs pp. 58-63 Planning Process, Section III.C-F: pp.270 - 321	X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))		Planning Process (Survey, meetings, web postings) Section III.C-F: pp.277 -321	X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))		Section I.A. Intro Describes data sources and use pp.15-21 Section I.B. Com Profile Table I 14. p. 45 Existing Plans, Codes and Ordinances Section I. B-D Com Profile, Hazard Chapters, References Data and sources listed pp. 23-130 Existing Plans and Policies Section IV, Resources: pp.388-345	X	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))		Section III.A. Plan Maint pp. 264-267	X	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)? (Requirement §201.6(c)(4)(i))		Section III.A. Plan Maint pp. 264-267	X	
ELEMENT A: REQUIRED REVISIONS				

ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 1.C. Natural Hazards pp.64-123 Community Profile vulnerabilities pp. 30, 33,44-57; Section IV. pp.330-340 Section III.F. pp. 308-321	X	
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section 1.C. Natural Hazards pp.64-123	X	
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Section 1.C. Natural Hazards pp. 64-123 Section 1.B. Com Profile Built Env. Pp. 45-57	X	
B4. Does the Plan address National Flood Insurance Program (NFIP) insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Section 1.C. Flood Hazard pp. 81-87 Section 1.B. Com Profile Geog. Pp. 29-30, Built Env pp 45-57; Table I-21, I-22, I-23	X	
<u>ELEMENT B: REQUIRED REVISIONS</u>			
ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Section I.A. Intro Describes data sources and use pp. 15-21 Section I.B. Com Profile Table I-14. p. 45 Existing Plans, Codes and Ordinances Section I. B-D Com Profile, Hazard Chapters, References and sources listed pp. 23-130 Existing Plans and Policies Section IV, Resources: pp.338-345 Section II.A-G Mitigation Strategy pp. 132-232	X	
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section 1.C. Flood Hazard pp. 81-87 Com Profile Built Env. pp. 51-53	X	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section II.A-G Mitigation Strategy pp. 133	X	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Section II.A-G Mitigation Strategy pp. 132-232 Section II.E. Econ Analysis of NHM Projects pp.154-161	X	
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Section II.A-G Mitigation Strategy pp. 132-262 Section II.E. Econ Analysis of NHM Projects pp.154-161	X	
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as	Section I.B. Com Profile Table I 14. p. 45 Existing Plans, Codes and Ordinances	X	

comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section IV.A.11. Policy Framework for NH, pp. 341-345		
ELEMENT C: REQUIRED REVISIONS			
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Section I.B. Com Profile Table I-14. p. 45 Existing Plans, Codes and Ordinances Section 1.B. Com Profile Built Env & Economy pp 45-57	X	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section II.B. 2016 Mitigation Action Status Tables pp. 133 -145 Section II. C. Mitigation Success pp.146	X	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section I.B. Com Profile Table I 14. p. 45 Existing Plans, Codes and Ordinances Mitigation Strategy Planning Process	X	
ELEMENT D: REQUIRED REVISIONS			
ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))		X	
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))			
ELEMENT E: REQUIRED REVISIONS			
OPTIONAL: HIGH HAZARD POTENTIAL DAM (HHPD) RISKS			
HHPD1. Did Element A4 (planning process) describe the incorporation of existing plans, studies, reports, and technical information for high hazard potential dams?			
HHPD1-a. Does the plan describe how the local government worked with local dam owners and/or the state dam safety agency?	Appendix A.12 p.358	X	
HHPD1-b. Does the plan incorporate information shared by the state and/or local dam owners?	Vulnerabilities, p. 44 Sec. D, p. 129 & p.148 Appendix A.12 pp. 347-358	X	
HHPD2. Did the plan address HHPDs in the risk assessment?			
HHPD2-a. Does the plan describe the risks and vulnerabilities to and from HHPDs?	Appendix A.12 pp. 349-355 Vulnerabilities, p. 44 Hazard Analysis, p. 336	X	
HHPD2-b. Does the plan document the limitations and describe how to address deficiencies?	Appendix A.12 pp. 349-355	X	
HHPD3. Did the plan include mitigation goals to reduce long-term vulnerabilities from HHPDs?			

HHPD3-a. Does the plan address how to reduce vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies?	Appendix A.12 pp. 349-355	X	
HHPD3-b. Does the plan link proposed actions to reducing long-term vulnerabilities that are consistent with its goals?	Appendix A.12 pp. 356-358	X	
HHPD4. Did the plan include actions that address HHPDs and prioritize mitigation actions to reduce vulnerabilities from HHPDs?			
HHPD4-a. Does the plan describe specific actions to address HHPDs?	Appendix A.12 pp. 356-358	X	
HHPD4-b. Does the plan describe the criteria used to prioritize actions related to HHPDs?	Appendix A.12 pp. 356-358	X	
HHPD4-c. Does the plan identify the position, office, department or agency responsible for implementing and administering the action to mitigate hazards to or from HHPDs?	Appendix A.12 pp. 347	X	
<u>REQUIRED REVISIONS</u>			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
The state of Oregon imposes no additional requirements upon local mitigation plans.			

SECTION 2: PLAN ASSESSMENT

INSTRUCTIONS: The purpose of the Plan Assessment is to offer the local community more comprehensive feedback on the quality and utility of the plan in a narrative format. The audience for the Plan Assessment is not only the plan developer/local community planner, but also elected officials, local departments and agencies, and others involved in implementing the Local Mitigation Plan. *The Plan Assessment must be completed by FEMA.* The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the Plan; 2) specific sections in the Plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically Risk MAP and Hazard Mitigation Assistance programs. The Plan Assessment is divided into two sections:

1. Plan Strengths and Opportunities for Improvement
2. Resources for Implementing Your Approved Plan

Plan Strengths and Opportunities for Improvement is organized according to the plan Elements listed in the Regulation Checklist. Each Element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each Element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the Plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

Resources for Implementing Your Approved Plan provides a place for FEMA to offer information, data sources and general suggestions on the plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

Strengths

- Several tribes were invited to the planning process. This shows a commitment to bringing in all communities.
- A community survey was used to gain public feedback. Over 150 answers were received.
- Websites were used as part of the public engagement. This makes it easy for people with computers to access.
- The table on page 277 clearly shows which communities were involved in the planning process and when.

Opportunities for Improvement

- Be explicit about who represented each community in each planning meeting. This can help further document the planning process.
- Consider including meeting minutes, sign-in sheets, or other documentation. While these are not required, they can help show what happened during the process.
- Expand the planning process by engaging with stakeholders who can discuss the plan with underserved communities. These groups are often the first to be affected by hazard events. They may also not have access to computers, which were used heavily in the outreach process. Reaching out to communities that have limited internet access can help expand public access to the plan.

Element B: Hazard Identification and Risk Assessment

Strengths

- The list of critical facilities provides a good look what is most vulnerable throughout the community.
- Vulnerabilities are specifically identified in each hazard profile.

Opportunities for Improvement

- Consider including more information on the vulnerabilities of each community in the hazard profiles. These are generally found in short tables right now.
- Some maps and figures in the risk assessment are very small and hard to read. Consider giving these their own pages.

Element C: Mitigation Strategy

Strengths

- Risk reduction recommendations are in all hazard profiles. This is a good way to show actions next to specific vulnerabilities. This also shows that the county is considering all mitigation options.
- The mitigation strategy has very detailed descriptions of each mitigation action. These are supported with pictures and maps. It also explains if these were actions from the previous plan. It includes partners and possible funding sources.

Opportunities for Improvement

- Consider further talking about how mitigation capabilities can be expanded. These are generally described in the plan and would benefit from more detail.

Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

Strengths

- Section C of the Mitigation Strategy explains projects that were successfully completed.
- There are many sections throughout the plan that discuss how it has changed since the previous version.
- The plan included a plan maintenance checklist, which helps ensure the plan is updated, evaluated, and implemented in a clear and consistent way. Be sure to include the results of this checklist in the next plan update.

Opportunities for Improvement

- For complete mitigation actions, consider including a short narrative about how they were successful in reducing risk. These types of stories can show that mitigation is worth the process.

B. Resources for Implementing Your Approved Plan

- **Funding Resources**

This comprehensive FEMA website provides a list of resources and information on key elements of the **Building Resilient Infrastructure and Communities (BRIC)** program. [Resource List for the BRIC Grant Program | FEMA.gov](#)

The **Region 10 Wildfire Mitigation Funding Opportunity Guides** provide state, tribes, and local officials with a wide range of application development resources for hazard mitigation grants. [Mitigation Funding Opportunity Guides | FEMA.gov](#)

This factsheet provides information on [Planning related activities from the Hazard Mitigation Grant Program \(HMGP\)](#). State, tribal, and/or local governments may use planning-related funding to reduce risk and include hazard mitigation with planning. Take a look at this guide for information on what types of mitigation activities may help you implement your projects.

Rehabilitation Of High Hazard Potential Dam (HHPD) Grant Program: The President signed the [Water Infrastructure Improvements for the Nation Act](#) or the “WIIN Act,” on December 16, 2016, which adds a new grant program under FEMA’s National Dam Safety Program ([33 U.S.C. 467f](#)). Section 5006 of the Act, Rehabilitation of High Hazard Potential Dams, provides technical, planning, design, and construction assistance in the form of grants for rehabilitation of eligible high hazard potential dams. High Hazard Potential is a classification standard for any dam whose failure or misoperation will cause loss of human life and significant property destruction. Learn more at <https://www.fema.gov/emergency-managers/risk-management/dam-safety/grants>.

- **Plan Integration Resources**

The **Region 10 Coffee Break Webinar on Integrating Natural Hazard Mitigation into Comprehensive Planning** is a resource specific to Region 10 states and provides examples of how communities are integrating natural hazard mitigation strategies into comprehensive planning. You can find it on FEMA’s YouTube page at [Integrating Natural Hazard Mitigation Plans into Local Planning - YouTube](#) along with our other Mitigation Planning coffee break series webinars at [Natural Hazards Mitigation Planning Coffee Break Series - YouTube](#)

Plan Integration: Linking Local Planning Efforts (2015)- This step-by-step guide helps communities review local plans for possible integration and improve alignment efforts, including interagency coordination. [Plan Integration: Linking Local Planning Efforts](#) (2015)

The **Mitigation Planning and Community Rating System Bulletin** provides an overview of how to bring together planning efforts between the Community Rating System (CRS) and hazard mitigation plans. [Mitigation Planning and the Community Rating System: Key Topics Bulletin \(fema.gov\)](#)

- **Mitigation Ideas/Best Practice Resources**

The **Region 10 Seismic Mitigation Showcase Guides** highlight mitigation successes in earthquake and tsunami mitigation by documenting specific locations and communities, the decision-making process, path to funding, and how partnerships were developed. [Seismic Mitigation Showcase Guides | FEMA.gov](#)

The **Mitigation Ideas: A Resource for Reducing Risk from Natural Hazards** resource presents ideas for how to mitigate the impacts of different natural hazards, from drought and sea level rise to severe winter weather and wildfire. The document also includes ideas for actions that communities can take to reduce risk to multiple hazards, such as incorporating a hazard risk assessment into the local development review process. You can find it in the FEMA Library at [Mitigation Ideas \(fema.gov\)](https://www.fema.gov/mitigation-ideas)

The **Local Mitigation Planning Handbook** provides guidance to local governments on developing or updating hazard mitigation plans to meet and go above the requirements. You can find it in the FEMA Library at [Local Mitigation Planning Handbook \(fema.gov\)](https://www.fema.gov/local-mitigation-planning-handbook).

The FEMA Region 10 **Risk Mapping, Analysis, and Planning program (Risk MAP)** releases a monthly newsletter that includes information about upcoming events and training opportunities, as well as hazard and risk related news from around the Region. Past newsletters can be viewed at [Newsletter \(starr-team.com\)](https://starr-team.com/newsletter) If you would like to receive future newsletters, email rxnewsletter@starr-team.com and ask to be included.

This Post Disaster Redevelopment Guide has guidance on how to integrate risk reduction strategies into existing local plans, policies, codes, and programs for community development or redevelopment patterns. [Planning for Post-Disaster Redevelopment \(fema.gov\)](https://www.fema.gov/planning-for-post-disaster-redevelopment)

The mitigation strategy may include eligible projects to be funded through FEMA's hazard mitigation grant programs (Building Resilient Infrastructure and Communities (BRIC), Hazard Mitigation Grant Program, and Flood Mitigation Assistance). Contact your State Hazard Mitigation Officer, Anna Feigum at anna.r.feigum@oem.oregon.gov, for more information.

SECTION 3:
MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

Multi- Jurisdiction Summary Sheet Requirements: (Met /Not Met)												
Line Number	Jurisdiction Name	Jurisdiction Type (city/borough/township/village, etc.)	Plan Point of Contact	Mailing Address	Email	Phone	A. Planning Process	B. Hazard Identification and Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation and Implementation	E. Plan Adoption	F. State Requirements
1	Curry County	County	Monica Ward				Met	Met	Met	Met		
2	Brookings	City	Anthony Baron				Met	Met	Met	Met		
3	Gold Beach	City	Jodi Fritts				Met	Met	Met	Met		
4	Port Orford	City	Jessica Ginsburg				Met	Met	Met	Met		
5	Port of Gold Beach	Port	Andy Wright				Met	Met	Met	Met		
6	Port of Port Orford	Port	Tom Calvanese				Met	Met	Met	Met		
7												
8												
9												