Crook County
Multi-Jurisdictional
Natural Hazards Mitigation Plan

Report For:

Crook County
City of Prineville
Crook County Fire & Rescue

Crook County Office
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Prineville, OR 97754

Prepared by:

COIC

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EFFECTIVE DATES

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Special Thanks & Acknowledgements

This updated Natural Hazards Mitigation Plan is a collaboration between Crook County, the City of Prineville and Crook County Fire & Rescue. Plan templates were provided by the Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement. Plan development was supported by the Community and Economic Development department of Central Oregon Intergovernmental Council (COIC). This project would not have been possible without technical and in-kind staff support provided by Crook County and the Steering Committee.

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About Central Oregon Intergovernmental Council

"COIC supports the region as a trusted leader and partner, helping communities identify and address their unique and common needs through collaboration, shared service delivery, technical assistance, information sharing, and resource development."

In 1972, COIC was designated a Council of Governments organized under ORS 190. We provide services to the counties of Crook, Deschutes and Jefferson, the cities of Bend, Culver, La Pine, Madras, Metolius, Prineville, Redmond and Sisters, as well as the Confederated Tribes of Warm Springs. Our offices are located throughout Central Oregon. COIC employs more than 100 people and services in the following areas: employment and training, alternative high school education, business loans, transportation, and community and economic development. The majority of the COIC Board is comprised of elected officials appointed by each of these member governments. Other appointed members of the Board represent timber and wood products, business and industry, under and unemployed, agribusiness and agriculture, and tourism and recreation.

For more information on COIC, visit www.coic.org

Plan Template Disclaimer

This Natural Hazards Mitigation Plan is based in part on a plan template developed by the Oregon Partnership for Disaster Resilience. The template is structured to address the requirements contained in Title 44 CFR Section 201.6; where language is applicable to communities throughout Oregon, OPDR encourages the use of standardized language. As part of this regional planning initiative, OPDR provided copies of the plan templates to communities for use in developing or updating their natural hazards mitigation plans. OPDR hereby authorizes the use of all content and language provided to Crook County in the plan template.

Crook County
Multi-Jurisdictional
Natural Hazards Mitigation Plan

Table of Contents

Executive Summary

2025 Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan

What is Mitigation?

Crook County developed this Multi-jurisdictional Natural Hazards Mitigation Plan (NHMP) in an effort to prepare for the long-term effects resulting from natural hazards. It is impossible to predict exactly when these hazards will occur, or the extent to which they will affect the community. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to create a resilient community that will benefit from long-term recovery planning efforts.

Natural hazard mitigation is a method of permanently reducing or alleviating the losses of life, property, and injuries resulting from natural hazards through long and short-term strategies. Example strategies include policy changes, such as updated ordinances, projects, such as seismic retrofits to critical facilities; and education and outreach to targeted audiences, such as Spanish speaking residents or the elderly. Natural hazard mitigation is the responsibility of the "Whole Community" - individuals, private businesses and industries, state and local governments, and the federal government.

Why Develop this Mitigation Plan?

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K) and the regulations contained in 44 CFR 201 require that jurisdictions maintain an approved NHMP in order to receive federal funds for mitigation projects. Local and federal approval of this plan ensures that the county and listed jurisdictions will remain eligible for post-disaster mitigation project grants.

Who Participated in the Development of the NHMP?

The Crook County Multi-Jurisdictional Natural Hazards Mitigation Plan (NHMP) is the result of a collaborative effort between the county, city, special districts, citizens, public agencies, non-profit organizations, the private sector and regional organizations. County, city, and special district Steering Committees guided the plan development process. Surrounding counties were provided with regular updates and opportunities for input.

The county Steering Committee included representatives from the following organizations:

- Crook County (Board of County Commissioners)
- Crook County (Planning Department)
- Crook County (Health Department)
- Crook County (Road Department)
- Crook County Sheriff's Office
- Bureau of Land Management
- Central Oregon Community College

- City of Prineville Police Department
- Crook County Fire & Rescue
- Crook County School District
- Deschutes County Health Services
- National Oceanic Atmospheric Administration (NOAA)
- Ochoco Irrigation District
- Oregon Department of Forestry (ODF)
- Oregon State Fire Marshal (OFSM)
- Oregon Water Resources Department (OWRD)
- Prineville-Crook County Chamber of Commerce
- U.S. Forest Service

The Crook County Sheriff's Office Emergency Management Program convened the planning process and will take the lead in implementing, maintaining and updating the plan. Crook County is dedicated to directly involving the public in the continual reviewing and updating of the natural hazards mitigation plan. Although members of the Steering Committee represent the public to some extent, the public will also have the opportunity to continue to provide feedback about the plan throughout the implementation and maintenance period.

The County will ensure continued public involvement by posting the NHMP on the county website, as well as on Central Oregon Intergovernmental Council's project webpage here: https://www.coic.org/emergency-preparedness/natural-hazard-mitigation-plans/Crook-county-nhmp/

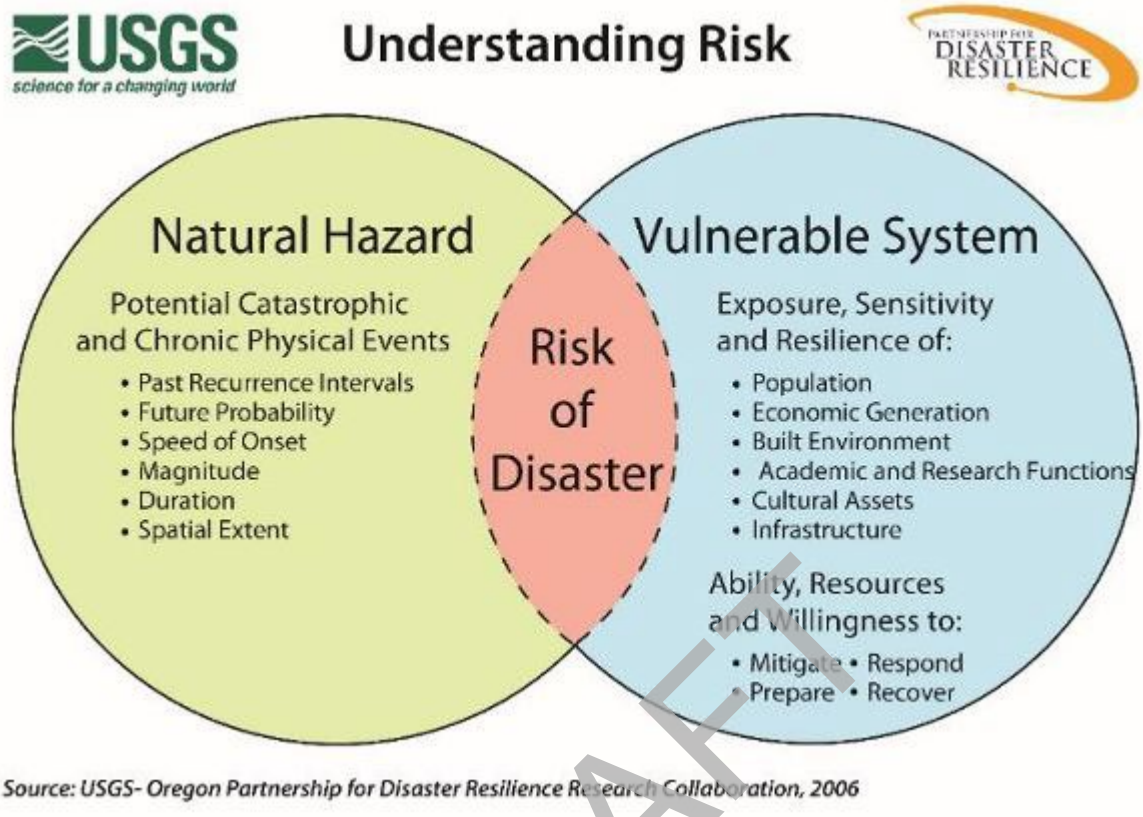
How Does this Mitigation Plan Reduce Risk?

The natural hazards mitigation plan is intended to assist Crook County reduce the risk from natural hazards by identifying resources, information, and strategies for risk reduction. It is also intended to guide and coordinate mitigation activities throughout the county. A risk assessment consists of three phases: hazard identification, vulnerability assessment, and risk analysis, as illustrated in the following graphic.

By identifying and understanding the relationship between natural hazards, vulnerable systems, and existing capacity, Crook County is better equipped to identify and implement actions aimed at reducing the overall risk to natural hazards.

Figure ES-1 below summarizes the components of risk that are assessed in a mitigation plan.

Figure ES-1: Understanding Risk[1]



Source: USGS- Oregon Partnership for Disaster Resilience Research Collaboration, 2006

What is the County's Overall Risk to Hazards?

Crook County reviewed and updated their risk assessment to evaluate the probability of each hazard as well as the vulnerability of the community to that hazard. In addition, the Steering Committees for the City of Prineville reviewed the recently updated Crook County risk assessment to compare risk and vulnerability particular to their jurisdiction (see addenda for more information). Table ES-1 summarizes hazard vulnerability and probability as determined by the county Steering Committee.

[1] Oregon Partnership for Disaster Resilience, 2006.

Table ES-1. County Risk Assessment Summary[2]

Hazard	History WF: 2	Vulnerability WF: 5	Maximum Threat WF: 10	Probability WF: 7	Total Score	Ranking
Drought	10	10	10	10	240	1
Flood	10	9	9	10	225	2
Wildfire	10	7	7	10	195	3
Earthquake	3	5	10	3	152	4
Severe Weather Event	10	5	6	10	175	5
Volcano	3	7	9	1	138	6
Landslide	2	2	9	4	132	7

What is the Plan's Mission?

The mission of the Crook County NHMP is to:

> *To reduce risk, prevent loss, and protect life, property, and the environment from natural hazard events through coordination and cooperation among public and private partners.*

What are the Plan Goals?

The plan goals describe the overall direction that the participating jurisdiction's agencies, organizations, and citizens can take toward mitigating risk from natural hazards. Below is a list of the plan goals in priority order:

Table ES-1. 2025 Crook County Natural Hazard Mitigation Plan Goals

Goal	Goal Statement	Community Priority
Partnership and Coordination	• Identify mitigation of risk reduction measures that address multiple areas (i.e. environment, transportation, and telecommunications). • Coordinate public/private sector participation in planning and implementing mitigation projects throughout the county. • Seek partnerships in funding and resources for future mitigation efforts.	1

[2] Crook County Steering Committee, 2025.

Emergency Services	• Minimize life safety issues. • Promote, strengthen, and coordinate emergency response plans. • Evaluate the performance of critical facilities during a natural hazard event.	2
Education and Outreach	• Further the public's awareness and understanding of natural hazards, potential risk, including economic vulnerability, and options available when natural hazard events occur.	3
Prevention	• Reduce the threat of loss of life and property from natural hazards. • Incorporate information on known hazards and provide incentives to make hazard mitigation planning in land use policies and decisions, which include plan implementation.	4
Property Protection	• Lessen impact from natural disaster on individual properties, businesses, and public facilities. • Increase awareness at the individual level and encourage activities that can prevent damage and loss of life from natural hazards.	5
Natural Resource Protection	• Preserve and rehabilitate natural systems to serve natural hazard mitigation functions (i.e. floodplains, wetlands, watersheds, and urban interface areas).	6
Structural Projects	• When applicable, utilize structural mitigation activities to minimize risks associated with natural hazards.	7

How are the Action Items Organized?

The county action items are organized within the *Action Item Matrix* included within Section 4, Mitigation Strategy (full descriptions are provided in Appendix A, Action Item Forms).

Data collection and research, local knowledge and understanding, and the public participation processes resulted in the development of the action items. *The Action Item Matrix* portrays the overall framework of the mitigation strategy and identifies linkages between the plan goals and actions. The Matrix documents the title of each action along with the coordinating organization, timeline, and priority. The Action Item Matrix for the county includes 34 strategies for addressing risks associated with the various hazards identified in this plan.

Action items particular to each of the participating cities and special districts are included in their respective addenda.

What Are the Priority Action Items for the County?

Of the 34 action items, the 2025 Steering Committee identified 9 as priority actions. Prioritization was based on an action's ability to improve the effectiveness of responding to an emergency, as well as the public input process. Table ES-2 provides a summary of the priority action items selected through this process.

Table ES-2. Priority Action Items[3]

Action Item #	Description
Multi-Hazard #3	Review the Crook County Emergency Operations Plan and the Natural Hazards Mitigation Plan on an annual basis. Conduct a complete review of the plans and have them officially promulgated by the approving authorities every 5 year.
Multi-Hazard #4	Promote natural hazards safety education.
Drought #2	Study and implement alternative irrigation water sources and other surface water and groundwater storage projects(s).
Drought #3	Improve irrigation efficiency by piping/lining canals, metering deliveries and automating systems.
Flood #3	Maintain compliance with the National Flood Insurance Program (NFIP) and Update the Flood Insurance Rate (FIRM) Maps for Crook County using the 2010 FIRM maps.
Flood #7	Coordinate with Ochoco Irrigation District to evaluate the vulnerability of Ochoco Dam to natural hazards.
Flood #8	Improve readiness in the event of catastrophic breach potential at Barnes Butte dam by exercising the Emergency Action Plan (EAP).
Wildfire #1	Continue to promote public awareness campaigns for individual property owners living in interface areas.
Wildfire #2	Identify and implement methods of disposal or utilization of fire fuels removed from individual properties.

[3] Crook County Steering Committee, 2025.

How will the Plan be Implemented?

The Plan Implementation and Maintenance strategy (Volume I, Section 5) of this NHMP details the formal process that will ensure that the Crook County NHMP remains an active and relevant document. The plan will be implemented, maintained, and updated by a designated convener. The Crook County Emergency Services Manager is the designated convener (Plan Convener) and is responsible for overseeing the review and implementation processes. The plan maintenance process includes a schedule for monitoring and evaluating the plan semi-annually and producing a plan revision every five years. This section also describes how the communities will integrate public participation throughout the plan maintenance process.

Plan Adoption

Once the plan is locally reviewed and deemed complete the Plan Convener submits it to the State Hazard Mitigation Officer at the Oregon Department of Emergency Management. OEM reviews the plan and submits it to the Federal Emergency Management Agency (FEMA – Region X) for review. This review will address the federal criteria outlined in FEMA Interim Final Rule 44 CFR Part 201.6. Once the plan is pre-approved by FEMA, the county, cities, and special districts formally adopt the plan via resolution. The county Plan Convener (and, separately, the conveners for the participating cities and special districts) will be responsible for ensuring local adoption of the Crook County NHMP and providing the support necessary to ensure plan implementation. Once the resolution is executed at the local level and documentation is provided to FEMA, the plan is formally acknowledged by FEMA and the county (and participating cities and special districts) will re-establish eligibility for the Hazard Mitigation Assistance (HMA) Grant Program.

The accomplishment of the NHMP goals and actions depends upon regular Steering Committee participation and adequate support from county and city/special district leadership. Thorough familiarity with this plan will result in the efficient and effective implementation of appropriate mitigation activities and a reduction in the risk and the potential for loss from future natural hazard events. Crook County, the City of Prineville, and Crook County Fire & Rescue will review the plan semi-annually as described in Section 5, Plan Implementation and Maintenance.

The Steering Committees for Crook County, Prineville, and Crook County Fire & Rescue each met to review the plan update process and their governing bodies adopted the NHMP as shown below:
Crook County adopted the plan on [DATE]
The City of Prineville adopted the plan on [DATE]
Crook County Fire & Rescue adopted the plan on [DATE]

FEMA Region X approved the Crook County Multi-Jurisdictional NHMP on [DATE]. With approval of this plan, the entities listed above are now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through [DATE].

Section 1: Introduction

2025 Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan

1.0 What is the Natural Hazard Mitigation Plan?

The 2025 Crook County Multi-Jurisdictional Natural Hazards Mitigation Plan (NHMP) includes resources and information to assist residents, public and private sector organizations, and others interested in participating in planning for natural hazards.

The NHMP is a mitigation plan for "all natural hazards" that may impact Crook County. The plan represents a collection of information on hazards, risks, and vulnerabilities for Crook County, as well as strategies for addressing those risks based on data available at the time it was created. The NHMP will be reviewed annually by the Crook County Office of Emergency Management to consider changes that may impact the performance of the plan, and to monitor implementation of the mitigation action items. The plan will receive a complete review and update every five years. During the complete review and update process, the plan will be evaluated with respect to new requirements and action items.

The NHMP provides a list of activities that may assist Crook County in reducing risk and preventing loss from future natural hazard events. The action items included in the plan address not only multi-hazard issues but also issues and risks pertaining to specific natural hazards including droughts, earthquakes, floods, wildfires, severe weather events, landslides, and volcanoes.

1.1 Why Develop a Mitigation Plan?

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

Crook County updated this Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP) to reduce future loss of life and damage to property resulting from natural hazards. It is impossible to predict exactly when natural hazard events will occur, or the extent to which they will affect community assets. However, with careful planning and collaboration among public agencies, private sector organizations and residents within the community, it is possible to minimize the losses that can result from natural hazards.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K) and the regulations contained in 44 CFR 201,

require that jurisdictions maintain an approved NHMP to receive federal funds for mitigation projects. Local and federal approval of this NHMP ensures that the County and listed cities/special districts will remain eligible for post-disaster mitigation project grants.

Finally, this plan supports the participating jurisdictions in maintaining compliance with statewide land use planning requirements. All Oregon cities and counties have comprehensive plans and implementing ordinances that are required to comply with the statewide planning goals. *Statewide land use planning Goal 7: Areas Subject to Natural Hazards* calls for local plans to include inventories, policies, and ordinances to guide development in or away from hazard areas. Goal 7, along with other land use planning goals, has helped to reduce losses from natural hazards. Through risk identification and the recommendation of risk-reduction actions, this NHMP aligns with the goals of the jurisdiction's Comprehensive Plan and helps each jurisdiction meet the requirements of statewide land use planning Goal 7.

The primary responsibility for the development and implementation of risk reduction strategies and policies lies with local jurisdictions. However, additional resources exist at the state and federal levels. Some of the key agencies in this area include the Oregon Department of 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).

1.2 How was the NHMP Developed?

The NHMP was developed by the Crook County Natural Hazard Mitigation Plan Steering Committee and the Steering Committees for the city of Prineville and Crook County Fire & Rescue. The Crook County Steering Committee formally convened on several occasions to discuss and revise the NHMP. The city of Prineville and Crook County Fire & Rescue Steering Committees met formally at least once. Steering Committee members contributed data and maps, reviewed, and updated the community profile, risk assessment, action items and implementation and maintenance plan.

An open public involvement process is essential to the development of an effective NHMP. To develop a comprehensive approach to reducing the effects of natural disasters, the planning process included an opportunity for the public, neighboring communities, local and regional agencies, as well as private and non-profit entities to comment on the NHMP during review. Crook County contracted with Central Oregon Intergovernmental Council (COIC) to facilitate and assist with the 2025 update and community input process.

To better understand Crook County communities' risk to natural hazards, and the communities' perceptions and opinions regarding the risk of and vulnerability to natural hazards in Crook County and its cities, COIC posted a Public Opinion Survey on their website. This survey was available online for 8 weeks during the beginning of the update process. The information collected from this survey was used to guide the 2025 Crook County NHMP

Steering Committee in developing the Mitigation Strategy, and guided community outreach practices throughout the 2025 MNMP update process.

Once the first draft of the 2025 Crook County NHMP was complete, COIC posted a copy of the document on their website for community members to review for 8 weeks. A Google Form was available for community members to provide feedback. Community members were encouraged to review the draft and provide feedback prior to a community input meeting.

A community input meeting was held to solicit community feedback and input on the final document during the drafting stage and prior to plan approval. Staff incorporated community input before submitting the final plan to FEMA for review.

More information on the 2025 Crook County NHMP community input process can be found in *Appendix C – Planning & Public Process*.

1.3 How is the NHMP Organized?

Each volume of the NHMP provides specific information and resources to assist readers in understanding the hazard-specific issues facing county and city residents, businesses and the environment. Combined, the sections work in synergy to create a mitigation plan that furthers the community's mission to reduce or eliminate long-term risk to people and their property from hazards and their effects. This NHMP structure enables stakeholders to use the section(s) of interest to them.

The NHMP is structured as follows:

Volume I: Basic Mitigation Plan

Executive Summary

The NHMP summary provides an overview of the NHMP and the planning process and highlights the key elements of the plan including the mission, risk assessment, mitigation strategy and implementation and maintenance plan.

Section 1: Introduction

The Introduction briefly describes the countywide mitigation planning efforts and the methodology used to develop the NHMP.

Section 2: A Tour of Crook County

The community profile describes the Crook County landscape, demographics, and history of hazards. This section also includes capability and vulnerability assessments, both of which are critical to evaluating the county's sensitivity and resilience to hazards. The capability assessment evaluates existing authorities, policies, programs, and resources associated with mitigation within the county. The vulnerability assessment includes an evaluation of the natural, socio-demographic, economic, built environment, and community capacities and greatest vulnerabilities.

Section 3: Natural Hazard Identification and Risk Assessment

The Risk Assessment allows readers to gain an understanding of each jurisdiction's vulnerability and resilience to natural hazards. A hazard summary is provided for each of the hazards addressed in the NHMP. The summary includes hazard history, location, extent, future conditions, vulnerability, impacts, and overall risk. This NHMP addresses the following hazards:

- Drought
- Earthquake
- Flood
- Landslide
- Extreme Weather
- Volcanic Event
- Wildfire

Section 4: Mitigation Strategy

This section documents the NHMP vision, mission, goals, and actions (mitigation strategy) and describes the components that guide implementation of the identified actions. Actions are developed to address the vulnerabilities and risk factors discussed in Section 3, the Risk Assessment. Additionally, details for each action item can be found in Appendix A, Action Item Forms.

Section 5: Plan Implementation and Maintenance

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

Volume II: Jurisdictional & Special District Addenda

Volume II of this NHMP is reserved for any city and special district addenda developed in this multi-jurisdictional planning process. The City of Prineville and Crook County Fire and Rescue created or updated their addendum during the 2025 update. As such, the five-year update cycle will be the same for these entities and the County. Crook County Fire & Rescue developed an addendum to this plan for the first time. Future updates to the NHMP will seek to incorporate other eligible special districts in the county as desired.

Volume III: Mitigation Resources

Appendix A: Action Item Forms

This appendix contains the detailed action item forms for each of the mitigation strategies identified in Section 3 of this Plan.

Appendix B: Acronyms

This appendix includes a list of terms, and their acronyms, related to natural hazard mitigation that are found throughout this NHMP.

Appendix C: Planning and Public Process

This appendix includes documentation of all the countywide public processes utilized to develop the NHMP.

Appendix D: Crook County NHMP Community Hazard Survey

This appendix includes the survey instrument and results from the preparedness survey implemented by COIC and Crook County. The survey aims to gauge household knowledge of mitigation tools and techniques to assist in reducing the risk and loss from natural hazards, as well as assessing household disaster preparedness and community priorities.

Appendix E: Economic Analysis of Natural Hazard Mitigation Projects

This appendix describes the Federal Emergency Management Agency's (FEMA) requirements for benefit cost analysis in natural hazards mitigation, as well as various approaches for conducting economic analysis of proposed mitigation activities.

Appendix F: Grant Programs and Resources

This appendix lists local, state, and federal resources and programs that support mitigation activities.

Section 2: A Tour of Crook County

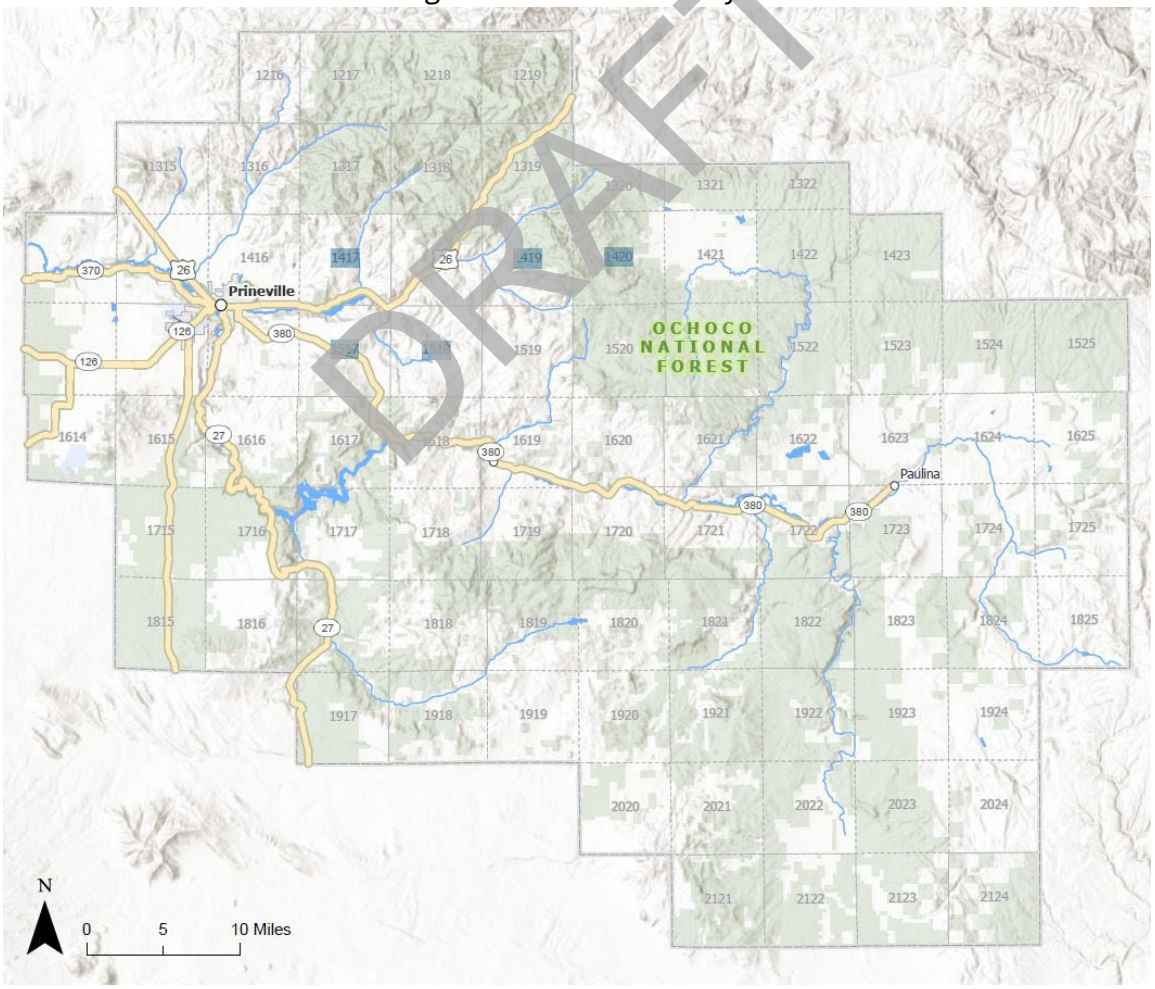
2025 Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan

2.0 Geographic Conditions

The Crook County Landscape

Located in the very center of the State, Crook County occupies the heart of Oregon and covers 2,991 square miles. The area is rich in natural resources; forests, mountains, rivers, streams, lakes, and high desert dominate the landscape. Crook County's climate is pleasant and diverse; the area's natural beauty has increased its popularity in recent decades. The growing population and increased development in Crook County increase its risk associated with natural hazard events by threatening loss of life and property as well as long-term economic disruption.

Figure 2-1. Crook County[4]

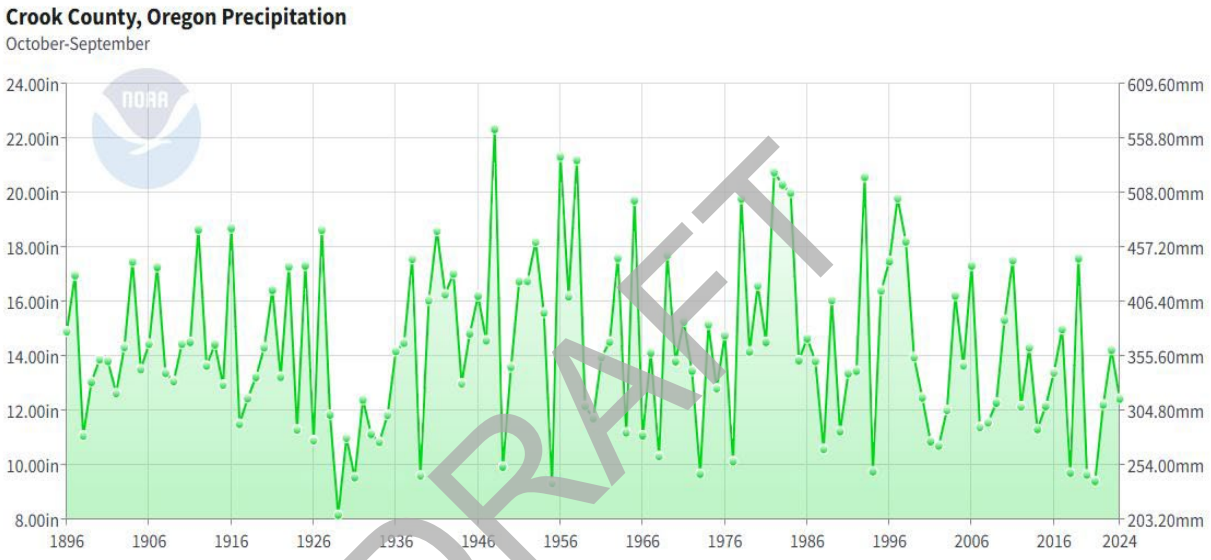


[4] Crook County GIS. Email communication with Crook County GIS, October 15, 2024.

Climate

Late October typically marks the beginning of the winter months in Crook County, which lasts until March. The high desert environment sees an average temperature of 31.8°F in January and 64.5°F in July with 10.5 inches of precipitation on average annually. The quantity of precipitation in Central Oregon is in sharp contrast to the 37 to 50 inches seen in many other parts of the Pacific Northwest. In most winters there are 1 to 4 snowstorms which result in an average of 10 inches of snow annually. Summer precipitation is very low. Crook County is one of the driest counties in the state, and holds one of the state's heat records of 114°F. These factors increase the risk of wildfire and require irrigation for the county's crops.

Figure 2-2. Annual Precipitation in Crook County (1896-2024)[5]



Topography

Four major terrain features characterize Crook County boundaries. The Ochoco Mountain Range to the east/northeast, the Maury Mountain Range to the south/southeast, the Powell Butte to the west, and the Grizzly Grey Buttes to the north. The Crooked River (and its tributaries) cuts through each of these regions on its journey to join the Deschutes River and Metolius River at the Round Butte Dam.

Crook County's terrain is typical of Central Oregon's high desert landscape. Considering low annual rainfall and unique soil conditions, landslides are an annual occurrence.

While seismic events within Crook County pose a relatively low severity threat to the county, seismic events epi-centered in the Cascade Range to the west pose a considerable threat considering aforementioned indirect impacts on transportation, supply and demand of goods/services, and displacement of Western Oregon residents to Crook County.

[5] NOAA National Centers for Environmental information, Climate at a Glance: County Time Series, published December 2024, retrieved on December 31, 2024 from https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/time-series

Ochoco Mountains/Ochoco National Forest

Photo Source: Morgan Shannon

With a total of almost 1,500 square miles, the Ochoco National Forest is endowed with vast natural resources, scenic grandeur, and tremendous recreation opportunities. People are drawn to the Ochoco for its majestic ponderosa pine stands, picturesque rim rock vantage points, deep canyons, unique geologic formations, abundant wildlife, and plentiful sunshine.

The Ochoco National Forest is divided into four ranger districts: Big Summit, Paulina, Prineville, and Snow Mountain. The Crooked River National Grassland is also administered by the Ochoco National Forest and is located in the western portion of the county.

The Ochoco National Forest contains three designated Wilderness Areas. The largest of the three, the 17,400-acre Mill Creek Wilderness contains deep canyons, towering pinnacles, and opportunities for solitude. The wilderness has meadows at 6,000 feet giving way to lower-elevation forests of dense pine and fir, dissected by Mill Creek and its tributaries. A unique feature of this wilderness is the pair of volcanic plugs called Twin Pillars. The Black Canyon Wilderness is 13,400 acres in size. It incorporates a variety of ecosystems ranging from dense forests to rugged canyons. Three sides of the canyon reach elevations to 6,000 feet, while waters in the gorge have cut through lava basalt and empty into the South Fork of the John Day River at 2,800 feet. The 5,400-acre Bridge Creek Wilderness is small but boasts wonderful scenic vistas and solitude. There are no trails maintained in this wilderness, but an old trail

and a mile of old road exist. The Bridge Creek Wilderness is characterized by steep terrain, open meadows, forested slopes, and barren plateaus called scab flats. Most visitors to the Bridge Creek arrive for fall hunting seasons.[6]

Nearby volcanic neighbors include Mt. Bachelor, North, Middle and South Sisters, Mt. Jefferson, and Mt. Hood. While dramatic eruptions of volcanoes have been absent during the last century, continued subduction and presence of numerous faults indicate that a significant seismic or volcanic event could occur at any time. Seismic activity can also trigger landslides and cause flash flood events due to breached dams, jeopardizing the safety of downstream Prineville.

Land Cover/Vegetation

The Ochoco mountain range, located in the northern and eastern portion of the county, transitions from high desert to elevations of 6,000 feet with broken terrain and a dry-forest ecotype dominated by Ponderosa Pines and interior Douglas fir. Lodgepole pine, Western larch and White fir are also common on north slopes and higher elevations. As weather moves across and into the higher elevation of the Ochoco Mountains, precipitation increases.

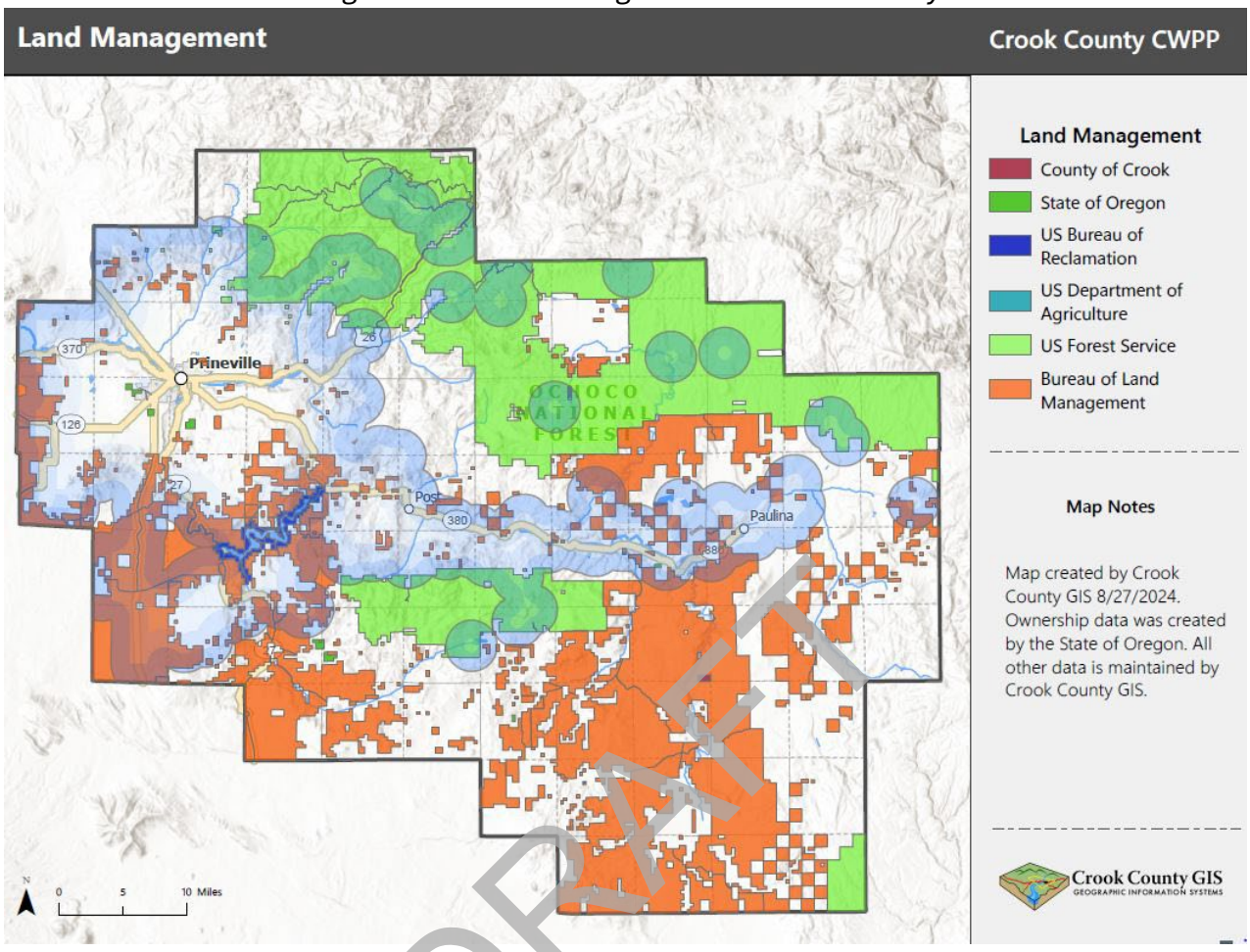
Crook County ecosystems, particularly those adjacent to development at low and mid elevations, are described as "fire-adapted". Vegetation in fire-adapted areas require fire to remain healthy and sustainable over time. Over the last century, fire suppression and forest management activities have altered the natural period between fires for these ecosystems (fire return interval). This has resulted in tree species shifts, increase in tree stand density and overgrowth of forest fuels, all of which increase the susceptibility of the forest to insects, disease and wildfire.[7]

Land Use

Due to the topography and climate described above, land is occupied most densely by people in the valley below two major dams: Bowman and Ochoco. Rural residential development also occurs in Juniper Canyon (southeast of Prineville) and Powell Butte (southwest of Prineville). In addition to topography and climate, federal and state land ownership also directs where development occurs in Crook County. Of the County's approximately 2,000,000 acres, 50 percent is public with the remaining 50 percent private ownership.[8]

[6] Ochoco National Forest, United States Forest Service.
[7] Personal communication with Stephen Fitzgerald, retired OSU Extension Silviculture Specialist.
[8] Crook County Natural Resources Policy, pg. 8.

Figure 2-3. Land Management in Crook County[9]



Development has largely followed the land use patterns of the early settlers when farmers located in the rich valley floors and miners located on the foothill and mountainous areas.[10] Farming, rural, suburban, urban, and industrial, land uses are concentrated in the fertile Prineville valley, while forest, open space, ranching, and a few limited rural service centers occur in surrounding mountainous and high desert plateau regions of the county. Development in the Prineville Valley is subject to risk from flood hazards associated with its geographical position. Forested mountains and juniper-covered land surrounding these valleys pose a significant risk to the entire region due to potential wildfire events.

The above-described land use pattern is reflected in the County's Comprehensive Plan, which was adopted in 1978. This plan directs heavy impact land uses, such as urban and industrial uses, in and around the City of Prineville. Outside of Prineville, there are limited urban uses, with such uses only allowed in rural services areas, like Powell Butte and Paulina. Rural residential use outside city limits is common in the western half of the County, but not in the eastern half of the County, where public land ownership, larger landholdings used for ranching operations, and a lack of infrastructure limit residential development.

[9] Crook County GIS. Created August 27, 2024, for the 2024 CWPP update.
[10] United States Geological Survey/recollection of Pioneer Citizens of Crook County

2.1 Population and Demographics

A Historical Perspective

Crook County was established on October 24, 1882. It was created from the southern part of Wasco County and named after U.S. Army Major-General George Crook.

Crook County is situated in the geographic center of Oregon. It has been reduced from its original size of 8,600 square miles to 2,986 square miles by the creation of Jefferson County in 1914 and Deschutes County in 1916. The current boundaries were established in 1927. Crook County is bounded by Jefferson and Wheeler Counties to the north, Grant and Harney Counties to the east, and Deschutes County to the south and west.

The first courthouse was a one-story wooden structure at the corner of West 5th and Main Streets in Prineville. In 1885, a two-story wooden structure was built for $5,474. By 1905, this building was considered unsafe to store the County's records, and a $16,526 bid was accepted to erect a new brick and stone courthouse. The building was completed in 1909, at a cost $48,590, and remodeled in the early 1990s.

The government of Crook County consisted originally of a county judge, two county commissioners, clerk, treasurer, and sheriff. The position of school superintendent appeared by 1899. The County also added an assessor.

The first census in 1890 showed a population of 3,244.

Routes over the Cascades were difficult to find and traverse, thus delaying development in the area until access was more developed. The first effort was in 1862 when a supply train with cattle crossed the Scott Trail. This was also the first group of non-natives to spend the winter in Central Oregon. The discovery and development of the Santiam Pass in the 1860s made the development of the area much easier.

Cities, Census Designated Places, and Unincorporated Communities

Crook County is comprised of one incorporated city, the city of Prineville (see Volume III, Jurisdictional & Special District Addenda). Additionally, the county is home to the Census Designated places of Juniper Canyon, Ochoco West, and Prineville Lake Acres. Crook County has a number of unincorporated communities which include Lone Pine, Post, Paulina, O'Neil, Powell Butte, and Alfalfa.

Demographics

Crook County is rural, with one incorporated city, Prineville, located in the geographical center of the state of Oregon. Prineville is the county seat and location for most services. Other distinct population areas include Post (34 miles from Prineville), Paulina (54 miles from Prineville), Powell Butte (15 miles from Prineville), and in the plateau south of Prineville, an area referred to as Juniper Canyon. Crook County is a remote area; there are limited public

transportation services, especially outside of Prineville the county is located 150 miles from the nearest international airport, train, or metro bus service.[11]

Figure 2-4. Crook County Population Growth, 2020-2024[12]

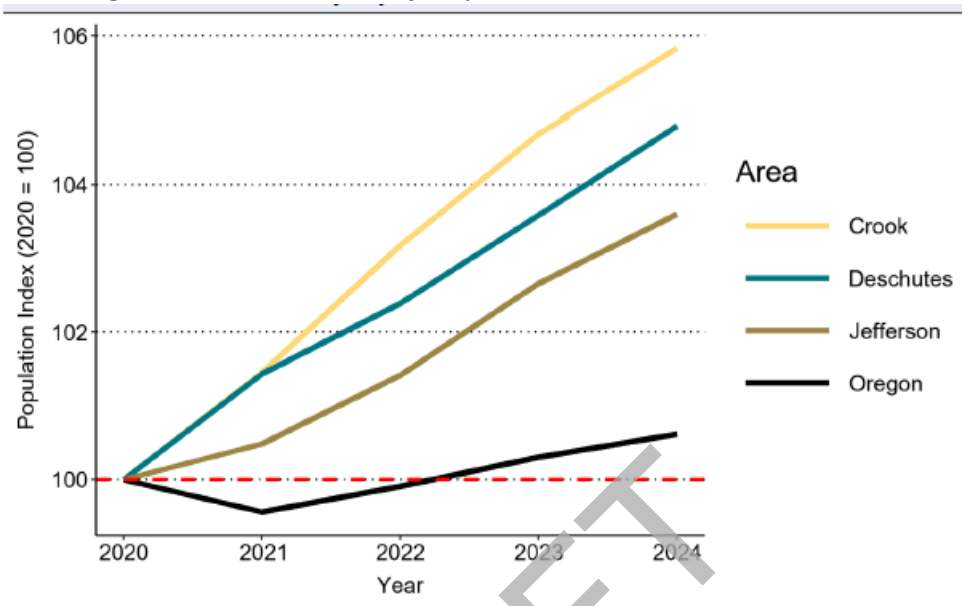


Figure 2-4 above shows that Crook County is Oregon's fastest growing county since 2020. Crook County's 2023 PSU-certified population estimate is 26,583[13] up 7.5% from the 2020 census which recorded a population of 24,738. Crook County has experienced rapid population growth in recent decades due mostly to high levels of inward migration, driven in part by housing pressure in surrounding areas. Between 2010 and 2020, the county's population increased 18%. Population growth in Crook County is expected to continue, with an estimated increase of 62% (42,079) by the year 2072.[14]

According to the U.S. Census Bureau, Crook County has an aging population, with 24.7% of its population being over 65. Additionally, 18.3% of the population is disabled (compared to 15.3% across Oregon). The poverty rate is 10.6%.[15]

Access and Functional Needs in Crook County

Natural hazards do not discriminate but impacts in terms of loss and the ability to recover vary greatly among individuals. According to Peggy Stahl of the FEMA Preparedness, Training, and Exercise Directorate, 80% of the disaster burden falls on the public, and within that number, a disproportionate burden is placed on individuals with disabilities and other access and

[11] Crook County Health Department, 2018
[12] Email with Kelsey Lucas with Crook County EDCO. February 28, 2025.
[13] 2023 Certified Population Estimate: Crook County, Portland State University Population Research Center. https://www.pdx.edu/population-research/population-estimate-reports.
[14] Portland State University Population Research Center. Coordinated Population Forecast 2022 through 2072: Crook County. https://www.pdx.edu/prc/sites/www.pdx.edu.prc/files/Crook_Forecast_Report_2022.pdf
[15] https://www.census.gov/quickfacts/fact/table/crookcountyoregon/PST045223

functional needs groups: women, youth, minorities, and seniors.[16] In 2011, the United States adopted a "whole community" approach emergency management policies and practices.[17] This approach acknowledges the access and service gaps in emergency response and promotes community participation and inclusive planning for emergency planning, response, recovery, and mitigation as a way to understand, engage, and empower communities in the process.

It is estimated that as many as 7.9% of Crook County residents are living below the poverty level.[18] In September of 2024, the State Employment Department reported Crook County's seasonally adjusted unemployment rate for August 2024 to be the highest in the state at 5.8%.[19] Crook County also has several foster care facilities and nursing homes located within its floodplains.

Education and outreach services can help all citizens of Crook County understand the risks of natural hazards and how to be prepared on an individual level for a natural hazard event. Another social issue related to natural hazards is the potential imbalance between the costs and benefits of natural hazards mitigation and recovery. The cost of natural hazard recovery can place unequal financial responsibility on the general population, when only a small proportion may benefit from government funds used to rebuild private structures.[20] The County strives to ensure that all county requirements and restrictions are consistently applied. Crook County Emergency Management is working with the Oregon State Department of Human Resources, Senior and Disabled Services and other community service organizations to develop a system that serves people with access and functional needs which might impair mobility, sight, or ability to independently respond to natural hazards.[21]

2.2 Understanding Hazards in Crook County

Why Plan for Natural Hazards?

Across the United States, natural hazards cost communities billions of dollars, taking a toll on the built environment, human life, and the local economy; Crook County is no exception. Since its early settlement in the mid-to-late 1800s, the county and its residents have been subject to financial loss and property damage from flooding, landslides, wildfires, and severe weather events. Natural hazards will inevitably continue to impact Crook County in the future,

[16] Hazards Workshop Session Summary #16, Disaster Diversity and Equity. (July 2000). University of Colorado, Boulder.
[17] FEMA, (December 2011). *A Whole Community Approach to Emergency Management: Principles, Themes, and Pathways for Action*. U.S. Department of Homeland Security.
[18] U.S. Census Bureau, American Community Survey, 2022.
[19] State of Oregon Employment Department (September 24, 2024). *August 2024 Employment and Unemployment in Oregon's Counties* [News Release].
[20] Olshansky, Robert B., David, J., Unstable Ground: *Landslide Policy in the United States,* Ecology Law Quarterly (Vol. 13:939, 1987) p 948
[21] Crook County Emergency Operations Plan, Section III, Annex Q, *Special Needs Population*

thereby demonstrating the critical need for strategies to reduce risk from future natural hazards.

While natural hazard events such as flooding and wildfires are natural parts of the ecosystem in Crook County, they can negatively impact both rural and urban human populations and communities. Crook County's growing population and associated development activities place increased demands on the county's infrastructure and undeveloped parts, increasing the interface between people, property, and the natural environment. Both urban and rural areas of Crook County are at risk of negative impacts associated with natural hazards.

Chronic Natural Hazard Events

Chronic natural hazards occur with some degree of frequency, including flooding, landslides, severe weather events, wildfires, and rock falls. These hazards can have devastating economic consequences on Crook County.

Over the last century, Crook County experienced at least 7 major flood events[22] with a landmark event occurring in March of 1952. This 1952 flood event completely covered the town of Prineville, causing significant damage to the local economy and infrastructure. Shortly after this 1952 flood event, Bowman Dam was constructed and regulated flows began in December of 1960. Another devastating flood event occurred in 1979 when Juniper Canyon Creek, which drains an area between the Ochoco Creek and Crooked River drainages, exceeded its banks, washing out the Paulina Highway and flooding most of the southern part of Prineville. In 1987, the Juniper Canyon flood control project was completed to convey water from Paulina Highway to the Crooked River. The Juniper Canyon Flood Control Board remains active today.

Severe Storms and Floods

In May of 1998, Crook County experienced a destructive severe storm event. A large storm system moved into Central Oregon, releasing approximately 7 inches of rain in a 24-hour period, an unusually high amount considering the 10.5-inch average annual rainfall in Crook County. To complicate matters, the Ochoco Reservoir was full anticipating the upcoming irrigation season. The high rainfall in combination with several other factors resulted in the overtopping of the reservoir's spillway with a discharge in the range of a 50-100 year storm event. This flood caused nearly 17 million dollars in damage to homes, businesses, and infrastructure in Crook County. More than 300 homes were affected by the flood and 50 were completely destroyed.[23] In June of 1998, President Clinton declared Crook County eligible for disaster assistance due to damages resulting from this flood.

Flood is not the only natural hazard that has affected Crook County over the past century; Crook County saw two devastating winter storms in 1919 and 1973 with 30 inches of snowfall in three days and 40 inches of snowfall in two days, respectively. These winter storms

[22] Bowman Museum, Prineville, OR; Central Oregonian; and Interviews with Local Pioneers.
[23] City of Prineville Crook County Flood Mitigation Action Plan (1999)

burdened Crook County infrastructure, resulting in residential plumbing issues, congested transportation routes, power outages, and impacts on the agricultural industry.
In the winter of 2005, a rural area of Crook County felt the impacts of another flood event. Despite the 1987 Juniper Canyon flood control project efforts, heavy precipitation and high-water volumes in Juniper Canyon damaged rural infrastructure and property and interrupted transportation.

Wildfires

Crook County has also experienced several substantial wildfire events in the past century resulting in millions of dollars in damage and suppression activities. While lightning is the primary cause of wildfire in Crook County, the risk of human-caused fires has increased with increases in population and the resulting expansion of the wildland urban interface. Human activities such as operating equipment or burning debris piles can contribute to increased wildlife risk.

Catastrophic Natural Hazard Events

Catastrophic events do not occur with the same frequency as chronic hazards but can have devastating consequences. Earthquakes and volcanoes are two types of catastrophic hazards. These types of natural hazards are difficult to predict, affect a wide geographic area, and can severely impact entire regions.

Earthquake Events

Crook County has been relatively unaffected by seismic activity since its settlement. Since 1982, there have been 11 small earthquakes with epicenters in Crook County; these earthquakes have all registered lower than 3.0 in magnitude. Crook County does, however, sit on two inactive faults[24], and Eastern Oregon remains a very active seismic area. A series of earthquakes in the 1990s in Klamath County, south of Crook County, cost this county seven million dollars in damage and complete destruction of the Klamath County Courthouse.

Although direct earthquake impacts are relatively mild in Crook County, all counties east of the Cascade Range have the potential to feel substantial indirect impacts of severe earthquake events sourced in the Cascadia Subduction Zone (CSZ).[25] Indirect impacts include disruption of transportation corridors (roads, rail, air), power supply, supply chain distribution (fuel, food, natural gas, etc.), demand for logistics and staging areas, shelter, and relocation of individuals and animals from the directly impacted areas. Transportation interruptions and prioritization of emergency supplies to Western Oregon will disrupt raw material imports and finished agricultural product export, thereby causing a large financial disruption with necessity for alternate routing to ports of opportunity, increasing shipping costs and affecting Oregon's agricultural economy. Massive staging areas are likely to be required in various areas of Central and Eastern Oregon with relief supplies likely to be primarily located at an

[24] State of Oregon Department of Geology and Mineral Industries (2003)
[25] Oregon Office of Emergency Management, Cascadia Subduction Zone Catastrophic Response Plan (2012). https://uploads.westernenergy.org/2015/12/09114712/OR_CSZ_Plan_Complete.pdf

established federal incident support base at Redmond Municipal Airport in Redmond, Deschutes County, Oregon. River traffic on the Columbia River will be an important response and recovery lifeline. Mutual aid from Eastern Oregon jurisdictions will be sought to the maximum degree possible. Many building inspectors, law enforcement, firefighters, medical personnel, engineers, and public works personnel may deploy to the impacted areas of Western Oregon.

Volcanic Events

There have been no documented volcanic events affecting Crook County during Oregon's recorded history. However, Crook County sits downwind of the volcanically active Cascade Range. Depending on weather and wind patterns, Crook County is susceptible to volcanic ash from more than 100 miles away coming from Mt. St. Helens, Mt. Adams, Mt. Hood, Mt. Jefferson, the Three Sisters area, Newberry Volcano, Crater Lake and other volcanoes in the area pose a threat.

Understanding the characteristics of hazards that affect Crook County helps define strategies to minimize the risk to personal safety and reduce potential damage to public and private property, the economy, and the environment. Communities engaged in natural hazards mitigation also have access to federal resources, such as FEMA's Hazard Mitigation Grant Program that can be used in the wake of a variety of natural hazard events. These funds become available to communities after the President of the United States declares a particular region a disaster area, as in the May 1998 flood example described above.

More information on the location, history, and risks associated with the eight natural hazards facing Crook County can be found in *Section 3 – Risk Assessment* and *Appendix C – Hazard Background Information*.

2.3 Capabilities Assessment

The Capability Assessment identifies and describes the ability of Crook County to implement the mitigation strategy and associated action items. Capabilities can be evaluated through an examination of broad categories, including existing authorities, policies, programs, funding, and resources.

Existing Authorities

Hazard mitigation can be executed at a local scale through three methods: 1) integrating hazard mitigation actions into other local planning documents (i.e. plan integration), 2) adopting building codes that account for best practices in structural hardening, and 3) codifying land use regulations and zoning designations that prescribe mitigation into the development requirements.

Comprehensive Plan

Oregon's Statewide Planning Goal 7 requires comprehensive planning within every jurisdiction that is designed to reduce risks to people and property from natural hazards. The Crook

County Comprehensive Plan is the official long range land use policy document for the county. It sets forth general land use planning policies and allocates land uses into resource, residential, commercial and industrial categories. It serves as the basis for the coordinated development and/or redevelopment of physical resources.

Chapter IX covers Statewide Planning Goal 7 and was originally adopted in 1978 and last amended in January 2003.

Future updates to the jurisdiction's Comprehensive Plan will reflect the data and findings within this NHMP and integrate analyses of future climate and natural hazards impacts. There is no longer a requirement that counties update their comprehensive plans. Accordingly, rural jurisdictions, like Crook County, often find it difficult to obtain the resources necessary to update their comprehensive plans. Crook County would like to update its comprehensive plan and continues to seek out the funding and resources necessary to complete the project.

Land Use Regulations

Land Use Codes

Crook County's land use ordinance is codified in Title 18 of the Crook County Code. Section related to natural hazards include the Flood Plain Combining Zone (CCC 18.84). Specific use zones, such as the Forest Zone, include provisions to limit wildfire risk (see e.g., 18.28.030).

Structural Building Codes

The Oregon Legislature recently adopted updated building codes for both residential and commercial structures since the last update of this Plan. These codes are based on the 2021 version of the international Building Code, International Fire Code, and International Existing Building Code. Crook County administers and enforces the most recent codes. As a result, both new residential and commercial structures will be required to build according to the latest seismic and wind hardening standards, in addition to requiring fire resistant building materials for those structures constructed in proximity or within the Wildland Urban Interface (WUI).

Policies and Programs

This Plan directs Crook County to explore integration into other planning documents and processes. Crook County has not made progress in integrating the NHMP into its portfolio of planning processes and programs since last updated in 2018. To effectively integrate the NHMP into its planning processes, the comprehensive plan should be updated to reflect the findings of the NHMP. Once the comprehensive plan is updated, the zoning ordinance can be updated into include specific requirements to better limit or eliminate the risk from natural hazards.

Personnel

The following county personnel integrate hazard and resilience planning into their greater work programs to the best of their ability. However, there is limited capacity to expand upon their

capabilities and workloads, meaning hazard planning often competes with other pressing priorities.

- County Planning – The Planning Department implements the Crook County Comprehensive Plan through Title 18 (the zoning ordinance). To the extent natural hazard mitigation is incorporated into Title 18, planning staff make findings insurance compliance with those standards, e.g., fire siting standards.
- Floodplain Manager – the Floodplain manager ensures compliance with minimum standards to limit damage to property owners and the community during a flood event.
- Communications Officer – Provides information to the public during a natural hazards event.
- Public Works – The Road Department assesses the conditions of critical road infrastructure under County ownership and makes recommendations regarding the need to improve or upgrade related infrastructure to ensure a functional road system in the case of a natural hazard event. The Road Department also serves a critical function in making sure roads are safe to travel during a weather event.
- County Emergency Manager – The Emergency Manager is responsible for ensuring update to CWPP and NHMP documents, coordinating with key personnel inside and outside the County organization to prepare for natural hazards, and to lead recovery efforts in the case of an emergency.
- County Admin – County Administration assists all County departments by ensuring adequate funding and resources necessary to respond to natural hazards. County Administration also plays a key leadership role in the time of a natural hazard event.
- County GIS – The GIS Department provides critical data and visual aids in assessing natural hazard risk. GIS also assists with real time mapping during an event, including during wildfires to ensure responders on the ground know where people and potential risk exists.
- County Health Department – The Health Department plays a critical role in ensuring people are safe and healthy during an emergency. They provide resources and information to the public through press releases and social media.

Capabilities Assessment Findings

Crook County has identified several potential natural hazards that could harm the public. However, limited funding and resources (including staffing) limit the County's ability to fully implement certain mitigation processes that may be beneficial to the public in both the near and short term. For example, lack of resources greatly limits the ability of the County to update its comprehensive plan, which was adopted in 1978 and codified in 2003. Updates to the comprehensive plan have been limited and often drive the request of an applicant. As a result, the County's comprehensive plan remains largely unchanged since 1978, despite the growth of the population and changing demographics.

2.4 Vulnerability Assessment

Community resilience can be defined as the community's ability to manage risk and adapt to natural hazard impacts. In order to help define and understand the County's sensitivity and resilience to natural hazards, the following capacities must be examined:

- **Natural Environment**
- **Socio-Demographic**
- **Economic**
- **Built/Infrastructure**
- **Community Connectivity**

The vulnerability assessment describes the sensitivity and resilience to natural hazards of Crook County as they relate to each capacity. It provides a snapshot in time when the plan was developed and will assist in preparation for a more resilient county. The information in this section, along with the hazard assessments located in Section 3 – *Risk Assessment* should be used as the local level rationale for the risk reduction actions identified in Section 4 – *Mitigation Strategy*. This is important because the identification of actions that reduce the county's sensitivity and increase its resiliency assist in reducing the overall risk of disaster.

Environment

The capacity of the natural environment is essential in sustaining all forms of life including human life. The natural environment includes land, air, water, and other natural resources that support and provide space to live, work and create. Natural capital such as wetlands and forested hill slopes play a role in protecting communities from weather related hazards, such as flooding and landslides.

Environmental Resources

- Crooked River Wetlands
- Ochoco National Forest
- Crooked River National Grassland
- Barnes Butte Dam
- Johnson Creek Dam
- Joe Fisher Dam
- Bowman Dam
- Ochoco Dam

Environmental Vulnerabilities

- Extended drought periods continue to affect snowpack and agricultural irrigation.
- Increasing development and activity (including recreation) in the Wildland Urban Interface (WUI) increases threat of wildfire to property and people.
- Changing climate combined with severe-weather related events are indicators of hazard vulnerability. Both wet and dry cycles are likely to last longer and be more extreme, leading to periods of deeper drought and more frequent flooding. Less

precipitation in the summers and subsequently lower soil moisture with hotter temperatures will likely increase the amount of vegetation consumed by wildfire.

Population

The socio-demographic qualities of the community population such as language, race, age, income, and education are significant factors that can influence a community's ability to cope. As noted above, the cost of disaster often falls to the public, and disproportionately impacts vulnerable populations like seniors, children, the disabled, minorities, and low-income individuals and households. For planning purposes, it is essential Crook County, and its communities, to consider both immediate and long-term socio-demographic implications of hazard resilience.

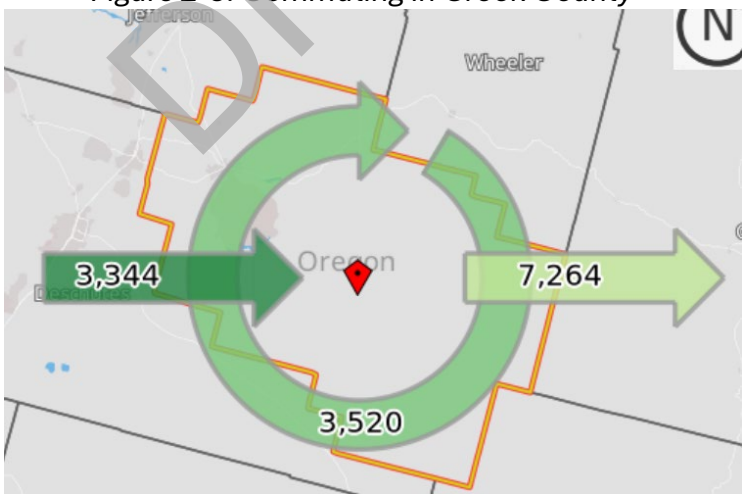
Population Vulnerabilities

- Aging population (24.7% are 65 or older)
- Poverty rate (10.6%)[26]

Economy

During the 1990s the wood products industry in Crook County lost a significant portion of its jobs; four major mills closed and left many residents commuting to surrounding communities, including Bend, Redmond, and Madras for work. Many residents still commute outside of Prineville, but the community has welcomed growth in various sectors. Figure 2-5 below shows people commuting in, working local, and commuting out of Crook County.

Figure 2-5. Commuting in Crook County[27]



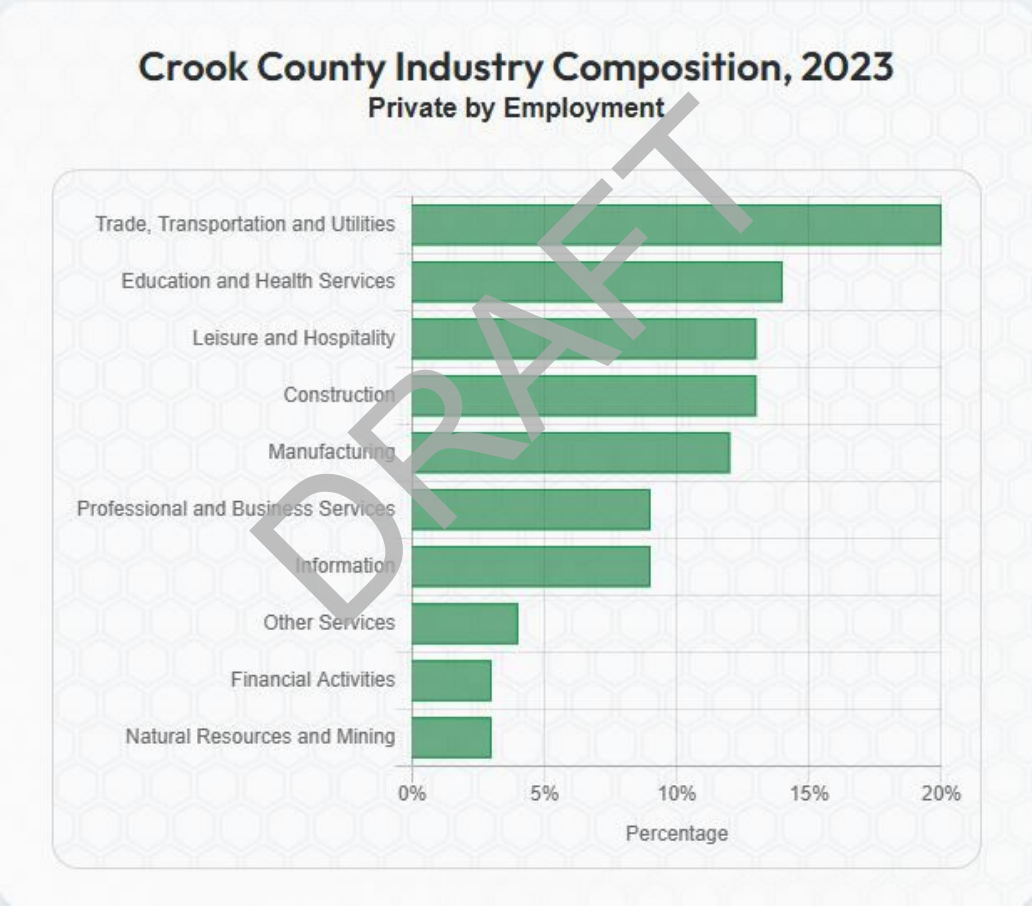
While the county's construction industry has shown tremendous growth due to increased population, a great deal of job growth in Crook County has been in the service and trade sectors as well as the data industry and other alternative energy technology sectors.

[26] https://www.census.gov/quickfacts/fact/table/crookcountyoregon/PST045223
[27] U.S. Census Bureau OnTheMap. February 2025.

Economic growth in these sectors has helped to offset the jobs lost to the crash of the local wood products industry.

Economic growth in Crook County has come from service, trade, or information sectors rather than the traditional resource-based industries. Services are in greater demand, particularly government and health services. Les Schwab is the largest employer in Crook County. Technological industry companies have been established in Prineville, including Apple and Facebook. Recreational uses have also grown in importance to the County, driving population growth and providing the basis for an increasingly important tourism sector of the economy. Beef production, grain, mint, and hay are the main products of Crook County's agricultural sector.

Figure 2-6. Industry Composition for Prineville (2023)[28]



Businesses and Economic Resources

Figure 2-6 above highlights the industry composition in Prineville, Crook County's only incorporated city. The top 3 industries are trade and utilities, education and health, and hospitality. Crook County is home to two Fortune 50 data centers, Meta and Apple.[29]

[28] EDCO Communities – Prineville. https://www.edcoinfo.com/communities/prineville.
[29] IBID.

Economic Vulnerabilities

Crook County's economy may be vulnerable to natural hazard events if, for example, highways, streets, and railroads become impassable due to flooding, landslides, wildfires, earthquakes, or other natural hazard events. Employees would be unable to get to work while products and business inventory, including perishable foods, would be stalled along the way. The County's tourism industry would be impacted. As businesses and industries recover from inventory damage, transportation delays, disruption of communications and utilities, and ultimately loss of customers in the wake of a natural hazard event, the entire community could suffer severe economic consequences.

As Crook County's population continues to grow, it becomes increasingly important that a broad spectrum of partnerships and collaboration exist to comprehensively address natural hazard mitigation and reduce risk and prevent loss for Crook County residents.

Prineville's economy may be negatively affected by a hazard event due to current economic factors such as unemployment and income levels. According to the Oregon Employment Department, Crook County's unemployment rate is 5.7% as of September 2024 (compared to 4.0% for the entire state). Additionally, Crook County's median income is $81,675, which is only slightly higher than the state median income of $80,160.[30]

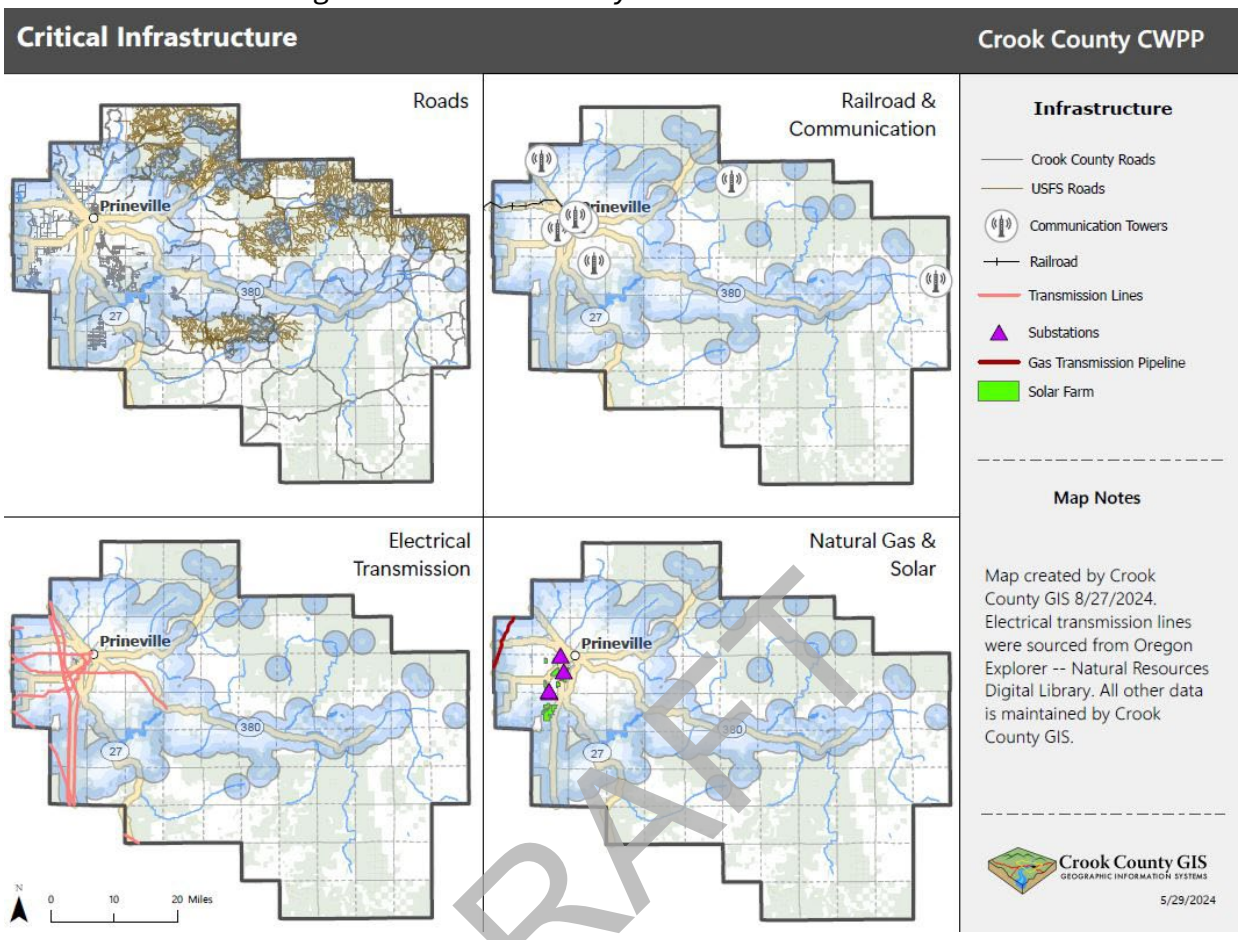
Built Environment, Critical Facilities, and Infrastructure

Critical facilities, housing supply, and physical infrastructure are critical during a disaster and are essential for proper functioning and response. Lack of or poor condition of infrastructure can negatively affect a community's ability to cope with, respond to, and recover from a disaster.

Following an event, communities may experience isolation due to infrastructure failure. The conditions force communities to rely on local and immediately available resources. Ensuring those resources can provide critical services during or immediately following a disaster are critical, particularly those that serve as or provide services for Community Lifelines. These are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.

[30] US Census Bureau. Crook County Oregon. https://data.census.gov/profile/Crook_County,_Oregon?g=050XX00US41013.

Figure 2-7. Crook County Critical Infrastructure[31]



Critical Facilities and Infrastructure

Figure 2-7 above was taken from the recently developed Crook County CWPP (2024). It shows major infrastructure and utilities like railroad lines, gas and electrical transmission lines, roads, and communication towers. All of these structures can be vulnerable to various hazards.

Additionally, the Crook County NHMP Steering Committee has identified the following as critical facilities/sites for the county. These areas may serve as evacuation sites, or provide supplies and lifesaving resources and services during and after an event, etc. They're also places that may be vulnerable to hazard events and thus should be considered when looking for opportunities to provide protection, redundancy, and resiliency in the county.

Critical facilities identified by the Steering Committee were:

- St. Charles Hospital
- Prineville Wetlands Water Treatment
- Crooked River Water Treatment Facility (ASR)
- Crook County Airport

[31] Crook County GIS. Created May 29, 2024, for the 2024 CWPP update.

- Crook County Courthouse
- Armory
- Ponderosa and Bonanza Electrical Feeders
- Crook County Library
- City of Prineville Police Department
- Crook County Sheriff's Office
- Crook County Fire and Rescue
- Crook County Landfill
- Solar Facilities (SW Baldwin Rd & SW George Milican Rd)

Critical Facilities and Infrastructure Vulnerabilities

- Almost all state and county roads and bridges in Crook County are vulnerable to multiple hazards including floods, wildfires, and landslides. Impacts on the transportation system can result in the isolation of vulnerable populations, limit access to critical facilities (like hospitals) and negatively impact employment and economic activity.
- St. Charles Prineville is a critical care hospital with limited beds and staff (16 beds, 198 staff). The campus includes a medical unit, ER, radiology, lab, and outpatient rehabilitation, as well as an integrated primary care and immediate care clinic. No specialists are located on site, but there are rotations of cardiology, endocrinology, orthopedic, podiatry, urology, and women's health.[32]
- There are 293 total lots that intersect with the 100 year floodplain, with a real market value of $101,217,790. Of the 293 lots, about 10 percent were mobile homes, which are very susceptible to flood damage.
- Most critical facilities listed above are built up to seismic code or have been retrofitted, with the exception of the old Crook County Courthouse.[33]

Community Connectivity

Community connectivity places strong emphasis on social structure, trust, and cultural resources within a community. Social and cultural capital are critical to stabilizing a community in recovery after a disaster. Social and cultural capital are present in all communities but will be uniquely reflective of the specific needs and composition of individual communities.

Historic and Cultural Resources and Sites

- Crook County Courthouse
- Bowman Museum and Annexes
- Crook County Fairgrounds

[32] St. Charles Prineville. https://stcharleshealthcare.org/locations/st-charles-prineville.
[33] Email communication with Will Vanvactor, County Administrator. March 7, 2025.

Social Resources

Crook County is home to many organizations that support the community and provide social services. Social resources typically include libraries, schools, churches, community based organizations, service providers, nonprofits, etc. These resources play a crucial role in a community's capacity to withstand and recover from a hazard or stressor by providing access to essential services, support networks, and education.

Below is a list of existing social resources in Crook County, developed by the Steering Committee in 2024:

- Crook County School District
- High Desert Education Services District
- Crook County Library
- Crook County Chamber of Commerce
- Crook County Foundation
- Crook County on the Move
- Central Oregon Community College (COCC)
- NeighborImpact
- Crook County 4-H
- OSU Extension Services
- Crook County Senior Services
- Family Access Network (FAN)
- Kiwanis Club of Prineville
- The Prineville Center Foundation
- The First Baptist Church Food Pantry
- Ascent Christian Church
- Calvary Baptist Church
- Prineville Church of Christ
- Eastside Church
- First Assembly of God
- Powell Butte Church
- Shiloh Ranch
- St Joseph's Parish
- Crook County Veteran Services
- Latino Community Association
- Redemption House Ministries
- St. Vincent de Paul of Crook County
- Crooked River Watershed Council

Political Capacity

Political capacity is recognized as the government and planning structures established within the community. In terms of hazard resilience, it is essential for political capital to encompass diverse government and non-government entities in collaboration; as disaster losses stem

from a predictable result of interactions between physical environment, social and demographic characteristics and the built environment.[34]

All departments with the county governance structure have some degree of responsibility in building overall community resilience. Each plays a role in ensuring that the county functions and normal operations resume after an incident. These roles, as well as existing policy and regulatory structures that provide political capacity are further highlighted in Section 2.3 – *Capability Assessment* above.

Vulnerability Assessment Findings

Vulnerability is a measure of the exposure of community assets to hazards. Identifying facilities, systems, and infrastructure at risk from various hazards will assist the county in directing damage assessment and recovery efforts after a hazard event has occurred. The exposure of county and city assets to each hazard and potential implications are explained in more detail in *Section 3 – Risk Assessment*.

Greatest Vulnerabilities

Crook County's greatest exposures and vulnerabilities are rapid population growth, higher than average unemployment, and an aging population. Crook County is also vulnerable to economic and physical isolation via transportation disruptions during natural events. Finally, the county lacks resources and capacity to regularly integrate hazard mitigation activities into existing policies, programs, and plans.

Greatest Assets

As is the case in many rural communities, the county has a strong social support network, built social capital, and is a deeply connected community. The county also has access to critical services and infrastructure that provide a strong base for community preparedness, response, and recovery. Finally, being surrounded by public and resource land provides Crook County with strong environmental assets that benefit the community and make them more resilient.

[34] Mileti, D. 1999. Disaster by Design: A reassessment of Natural Hazards in the United States. Washington D.C.: Jpseph Henry Press.

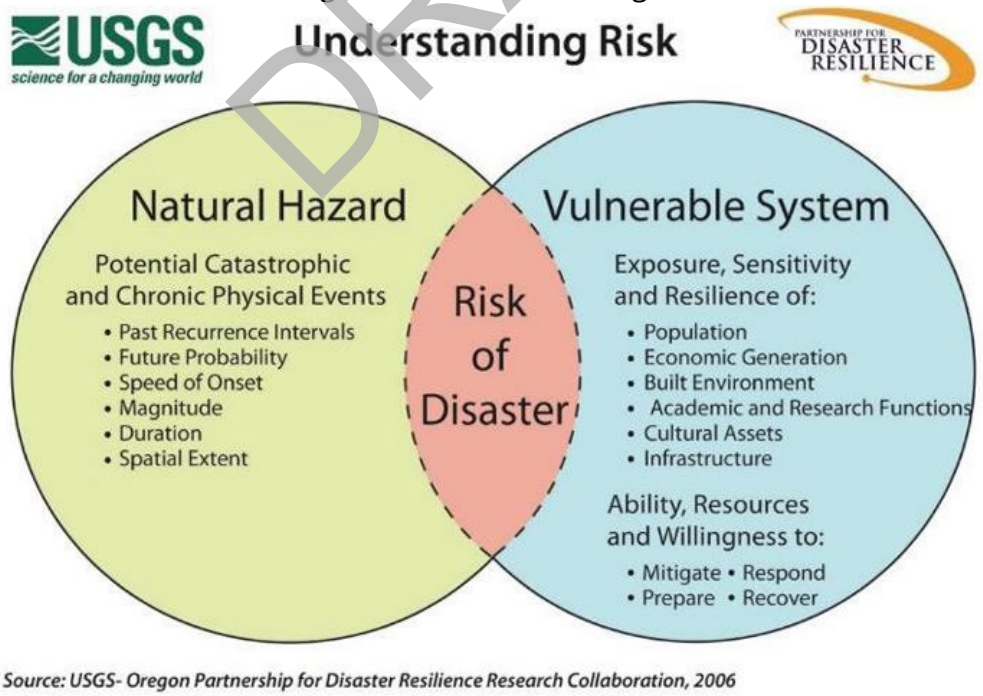
3.0 Natural Hazard Identification and Risk Assessment

Background and Overview

This section of the NHMP addresses 44 CFR 201.6(b)(2) - Risk Assessment. The Risk Assessment applies to Crook County and the addenda included in this NHMP. We address the city and special district specific information where relevant. In addition, this chapter can assist with addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

We use the information presented in this section, along with community characteristics presented in Section 2 – A Tour of Crook County, to inform the risk reduction actions identified in Section 4 – Mitigation Strategy. Figure 3-1 below is a conceptual framework for this risk assessment. Ultimately, the goal is to reduce the area where hazards and vulnerable systems overlap.

Figure 3-1. Understanding Risk[35]



Source: USGS- Oregon Partnership for Disaster Resilience Research Collaboration, 2006

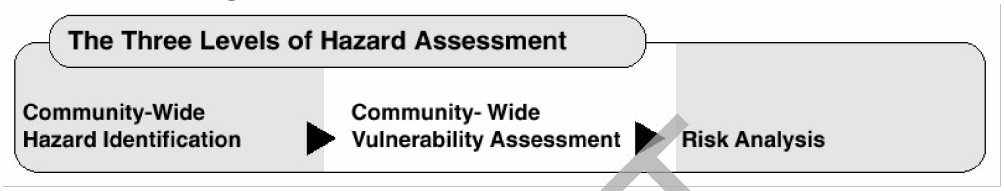
[35] Oregon Partnership for Disaster Resilience.

What is a Risk Assessment?

A risk assessment consists of three phases:

Phase 1 – Hazard Identification: Identify hazards that can affect the jurisdiction. This includes an evaluation of potential hazard impacts – type, location, extent, etc.
Phase 2 – Vulnerability Assessment: Identify important community assets and system vulnerabilities. Examples of vulnerabilities include people, businesses, homes, roads, historic places and drinking water sources.
Phase 3 – Risk Analysis: Evaluate the extent to which hazards overlap with, or have an impact on, the important assets identified by the community.

Figure 3-2. Three Phases of a Risk Assessment[36]



Hazard Identification

The 2018 Crook County NHMP included information and mitigation action items for six natural hazards, including flood, wildfire, severe winter storms, volcano, earthquake, and landslide hazards. During the 2024-25 NHMP update, the Steering Committee reviewed these six hazard types as well as the other possible natural hazards and decided that they remain accurate as the major hazards which impact Crook County, with the addition of one hazard – Drought.

Additionally, subsections on Extreme Heat and High Hazard Potential Dams were added to the Severe Weather Events and Flood sections respectively. Table 3-1 below lists the hazards identified by the Crook County Steering Committee in comparison to the hazards identified for Central Oregon (which includes Crook County) in the 2020 State of Oregon NHMP.

The seven natural hazards, and four sub-hazards, which impact Crook County included in this NHMP are as follows:

1. Drought
2. Flood
    a. High Hazard Potential Dams
3. Wildfire
4. Earthquake
5. Severe Weather Events
    a. Extreme Heat
    b. Windstorms
    c. Winter Storms
6. Volcano

[36] Planning for Natural Hazards: Oregon Technical Resource Guide, 1998.

7. Landslide

Table 3-1. Crook County Hazard Identification Compared to State of Oregon[37]

2025 Crook County NHMP	2020 State of Oregon NHMP Region 6
Drought	Drought
Flood	Flood
High Hazard Potential Dams	N/A
Wildfire	Wildfire
Earthquake	Earthquake
Severe Weather Events	---
Extreme Heat	Extreme Heat
Windstorm	Windstorm
Winter Storm	Winter Storm
Volcanoes	Volcanoes
Landslide	Landslide

Hazard Analysis Matrix

For local governments, conducting the hazard analysis described in this document is a useful early step in planning for hazard mitigation, response, and recovery. This method provides the jurisdiction with a sense of hazard priorities, or relative risk. It doesn't predict the occurrence of a particular hazard, but it does "quantify" the risk of one hazard compared with another. By doing this analysis, planning can first be focused on where the risk is greatest.

This hazard analysis is meant to:

- Help establish priorities for planning, capability development, and hazard mitigation;
- Serve as a tool in the identification of hazard mitigation measures;
- Be one tool in conducting a hazard-based needs analysis;
- Educate the public and public officials about hazards and vulnerabilities; and
- Help communities make objective judgements about acceptable risk.

Methodology

Crook County conducted and completed a hazard analysis of the eight natural hazards using hazard analysis methodology available through resources provided by the Oregon Office of Emergency Management (OEM). The document states the following:

> This hazard analysis methodology was first developed by FEMA circa 1983 and gradually refined by OEM over the years. During 1984, the predecessor agency to OEM (Emergency Management Division) conducted workshops around the State of Oregon

[37] State of Oregon Natural Hazards Mitigation Plan, 2020.

that resulted in all of Oregon's 36 counties producing an analysis using this methodology. Since then, several cities have also conducted an analysis using this method.

The methodology produces scores which range from 24 (lowest possible) to 240 (highest possible), one order of magnitude from lowest to highest. Vulnerability and probability are the two key components of the methodology. Vulnerability examines both typical and maximum credible events, and probability endeavors to reflect how physical changes in the jurisdiction and scientific research modify the historical record for each hazard. Vulnerability accounts for approximately 60% of the total score, and probability approximately 40%.[38]

The eight natural hazard types were scored with severity ratings and weighted factors to produce a numerical hazard rating. The outcomes were then used to prioritize the disasters by type, risk, and vulnerability to Crook County residents and property.

In this analysis method, there are four categories used to consider the overall risk, including:

1. History
2. Vulnerability
3. Maximum Threat
4. Probability

Using the OEM methodology, severity ratings (SR) are applied using the following values:

Low = choose the most appropriate number between 1 to 3 points
Medium = choose the most appropriate number between 4 to 7 points
High = choose the most appropriate number between 8 to 10 points

The severity rating values are used to fill in the following categories as follows:

History (record of previous occurrences)

Low	0 - 1 event per 100 years
Medium	2 - 3 events per 100 years
High	4 + events per 100 years

Vulnerability (percentage of population and property likely to be affected)

Low	< 1 % affected
Medium	1 - 10% affected
High	> 10% affected

Maximum Threat (percentage of population and property that could be impacted under a worst-case scenario)

Low	< 5% affected
Medium	5 - 25% affected

[38] Oregon Emergency Management Hazard Analysis Methodology, updated June 2021 https://www.oregon.gov/oem/Documents/oem_hazard_analysis_methodology_june_2021.pdf

High	> 25% affected

Probability (the likelihood of occurrence within a specified period of time)

Low	one incident likely within a 75 to 100 year period
Medium	one incident likely within a 35 to 75 year period
High	one incident likely within a 10 to 35 year period

Each of the four categories is then weighted to produce a score. The weighted factors are as follows:

1. History (SR X 2)
2. Vulnerability (SR X 5)
3. Maximum Threat (SR X 10)
4. Probability (SR X 7)

Although the analysis considers both objective data and subjective factors, the method produces an outcome in which the hazard types can be compared against one another to prioritize overall hazard risk. Table 3-2 below demonstrates the results of this analysis. "WF" refers to weight factor.

Table 3-2. Crook County Hazard Analysis Matrix[39]

Hazard	History WF: 2	Vulnerability WF: 5	Maximum Threat WF: 10	Probability WF: 7	Total Score	Ranking
Drought	10	10	10	10	240	1
Flood	10	9	9	10	225	2
Wildfire	10	7	7	10	195	3
Earthquake	3	5	10	3	152	4
Severe Weather Event	10	5	6	10	175	5
Volcano	3	7	9	1	138	6
Landslide	2	2	9	4	132	7

As shown in Table 3-2, the **Drought** hazard scored the highest overall risk score with 240 points out of a total of 240 possible points. This is due to the historic and projected frequency of drought in Crook County, as well as the impact on water availability and quality. The **Flood** hazard scored the second-highest overall risk score with 225 points; this high score is due to fairly frequent flood events with high probability of reoccurrence within the next 10–35-year time period. Understanding the comparative risk of the other listed hazards will have a similar logic.

[39] Crook County Steering Committee. 2024.

Completing the hazard analysis required knowledge of the hazards, including history of occurrences, impacts on property and populations, indicators of future probability, and how risks vary throughout the plan area. This knowledge and input from the NHMP Steering Committee was coupled with historical and probability data to develop a score for each hazard.

3.1 Natural Hazards Profiles

Sections 3.1.1 – 3.1.7 provide information specific to each hazard type, including the type, location, and extent of each hazard, the hazard history prior to 2025, future conditions, data sources, vulnerability assessments, and risk assessments. More extensive background information for each hazard in *Appendix C - Hazard Background Information*.

3.1.1 Drought Hazard

Drought is a persistent threat in Crook County caused by a deficiency in precipitation over a period of time. More specifically, it is caused by warmer weather, reduced precipitation and less snowpack in the mountains.

Drought in Crook County threatens people, livestock and agricultural production. Lack of precipitation threatens groundwater (both quantity and quality) that is used for domestic, industrial and agricultural purposes. It also leads to a reduction in surface water that can limit agricultural irrigation, harm wildlife, reduce recreational opportunities, and increase wildfire risk. These impacts can lead to a reduction in economic output and threaten public health.

Drought threatens all parts of Crook County, including the rangeland and forests in the eastern part of the County, as well as the farms, ranches, and populated areas in the western portion of the County. Recent persistent drought conditions correlate with recent population growth leading to an increase in water demand for domestic, industrial, and agricultural uses throughout the County.

Location and Extent

Oregon's climate is very dry in the summer months when water demand is greatest. Central and southeast Oregon are the state's driest regions. Much of Crook County is located in the high desert with an annual precipitation of 10-15 inches. More precipitation falls in the forested Ochoco and Maury mountains, with annual precipitation in a few locations of about 35 inches. This results in very low natural stream flows in most areas in the dry season, especially in late summer and early fall. In a lower-than-average precipitation year drought can easily occur. In years with below average rainfall droughts are not uncommon and can affect the entire County.

Drought severity depends on drought duration and intensity relative to historical conditions at a given location. Drought severity and extent depends on variability in historical weather, climate, and soil moisture is a major consideration in classifying drought. The weekly U.S. Drought Monitor is based entirely on assessment of physical drought indicators and the

duration of dry conditions. The U.S. Drought Monitor drought classification reflects an assessment of physical indicators of drought severity and extent, most of which are meteorological or hydrological (e.g., precipitation, now water equivalent (SWE), streamflow, soil moisture, shallow groundwater, and evapotranspiration), at several temporal extents.

Drought classification is determined by these drought indicators and shown on a national map of drought severity that differentiates short-term drought (duration less than 6 months) from long-term drought (duration greater than 6 months). The U.S. Drought Monitor drought classification has several uses, including the consideration of administrative drought declarations. Examples include emergency drought declarations issued at the county level by the Governor of Oregon or drought declarations issued by the U.S. Department of Agriculture (USDA) to trigger financial relief and crop insurance programs for agricultural producers. In contrast to the U.S. Drought Monitor, administrative drought declarations are based not only on the existence of drought, but also its impacts. These impacts may include shortages of water for municipal use, irrigation, livestock rearing, and other social and economic priorities.

Hazard History

Drought has been common in Oregon in the last 25 years. Central Oregon Counties have had frequent drought declarations since 1991. Klamath has the most, with the other central Oregon counties not uncommonly in a state declared drought emergency. Table 3-3 below shows Governor Declared droughts for Crook County.

Table 3-3. Crook County Governor Declared Droughts since 1991[40]

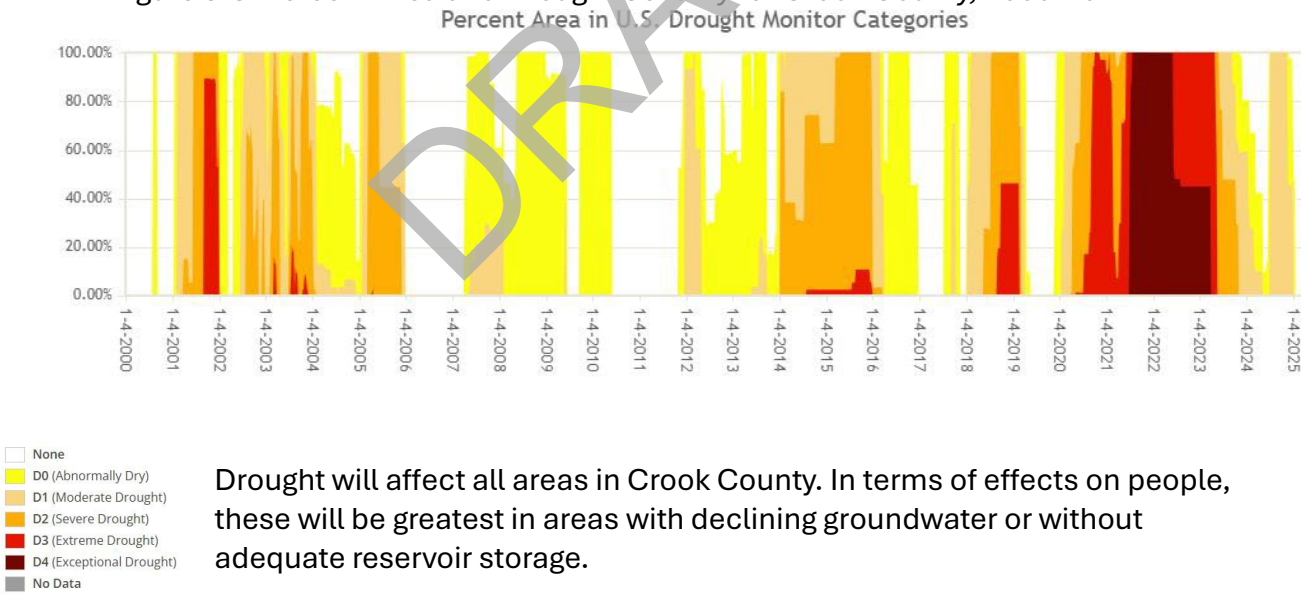
Year	Drought Status	County Request Date	Governor Declaration Date	Fed Declaration Date	Executive Order	Drought Begin Date	Drought End Date
1991	Governor Declared	N/A	4/11/1991	N/A	91-05	4/11/1991	N/A
1992	Governor Declared	N/A	9/3/1992	N/A	92-21	9/3/1992	10/31/1992
1994	Governor Declared	N/A	7/13/1994	N/A	94-08	7/13/1994	9/18/1996
2001	Governor Declared	N/A	5/9/2001	N/A	01-05	5/9/2001	6/26/2003
2002	Governor Declared	N/A	5/9/2001	N/A	01-05	5/9/2001	6/26/2003
2003	Governor Declared	N/A	6/26/2003	N/A	03-05	6/26/2003	12/31/2003
2005	Governor Declared	N/A	4/7/2005	N/A	05-05	4/7/2005	12/31/2005

[40] Oregon Water Resources Department. (2024). Declaration Status Report [Table]. Oregon Water Resources Department. Internal document.

2014	Governor Declared	2/19/2014	3/20/2014	N/A	14-02	3/20/2014	12/31/2014
2015	Governor Declared	3/18/2015	4/2/2015	4/22/2015	15-03	4/2/2015	12/31/2015
2020	Governor Declared	6/17/2020	7/1/2020	5/12/2020	20-31	7/1/2020	12/31/2020
2021	Governor Declared	5/5/2021	6/8/2021	N/A	21-13	6/8/2021	12/31/2021
2022	Governor Declared	3/2/2022	3/21/2022	N/A	22-04	3/21/2022	12/31/2022
2023	Governor Declared	1/12/2023	2/15/2023	N/A	23-05	2/15/2023	12/31/2023

Crook County has been in a state of persistent drought since 2020 and has been dealing with consistent drought conditions since at least 2014. The graph below[41] depicts the extent of the drought conditions during that time period. The yellow represents abnormally dry conditions, with the darkest color representing the most exceptional drought conditions. Drought declarations by the Governor and local government were made in consecutive years from 2020-2023.

Figure 3-3. Percent Area and Drought Severity for Crook County, 2000-2024[42]



Drought will affect all areas in Crook County. In terms of effects on people, these will be greatest in areas with declining groundwater or without adequate reservoir storage.

[41] https://www.drought.gov/states/oregon/county/crook

[42] *U.S. Drought Monitor. (2024). Time Series. U.S. Department of Agriculture, National Drought Mitigation Center, & National Oceanic and Atmospheric Administration.* https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx

Figure 3-4. Example of Historically Observed Impacts of Different Severities of Drought[43]

Category	Examples of historically observed impacts
D0	Ski season is impacted
D1	Some fields are left fallow
	Water levels begin to decline; recreation and other uses impacted
D2	Fire risk increases
	Marshes are drying up, little water is available for waterfowl and wildlife; bears are moving into urban areas
	Pastures are brown; hay yields are down and prices are up; producers are selling cattle
	River flows are low and tributaries are running dry; conservation efforts begin in irrigation districts
D3	Low oxygen and high river water temperatures are affecting fish
	Planting is delayed
	Pumping well water increases; wells are going dry; homeowners are trucking in potable water
	Reservoirs and lakes are very low compared to normal; irrigation water is scarce
	Waterfowl disease outbreaks increase
	Wldfire activity is high

Surface Water (Stream Flows and Natural Lakes)

With higher temperatures and less snow expected to continue, on average there will be less natural stream flow as compared to historical averages. Lack of surface water is one of the main reasons for the past drought declarations. In Oregon, water is appropriated using water rights, which are based on senior water right holders having a right to use limited water supplies, with junior water right holders restricted from using limited water when water availability is insufficient. Junior users frequently are not able to use water in drought years. This means that, for farmers, there may be insufficient water for essential farm uses. This also means that streamflows can be low to non-existent, so aquatic life including fish may suffer. In severe droughts, there can be a water user exception for human and livestock use if the exception is included in a Governor's drought declaration.

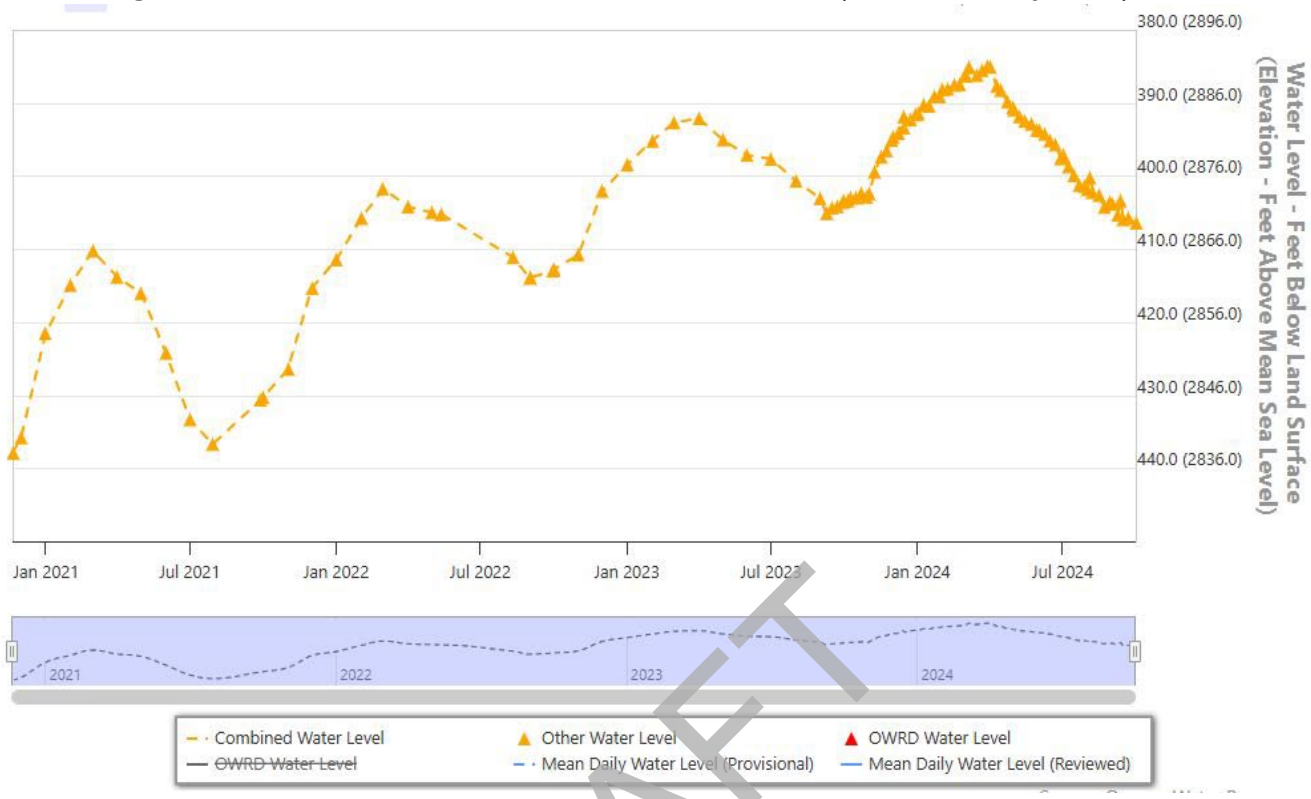
In Crook County, most of the water used by communities and for general use by households is not directly from surface water, but rather from wells as described in the next section.

Groundwater and Wells

Wells are a very important source of water for community members, individuals and for some of the agricultural uses in Crook County. Prineville has city owned wells. The city has a project near their airport that coincided with increased water use associated with data center operation. Aquifer storage and recovery (ASR) is a process that conveys water into underground aquifers. The ASR project near Prineville Airport has had success in elevating local groundwater levels as well. Figure 3-5 below shows the impact of that work.

[43] Ibid.

Figure 3-5. Groundwater Levels for CROO 54907 Well (Jan 2021 – July 2024)[44]



Groundwater levels in several Crook County aquifers show declines in recent years, and there have been many dry well complaints in those areas.

- Deep alluvial aquifer in the Prineville valley has declined ~30 feet in the last 5 years (e.g. CROO 51607). This coincides with very dry conditions in the area and an increase in use from wells in that aquifer.
- Juniper canyon area 5 miles SE of Prineville has a high density of domestic wells accessing a volcanic aquifer. Observation wells show persistent declines of 10-20 feet over the last ten years (e.g. CROO 52726).
- The broad Deschutes aquifer (Sisters-Bend-Redmond area discharging to Crooked and Deschutes Rivers) extends into Crook county. CROO 24 is ten miles west of Prineville and shows 40 feet of decline in the last 30 years.
- There are groundwater level declines occurring in the eastern part of the county. Generally speaking, these declines are associated with Columbia River Basalt aquifers, although there are some exceptions to that.

Reservoirs

Two major reservoirs are owned by the Bureau of Reclamation and managed by the Ochoco Irrigation District. These reservoirs provide water essential for agricultural irrigation and do provide instream flow and flood protection benefits. There are also many privately owned reservoirs in Crook County, most of which are used for irrigation. Reservoirs can also provide

[44] Oregon Water Resources Department.

water for firefighting; however, some irrigation-use reservoirs can be dry during the late parts of fire season. Some reservoirs have other uses as well. Barnes Butte is not emptied for irrigation use, so it is a potential fire-fighting water supply if needed for helicopters to drop on urban interface fires. Joe Fisher dam is believed to recharge groundwater and can also provide fire control water for the Ochoco West community. Dams also can pose risks of flooding if they fail. Dam risks are discussed in the Section on High Hazard Potential Dams.

Future Conditions

Increased numbers of and severity of drought are likely to continue into the future. Along with higher temperatures, increased number and severity of drought. Evidence of change has been observed and may exceed that predicted by models. Add to this that groundwater and surface water are over appropriated in locations, and water supply is lower. All indications are that drought will be at least as frequent in the future as it has been (and in Central Oregon it has been very frequent).

In the 1990s, Central Oregon experienced an annual number of 186 dry days. This number is expected to increase to 192 by 2050.[45] The increase will bring a reduction in quantity and quality of water for domestic and agricultural uses. Because of this, the drier natural vegetation will perpetuate an increase to wildfire risk and even cause a decrease in crop yields, and a decrease or total loss of abundance for some plant species. Malnutrition and food insecurity are both potential threats to Crook County residents as a result of droughts.[46]

Drought Vulnerability Assessment

Drought threatens groundwater reserves resulting in a reduction in water quantity and quality. Rural Crook County relies on groundwater for domestic and agricultural purposes. A decline in water quantity threatens. A lack of a reliable water source may lead to financial loss, leading to mental health issues such as stress and depression.[47] Drought also threatens the quality of groundwater. For example, drought conditions can lead to elevated levels of arsenic.[48]

Drought can lead to declines in crops and livestock productivity.[49] Crook County is a rural community with agriculture serving as an important component of its economy. As drought persists, water availability is limiting increasing the cost to access water for crop or forage production. This can lead to crop failure and pasture loss.[50] Drought can also lead to distribution of pests and diseases that affect crops, forage, and livestock.

[45] Ibid.
[46] Ibid.
[47] https://pmc.ncbi.nlm.nih.gov/articles/PMC4627029/
[48] https://www.hhs.gov/climate-change-health-equity-environmental-justice/climate-change-health-equity/climate-health-outlook/drought/index.html
[49] https://www.google.com/search?q=driought+impact+on+agricultural+uses&rlz=1C1GCEU_enUS1075US1075&oq=driought+impact+on+agricultural+uses&gs_lcrp=EgZjaHJvbWUyBggAEEUYOTIJCAEQIRgKGKABMgkIAhAhGAoYoAEyCQgDECEYChigAdIBCDcyMjVqMGo0qAIAsAIA&sourceid=chrome&ie=UTF-8
[50] *Ibid.*

During drought, fuels, such as grasses and trees, can dry out and become more flammable, posing an increased risk of wildfire.[51] While persistent drought can lead to a reduction in fuels limiting the wildfire risk in some instances, Crook County has seen regular wildfire activity. Drought can lead to extreme wildfire behavior, such as rapid spread and increased severity. This type of fire activity poses a risk to all of Crook County. When wildfire occurs in a drought impacted area, watersheds and reservoirs can be further impacted resulting in a negative effect on animal and human health.[52]

Drought Risk Assessment

As can be noted from Table 3-2, the drought hazard was scored as the highest overall risk score with 240 points out of 240 possible points. Drought has occurred frequently in Crook County's past, and the probability of future occurrence is high. Along with higher temperatures, comes an increased likelihood of occurrence and severity of drought. Additionally, resources are already strained given that groundwater and surface water are over appropriated in locations, and water supply is lower. This will likely continue to impact water availability for farming and municipal uses.

Based upon the experiences documented within this plan, the county finds that there is ***High*** risk associated with the drought hazard, and the vulnerability and maximum threat to property and populations within the County to also be ***High.***

The Crook County Hazard Analysis Matrix Table 3-2 describes the values placed on the overall risk associated with this natural hazard.

[51] https://www.drought.gov/sectors/wildfire-management#:~:text=During%20drought%20conditions%2C%20fuels%20for,rate%20at%20which%20fire%20spreads.
[52] Ibid.

3.1.2 Flood Hazard

Heavy rainfall on top of deep snowpack is the most common cause of general flooding in Crook County. The winter season in the high desert is typically mid-November through early April. Localized flooding can also be caused by intense convective (thunder) storms that occur between mid-March through August.

Crook County lies in the central part of Oregon along the Ochoco Mountains. It is wholly within Climate Division 7 (South Central Oregon) established by the National Climatic Data Center. Prineville (or other specific location) typically receives approximately 10.5 inches of precipitation annually. About half of this precipitation falls in the form of snow while the other half is rain. Rain falling on snow causes the snow to melt more quickly, and river and creek levels to rise rapidly. The two most severe flood events in Crook County were the result of rain falling on an existing snowpack.[53]

Figure 3-6. Mean Annual Precipitation of Crook County, 1991-2020[54]

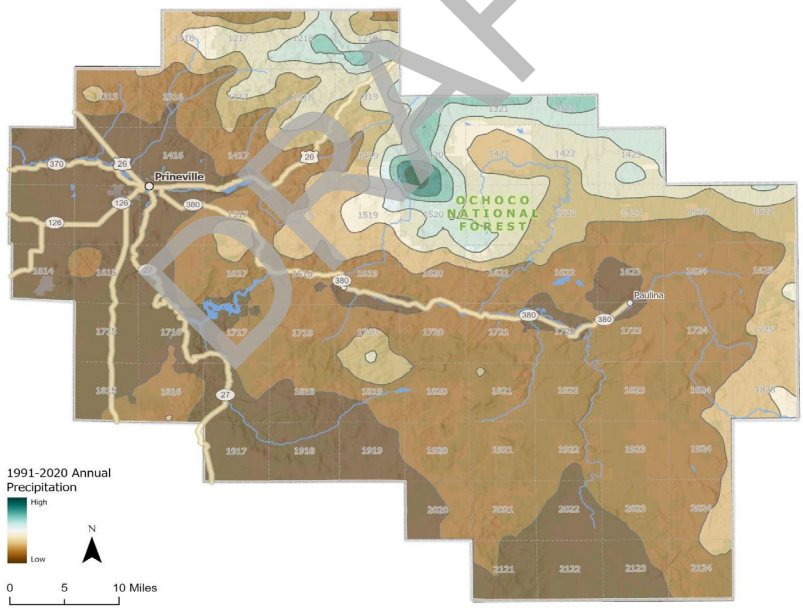


Table 3-4 highlights monthly and annual average precipitation in Crook County, as observed at long-term climate stations within the county.

[53] Interviews with the Crook County Historical Society (September 2003).
[54] 2024 Crook County CWPP. Map developed by Crook County GIS.

Table 3-4. Monthly and Annual 30 Year Average Precipitation Accumulation (Inches) in Crook County (1991-2020)[55]

Weather Station	Mean Precipitation (Inches)												
	J	F	M	A	M	J	J	A	S	O	N	D	Annual
Derr	9.4	13.6	16.8	20.1	22.9	25.5	27.3	27.8	27.9	0	1.9	4.9	16.5
Ochoco Meadows	9.5	13.7	16.5	19.5	22.2	24.6	26.2	26.9	27.6	0	1.8	5	16.1
`Snow Mountain	8.8	12.4	15.1	18.1	20.9	23.3	24.8	25.2	25.7	0	2	4.9	15.1

Table 3-5. Mean 30-Year Snow Water Equivalent (Inches) in Crook County (1991-2020)[56]

SNOTEL Station	Snow Water Equivalent at Month Start (Inches)											
	J	F	M	A	M	J	J	A	S	O	N	D
Derr	5.7	9.6	12.6	12.5	3.5	0	0	0	0	0	0.1	1.6
Ochoco Meadows	4.4	7.5	9.1	7.2	1	0	0	0	0	0	0	1.3
Snow Mountain	3.9	7	9.1	10.5	4.8	0.1	0	0	0	0	0.2	1.3

Location and Extent

The eastern, northern, and southern boundaries of Crook County are mountainous, with the Crooked River and tributary valleys in the center of the county. Mountain basins collect rain and snow and deliver it to Crooked River and Ochoco Creek Valley.

The depth of soil, permeability of soil and rock, type and relative amount of vegetation cover and permeability of the ground surface all affect how rain and snowmelt moves into stream channels or is stored in soil or as groundwater in rock. When soils are compacted or altered to a hydrophic condition by fire, rainwater moves rapidly into the streams, increasing flooding potential. Clearing for development, agricultural use, and logging or forest management that compacts or burns soil contribute to increased flood potential.

The rural area of Crook County has relatively limited floodplain residential development given the agricultural use outside city limits. While residential development in rural areas is limited in the flood prone areas, existing homes and critical infrastructure, such as roads, bridges, and dams, can be damaged during flash floods or other flood related events.

[55] USDA Air and Water Database Report Generator. Accessed March 3, 2025.
[56] Ibid.

Areas where historic development in the floodplain occurs in Crook County are concentrated along Ochoco Creek, McKay Creek and the Crooked River in and around the City of Pineville. Increased development within the floodplain increases the risk of flood damage to buildings and people. When structures or fill are placed in the floodplain, water is displaced. Impermeable surfaces such as roads, parking lots and buildings have the greatest effect on increasing timing and volume of runoff delivered to streams. Development may cause floodwater to rise higher than before the development was located in the hazard areas. This is particularly true if the development is located within the floodway. Impervious surfaces, including roads, parking areas, and roof structures collect water rapidly and transport the water to stormwater systems that may not be designed to mitigate heavy rainfall conditions, which will result in flooding.

The floodplain begins as a very narrow strip of land adjacent to the upper tributaries of Ochoco Creek and Crooked River and steadily increases in width at lower elevations. The floodplain is widest in the center of Prineville and near the confluence of Ochoco Creek and Crooked River. The Ochoco River bisects the City of Prineville, and the floodplain location includes urban areas.

Hazard History

Flooding is a familiar occurrence in Crook County. Over the past 100 years, the county has experienced flooding events on a regular basis. Floods are the most common of all natural hazards, and both Oregon and Crook County have an extensive history of flooding. The frequency of flooding combined with concentrated development along rivers and streams caused millions of dollars in damage to Crook County over the past several decades. The growing population and development activity in the floodplain can increase the risk of flood related damages.

The following timeline lists some of the major flood events that have occurred in Crook County:

- August 4, 1904: Crooked River floods, destroys crops, shuts down the Prineville Railway, washes away portions of a State Highway.
- 1918: A flood in downtown Prineville, homes and businesses were damaged. Citizens were displaced and both the Crooked River and Ochoco Creek swelled.
- December 1951, January 1952: Prineville flooded, Crooked River ran well over its banks. Many businesses and homes were damaged. 300 people and 150 homes evacuated.
- December 1955, January 1956: Prineville flooded. Citizens were evacuated, homes and businesses were damaged.
- August 1991: Rural Crook County, Near Post. What was described as the Aspen Valley Flood. Also described as Newsome Creek. A summer supercell dumped several inches of rain. Barns and houses were demolished, one person was killed, and one person was injured.
- May 1998: Prineville flooded, Ochoco Creek rose beyond flood levels. A Federal Disaster Declaration resulted.

- Winter 2005: Juniper Canyon flooded. Damage to rural infrastructure and property occurred; including transportation disruptions.
- January 2011: Rural Crook County, near Post and Juniper Canyon. A heavy rainfall, melting snow, and ice-dammed culverts contributed to flood conditions. Damage to rural infrastructure and property occurred; including transportation disruptions.
- May 2023: Rural Crook County, near Dry Creek (near Juniper Canyon Road). Heavy rainfall caused snow to melt, filling reservoirs and raising Ochoco Creek and the Crooked River levels. Flooding was limited to Dry Creek where high waters caused Juniper Canyon Road to close. Some outbuildings experienced water infiltration.
- May 2023: Rural Crook County in Powell Butte: Strong thunderstorm caused flash flooding, damaging roads in Crook County and also damaging homes in the Brasada Ranch community.

The landmark flood event for Crook County in the last century was the flood of 1952. This flood set most of the record high-water marks for the region. The primary cause of this flood was warm rain on a substantial snowpack. The rain quickly melted the snow and caused Ochoco Creek and the Crooked River to overrun their banks. All subsequent floods have been compared to this event. The 1952 flood was characterized as a "100-year" flood event, or a flood event with a return interval of 100 years. A "100- year" flood has a 1% chance of occurring in any given year, or a 26% chance of occurring during the life of a 30-year home mortgage.

In May 1998, Crook County experienced another devastating flood. In the weeks preceding the flood, the county received abundant rain and snowfall. A warm and heavily moisture-laden storm front, typical to the Pacific El Nino pattern, followed the abundant snowfall. The warm rain quickly melted the snowpack, and county streams and rivers rapidly filled their channels, exceeding their banks. This particular flood event caused over $16 million in damages to Crook County homes, businesses and infrastructure, including damage to over 1,000 properties; over 1,000 residents were impacted by the flood.[57]

Future Conditions

Different from temperature, there is great uncertainty in the effects of future climate variability on precipitation in Oregon. In general, rainfall producing storms should become more extreme, but occur less frequently. With increased winter temperature there has been less snowpack overall, and this trend is expected to continue. This may mean that there will be more intense short duration storms, but possibly less likely long duration storms in Central Oregon (localized flooding may increase, large river flooding may decrease).

Extreme precipitation will bring an increase in the frequency and intensity of floods due to stronger storms and the shift from snowfall to rainfall during warmer winters. With the increase of flooding brings an increase to exposure of water and vector-borne diseases.

[57] City of Prineville/Crook County Flood Mitigation Action Plan, Clay Moorhead, CDA Consulting Group Inc. (2000)

The Water Resources Department (OWRD) is currently funding two studies looking at extreme precipitation in Oregon, and how that has been or might be affected by future climate variability. Preliminary results indicate that the existing methods used to calculate probable maximum precipitation do not reflect meteorological processes and orographic conditions in Oregon. The results of this study should be completed in 2026. Prior to the OWRD study there had been no observation of non-stationarity (change in extreme precipitation) apparent in Oregon.

3.1.2.1 High Hazard Potential Dams

Failure of dams usually results from flooding that is much more severe than other types of floods, since they can store and release months to years volume of water in a very short time period. Failures of dams can and have been catastrophic if there are people in the area inundated by the dam failure. Because of this risk, there are state and federally authorized dam safety programs. The Oregon Water Resources Department is the state authority for dam safety with specific authorizing laws and implementing regulations for dams. Oregon's dam safety laws were rewritten in 2019. This law and new regulations both became operative on July 1, 2020.

OWRD coordinates on but does not directly regulate the safety of dams owned by the United States or most dams used to generate hydropower. With the Department of Emergency Management, OWRD is the Oregon Emergency Response System contact in the event of a major dam emergency. Oregon's statutory size threshold for dams to be regulated by OWRD is at least 10 feet high and storing at least 3 million gallons. Oregon's new dam safety laws were developed considering the joint Association of State Dam Safety Officials and FEMA's Model State Dam Safety Program. Oregon uses the three recommended hazard ratings, High, Significant, and Low, and requires Emergency Action Plans for dams rated high hazard.

High Hazard Potential Dams in Crook County

Dam failures are uncommon but have occurred in many parts of Oregon. The OWRD Dam Safety Program has records of at least 55 dam failures in the State. Many of these failures had very little or no impact on people, structures, or properties. Of these, 21 dams had more serious to tragic effects and include one Crook County dam, Bonney View, which failed in 1920. That dam is located on Horse Heaven Creek near Post. It has been reconstructed. It is currently rated as a significant hazard potential.

State Regulated Dams

Oregon regulates non-federal owned dams, including dams on Federal lands with a non-federal water right. The three State regulated dams currently rated high hazard are shown below in Table 3-6. Barnes Butte dam is the only dam eligible for HHPD rehabilitation funding.

Table 3-6. State Regulated Dams Located in Crook County[58]

Dam Name	NID	Location	Owner	Condition
Barnes Butte	OR00284	0.5 Miles NE of Prineville	Private	Unsatisfactory
Johnson Creek	OR00232	3 Miles NE of Prineville	Private	Fair
Joe Fisher	OR00248	8 Miles N of Prineville	Ochoco West	Satisfactory

The OWRD Dam Safety Program assisted in funding the completion of an Emergency Action Plan (EAP) for the Barnes Butte dam. The EAP was completed in 2014 with OWRD assistance. An EAP table-top exercise based on the most likely potential failure mode was planned for late 2024. This exercise compiled information necessary for more effective warning and evacuation if needed. The exercise will be used to update the EAP as needed.

Federal Owned/Regulated Dams

Federal dams are not eligible for HHPD funding, and information on these dams can be obtained directly from the Federal owners. The County has coordinated on Emergency Action Plan exercises for the two high hazard Federal dams in Crook County, which are shown below in Table and Figure 3-7.

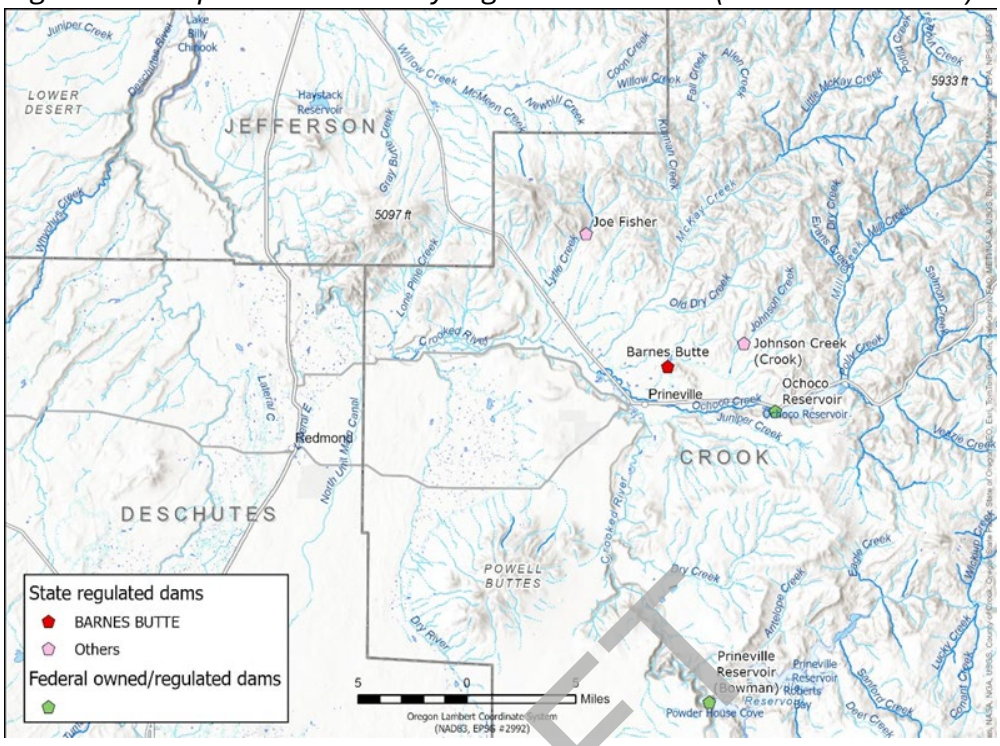
Table 3-7. Crook County Federally Owned Dams[59]

Dam Name	NID	Location	Owner/Regulator
Bowman (Prineville)	OR00098	15 Miles S of Prineville	Bureau of Reclamation
Ochoco	OR00579	5 Miles E of Prineville	Bureau of Reclamation

The dam safety authority for the two Federal dams in Crook County is the US Department of Interior Bureau of Reclamation. The two Federal dams are operated by the Ochoco Irrigation District. The Ochoco dam is currently under risk analysis for seismic stability vulnerability, and that analysis is expected sometime in 2025.

[58] Keith Mills, OWRD Senior Dam Safety Engineer. 2024.
[59] Ibid.

Figure 3-7. Map of Crook County High Hazard Dams (State and Federal)[60]



One state regulated dam in Crook County, Barnes Butte dam is in Unsatisfactory Condition. This is the only dam eligible for HHPD rehabilitation funding. One other dam (Ochoco, which is federally owned and regulated) is currently under risk analysis for seismic stability vulnerability, and that analysis is expected at the end of 2024. Federal dams are not eligible for HHPD funding. The following is a summary of basic information on Barnes Butte dam. The acronym PAR means Population at Risk, or the population living in the area that would be inundated by failure of the dam. This number is larger or much larger than expected loss of life in an actual dam failure.

Communications of Existing Dam Plans and Studies

This section is intended to communicate important dam safety information about Barnes Butte dam. More detailed information is also available from the dam safety program, almost all of which is public information, with only specific contact information and dam vulnerabilities not available to the public (but available to emergency managers). The Oregon dam safety program provided funding for a Probable Maximum Flood (PMF) and risk-based inflow design determination and spillway alternatives analysis project for Barnes Butte dam and also completed a semi quantitative risk assessment for this dam and 16 other state regulated dams.

The dam safety program maintains the following documents or type of documents for Barnes Butte dam:

[60] Keith Mills, Oregon Water Resources Department, 2024.

Dam Breach Inundation Analyses: An analysis project was completed for the dam in 2013. The inundation analysis was conducted using the version of HEC-RAS available at that time of mapping. The inundation map is included in the Emergency Action Plan for the dam.

Emergency Action Plan: The OWRD Dam Safety Program assisted in funding the completion an Emergency Action Plan (EAP) for the dams. The EAP was completed in 2014 with OWRD assistance. An EAP table-top exercise based on the most likely potential failure mode will be planned for late 2024. This exercise will compile information necessary for more effective warning and evacuation if needed. The exercise will be used to update the EAP as needed.

Dam Safety Inspections: As a high hazard rated dam, state dam safety engineers inspect Barnes Butte dam once every year. These inspection summaries and forms, as well as photos, are maintained by the dam safety program for the life of the dam and are available upon request.

Notices and Enforcement: OWRD dam safety sent the most recent Notice of Corrective Action for Barnes Butte dam was sent by registered mail to the owner on March 12th, 2024.

Construction Records: The dam was constructed in 1956. There is a single design drawing for the project, and a single construction inspection letter. This is a much smaller set of records than for most state regulated dams.

Conceptual Spillway Design: Initial HHPD funding has been used for engineering analysis of spillway alternatives for the dam. These reports were developed based on engineering analysis. The spillway analyses and risk analyses for this dam are available upon request from the dam safety program. HHPD funding could be available to assist with final design and construction work. The owner was informed there is a cost match associated with the funding.

HHPD Risk Assessment

With risk assessment now an important dam safety function, Oregon dam safety staff developed and implemented an assessment protocol for use on State regulated dams to support FEMA grant processes. Seventeen high hazard dams with known or suspected major safety deficiencies, including Barnes Butte dam have been assessed. The assessments included quantitative evaluation of events associated with failures, loadings in those events, and loss of life from catastrophic failure. Events assessed in this project include flood, high water earthquake, and landslides above the reservoir or dam. Existing file information was comprehensively reviewed during this project, with special inspection elements based on information and gaps in the dam safety program files for those dams. The product is a consistent procedure and includes a rating of confidence in the information. Results are calculated in terms of expected loss of life

on an annualized basis. Much more detail on the risk assessment can be found in Report EMW-2019-GR-0029, which is available from the Oregon dam safety program.

Semi Quantitative Risk Assessment

The combined mean annual risk of failure of this dam is 1.0E-4 plus or minus 2 orders of magnitude. The primary mode of failures is overtopping in an extreme flood, most likely from a local thunderstorm that is stationary or nearly stationary. The average day/night population of 1718 was used for this analysis. The annual loss of life risk is approximately 3.4E-1 plus or minus 2 orders of magnitude. This is the 2nd highest of the 17 dams HHPD dams assessed for risk by the Oregon WRD dam safety program.

Advanced Warning and Evacuation Potential

There is no reservoir level gauge at the dam, so early warning of unusually high reservoir level is unlikely, and therefore it's likely there would be little warning prior to failure (from no warning to about 3 hours warning). Based in part on this information, the loss of life was estimated to be 20 percent of the PAR. There is no significant potential for cascading impacts from storms, seismic events, landslides, wildfires, etc. on dams that might affect upstream and downstream flooding potential at Barnes Butte dam.

Location of the Population at Risk

City of Prineville city center, especially around Main Street and around Ochoco Creek west of Main Street. Likely significant fatalities unless people are safely evacuated prior to dam failure.

Infrastructure Impacts

Highway 26 and Main Street washed out and disrupted all utilities in parts of the inundation area.

Economic, Environmental, and Social Impacts

Very significant economic and social impacts, including many homes and businesses being destroyed, and many more damaged.

Methodology and Limitations

PAR was calculated using the DSS-Wise HCOMM analysis tool. Structures were evaluated with numbers taken directly from DSS-Wise HCOMM. Risk Estimates are documented in Report EMW-2019-GR-0029. The other limitations include limited design information and lack of construction documentation for Barnes Butte dam.

Flood Vulnerability Assessment

The flood hazard for Crook County and the City of Prineville was identified by FEMA in their Crook County Flood Insurance Rate Maps (FIRMs). These maps were first completed in July 1989. The maps outline the extent of the 100-year, or base, floodplain; the floodplain consists of the area of land which would be impacted by floodwaters in a flood event of this magnitude. These maps are used by FEMA to identify properties that need to purchase flood insurance

and, if developed, need to meet floodplain development regulations. FIRMs for Crook County were updated by FEMA in February 2012. These maps were based upon updated information and technology that increased the accuracy of delineating the 100-year floodplain and floodway area along the Crooked River and Ochoco River. Updated FIRMs are available at the FEMA Flood Map Service Center.[61]

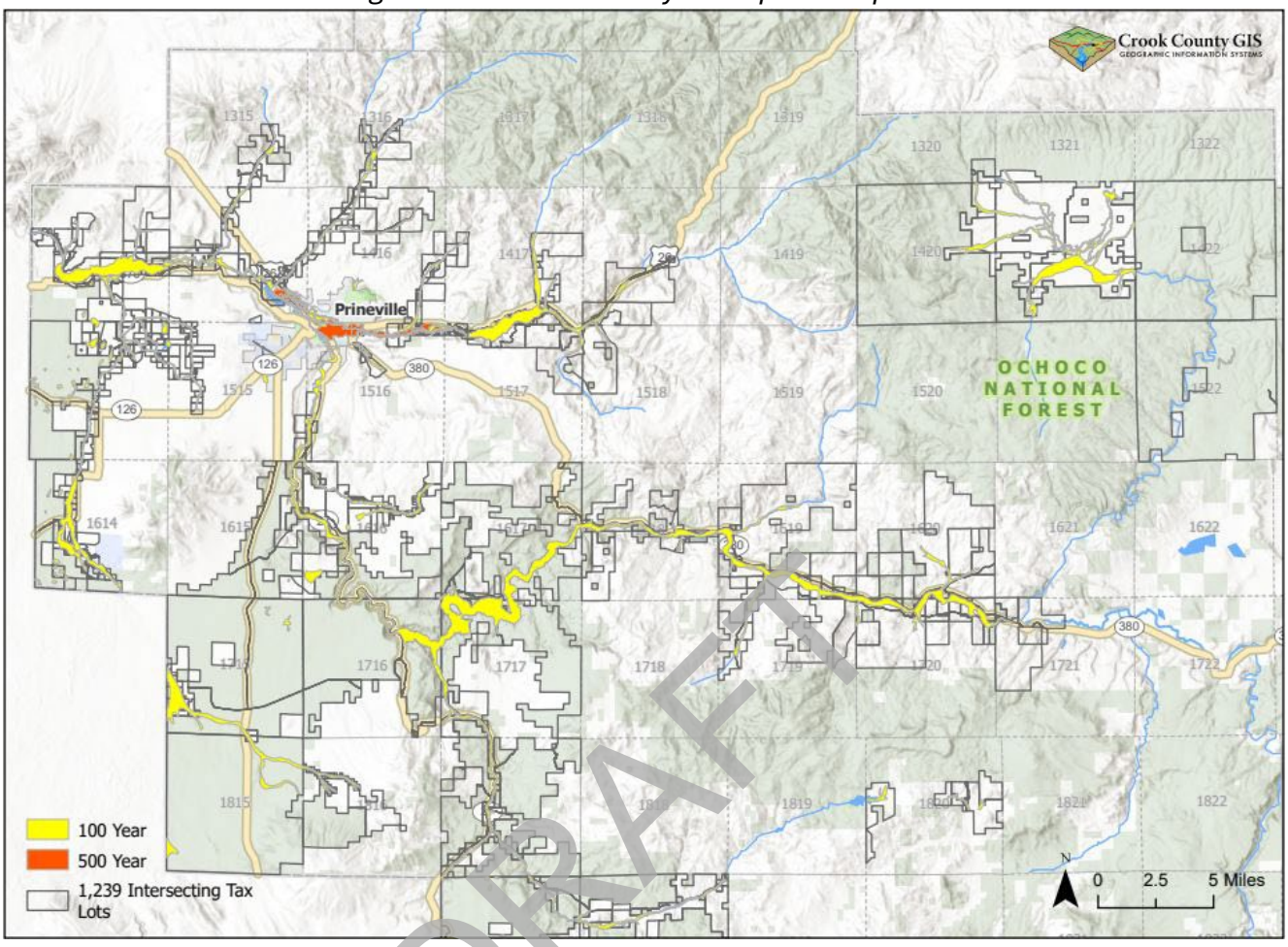
Using GIS technology and inundation analysis models, it is possible to map the damage that can be expected from different flood events. The Crook County Geographic Information System (GIS) Department has incorporated updated FIRM data into their GIS database. A query was developed to combine floodplain boundaries of 2012 FIRM data with the current certified tax roll for properties within the County. FIRM data was used to identify the flood hazard for the 2018 NHMP update and further refined during the 2024-25 update.

Figures 3-7 below show the spatial distribution of the Crook County 100-year-event and 500-year-event floodplain as identified in the 2012 FIRMs. Although the scale of the county-wide map shown in Figure 3-7 makes it difficult to identify exact structures which would be impacted in a 100-year and 500-year flood event, we use this to reference the floodplain data available through the FEMA FIRMs and through Crook County's GIS system.

Additional flood hazard risk potential is in regard to the Ochoco Reservoir Dam and Barnes Butte dams. See the HHPD Section of this chapter above for more detail on dam breach related flood potential.

[61] FEMA Flood Map Service Center. https://msc.fema.gov/portal

Figure 3-8. Crook County Floodplain Map[62]



Flood Risk Assessment

The Prineville city boundary has expanded in recent years. In 2018 (updated in 2024), a query was developed through Crook County GIS which used updated corporate boundary lines to select tax lot parcels that intersected the 100-year floodplain. This information was cross-referenced to the real market value (improvements component only) for five building types. In the 2025 NHMP update, a request was made to FEMA and the Oregon Department of Land Conservation and Development (DLCD) to determine if there were any properties located in Crook County that were National Flood Insurance Program (NFIP) repetitive flood loss properties; none were identified.[63]

Information from the Crook County GIS office was combined with the FIRMs to estimate the improved property value which may be vulnerable to damage due to a 100-year flood event in Crook County. Table 3-8 shows statistics for Crook County (unincorporated), the City of Prineville, and Crook County (combined total) in regard to the real market value (improved

[62] Crook County GIS. Received via email March 6, 2025.
[63] Email communications with Christine Shirley, NFIP Coordinator, OR Department of Land Conservation and Development, 3/29/2017 & 4/5/2017.

components only) for five building types which intersect the 100-year floodplain; this table identifies the number of tax lots and the real market value (RMV) for the Crook County flood hazard areas, and the maximum estimated losses caused by a flood disaster occurring along the Crooked and Ochoco Rivers. As of January 2025, there were 293 tax lots located within the 100-year floodplain, with an improved real market value of $101,217,790. Of the 293 lots, about 10 percent were mobile homes, which are very susceptible to flood damage. Table 3-9 provides information received from FEMA Region X related to how Crook County and the City of Prineville participate in the National Flood Insurance Program (NFIP).

Table 3-8. The Crook County Flood Hazard Assessment Table

Shows the number and real market value (RMV) (improvement components only) of structures which intersect the 100-year flood event floodplain.[64]

Building Type	Crook County (Unincorporated)		City of Prineville		Crook County Combined	
	# Tax Lots	RMV Land	# Tax Lots	RMV Land	# Tax Lots	RMV Land
Single Family (101, 401, 801)	258	$42,673,830.00	383	$38,305,430.00	641	$80,979,260.00
Multifamily (701)	1	$558,460.00	5	$974,480.00	6	$1,532,940.00
Mobile (019) *This is calculating the RMV Land of the tax lot, which mobile homes exist on.	28	$4,657,010.00	13	$1,012,660.00	41	$5,669,670.00
Commercial (201)	2	$1,254,470.00	60	$6,090,220.00	62	$7,344,690.00
Industrial (301, 303)	4	$228,470.00	24	$5,462,760.00	28	$5,691,230.00
Total	293	$49,372,240.00	485	$51,845,550.00	778	$101,217,790.00

[64] Crook County GIS, 2025.

Table 3-9. Information Regarding the Participation of Crook County and the City of Prineville in FEMA's National Insurance Program[65]

FIRM = Flood Insurance Rate Map. Rep. = repetitive. CAV = Community Assistance Visits.

Jurisdiction	Current FIRM Date	Initial FIRM	CAV Date	Total Paid Losses	Substantial Damage Claims	Rep Losses	Severe Rep Losses	Total Policies	Pre-FIRM Policies
Crook County (Un-incorporated)	February 2012	July 1989	May 1999	11	0	0	0	65	34
City of Prineville	February 2012	July 1989	May 1999	37	3	0	0	134	74

DOGAMI is currently developing a multi-hazard risk assessment for Crook County for four hazards, including flood.[66] This assessment combines building location with assessor information to develop a detailed building inventory. Those buildings are then overlayed with hazard information. Risk is calculated in terms of the dollar amount and number of people impacted. Critical facilities that may be impacted are included in the report. This report is expected to be available to Crook County in July of 2025.

As can be noted from Table 3-2, flood hazards scored as the second- highest overall risk score with 225 points out of 240 possible points. This is supported by the fact that there have been more frequent and more severe impacts associated with flood occurrence. This is compounded by a high probability of occurrence within the next 10-35-year time period. Historically, significant development and urban populations are located within flood prone areas of Crook County (specifically, in and around Prineville).

Based upon the experiences documented within this plan, the county finds that there is ***High*** risk associated with the flood hazard, and the vulnerability and maximum threat to property and populations within the county is also ***High*.**

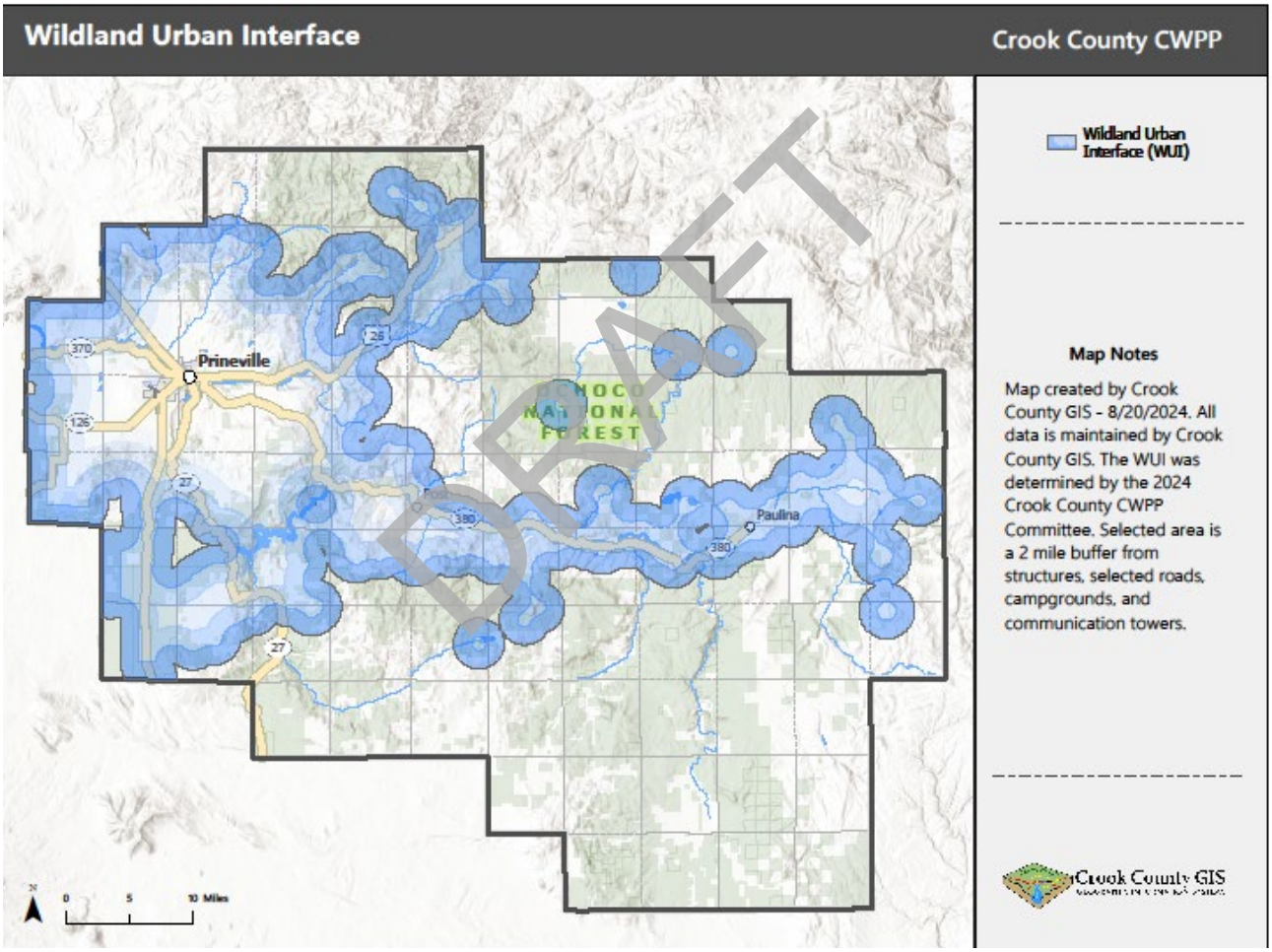
[65] Email communications with Christine Shirley, NFIP Coordinator, OR Department of Land Conservation and Development, 3/29/2017 & 4/5/2017.

[66] Email communication with Matt Williams, DOGAMI. January 2025.

3.1.3 Wildfire Hazard

Wildland fire is a significant natural hazard in Central Oregon due to its frequency and severe impacts. While Crook County has experienced only a few large wildland-urban-interface (WUI) fires, it has been the setting for many smaller fires with significant potential for major impact on WUI areas and critical infrastructure. Neighboring counties have experienced numerous high impact WUI fire incidents providing Crook County emergency managers insight into the complexities of such incidents. Crook County residential development is expanding further into sites traditionally covered by wildland vegetation. Figure 3-9 below shows the wildland-urban interface (WUI) map the 2024 Crook County Community Wildfire Protection Plan Steering Committee created to identify their community's wildfire risk.

Figure 3-9. Wildland Urban Interface as Identified by the 2024 Crook County CWPP[67]



Location and Extent

The escalating size and intensity of these interface fires is the subject of continued research in several scientific disciplines, including forest health, hazardous fuels treatment, and community infrastructure protection as well as study of the impacts of future climate

[67] 2024 Crook County Community Wildfire Protection Plan, Appendix D, page 79.

variability. These issues are likewise the subject of significant public discourse. Over the last two decades, community awareness has developed substantially regarding the WUI fire threat as well as interest and involvement in issues of hazardous fuels treatment activities. Increases in large fires in recent years have heightened community awareness and willingness to address fire safety.

During the 2010s and early 2020s, Crook County has seen continued growth in and around the City of Prineville, as well as in unincorporated rural residential areas. According to the United States Census Bureau, based on 2022 estimates, Crook County was the fastest growing county in Oregon. The 2022 Census estimates the population of Crook County to be 26,583, with having a growth rate of 6.6% between 2020 and 2022.[68] This growth provides exciting opportunities for the community and its citizens but poses challenges that must be addressed. One such challenge is increased development in fire-prone areas and the wildland-urban interface, exposing citizens to increased risk from wildland fire.

Crook County Fire & Rescue staff help property owners better understand how to protect their homes from wildfire through their Defensible Space Assessment / Crook County Fire Ready program. Through this program, CCFR staff conduct wildland risk assessments of private landowner property and educate property owners on how to make their property more fire resistant. Since 2018, four communities throughout Crook County have worked with local fire officials to obtain and maintain their Firewise USA certification through the National Fire Protection Association's (NFPA's) Nationally Recognized Program. The outputs of these risk assessments and Firewise community efforts have been incorporated into the 2024 CWPP. The 2024 Crook County CWPP (https://www.colc.org/crook-county-cwpp/) can be found online at or by contacting your local fire district.

The high desert climate of Crook County contributes to its wildfire risk. Lightning is a main fire cause in Crook County with human caused fires following behind it. Fuels, topography and weather influence wildfire behavior for the County. While fuel is a factor that can be mitigated, weather and topography cannot. These two factors play a significant role in fire behavior, but can only be understood, not influenced. Precipitation patterns can impact Crook County's topography and fuel. Figure 3-6 in the Flood section above illustrates Crook County precipitation patterns.

Large Fire History: 1990-2010

Tables 3-10 and 3-11 list some of the larger wildland fires (>40 acres) in the area that necessitated an emergency management response beyond that of the local wildland fire and natural resource agencies. Since the 1990 Awbrey Hall fire, the local structural and wildland fire services have substantially refined the emergency response system for these types of destructive interface fires.

[68] PSU Research Center

Table 3-10. Large Fire History in Crook County (1990-2010)[69]

Year	Fire Name	Size (Acres)	Start Date	County	Conflagration Act Resources Mobilized	Unprotected Areas Involved	Remarks
2000	Hash Rock	18,500	8/23/2000	Crook	Yes	Structural	30 residences and 32 commercial buildings threatened in the Mill Creek and Marks Creek drainages. U.S. Hwy 26 traffic controlled with pilot car.
2007	Mile Post 8	120	9/27/2007	Crook		Structural, Wildland	1 dwelling structure saved, 1 threatened, zero destroyed.
2008	Juniper Butte	40	7/19/2008	Crook		Structural, Wildland	5 dwelling structures saved, 5 threatened, zero destroyed.

Table 3-11. Wildland Urban Interface Fires in Central Oregon, 2011-2016[70][71]

Year	Fire Name	Size (Acres)	Start Date	County	Conflagration Act Resources Mobilized	Unprotected Areas Involved	Remarks
2012	Pole Creek	26,119	9/9/2012	Deschutes	No	No	Lightning-caused wilderness fire that impacted the community of Sisters

[69] Data derived from multiple Oregon State Fire Marshall, U.S. Forest Service, Oregon Department of Forestry and Bureau of Land Management sources. Data since 2010.
[70] Email communication from Lauren Miller, Fire/Fuels Planning Support, Central Oregon Fire Management Service, U.S. Forest Service. Communication: 3/10/2017.
[71] Adam Barnes, Assistant Unit Forester, Oregon Department of Forestry. Email communication on 5/8/2017.

							and high recreation use areas for several weeks.
2014	Fox	9,955		Crook	No	N/A	N/A
2014	Two Bulls	6,906	6/7/2014	Deschutes	Yes	No	This fire was extremely close to the western boundary of the City of Bend. 260 structures saved, 260 threatened, zero destroyed.
2014	Center	2,515	7/13/2014	Crook	No	N/A	N/A
2014	Donny-brook	20,763	7/13/2014	Jefferson	No	N/A	N/A
2015	Corner Creek	25,660	6/29/2015	Multiple, Including Crook	No	N/A	Early season, lightning-caused fire which impacted multiple jurisdictions as well as Greated Sage-Grouse habitat.
2015	Cove Fire	282	August	Jefferson	No	N/A	2 homes lost.
2015	County Line 2	67,207	8/12/2015	Multiple, Including Jefferson	Yes	N/A	1,077 structures saved, 1,084 threatened, 7 destroyed.

2016	Akawana	2,094	6/7/2016	Deschutes	Yes	No	Early season, lightning-caused fire in the wildland urban interface. 912 structures saved, 912 structures threatened, zero destroyed.

Large Fire History: 2016-2024

Since the creation of the previous NHMP in 2018, there have been a number of documented wildfire events varying in impact and extent in Crook County. Large wildfire event information is provided in the table below.

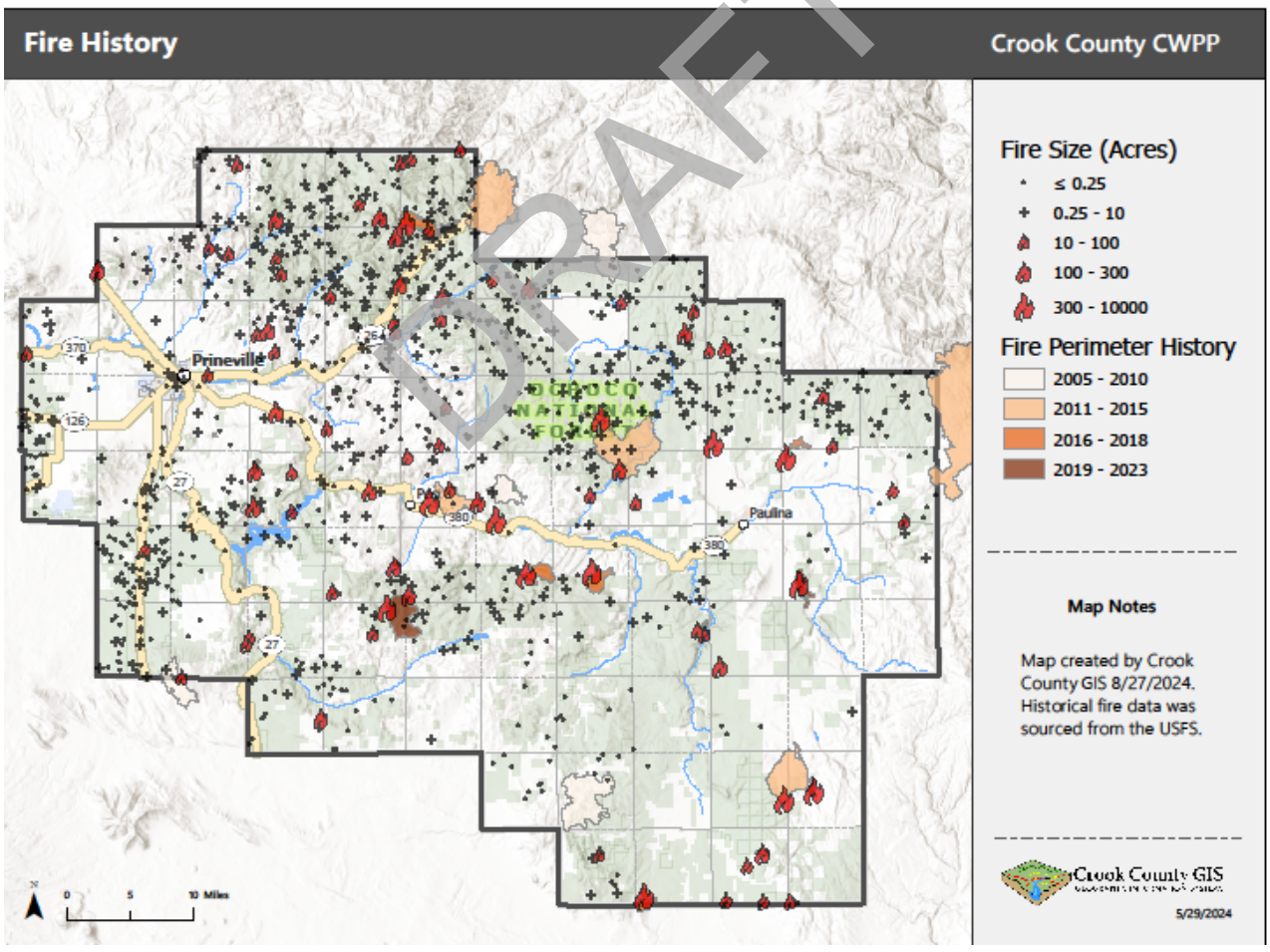
Table 3-12. Crook County Large Fire History (>100 Acres), 2016-2024

Wildfire Name	Year	Acres Burned	Cause
Rail Ridge	2024	176,661	Lightning *Fire started in Grant County then burned into Crook County.
Crazy Creek	2024	86,963	Lightning
Durgan	2024	3,245	Lightning
Hawley Ridge	2024	199	Lightning
Camp Creek	2024	1,581	Lightning
Wiley Flat	2024	30,186	Lightning
McCaffery	2024	458	Human
Cat Rock	2024	219	Human
Cowboy	2022	203	Human
Freezout	2022	403	Unknown
Ryegrass	2021	1,100	Unknown
Black Mountain	2021	139	Lightning
Frog	2020	3,930	Lightning
Pucker Hill	2020	218	Unknown
Cemetery	2018	1,414	Unknown

Hammer	2018	126	Unknown
Desolation	2017	2,475	Lightning
Hampton	2017	832	Unknown
Wolf Creek	2017	538	Unknown
Wildcat	2017	131	Lightning
Belknap	2017	111	Lightning
Newsome Creek	2017	110	Unknown
East Maury	2016	1,526	Escaped Treatment / Human

Information compiled from both the 2024 Oregon Wildfire Risk Explorer Advanced Report and the USFS database.

Figure 3-10. Crook County Fire History (2005-2023)[72]



[72] 2024 Crook County Community Wildfire Protection Plan, Appendix D, page 84.

Future Conditions

In the 2020s, Central Oregon experiences an average of 11 high fire danger days during the summer and fall. By the 2050s, this number is projected to rise to 15. This increase will heighten the risk of wildfires within the wildland-urban interface. Central Oregon faces the threat of greater timber loss, reduced livestock forage, and increased damage to homes and infrastructure because of wildfire.[73]

As a result of an increase in wildfire smoke, more severe public health issues are likely to arise due to impacted air quality.[74] A higher concentration of fine particulate matter could cause an increase in respiratory illnesses for community members.[75]

Wildfire Vulnerability Assessment

The Crook County Community Wildfire Protection Plan (CWPP) was adopted in June 2005, updated in 2014, and again in 2024. The CWPP describes numerous areas where Crook County is vulnerable to wildfire, many of which are designated as having "high" or "extreme" hazard ratings. The CWPP describes a residential boom in Crook County in the 2000s with associated increases in housing units as well as increases in economic infrastructure during recovery from the economic collapse in 2008/2009. These increases in residential and economic infrastructure have expanded the county's wildland urban interface (WUI), exposing more residents and infrastructure to risks posed by wildfire.[76]

Vulnerability to fire is caused by numerous conditions. The Crook County CWPP states that most of the WUI areas occur in sites dominated by either juniper, sagebrush/grass or ponderosa pine/dry fir.[77] Climate and weather as well as development within the WUI all have a significant impact on wildfire vulnerability. Additionally, transportation routes such as roads have a large impact on fire response, including mitigation efforts and evacuation.

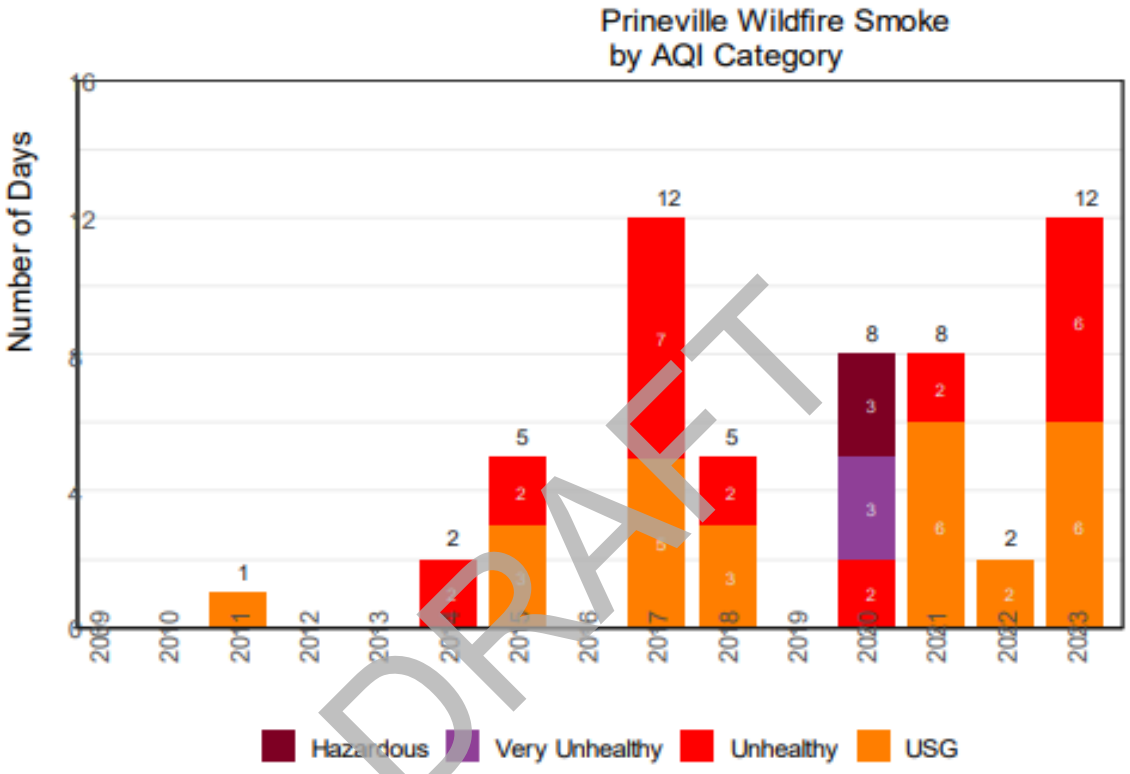
Smoke Impacts/Air Quality

The City of Prineville and Crook County have adopted the "Prineville Area - Fine Particulate Matter (PM2.5) Action Plan to discuss, highlight, and mitigate smoke impacts locally. Often times however, smoke inundation of Prineville and Crook County is the result of fires elsewhere in the state, nation, or globally. Figure 3-11 below from DEQ's Wildfire Smoke Trends and Air Quality Index Report illustrates the number of days impacted by wildfire smoke

[73] Oregon Climate Change Research Institute, Regional Profiles on Climate Change, August 2024, https://www.oregon.gov/lcd/CL/Documents/Region_6.pdf?utm_medium=email&utm_source=govdelivery
[74] Oregon Climate Change Research Institute, Regional Profiles on Climate Change, August 2024, https://www.oregon.gov/lcd/CL/Documents/Region_6.pdf?utm_medium=email&utm_source=govdelivery
[75] Oregon Health Authority, Public Health Authority. Climate and Health Adaptation Plan, Crook County, Oregon. December 2023. https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/CLIMATECHANGE/Documents/AdaptationPlans/summry-sheet-crook.pdf
[76] Crook County Community Wildfire Protection Plan. (2014). https://newcoic.files.wordpress.com/2013/10/crook- county-cwpp-2014_reduced-size-for-web.pdf
[77] Crook County Community Wildfire Protection Plan. (2014). https://newcoic.files.wordpress.com/2013/10/crook- county-cwpp-2014_reduced-size-for-web.pdf

from 2009-2023. The trends in Prineville as well as across the state of Oregon are towards more frequent days with an AQI at or above USG (Unhealthy for Sensitive Groups). Air quality data in this table is collected by an OR DEQ monitor placed in Davidson Park in Prineville. Additional air quality monitors such as Purple Air monitors, alongside government AQ monitors as shown on fire.airnow.gov provide a broader picture of air quality across the county which can vary based on weather, topography, wind and smoke source.

Figure 3-11. Prineville Wildfire AQI Trends[78]



The trend towards more frequent days with air quality impacts from wildfire smoke, whether it comes from local or distant fires, increases the hazard presented by wildfire smoke. Wildfire smoke contains tiny particulate matter, PM2.5, that can be absorbed into the bloodstream, posing risks to health. Exposure to PM 2.5 is associated with mortality, respiratory health, adverse birth outcomes, and cardiovascular health.[79] Some groups experience more harm from exposure. These include older adults, people with chronic conditions, youth, pregnant women, outdoor workers and low-income groups.[80]

[78]Wildfire Smoke Trends and the Air Quality Index, data from 1985-2023, Oregon Department of Environmental Quality. March 2024.

[79] Oregon State University Public Health, Oregon Climate Assessment, 2023. https://oregonstate.app.box.com/s/x9wj1xz6n6trunar9wzirl57d118rkqz

[80] EPA: Wildfire Smoke A Guide for Public Health Officials (https://www.airnow.gov/sites/default/files/2021-09/wildfire-smoke-guide-forward_0.pdf) (see "Recommendations for Public Health Actions, page 3)

Public Health efforts to address wildfire smoke exposure include education, risk communication, and working with community partners to identify clean air centers where members of the public can seek respite from smoke when air quality is poor. Throughout wildfire season and when wildfire smoke hazards are present, Crook County Public Health staff attend Wildfire Smoke Coordination calls convened by the Department of Environmental Quality and the Oregon Health Authority and communicate about forecasted smoke impacts, as well as recommended strategies for the public to protect their health.

Wildfire Risk Assessment

Wildfires are a common and widespread natural hazard in Oregon; the state has a long and extensive history of wildfire. A significant portion of Oregon's forestland is dominated by ecosystems dependent upon fire for their health and survival. In addition to being common, chronic occurrences, wildfires frequently threaten communities. The information above and in Table 3-10, Table 3-11, and Table 3-12 illustrates not only the escalating size of large wildland fires in Central Oregon, but also the increasing impact to the citizens, communities-at-risk, infrastructure and property of Crook County.[81]

There is an extensive history of wildfires in and around Crook County. The majority of wildfires take place between June and October, though fire season has been increasing in length since 1970 and is now, on average, 78 days longer than it used to be.[82] With increases in population, especially within WUI areas, these impacts may increase the county's vulnerability and maximum threat in future years.

Large wildfires can have significant financial and social costs. Not only can they impact lives and property, they can also have negative short- and long-term economic and environmental consequences. Typically, large wildfires result from lightning in remote, inaccessible areas, causing extra resources needed to contain them.

Some of the significant ways that Crook County has worked to reduce catastrophic risk to wildfire is through hazardous vegetation treatment, the development of four Firewise communities since 2018, Crook County Fire & Rescue's Fire Ready home assessments, and the development of the Rangeland Fire Protection Associations in eastern and southern Crook County. Several local, state and federal agencies coordinate on their efforts to reduce wildfire risk throughout Crook County. The 2024 Crook County CWPP, identifies how many acres of fuel treatment have been conducted around the County, and identifies the agency that has completed the treatment.

The CWPP identifies six geographical risk assessment areas, each containing communities and multiple components of critical infrastructure. These are identified as:

1. Powell Butte
2. McKay
3. Juniper Canyon

[81] Adam Barnes, Assistant Unit Forester, Oregon Department of Forestry. Email communication on 5/8/2017.
[82] 2020 Oregon NHMP

4. Maury
5. Paulina
6. Twelve Mile

The CWPP includes an assessment for each risk assessment area. Priority action items to reduce wildfire were identified for each risk assessment area were identified. The CWPP provides a numerical scoring for identified hazard locations to prioritize areas with higher vulnerability and risk to wildfires. The CWPP Steering Committee will meet on an annual basis to review the goals identified in the plan and will complete a total rewrite of the plan every 5 years.

DOGAMI is currently developing a detailed multi-hazard risk assessment for Crook County for four hazards, including wildfire.[83] This assessment combines building location with assessor information to develop a detailed building inventory. Those buildings are then overlayed with hazard information. Risk is calculated in terms of the dollar amount and number of people impacted. Critical facilities that may be impacted are included in the report. This report is expected to be available to Crook County in July of 2025.

The county ranked wildfire as the third highest risk to the county, scoring 195 points out of 240. This is due to a strong history of occurrence, as well as a future probability of more frequent and large-scale fires. Additionally, the community is vulnerable to wildfire due to increasing development within the WUI.

Based upon the experiences documented within this plan, as well as within the 2024 CWPP, the county finds that there is ***High*** risk associated with the wildfire hazard, and finds the vulnerability and maximum threat to property and populations within the county to also be ***High*.**

The Crook County Hazard Analysis Matrix Table 3-2 describes the values placed on the overall risk associated with this natural hazard.

[83] Email communication with Matt Williams, DOGAMI. January 2025.

3.1.4 Earthquake Hazard

According to the Pacific Northwest Seismic Network (PNSN):

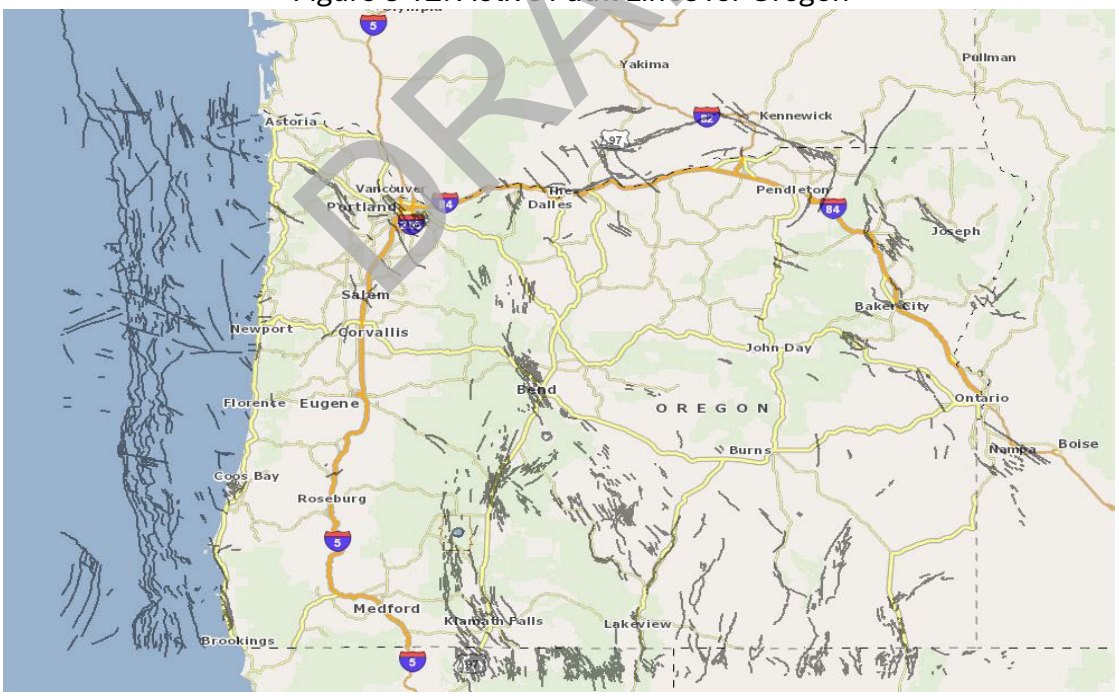
> The seismology lab at the University of Washington records roughly 1,000 earthquakes per year in Washington and Oregon. Between one or two dozen of these cause enough ground shaking to be felt by residents. Most are in the Puget Sound region, and few cause any damage. However, based on the history of damaging past earthquakes and our understanding of geologic history of the Pacific Northwest, we are certain that damaging earthquakes (magnitude 6 or greater) will recur in our area, although we have no way to predict whether this is more likely to be today or years from now.[84]

Location and Extent

The geographical position of Crook County makes it susceptible to earthquakes from four sources, though expert opinions vary regarding the degree of susceptibility from each. The four sources include:

1. The offshore Cascadia Fault Zone,
2. Deep intraplate events within the subducting Juan de Fuca Plate,
3. Shallow crustal events within the North American Plate, and
4. Earthquakes are associated with renewed volcanic activity.

Figure 3-12. Active Fault Lines for Oregon[85]



All have some tie to the subducting or diving of the dense, oceanic Juan de Fuca Plate under the lighter, continental North American Plate. In the "Basin and Range" area in the southern

[84] University of Oregon, Pacific Northwest Seismic Network.
[85] Oregon HAZUS. Accessed December 2024.

part of the region (Klamath and Lake Counties) earthquakes are also associated with extension (pulling apart of the crust). Stresses occur because of these movements. There also appears to be a link between the subducting plate and the formation of volcanoes some distance inland from the offshore fault zone.

When crustal faults slip, they can produce earthquakes with magnitudes (M) up to 7.0 and can cause extensive damage, which tends to be localized in the vicinity of the area of slippage. Deep intraplate earthquakes occur at depths between 30 and 100 kilometers below the earth's surface. They occur in the subducting oceanic plate and can approach M7.5. Subduction zone earthquakes pose the greatest hazard. They occur at the boundary between the descending oceanic Juan de Fuca Plate and the overriding North American Plate. This area of contact, which starts off the Oregon coast, is known as the Cascadia Subduction Zone (CSZ). The CSZ could produce a local earthquake along the coast up to 9.0 or greater.

Central Oregon includes portions of five physiographic provinces including High Cascades, Blue Mountains, Basin and Range, High Lava Plains, and Deschutes-Columbia Plateau. Consequently, its geology and earthquake susceptibility vary considerably. There have been several significant earthquakes in the region, though none with an epicenter in Crook County.

Although direct earthquake impacts are relatively mild in Crook County, all counties east of the Cascade Range have the potential to have substantial indirect impacts of severe earthquake events sourced in the Cascadia Subduction Zone (CSZ)[86] which would have impacts on the transportation to and from and increased population within the region. Central Oregon may be the command and control center for the state of Oregon in response to this event, and very importantly may need to house many people displaced from western Oregon.

The topic of CSZ earthquake preparedness is a consistent part of the Crook County Emergency Preparedness Committee agenda and discussion. All Crook County employees take Incident Command System classes as part of their professional development and preparedness, and a new employee reporting policy requires employees to report attendance information which would be useful in case of an emergency. Mutual aid agreements exist between Crook and other Oregon counties which outline details of how counties can share resources in disaster situations.

Hazard History: Prior to 2005

The most recent earthquake event in the area occurred in April 2004 with a two-day swarm of 100 to 200 small, unfelt earthquakes. Table 3-13 below shows significant earthquakes in Central Oregon (in and around the Sisters Bulge) prior to 2005.

[86] Oregon Office of Emergency Management, Cascadia Subduction Zone Catastrophic Response Plan (2012). https://uploads.westernenergy.org/2015/12/09114712/OR_CSZ_Plan_Complete.pdf

Table 3-13. Significant Earthquakes in the Central Oregon Region[87]

Date	Location	Magnitude	Remarks
Approx. Years 1400 BCE, 1050 BCE, 600 BCE, 400 CE, 750 CE, 900 CE	Offshore, Cascadia Subduction Zone	Likely 8-9	Based on studies of earthquakes and tsunamis in Willapa Bay, WA. These are the midpoints of the age ranges for these six events. (BCE-Before Common Era; CE-Common Era)
January 1700	Offshore, Cascadia Subduction Zone	Approx. 9.0	Generated a tsunami that struck OR, WA, Japan; destroyed Native American coastal villages.
April 1906	North of Lakeview	V	Three felt aftershocks.
April 1920	Crater Lake	V	One of three shocks.
January 1923	Lakeview	VI	
March 1958	SE of Adel	1/4/1900	
May-June 1968	Adel	4.7-5.1	Damage to homes. 20 earthquakes of M4 or greater were recorded between 5/28/68 and 6/24/68.
September 1993	Klamath Falls	5.9 and 6.0	Series of earthquakes, the largest being M6. Damage to Klamath Falls - two related fatalities.

Hazard History: 2005-Present

While there have been small, registered quakes in the county beyond 1993, they have been very minor, and none have registered a magnitude of over 3.1.

Future Conditions

The last Cascadia earthquake occurred in January of 1700. The average recurrence of a full Cascadia rupture is approximately once every 500 years. Over time, there will be a very slight increase in risk as time goes by. Earthquake risk is generally believed to be unrelated to climate.

Vulnerability Assessment

DOGAMI has developed two earthquake loss models for Oregon based on the two most likely sources of seismic events: 1) The Cascadia Subduction Zone (CSZ), and 2) combined crustal events. The Cascadia loss model is based on HAZUS, a computerized program, currently used by the Federal Emergency Management Agency (FEMA) as a means of determining potential

[87] Wong, Ivan, Bolt, Jacqueline, 1995, A Look Back at Oregon's Earthquake History, 1841-1994, Ore. Geology, p.125-139

losses from earthquakes. The CSZ event is based on a potential M 9.0 earthquake generated off the Oregon coast. The model does not consider a tsunami, which would probably develop from the event. The combined crustal events loss model is based on the National Earthquake Hazard Model; it encompasses many faults, each with a 10% chance of producing an earthquake in the next 50 years. The model assumes that each fault will produce a single "average" earthquake during this time. Neither model considers unreinforced masonry buildings. DOGAMI investigators caution that both models contain a high degree of uncertainty and should be used only for general planning purposes. Despite their limitations, the models do indicate that damage would occur.

DOGAMI is currently working on an updated Multi-Hazard Risk Assessment for Crook County for both an M 9.0 CSZ scenario and a crustal fault earthquake scenario, which will include estimated damages in Crook County. This is expected to be completed in the summer of 2025.

Although direct earthquake impacts are relatively mild in Crook County, all counties east of the Cascade Range have the potential to feel substantial indirect impacts of severe earthquake events sourced in the CSZ.[88] Indirect impacts include disruption of, and other impacts related to transportation corridors (roads, rail, air), power supply, supply chain distribution (fuel, food, natural gas, etc.), demand for logistics and staging areas, shelter, and relocation of individuals and animals from the directly impacted areas. Transportation interruptions and prioritization of emergency supplies to Western Oregon will disrupt raw material imports and finished agricultural product export, thereby causing a large financial disruption with necessity for alternate routing to ports of opportunity, increasing shipping costs and affecting Oregon's agricultural economy. Massive staging areas are likely to be required in various areas of Central and Eastern Oregon with relief supplies likely to be primarily located at an established federal incident support base at Redmond Municipal Airport in Redmond, Deschutes County, Oregon. River traffic on the Columbia River will be an important response and recovery lifeline. Mutual aid from Eastern Oregon jurisdictions will be sought to the maximum degree possible. Many building inspectors, law enforcement, firefighters, medical personnel, engineers, and public works personnel may deploy to the impacted areas of Western Oregon.

Although the region is vulnerable to earthquake-induced landslides alongside volcanoes and strong ground shaking, little evidence is presented for these events specific to Crook County. However, potential earthquake-induced landslides and liquefaction are vulnerabilities in Crook County. The liquefaction hazard is primarily due to Crook County's position in a valley. Risk would be higher if the earthquake occurred during an unusually rainy period.

[88] Oregon Office of Emergency Management, Cascadia Subduction Zone Catastrophic Response Plan (2012). https://uploads.westernenergy.org/2015/12/09114712/OR_CSZ_Plan_Complete.pdf

Figure 3-13. Earthquake-Induced Liquefaction Hazard in Central Oregon[89]

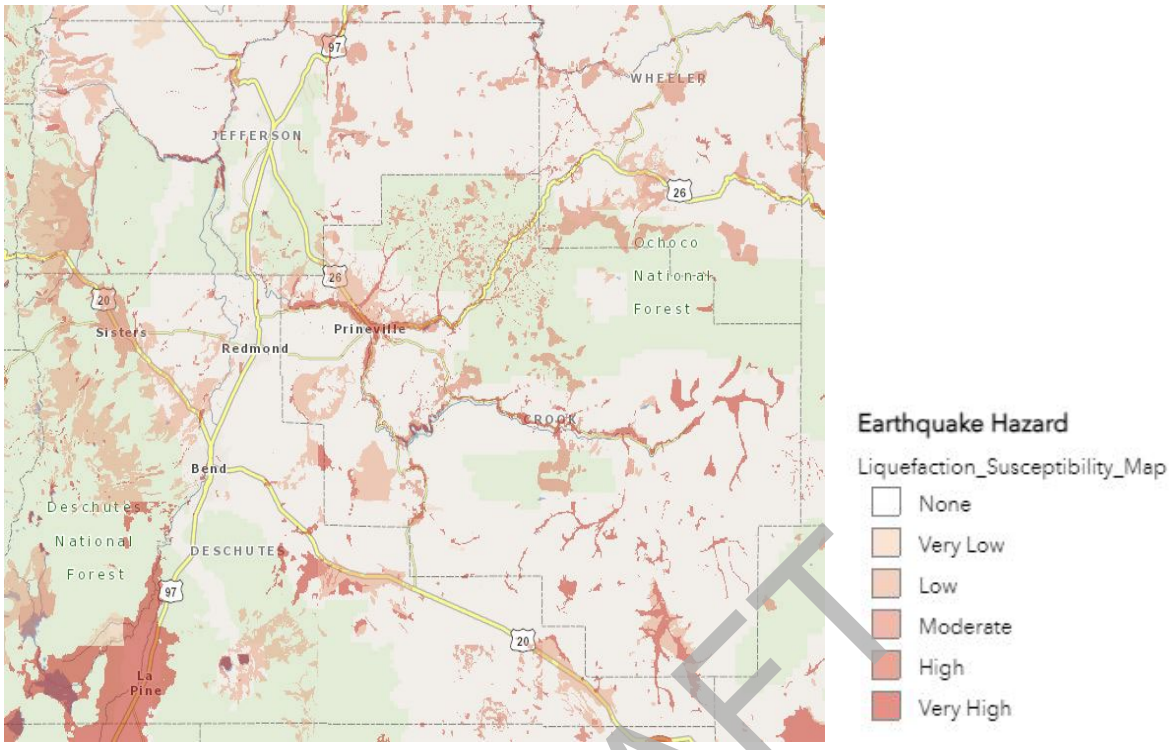
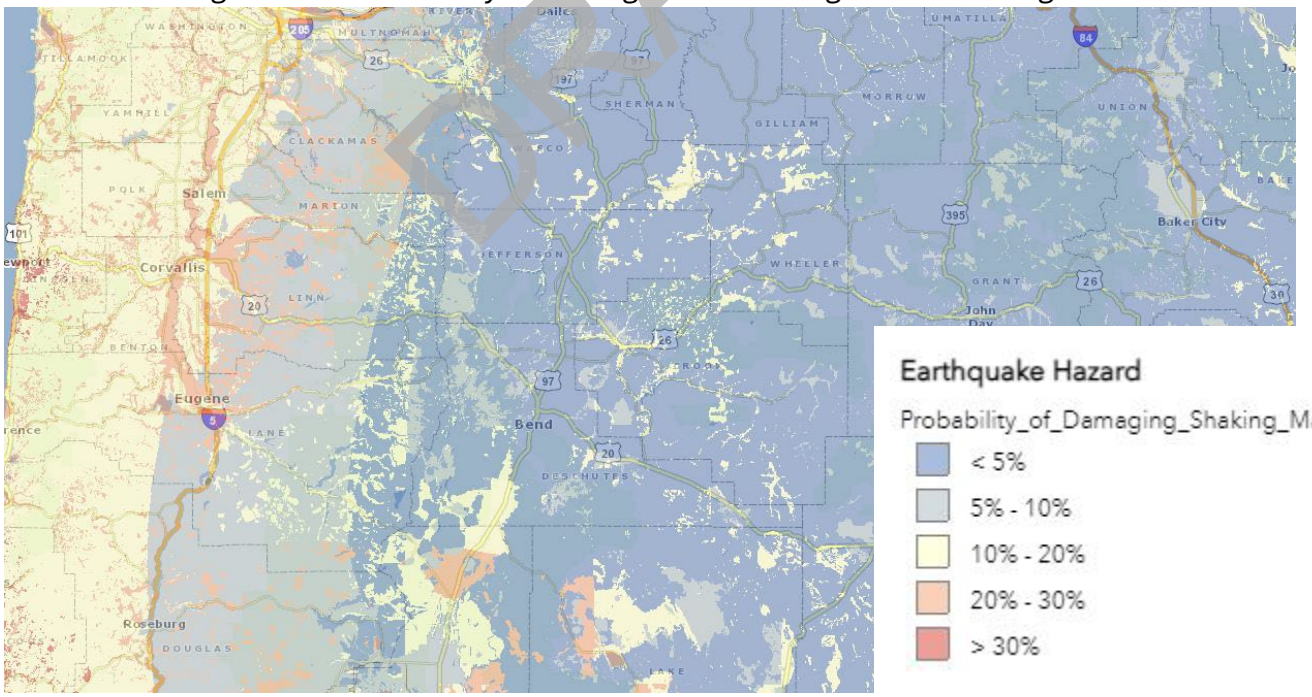


Figure 3-14. Probability of Damage from Shaking in Central Oregon[90]



[89] Oregon Department of Geology and Mineral Industries HazVu, retrieved 8/19/2024 from https://gis.dogami.oregon.gov/maps/hazvu/

[90] Oregon Department of Geology and Mineral Industries HazVu, retrieved 8/19/2024 from https://gis.dogami.oregon.gov/maps/hazvu/

Risk Assessment

DOGAMI is currently developing a detailed risk assessment for Crook County for four hazards, including earthquake.[91] This assessment combines building locations with assessor information to develop a detailed building inventory. Those buildings are then overlayed with hazard information. Risk is calculated in terms of the dollar amount and number of people impacted. Rapid Visual Screening is also conducted to assess seismic vulnerability. Critical facilities that may be impacted are included in the report. This report is expected to be available to Crook County in July of 2025.

The Cascadia Subduction Zone generates devastating earthquakes (magnitude 8+ and 9+ range) on average every 250-500 years. However, as with any natural processes, the average time between events can be misleading. Seventy-five percent of large Cascadia earthquakes which have occurred over the past 8,000 years have occurred less than 310 years apart. Local earthquakes along regional faults may also pose concerns as well.[92]

Earthquake hazards can be reduced by advance preparation; such as coordinating emergency communications and activities across jurisdictional lines, preparing personal emergency plans, and considering seismic hazards in land use plans, building codes, and planning for medical, utility, and emergency facilities.[93]

Using information provided above, the county ranked earthquake as the fourth highest risk to the county, scoring 152 points out of 240. If a significant CSZ earthquake event were to occur, the maximum threat to Crook County is high due to secondary impacts which could occur; this event would greatly impact transportation routes in and out of the region, thereby isolating Central Oregon. This isolation would cause concerns not only for people, but for goods and fuel as well. There is a 10-15% chance of a magnitude 9+ earthquake occurring in the next 50 years, and a 37% chance of a magnitude 8+ earthquake occurring in the next 50 years.[94]

Based upon the experiences documented within this plan, the county finds that there is ***Moderate*** risk associated with the earthquake hazard and finds the vulnerability of property and populations within the county to also be ***Moderate.***

The Crook County Hazard Analysis Matrix Table 3-2 describes the values placed on the overall risk associated with this natural hazard.

[91] Email communication with Matt Williams, DOGAMI. January 2025.
[92] [Entire paragraph] - email communication on 4/29/2017 with Daniele McKay, Natural Resources Instructor, Oregon State University Cascades.
[93] http://www.pnsn.org/INFO_GENERAL/eqhazards.html
[94] Email communication on 4/29/2017 with Daniele McKay, Natural Resources Instructor, Oregon State University Cascades.

3.1.5 Severe Weather Events Hazard

Crook County is threatened by hazards generated from weather conditions almost every year. Storms bring heavy rains, strong winds, hail, and occasionally ice and snow. Flooding, and less commonly, landslides can also accompany severe rainfall, producing storms. Severe storms can create conditions that disrupt essential regional systems such as public utilities, telecommunications, and transportation routes. Wind, snow, and ice associated with severe winter storms can knock down or otherwise damage trees, power lines, and utility services. Freezing winter temperatures can damage agricultural crops and utilities. Lightning poses a risk to life and can result in property damage. Hailstorms also pose a risk to people, property and agricultural production in Crook County. Tornados are very uncommon in Crook County, but have resulted in damage and fatalities in other eastern Oregon Counties

Severe storms affect all parts of Crook County. However, the varied elevations and topography of the county mean that the impact of a storm is variable depending on the location. The Ochoco Mountains, located within the center and eastern portions of the County, regularly receive the highest amounts of snowfall, and the strongest wind gusts in the County. The Cascade Mountain range to the west of the County blocks much of the potential rainfall in the area.

The most frequent severe weather-related hazards in Crook County are thunderstorms, snow, wind, ice, extreme heat, and freezing temperatures. Occasionally, storms from the Pacific bring rain during the warmer months with the most severe rainstorms coming in the form of thunderstorms. While tornadoes are very infrequent and pose a relatively small risk to Crook County, there is a slight potential for this hazard as well.

Location and Extent

The geographic location and extent of severe weather events covers all of Crook County, however, no spatial data are available to map extreme weather occurrences in Crook County. The nature of this hazard varies by location, with elevation playing a large role in spatial distribution. Although severe storm conditions are more hazardous at higher elevations, population centers generally concentrated at lower elevations are at high risk of this hazard. Localized and flash flooding, snow, ice, hail, lightning, and high winds associated with severe weather events put people and property at risk.

The damage sustained by a winter storm and other severe weather hazards is very dependent on types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas. Changes in vegetation, soil grading, storm water systems, the amount of impermeable surface, etc. can impact the likelihood and degree of severe weather hazards.

Hazard History: 2005-2024

Table 3-14 shows recently recorded storms and unusual weather phenomenon in Crook County.

Table 3-14. Storm Data and Unusual Weather Phenomenon in Crook County, 2008-2015[95][96]

Year/Month	Type	Remarks
July 2008	Hail	Hail: 0.75 inch diameter
August 2008	Hail	Hail: 0.75-1.0 inch diameter
June 2009	Heavy Rain, Hail, Wind	Water covering road, damaging wind, large hail
July 2009	Hail	Hail: 1.0 inch diameter
August 2009	Wind, Hail	Hail: 0.88 inch diameter, damaging winds
January 2011	Ice, Rain	Flood due to ice dam, warm temperatures
January 2017	Snow	Snow: Local emergency declared, 12 inches on January 11
February 2019	Snow	Snow: 12 inches on February 25
June 2023	Flash Flood, Hail	Flash Flood: buildings flooded downtown; Hail: 0.75-1.0 inch diameter

Future Conditions

Since 2020, Central Oregon has experienced an average of 12 days above 90 degrees. This average is predicted to increase to 26 in the 2050s. The increase of extreme heat threatens Crook County crops and dairy cows. This severe weather event also threatens Crook County's food supply as the rate of seedling mortality and the number of plants that will succumb to heat-scorching increases.[97]

A decrease in the total amount of snowfall in the winter means earlier springs and earlier peak streamflow. The decrease in the amount of snowfall makes wildfire seasons longer and gives room for the evasion of some pests, and an increase in diseases and invasive species.[98]

Additionally, severe weather events such as extreme heat heightens the risk of economic stress and negative mental health on urban residents and outdoor workers. In some cases, severe weather events may lead to displacement of Crook County residents.[99]

Severe Weather Vulnerability Assessment

While a quantitative vulnerability assessment (an assessment that describes number of lives or amount of property exposed to the hazard) has not yet been conducted for Crook County

[95] Email communication with Dennis Hull, National Weather Service on 3/28/2017.
[96] Will Vanvactor, County Manager. 2025.
[97] Oregon Climate Change Research Institute, Regional Profiles on Climate Change, August 2024, https://www.oregon.gov/lcd/CL/Documents/Region_6.pdf?utm_medium=email&utm_source=govdelivery
[98] Oregon Climate Change Research Institute, Regional Profiles on Climate Change, August 2024, https://www.oregon.gov/lcd/CL/Documents/Region_6.pdf?utm_medium=email&utm_source=govdelivery
[99] Oregon Climate Change Research Institute, Regional Profiles on Climate Change, August 2024, https://www.oregon.gov/lcd/CL/Documents/Region_6.pdf?utm_medium=email&utm_source=govdelivery

windstorms, winter storms, and other severe weather events, there are many qualitative factors (issues relating to what is in danger within a community) which provide insights regarding potential vulnerability. Severe weather can cause power outages, transportation and economic disruptions, significant property damage, and pose a high risk for injuries and loss of life. The event can also be typified by a need to shelter and care for individuals impacted by the event. Several destructive severe weather events have brought economic hardship to the county and have affected the safety of county residents. Future events may carry similar impacts.

Severe Winter Storms

Crook County has severe winter storms that occur with regularity, although none have been noted to be on the magnitude of a national disaster. Higher elevations have greater exposure to snow and ice, but may be less economically vulnerable, because they are sparsely populated. Roads may be closed longer in more isolated areas, and extreme snowfall or flash flood events may simply be more dangerous in the mountains. Outreach programs, emergency communications systems, and special emergency response plans may be the most effective ways to reduce vulnerability in outlying areas of the county.

Windstorms

Every location in the county is exposed to some level of windstorm-related hazard, and each location is vulnerable to the extent that trees are in close proximity to a structure, road, power line, or other critical infrastructure. Because of Crook County's high elevation, many of its residents are often exposed to high winds, especially during the winter months and during summer thunderstorms. Certain properties or facilities are vulnerable because of an inherent susceptibility to wind damage, perhaps at certain critical times. As with severe winter storms, Crook County's higher elevations have greater exposure to high winds but may be less economically vulnerable than other regions of the state because of its low population levels.

Extreme Heat

High desert climates are marked by hot summer days with significant overnight cooling. The trends in increasing daytime and overnight temperatures in Prineville are illustrated in the tables above. The number of days exceeding 95 or 100 degrees have both increased as well as nights with temperatures above 60 degrees. The NWS HeatRisk tool characterizes heat by 4 risk levels. Extreme heat, defined as extreme heat of rare and/or long duration with little to overnight relief, is the highest risk level. Exposure to heat without respite increases risk of heat-related illness, including heat exhaustion and heat stroke, and can be deadly. Some groups are at greater risk of experiencing harm from extreme heat, including older adults, youth, people with chronic conditions, outside workers, and pregnant women (https://www.cdc.gov/heat-health/about-heat-and-your-health.html). Air conditioning is relatively uncommon (not sure where that data might exist) in Central Oregon/Crook County; extreme heat is of highest concern when the combined hazard of wildfire smoke is also present.

Figure 3-15. Prineville Number of Nights At Least 60 Degrees, 1993-2023[100]

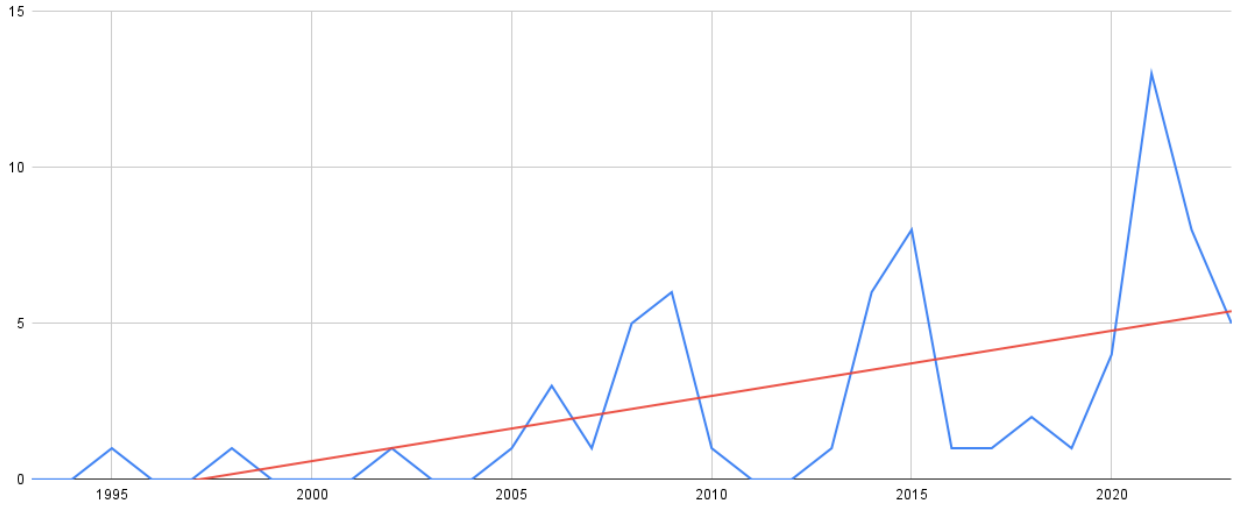
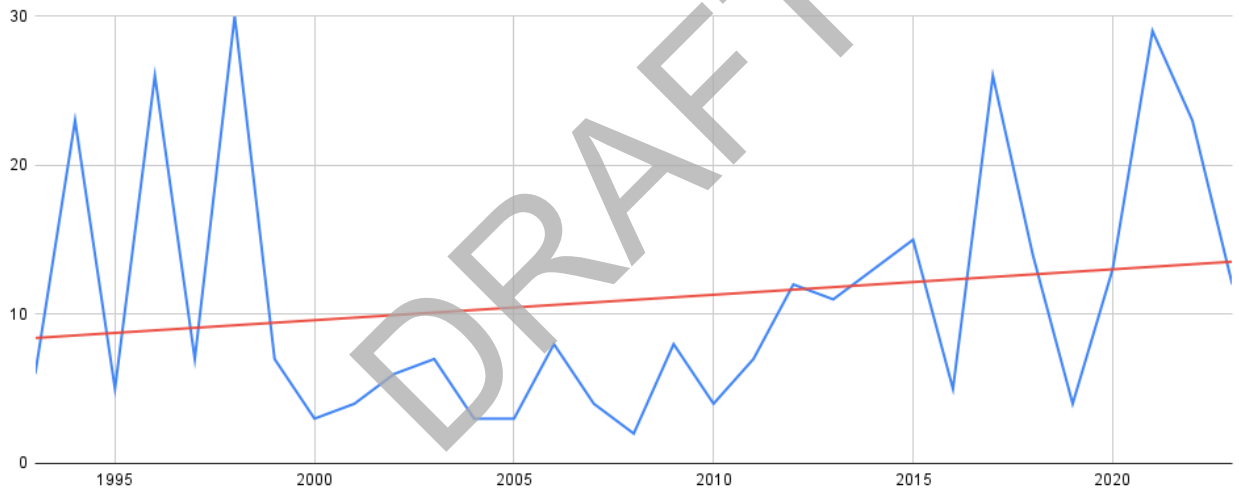
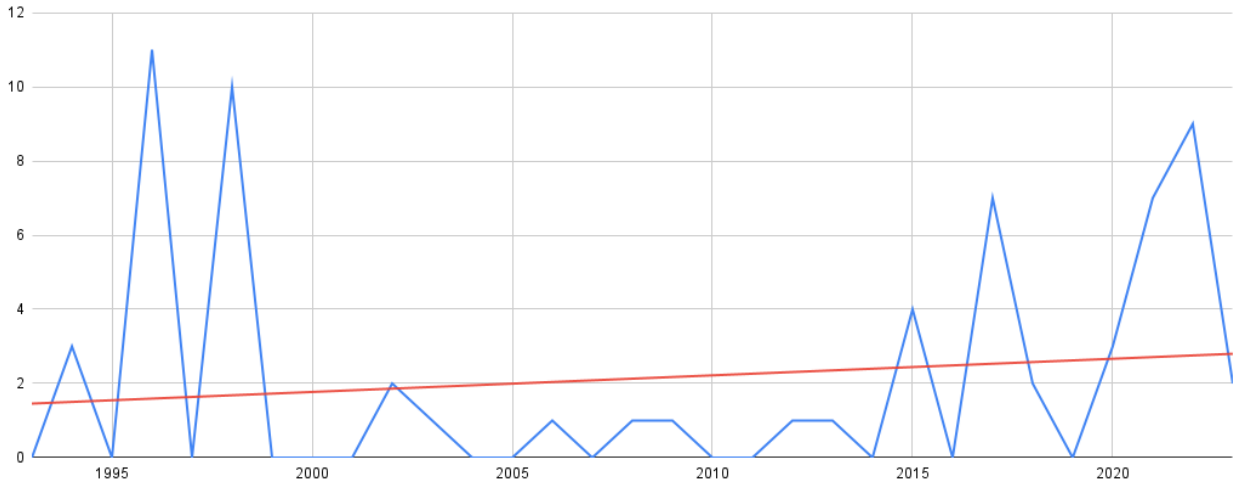


Figure 3-16. Number of Days of Maximum Temperatures 95+ Degrees, 1993-2023[101]



[100] xmACIS (NOAA Regional Climate Centers): https://xmacis.rcc-acis.org/
[101] Ibid.

Figure 3-17. Prineville Number of Days 100+ Degrees (1993-2023)[102]



Severe Weather Risk Assessment

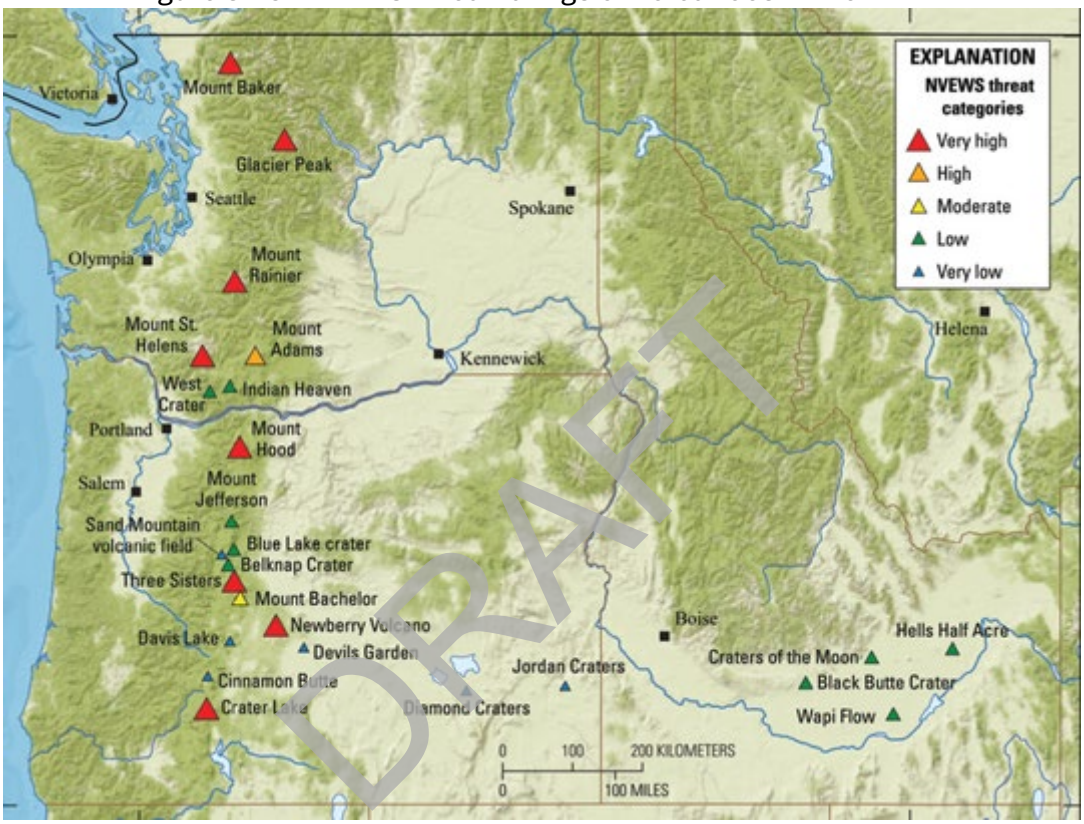
Crook County has a strong history of severe weather events, but to date this weather has not caused severe impacts to Crook County populations or property. Based upon the experiences documented within this plan, the county finds that there is ***moderate*** risk associated with the devastating impact of a severe weather event hazard, and the vulnerability and maximum threat to property and populations within the County to also be ***moderate***.

[102] Ibid.

3.1.6 Volcano Hazard

Volcanos are present in Washington, Oregon, and California where volcanic activity is generated by continental plates moving against each other (Cascadia Subduction Zone movement). In 2018, the USGS threat assessment identified 18 U.S. volcanoes as "very high threat" due to activity and proximity to development. Four of those volcanoes are in Oregon – Crater Lake, Mount Hood, Newberry, and Three Sisters.[103]

Figure 3-18. NVEWS threat ratings of Volcanoes in the NW[104]



Location and Extent

Crook County sits east of the Cascade Range Volcanoes. The terrain between Crook County and its closest volcanic threats; Newberry Volcano, Three Sisters area, Mt. Jefferson and Mt. Hood makes for a very low probability that a lahar would affect Crook County.[105] However, lava flows are a slightly higher possibility in Crook County, especially in the southern and western portions of the county.[106]

[103] Ewert, J. W., Diefenbach, A. K., & Ramsey, D. W. *2018. Update to the U.S. Geological Survey National Volcanic Threat Assessment*.
[104] Ibid.
[105] Email communication on 3/30/2017 with Daniele McKay, Natural Resources Instructor, Oregon State University Cascades.
[106] Email communication on 3/30/2017 with Daniele McKay, Natural Resources Instructor, Oregon State University Cascades.

Volcanic eruptions can send volcanic ash airborne with wind spreading the ash for many miles, putting Crook County at some risk for ash fall from volcanic eruptions nearly anywhere in the Cascades.[107] An erupting volcano can also trigger flash floods, earthquakes, rockfalls, and mudflows. Volcanic ash can contaminate water supplies, cause electrical storms, and collapse roofs. Additionally, volcanic ash can have significant impacts on air quality, thereby creating risks for human health.

The nature of volcanic eruptions is such that the immediate danger area covers approximately a 20-mile radius from the eruptive origin, but danger can also extend 100 miles or more from a volcano. Since Crook County falls outside of the 20-mile immediate threat area, our main hazard will be ash fall from volcanoes as far north as Mount St. Helens to as far south as Mount Shasta.

Businesses and individuals can make plans to respond to volcano emergencies. Planning is prudent because once an emergency begins, public resources can often be overwhelmed, and citizens may need to provide for themselves and make informed decisions. Knowledge of volcano hazards can help citizens plan of action based on the relative safety of areas around home, school, and work.

Hazard History: Prior to 2005

Although lava rock is relatively easy to find in Crook County, there have been no recent volcanic events in Crook County. The last volcanic eruption happened hundreds of thousands of years ago; this eruption created the basaltic rock that is seen in the Crook River canyon below Bowman Dam.

The closest recent volcanic eruption occurred at Mount St. Helens beginning on May 18, 1980. Following two months of earthquakes and minor eruptions and a century of dormancy, Mount St. Helens in Washington, exploded in one of the most devastating volcanic eruptions of the 20th century. Although less than 0.1 cubic mile of magma erupted, 58 people died, and damage exceeded 1.2 billion dollars. Fortunately, most people in the area were able to evacuate safely before the eruption because the U.S. Geological Survey (USGS) and other scientists had alerted public officials to the danger. As early as 1975, USGS researchers had warned that Mount St. Helens might soon erupt. Coming more than 60 years after the last major eruption in the Cascades (Lassen Peak), the explosion of St. Helens was a spectacular reminder that the millions of residents of the Pacific Northwest share the region with live volcanoes.

The eruption of Mount St. Helens caused heavy damage and disruption to businesses and other essential services throughout Washington and much of Oregon. If one of the Central Oregon Cascade volcanoes erupted, the impact on people and property would be severe.

[107] Email communication on 3/30/2017 with Daniele McKay, Natural Resources Instructor, Oregon State University Cascades.

Hazard History: 2005-2024

No documented volcanic activity was reported by these agencies for any volcanic activity in proximity to Crook County for this time period. In 2024, the Steering Committee, including a University of Oregon Senior Instructor for Earth Sciences, discussed the hazard history since 2005 and concluded that no additional significant volcanic activity has occurred in this time period.

Future Conditions

Volcanic eruptions are generally not thought to be climate driven. Therefore, the risks are not expected to change over time.

Volcano Vulnerability Assessment

Mount St. Helens is a tephra (ash) producing volcano. According to a USGS publication[108], the most serious tephra hazard in the region due to Mount St. Helens, the most prolific producer of tephra in the Cascades during the past few thousand years. The report exhibits a probability map that identifies that Crook County has an annual probability of receiving an accumulation of 10 centimeters or more of tephra accumulation at 0.01% or less.[109] Data was not available at the time of this update to determine the specific vulnerability to the types and numbers of existing or future buildings, infrastructure and critical infrastructure.

According to a report prepared by John R. Labadie entitled *Volcanic Ash Effects and Mitigation*[110], "volcanic ash is abrasive, mildly corrosive, and conductive (especially when wet); it may also carry a high static charge for up to two days after being ejected from a volcano. The ash is easily entrained in the air by wind or vehicle movement and may remain suspended in the air for many minutes. Due to the combination of these qualities, volcanic ash is pervasive. It can penetrate all but the most tightly sealed enclosures." Ash can have a significant impact on all forms of activity including public health, transportation, traffic, utilities, critical infrastructure electronics, and others. Specifically, suspended and ground ash could significantly impair aviation and ground transportation activities; with decreased function of air transportation, emergency response and other regional and beyond-region transportation, various activities could be significantly impacted.

Crook County has other vulnerabilities associated with volcanic impacts in addition to ash-related impacts. For example, if Mt. Hood or another regional volcano had a warm thaw, the associated flooding could cause large mud flows to come off the mountain. This type of hazard could disrupt transportation, causing more people to be in Central Oregon.[111]

[108] W.E. Scott, R.M. Iverson, J.W. Vallance, and W. Hildreth, 1995,
Volcano Hazards in the Mount Adams Region, Washington: U.S. Geological Survey Open-File Report 95-492
[109] http://vulcan.wr.usgs.gov/Volcanoes/Cascades/Hazards/ash_accumulation_10cm.html
[110] The full report is included in the Hazard Background appendix
[111] Personal communication on 3/29/2017 with Carrie Gordon, USFS Geologist, Ochoco National Forest & DOGAMI website.

Volcano Risk Assessment

The likelihood or magnitude of a specific volcanic eruption cannot be forecast with confidence.[112] In the dams to weeks prior to an eruption there is likely to be an increase in earthquakes below the eruption source. If an eruption of significant magnitude occurs, the volcanic ash cloud and fallout could be a high hazard for Crook County, and the most likely risk appears to be from ash accumulation, with a chance of accumulation being very low in any given year. Seismic activity (shown in the chapter on earthquake hazard) identifies numerous and regular earthquake activity within the Pacific Northwest. No specific earthquake data was identified for Crook County. As such it is concluded that Crook County faces no immediate and direct threat from a volcanic eruption and therefore has a low probability of threat. The county does have an indirect risk of ash accumulation that could have broad ranging impacts. Through the research and discovery phase of this update, there was insufficient data available to determine losses associated with a volcanic hazard event. This does not mean that such an eruption could not occur in any given year.

Based upon the experiences documented within this plan, there is a very low probability of a volcanic event occurring within the next 100 years. The county finds that there is overall a ***Low*** risk of a volcanic event in Crook County, and the overall vulnerability to be ***moderate***. Should an event occur, the damage would likely be extensive, making the maximum threat to people and property ***High***.

The Crook County Hazard Analysis Matrix Table 3-2 describes the values placed on the overall risk associated with this natural hazard.

[112] John R. Labadie entitled *Volcanic Ash Effects and Mitigation*.

3.1.7 Landslide Hazard

Landslides are defined as any detached mass of soil, rock, or debris that moves down a slope or a stream channel. Seldom, if ever, can a landslide be attributed to a single cause, however most Oregon landslides have been initiated by increase pore water pressure in soil or rock from rainfall or snowmelt infiltrating into the ground. All landslides involve the failure of earth materials under stress. Landslides are typically triggered by periods of heavy rainfall and/or rapid snowmelt. Earthquakes, volcanoes, and excavations may also trigger them.

An intense wildfire may destroy vegetation and affect organic material so that with even normal rainfall, soil saturation may trigger a landslide. Wildfire generally reduces soil permeability so it can increase potential for debris flows (which consist of rock, logs and typically a boulder rich front moving down steep slopes and steeper stream channels. Locations with steep slopes are more susceptible to landslides. Landslides on these slopes tend to move more rapidly and can be more dangerous than other landslides. Landslides are particularly common along streams.

Although landslides are natural geological processes, their incidence and impact on people and property can be exacerbated by human activities such as excavation and grading, drainage and groundwater alterations, and changes in vegetation.

Landslides are a serious geologic hazard in almost all states but are especially serious in the Pacific coast states west of the Cascade/Sierra mountains in steep terrain. Landslides can threaten transportation corridors, fuel and energy conduits, and communications facilities. While not all landslides result in property damage, many landslides impact roads and other infrastructure, and can pose a serious life-safety hazard. Growing population and an increase in housing demand has caused development to occur more frequently in hazard-prone areas.

Location and Extent

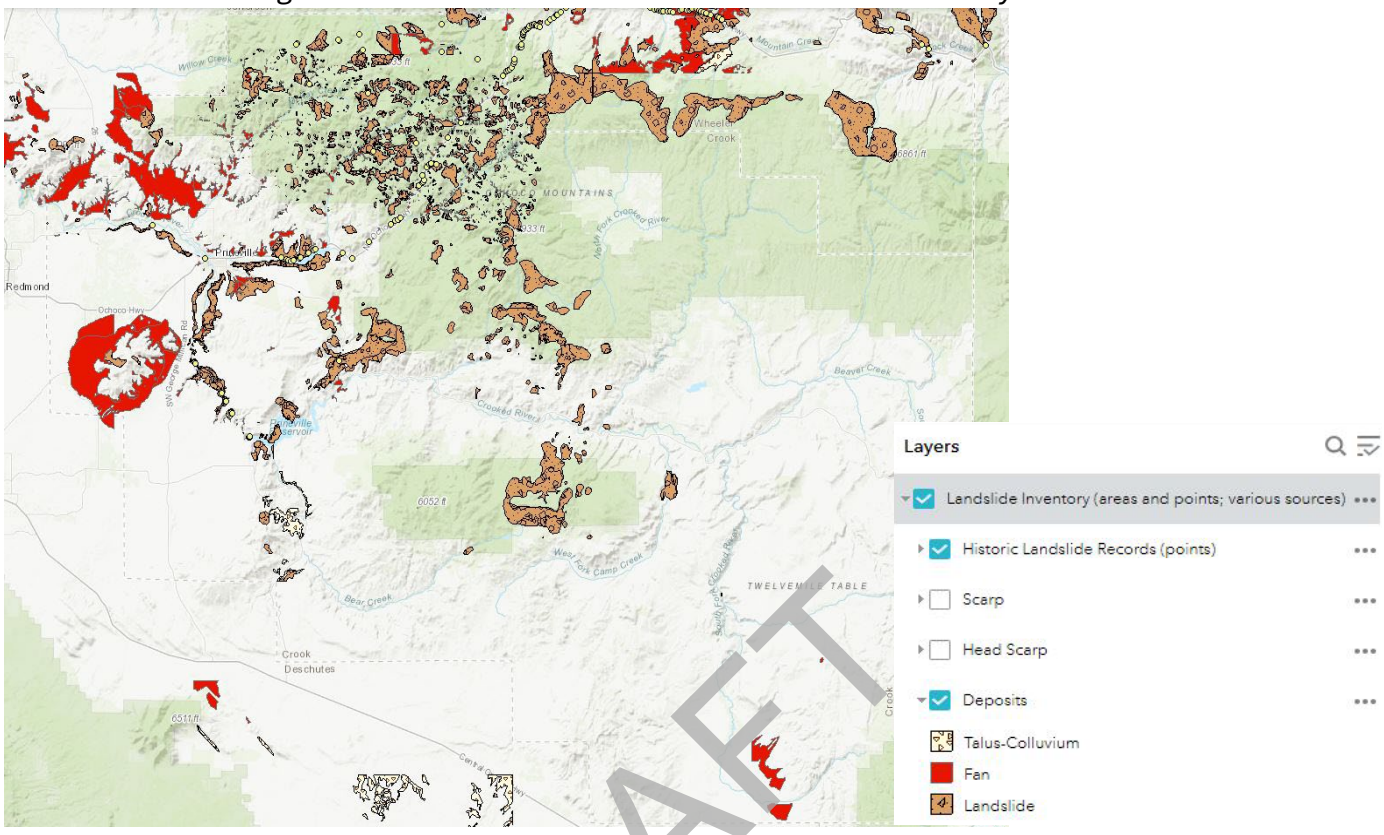
Landslides occur mostly in the mountainous parts of Crook County. Most neighboring counties have higher landslide risks than Crook County.[113]

History

Figure 3-19 below shows historic landslide points (roughly 1849-2019), and associated deposits.

[113] Keith Mills, Oregon Water Resources Department, 2024.

Figure 3-19. Historic Landslide Record for Crook County[114]



Future Conditions

There is likely to be little change to a slight decrease in the overall occurrence of landslides for Crook County in the future. Many of the mapped landslides appear to have occurred in the Pleistocene – and may move but at slower rates. There should be no change for rockfall type. However, after a wildfire there may be some increase in shallow landsliding and subsequent debris flows (though debris flows are much more common in western and northeast Oregon than in central Oregon).

Due to the extreme precipitation that is predicted to increase in Central Oregon in the future, the risk of landslides and mudslides is predicted to increase in intensity when they do happen. These landslides and mudslides pose a threat to transportation infrastructure, such as roads, bridges, and railroads, and an increased risk of erosion in Crook County.

Landslide Vulnerability Assessment

The coordination effort to identify data related to significant landslide disaster activity in Crook County demonstrates a lack of vulnerability studies for locations other than the state highway system. Although topographic and steep slope data is available, there are no correlation studies that pinpoint vulnerability locations that would impact buildings or people.

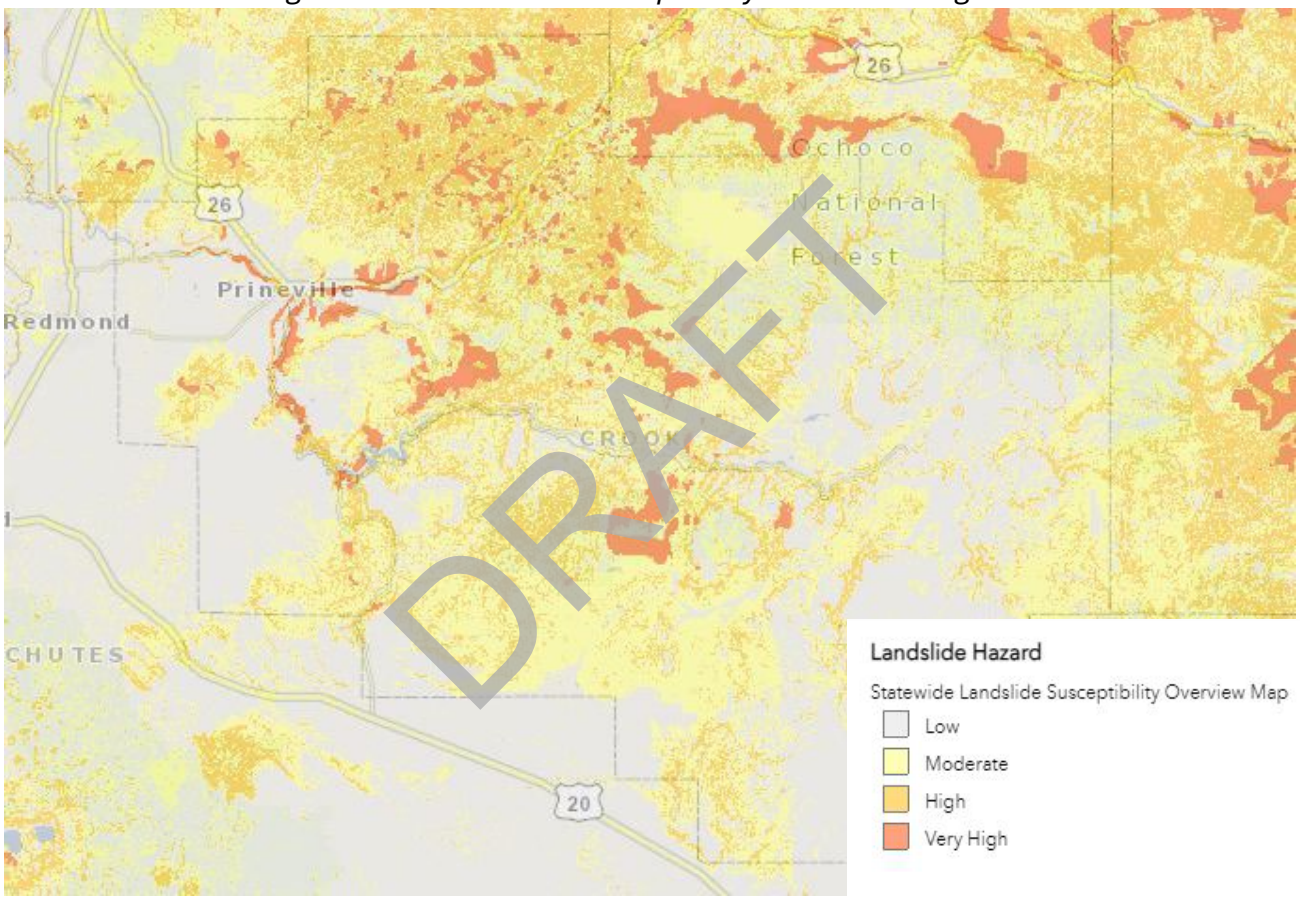
[114] Statewide Landslide Information Layer for Oregon, Oregon Dept of Geology and Mineral Industries. Accessed October 2024.

Nonetheless, both the City of Prineville and Crook County have implemented steep slope ordinances to regulate development in hazard-prone areas.

Landslides can affect services needed to support the Crook County population, including transportation systems, utilities, and property damage. A very large landslide could have a significant impact of maintaining critical lifelines, with limited risk to Highway 26 through the Ochoco Mountains.

Earthquake-induced landslides are a generally low vulnerability within Crook County.

Figure 3-20. Landslide Susceptibility in Central Oregon[115]



Landslide Risk Assessment

Crook County finds that there is no significant history of devastating impacts from landslides. Although landslides could cause serious damage, the vulnerability of impacts to populations or property is low. However, if a serious landslide event were to occur, the maximum threat from this type of disaster would be high. The probability of a severe landslide occurring within the next 35-100-year period is currently anticipated to be moderate. It is important to note that there is a significant amount of dormant landslide terrain within Crook County (specifically

[115] Oregon Department of Geology and Mineral Industries HazVu, retrieved 8/19/2024 from https://gis.dogami.oregon.gov/maps/hazvu/

within the Ochocos) which will reactivate at some point, potentially during a significantly wet spring. These reactivations have the potential to cause significant damage; for example, the Ochoco Dam is built on dormant landslide terrain. Additionally, the potential for and impacts of landslides in neighboring counties are high.

DOGAMI is currently developing a detailed risk assessment for Crook County for four hazards, including landslide.[116] This assessment combines building location with assessor information to develop a detailed building inventory. Those buildings are then overlayed with hazard information. Risk is calculated in terms of the dollar amount and number of people impacted. Critical facilities that may be impacted are included in the report. This report is expected to be available to Crook County in July of 2025.

Landslides are the lowest ranked hazard within the Crook County Hazard Analysis Matrix as seen in Table 3-2. Based upon the experiences documented within this plan, the county finds that there is ***Low*** risk associated with landslides in Crook County and finds the vulnerability to also be ***Low***. However, should the worst case scenario occur, landslides can be particularly damaging to infrastructure and people.

[116] Email communication with Matt Williams, DOGAMI. January 2025.

Section 4: Mitigation Strategy

2025 Crook County Natural Hazard Mitigation Plan

4.0 Mitigation Introduction

Section 4 outlines Crook County's strategy to reduce or avoid long-term vulnerabilities to the identified hazards. Specifically, this section presents a mission and specific goals and actions thereby addressing the mitigation strategy requirements contained in 44 CFR 201.6(c)(3)(i). The Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP) Steering Committee reviewed and updated the mission, goals and action items documented in this plan. Additional planning process documentation is in *Appendix C, Planning and Public Process*.

4.1 Mitigation Plan and Action Item Development

2005 Development

The 2005 Crook County Multi-Jurisdiction Natural Hazard Mitigation Action Plan (NHMP) included 42 short term and long-term action items that could reduce the County's risk and vulnerability to natural disasters.

2010 Update

In 2010 the Crook County NHMP was updated through an extensive process that included numerous opportunities for public input. A Steering Committee was also established to assist in thoroughly reviewing the Plan's content and to update the action items.

The 2010 Update Steering Committee found that eleven action items had been completed and a couple more were moved to the county's operational plans (such as the Emergency Operations Plan). Some of the action items also fell within an "ongoing" category where continuous efforts were expected to occur, and the remaining items were continuing in some form of work plan.

They believed these accomplishments had reduced Crook County's vulnerability and risk to natural disasters. They also noted that mitigation efforts need to continue, likely indefinitely. Reviewing the action items and the Plan's goals, the Steering Committee refined the actions that they believed provided the greatest benefit toward enhancing the County's natural hazard preparedness. This included efforts to mitigate the vulnerabilities and risks of natural hazards. The Steering Committee recommended 28 new and revised Action Items through the 2010 Update for the next 5-year planning period.

2018 Update

Action items were again updated during the 2018 NHMP update process. Specifically, coordinating and partner organizations were examined and updated as necessary. Action items were examined and updated to reflect any changes in completion, change in need, etc.

The changes described above were reflected in the action items that were prioritized for work through the last plan update cycle (2018-2022). The action items were intended to achieve compliance with national and state regulations and aided in the reduction of effects of hazards on new, existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

2025 Update

During the 2024-25 NHMP update process, the Steering Committee reviewed and updated the mitigation action items. Action items were examined and updated to reflect any changes in completion status, change in partners, etc. New action items were identified at this time (see action items worksheets located in *Appendix A*) and action items that were no longer relevant were removed.

4.2 Mitigation Mission

The Crook County/Crook County Multi-Jurisdictional Natural Hazards Mitigation Plan Mission is:

> *To reduce risk, prevent loss, and protect life, property, and the environment from natural hazard events through coordination and cooperation among public and private partners.*

The 2024-25 NHMP Steering Committee reviewed the mission statement and confirmed that it still accurately conveys the appropriate approach for prioritizing hazard mitigation within Crook County.

4.3 Mitigation Goals

Mitigation plan goals are more specific statements of direction that Crook County citizens and public and private partners can take while working to reduce the county's risk from natural hazards. These statements of direction form a bridge between the broad mission statement and particular action items. The goals listed here serve as checkpoints as agencies and organizations begin implementing mitigation action items.

Public participation was a key aspect in developing the plan goals initially in 2005. Meetings with the project Steering Committee, stakeholder interviews and public workshops all served as methods to obtain input and priorities in developing goals for reducing risk and preventing loss for natural hazards in Crook County.

The 2024-25 Crook County NHMP Steering Committee reviewed the 2018 goals and chose to adopt the same goals with no changes. All the plan goals are important and are listed below in priority order. Establishing community priorities within action items neither negates nor eliminates any goals, but it establishes which action items to consider implementing first, should funding become available. During the Steering Committee meetings for the participating jurisdictions and special districts (the City of Prineville and Crook County Fire & Rescue), the Crook County NHMP mission statement and goal statements were reviewed and agreed upon by all.

Table 4-1 below lists the plan goals, as confirmed by the Steering Committee.

Table 4-1. 2025 Crook County Natural Hazard Mitigation Plan Goals

Goal	Goal Statement	Community Priority
Partnership and Coordination	• Identify mitigation of risk reduction measures that address multiple areas (i.e. environment, transportation, and telecommunications). • Coordinate public/private sector participation in planning and implementing mitigation projects throughout the county. • Seek partnerships in funding and resources for future mitigation efforts.	1
Emergency Services	• Minimize life safety issues. • Promote, strengthen, and coordinate emergency response plans. • Evaluate the performance of critical facilities during a natural hazard event.	2
Education and Outreach	• Further the public's awareness and understanding of natural hazards, potential risk, including economic vulnerability, and options available when natural hazard events occur.	3
Prevention	• Reduce the threat of loss of life and property from natural hazards. • Incorporate information on known hazards and provide incentives to make hazard mitigation planning in land use policies and decisions, which include plan implementation.	4
Property Protection	• Lessen impact from natural disaster on individual properties, businesses, and public facilities. • Increase awareness at the individual level and encourage activities that can prevent damage and loss of life from natural hazards.	5

Natural Resource Protection	• Preserve and rehabilitate natural systems to serve natural hazard mitigation functions (i.e. floodplains, wetlands, watersheds, and urban interface areas).	6
Structural Projects	• When applicable, utilize structural mitigation activities to minimize risks associated with natural hazards.	7

4.4 Action Item Development Process

The development of action items was a multi-step, iterative process that involved brainstorming, discussion, review, and revisions. Many of the action items were first created during the 2005 NHMP planning process. During that process, the Steering Committee developed maps of local vulnerable populations, facilities, and infrastructure in respect to each identified hazard. Reviews of these maps generated discussion around potential actions to mitigate impacts on vulnerable areas. All actions were then reviewed by the committee, discussed at length, and revised as necessary before becoming a part of this document. In 2010, 2018, and now 2025, the Steering Committee reviewed the previous action items and provided status updates for each. New action items were developed by Steering Committee members and approved by the full group throughout the update process. Action items that the Steering Committee believed to be vague or too similar to the Plan's goals were removed. More information on action items can be found within the action item worksheets in *Appendix A, Action Item Worksheets*.

4.5 How Action Items Are Organized

The mitigation action items list activities in which county governments, agencies, associations, and citizens can work to reduce the risks associated with natural hazards. Each action item includes an estimate of the timeline for implementation.

The NHMP action items are grouped into eight hazard topics which include:

1. Multi-Hazard
2. Drought Hazard
3. Flood Hazard
4. Wildfire Hazard
5. Severe Weather Events
6. Earthquake Hazard
7. Volcano Hazard
8. Landslide Hazard

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

Proposed Action Title

Each action item includes a brief description of the proposed action.

Alignment with Plan Goals

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

Affected Jurisdiction(s)

Many of the action items within this Plan apply to all the participating cities and the county; however, some action items are specific. The list of affected jurisdictions is provided on the right side of the matrix. Each city identified as an "affected jurisdiction" will contribute to accomplishing the specified action at a local level.

Alignment with Existing Plans/Policies

Identify any existing community plans and policies where the action item can be incorporated. Incorporating the mitigation action into existing plans and policies, such as comprehensive plans, will increase the likelihood that it will be implemented.

The Crook County NHMP includes a range of action items that, when implemented, will reduce loss from hazard events in the County. Within the Plan, FEMA requires the identification of existing programs that might be used to implement these action items. Crook County and the City of Prineville currently address statewide planning goals and legislative requirements through their comprehensive land use plans, capital improvements plans, mandated standards, and building codes. To the extent possible, the jurisdictions will work to incorporate the recommended mitigation action items into existing programs and procedures. (Note: Crook County is currently participating in a review of its development code to determine options for improvement regarding the flood and wildfire hazards.)

Many of the recommendations contained in the Crook County NHMP are consistent with the goals and objectives of the existing plans and policies. Where possible, Crook County and the participating cities will implement the recommendations and actions contained in the NHMP through existing plans and policies. Plans and policies already in existence have support from local residents, businesses, and policymakers. Many land-use, comprehensive, and strategic plans get updated regularly, and can adapt easily to changing conditions and needs. Implementing the action items contained in the NHMP through such plans and policies increases their likelihood of being supported and implemented.

Rationale or Key Issues Addressed

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Action items can be developed at any time during the planning process and can come from several sources, including participants in the planning process, noted

deficiencies in local capability, or issues identified through the risk assessment. The rationale for proposed action items is based on the information documented in Section 3: Natural Hazards Identification and Risk Assessment.

Ideas for Implementation

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

Coordinating (Lead) Organization

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

Internal and External Partners

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

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

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

Potential Funding Sources

Where possible, potential funding sources were identified for the action item.

Estimated Cost

A rough estimate of the cost for implementing each action item is included. Costs are shown in general categories showing low, medium, or high cost. The estimated cost for each category is outlined below:

Low – Less than $50,000
Medium - $50,000 - $100,000
High – More than $100,000

Timeline

Action items include both short and long-term activities. Each action item includes an estimate of the timeline for implementation. Short-term action items (ST) are activities that may be implemented with existing resources and authorities in one to two years. Medium-term action items (MT) may require some resource development and coordination and may take 2-5 years. Long-term action items (LT) may require new or additional resources and/or authorities and may take from one to five years to implement. Ongoing action items signify that work has begun and will either exist over an indefinite timeline, or an extended timeline.

Status

As action items are implemented or new ones are created during the Plan maintenance process, it is important to indicate the status of the action item—whether it is new, ongoing, deferred, or complete. Documenting the status of the action will make reviewing and updating the mitigation Plan easier during the Plan's five-year update and can be used as a benchmark for progress. Deferred action items have yet to see any significant work begin on the particular action.

Priority

High priority action items are designated to clarify the importance of these mitigation actions for the affected jurisdictions.

4.6 Mitigation Strategy

A mitigation strategy provided the County's blueprint for reducing potential losses of identified risks. Within *Section 3: Natural Hazard Identification and Risk Assessment* is the Crook County Hazard Analysis Matrix. This analysis provides more information on the risk and vulnerabilities of natural hazards in Crook County.

Mitigation Strategy

The Mitigation Strategy for the 2025 NHMP is to support the Plan Mission by promoting the Plan Goals through implementation of Action Items that have been prioritized by the Steering Committee as being short-term or long-term tasks. The County will consider the cost/benefit of implementing Mitigation Action Items identified within this Plan and will consider the approaches for Cost/Benefit analysis described in Appendix F of this Plan.

Analysis

This section identifies and analyzes a comprehensive range of specific mitigation actions and projects recommended to reduce the effects of each natural hazard type.

Prioritization

The Action Items listed within this Section are prioritized by natural hazard type into short-term and long-term tasks (defined in the Action Item Identifier above). The Steering Committee considered costs and benefits in the prioritization of each action item. Action items that **improve the effectiveness of responding to an emergency** were prioritized. The committee also **used the public input processes to further identify community priorities.**

Implementation

The Action Items are implemented and administered by Crook County and in some circumstances the City of Prineville. Each Action Item listed within the Section includes a "Coordinating Organization." The Coordinating Organization is tasked with the implementation of the action item.

Compliance with NFIP

Crook County NHMP is intended to comply with the National Floodplain Insurance Plan (NFIP). Both Crook County and the City of Prineville participate in the NFIP. This Plan includes a Mitigation action item designed to ensure the county maintains compliance with the NFIP through a local compliance review that occurs during each annual review of this NHMP.

4.7 Action Item Matrix

Table 4-2 below documents each action along with the lead organization, partners, timeline, status, and identifies which goal it aligns with.

Priority action items are highlighted in orange. NHMP Steering Committee members reviewed each action item and determined if an item was a priority based on the actions ability to improve the effectiveness of responding to an emergency, as well as the public input process.

Action items in red text were removed from the Crook County NHMP action item matrix. Steering Committee members reviewed each action and removed items that were not specific enough or were too similar to the NHMP goals. Refer to Appendix A for detailed information about each action item.

Table 4-2. 2025 Crook County Natural Hazard Mitigation Priority Action Items[117]

Multi-Hazard	LT or ST	Proposed Action Title	Lead Agency	Partner Organizations	Timeline	Status	Plan Goals						
							1	2	3	4	5	6	7
MH #1	ST	Sustain a public awareness campaign about natural hazards.	Crook County Emergency Management	Bowman Museum, City of Prineville, Crook County Planning, Crook County Fire & Rescue, Crook County Public Health, ODF, BLM, USFS. Crook County Library, COCC, OSU Extension	Ongoing	Removed		X	X	X			
MH #2	ST	Develop public and private partnerships to foster natural hazard program coordination and collaboration in Crook County.	Crook County Emergency Management	City of Prineville, Crook County Emergency Management, Crook County Planning, Crook County Fire, ODF, BLM, USFS, Crook County Public Health, Jefferson County Emergency Management, Deschutes County Emergency Management	Ongoing	Removed	X		X	X			

[117] Crook County Steering Committee, 2025.

MH #3	ST	Review the Crook County Emergency Operations Plan and the Natural Hazards Mitigation Plan on an annual basis. Conduct a complete review of the plans and have them officially promulgated by the approving authorities every 5 year.	Crook County Emergency Management and Central Oregon Intergovern-mental Council	City of Prineville, Crook County Emergency Management, Mitigation Plan Steering Committee, ARC, Law Enforcement Heads, Fire Heads, OSP, ODF, ODOT, ARNAG, ARES, OEM, FEMA, Crook County Public Health	Ongoing	Ongoing		X					
MH #4	ST	Promote natural hazards safety education.	Crook County Emergency Management	School Districts, Facility Safety Personnel, Search and Rescue, City of Prineville, Crook County Emergency Management, Crook County Planning, Crook County Fire, ODF, BLM, USFS, OEM, FEMA, Association of Safety Engineers, Media, Utility and Telecommunications	Ongoing	Ongoing	X		X	X			

				Companies, Crook County Public Health									
MH #5	ST	Establish partnerships with other local, state, and federal agencies to coordinate and collect geo-science and technical information for identifying and mapping potential areas of risk.	Crook County GIS	City of Prineville, Crook County Planning, Crook County Fire, ODF (GIS), BLM, USFS, DOGAMI, USGS, NOAA, OEM, FEMA, Crook County Public Health, USFS (GIS)	Ongoing	Deferred	X		X	X			
MH #6	ST	Maintain and enhance the systems that support individuals with disabilities and other access and functional needs during disaster.	Crook County Emergency Management	All Emergency Management Organizations in Crook, Deschutes and Jefferson Counties; City of Prineville; Crook County Public Health; County GIS, ARC, Central Oregon Disability Support Network (CODSN), ODHS OREM	1-2 Years	Deferred	X	X	X	X			
MH #7	ST	Explore funding sources and grant opportunities for	Crook County Emergency Management	City of Prineville, Crook County Emergency Management, Crook	Ongoing	Ongoing			X	X			

		county-wide natural hazard mitigation activities.		County Administration, OEM, FEMA, Crook County Public Health, Crook County Fire and Rescue									
MH #8	ST	Evaluate security methods and processes to assess what types of data will have open public access versus restricted responder agency access.	Crook County Sheriff / IT	City of Prineville, Crook County Administration, OEM, FEMA, Crook County Public Health	Ongoing	Ongoing			X	X			
MH #9	ST	Create and maintain a single GIS inventory resource of all critical facilities, large employers/public assembly areas, and lifelines.	Crook County GIS	Crook County GIS, City of Prineville, Crook County Planning, Crook County Fire, ODF, BLM, USFS, ARC, QWEST, Crook County Road, Prineville Public Works, Power Companies, OID, Crook County Public Health, Oregon Department of Geology and Mineral Industries	Ongoing	Deferred		X	X	X			

MH #10	LT	Use hazard information as a basis for reviewing site-specific land use decisions.	Crook County Planning; City of Prineville Planning	Crook County GIS	Ongoing	Ongoing				X			
MH #11	LT	Improve planning, notification, and training for volunteers.	Tri County Emergency Management (Crook, Deschutes, Jefferson)	City of Prineville, Crook County Administration, Crook County SO, CERT, ARC, CCSO SAR, Crime Prevention, Crook County Public Health	6+ Years	Ongoing	X	X	X	X			
MH #12	LT	Promote hazard resistant utility and telecommunication construction and maintenance methods.	Crook County	Auxiliary Communications, City of Prineville, Crook County Emergency Management, Crook County Planning, Crook County Information Technology, Prineville Information Technology, Private Utilities	3-5 Years	Ongoing			X	X			

MH #13	LT	Collect data for significant non-declared natural hazard events.	Crook County Planning & GIS	City of Prineville, Insurance Companies, OSU Extension, County GIS, County Building, County Planning, U.S. Forest Service, Bureau of Land Management, Oregon Department of Transportation	Ongoing	Ongoing			X	X	X		
MH #14	LT	Develop a recovery plan for Crook County and Prineville from the effects of catastrophic hazards.	Crook County Emergency Management	Crook County Administration, City of Prineville, OEM	3-5 Years	Ongoing	X		X				
Drought	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
DR #1	LT	Educate the public on alternative landscaping possibilities.	County Planning	City of Prineville Planning and Zoning, OSU-Extension	6+ Years	NEW			X		X		
DR #2	LT	Study and implement alternative irrigation water sources and other surface water and groundwater	OID/Crook County	Crook County, BOR, OWRD, NRCS	6+ Years	NEW							

		storage projects(s).											
DR #3	LT	Improve irrigation efficiency by piping/lining canals, metering deliveries and automating systems.	OID/Crook County	Crook County, City of Prineville, BOR, OWRD, NRCS	6+ Years	NEW						X	X
Earthquake	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
EQ #1	ST	Develop in-depth studies to determine county and region's vulnerability to earthquake.	Crook County Emergency Management	City of Prineville, OEM, DOGAMI, FEMA, USGS, Public Environmental Health, Crook County Public Health	1-2 Years	Ongoing	X			X			
EQ #2	ST	Promote building safety through nonstructural improvements.	Crook County Planning & Zoning	City of Prineville, Local Businesses, Tri - County Emergency Management	Ongoing	Deferred	X			X	X		
Flood	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**

FL #1	ST	Coordinate river gauge information that is tied into National Weather Service flood forecasting.	NWS (Pendleton Office)	City of Prineville, Ochoco Irrigation District, Bureau of Reclamation, Watershed Councils, Cities, OSU Extension Service, USGS, WRD, USACE, BOR, Private River Gauges	Ongoing		X						
FL #2	ST	Conduct a workshop for target audiences on National Flood Insurance Programs, mitigation activities, and potential assistance from FEMA's Flood Mitigation Assistance and Hazard Mitigation Grant Programs.	Crook County Planning, Crook County Community Development, Crook County Emergency Management	City of Prineville, Watershed Councils, OEM, FEMA	Annually	Deferred	X		X	X	X		

FL #3	ST	Maintain compliance with the National Flood Insurance Program (NFIP) and Update the Flood Insurance Rate (FIRM) Maps for Crook County using the 2010 FIRM maps.	Crook County Planning, Crook County Emergency Management	County GIS, City of Prineville, FEMA, DLCD	Annually		X			X	X		
FL #4	LT	Encourage private property owners, and public agencies to restore natural systems within the floodplain, and to manage riparian areas and wetlands for flood abatement.	County and City Planning	Watershed Councils, Cities, Natural Resource Conservation Service, City of Prineville Planning, County Parks and Planning, FEMA, USACE, DSL	Ongoing	Deferred					X	X	
FL #5	LT	Preserve water quality by using storm water best management practices.	Crook County Roads Department	DEQ, City of Prineville, Watershed Councils, WRD, USACE	Ongoing							X	

FL #6	LT	Evaluate and assess the interest in County and City participation in the NFIP Community Rating System.	Crook County Emergency Management	Ochoco Irrigation District, Bureau of Reclamation, City of Prineville, County Planning, Watershed Councils, OEM, FEMA	3-5 Years	Ongoing			X	X			X
FL #7	LT	Coordinate with Ochoco Irrigation District to evaluate the vulnerability of Ochoco Dam to natural hazards.	Crook County Emergency Management	Ochoco Irrigation District, Bureau of Reclamation, City of Prineville, Watershed Councils, USACE, BOR, WRD	3-5 Years	Ongoing			X	X			X
FL #8	ST	Improve readiness in the event of catastrophic breach potential at Barnes Butte dam by exercising the Emergency Action Plan (EAP).	OWRD and Private Land Owners	Crook County Emergency Management, City of Prineville Police Department, Crook County Fire & Rescue, Ochoco Irrigation District		NEW	X	X	X	X	X		

FL #9	ST	Install a reservoir level gage for Barnes Butte dam and develop an Operations and Maintenance Plan with safe reservoir levels at times when flooding could occur.	OWRD Dam Safety Program and Private Land Owners	City of Prineville, OID, FEMA, ODEM		NEW	X	X		X	X		
FL #10	LT	Mitigate risk of failure by widening spillway on the Barnes Butte dam.	OWRD Dam Safety Program & Private Dam Owner	City of Prineville, Ochoco Irrigation District, Crook County Sheriff, FEMA		NEW	X	X		X			X
Landslide	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
LS #1	LT	Assess Crook County's and City of Prineville's Vulnerability to Landslides	Oregon Emergency Management	City of Prineville, ODOT, DOGAMI, Crook County Emergency Management, ODF, County Planning, USFS, BLM	1-2 Years	Ongoing				X			X
Severe Weather Events	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**

SWE #1	ST	Coordinate with local and state agencies to collect and identify data that would assist in developing a vulnerability and risk assessment related to the possible effects of future climate variability, especially as it may be associated with drought and a reduction of the water table.	Crook County Emergency Management	City of Prineville, NHMP Steering Committee, Oregon Water Master, Crook County Planning, Crook County Fire, ODF, BLM, USFS, DOGAMI, USGS, NOAA, OEM, FEMA, Crook County GIS, Crook County Public Health	1-3 Years	Deferred	X	X		X			
Volcanic Event	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
VE #1	ST	Provide a Volcanic Ash Mitigation Guidebook on the County Website for citizens and businesses.	Crook County Emergency Management, USGS-Cascade Volcano Observatory	City of Prineville, DOGAMI, COCC/OSU	1-2 Years	Ongoing			X				
Wildfire	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**

WF #1	ST	Continue to promote public awareness campaigns for individual property owners living in interface areas.	Crook County Emergency Management	City of Prineville, Fire District, Media, County Planning, OEM, FEMA, Crook County Public Health, Crook County CWPP, Steering Committee, Oregon Department of Forestry, BLM, USFS, OSFM, OSU-Extension	Ongoing	Ongoing	X		X	X	X		
WF #2	ST	Identify and implement methods of disposal or utilization of fire fuels removed from individual properties.	Tri-County Emergency Management (Crook, Deschutes, and Jefferson Counties)	City of Prineville, County Planning, State Fire Marshal, Crook County Fire & Rescue, Crook County Public Health, Crook County Landfill, BLM, ODF, USFS	Ongoing	Ongoing	X					X	

Section 5: Plan Maintenance and Updating

2025 Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan

5.0 Plan Implementation and Maintenance Overview

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

Part of any successful plan is keeping the plan current through continuous maintenance. Regular plan maintenance allows this document to remain relevant and enables the county to advance its level of preparedness through the implementation of mitigation action items. Plan maintenance is a process that combines open public involvement and the collection of new data to make informed decisions that assist in mitigating the disastrous effects of natural hazards, making the county more resilient to natural disasters.

5.1 Plan Adoption Process Overview

The Crook County NHMP was developed and will be implemented through a collaborative process. After the plan is locally reviewed and deemed complete, the Crook County Plan Convener submits it to the State Hazard Mitigation Officer (SHMO) at the Oregon Department of Emergency Management (OEM). OEM submits the plan to the Federal Emergency Management Agency (FEMA-Region X) for review. This review addresses the federal criteria outlined in the FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, the County will adopt the plan via resolution. At that point the County will gain eligibility for the Hazard Mitigation Grant Program funds. Following adoption by the county, the participating jurisdictions should convene local decision makers and adopt the Jefferson County NHMP.

5.2 Implementation Process

The success of the Crook County NHMP depends on how well the outlined action items are implemented. In an effort to ensure that the activities identified are implemented, the following steps will be taken: 1) the NHMP will be formally adopted, 2) a Steering Committee will be assigned, 3) a Convener shall be designated, 4) semi-annual meetings will be held, 5) the identified activities will be prioritized and evaluated, and 6) the NHMP will be implemented through existing plans, programs and policies.

Implementation Roles

Plan Convener

The Crook County Emergency Manager will take responsibility for NHMP implementation and will facilitate the Hazard Mitigation Steering Committee meetings and will assign tasks such as updating and presenting the NHMP to the rest of the members of the Steering Committee (see City and Special District Addenda for their respective conveners). NHMP implementation and evaluation will be a shared responsibility among all of the assigned Steering Committee Members.

The Convener's responsibilities include:

- Coordinate Steering Committee meeting dates, times, locations, agendas and member notification;
- Document the discussions and outcomes of committee meetings;
- Serve as a communication conduit between the Steering Committee and the public/stakeholders;
- Identify emergency management-related funding sources for natural hazard mitigation projects; and
- Utilize the Risk Assessment as a tool for prioritizing proposed natural hazard risk reduction projects.

Steering Committee

The Crook County Convener will maintain a Natural Hazard Steering Committee for updating and implementing the NHMP.

The Steering Committee responsibilities include:

- Attend future maintenance and NHMP update meetings (or designating a representative to serve in your place);
- Serve as the local evaluation committee for funding programs such as the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds and Flood Mitigation Assistance program funds;
- Prioritize and recommend funding for natural hazard risk reduction projects;
- Evaluate and update the NHMP in accordance with the prescribed maintenance schedule;
- Develop and coordinate ad hoc and/or standing subcommittees as needed; and
- Coordinate public involvement activities.

The following jurisdictions, agencies and/or organizations were represented and served on the Steering Committee during the development of the Crook County NHMP and may be represented during implementation and maintenance phase (for a list of individuals see *Acknowledgements*):

- Crook County (Board of County Commissioners)
- Crook County (Planning Department)
- Crook County (Health Department)

- Crook County (Road Department)
- Crook County Sheriff's Office
- Bureau of Land Management
- Central Oregon Community College
- City of Prineville Police Department
- Crook County Fire & Rescue
- Crook County School District
- Deschutes County Health Services
- National Oceanic Atmospheric Administration (NOAA)
- Ochoco Irrigation District
- Oregon Department of Forestry (ODF)
- Oregon State Fire Marshal (OFSM)
- Oregon Water Resources Department (OWRD)
- Prineville-Crook County Chamber of Commerce
- U.S. Forest Service

To make the coordination and review of the Crook County NHMP as broad and useful as possible, the Steering Committee will engage additional stakeholders and other relevant hazard mitigation organizations and agencies to implement the identified action items. Specific organizations have been identified as partners in the *Action Item Matrix*.

Ongoing Monitoring

NHMP maintenance is a critical component of the NHMP. Proper maintenance of the NHMP ensures that it will maximize the county and participating cities/special districts' efforts to reduce the risks posed by natural hazards. This process was developed by the Crook County Steering Committee, who will be responsible for implementing this process, in addition to maintaining and updating the NHMP through a series of meetings outlined in the maintenance schedule below.

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

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

Implementation through Existing Programs

Crook County addresses statewide planning goals and legislative requirements through its Comprehensive Land Use Plan, capital improvement plans, and county building codes. The NHMP provides a series of recommendations that are closely related to the goals and objectives of existing planning programs. Crook County will have the opportunity to implement recommended mitigation action items through existing programs and procedures.

Project Prioritization Process

The Disaster Mitigation Act of 2000 requires that jurisdictions identify a process for prioritizing potential actions. Potential mitigation activities often come from a variety of sources; therefore, the project prioritization process needs to be flexible. Committee members, local government staff, other planning documents or the risk assessment may be the source to identify and prioritize projects.

Step 1: Examine Funding Requirements

The first step in prioritizing the NHMP's action items is to determine which funding sources are open for application. Several funding sources may be appropriate for the County's proposed mitigation projects. Examples of mitigation funding sources include but are not limited to: FEMA's Pre-Disaster Mitigation competitive grant program (PDM), Flood Mitigation Assistance (FMA) program, Hazard Mitigation Grant Program (HMGP), National Fire Plan (NFP), Community Development Block Grants (CDBG), local general funds and private foundations, among others. Please see *Volume III, Appendix F, Grant Resources* for a more comprehensive list of potential grant programs. Because grant programs open and close on differing schedules, the Steering Committee will examine upcoming funding streams' requirements to determine which mitigation activities would be eligible. The Steering Committee may consult with the funding entity, Oregon Department of Emergency Management (OEM), or other appropriate state or regional organizations about project eligibility requirements. This examination of funding sources and requirements will happen during the Steering Committee's semi-annual NHMP maintenance meetings.

Step 2: Complete Risk Assessment Evaluation

The second step in prioritizing the NHMP's action items is to examine which hazards the selected actions are associated with and where these hazards rank in terms of community risk. The Steering Committee will determine whether the NHMP's risk assessment supports the implementation of eligible mitigation activities. This determination will be based on the location of the potential activities, their proximity to known hazard areas and whether community assets are at risk. The Steering Committee will additionally consider whether the selected actions mitigate hazards that are likely to occur in the future or are likely to result in severe/catastrophic damages.

Step 3: Steering Committee Recommendation

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

Step 4: Complete Quantitative and Qualitative Assessment and Economic Analysis

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

If the activity requires federal funding for a structural project, the Steering Committee will use a FEMA-approved cost-benefit analysis tool to evaluate the appropriateness of the activity. A project must have a cost-benefit ratio of greater than one in order to be eligible for FEMA grant funding. For non-federally funded or nonstructural projects, a qualitative assessment will be completed to determine the project's cost effectiveness. The Steering Committee will use a multivariable assessment technique called STAPLE/E to prioritize these actions. STAPLE/E stands for Social, Technical, Administrative, Political, Legal, Economic and Environmental. Assessing projects based upon these seven variables can help define a project's qualitative cost effectiveness. OPDR at the University of Oregon's Community Service Center has tailored the STAPLE/E technique for use in natural hazard action item prioritization.

5.4 Continued Public Involvement

This section of the NHMP addresses 44 CFR § 201.6(c)(4)(iii), *Plan Maintenance Requirements*.

The participating jurisdictions are dedicated to involving the public directly in the continual reshaping and updating of the Jackson County NHMP. To ensure that these opportunities will continue, the County and participating jurisdictions will:

- Post copies of their plan on corresponding websites;
- Place articles in the local newspaper directing the public where to view and provide feedback; and
- Use existing newsletters such as schools and utility bills to inform the public where to view and provide feedback.

In addition to the activities listed above, Crook County, The City of Prineville, and Crook County Fire & Rescue will ensure continued public involvement by posting a link to the Crook County NHMP on their websites.

5.5 Five-Year Review of NHMP

This NHMP will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. The Crook County NHMP is due to be updated by [INSERT DATE ONCE APPROVED]. The Convener will be responsible for organizing the Steering

Committee to address NHMP update needs. The Steering Committee will be responsible for updating any deficiencies found in the NHMP and for ultimately meeting the Disaster Mitigation Act of 2000's NHMP update requirements. The following 'toolkit' can assist the Convener in determining which NHMP update activities can be discussed during regularly scheduled NHMP maintenance meetings and which activities require additional meeting time and/or the formation of sub-committees.

Table 5-1. Natural Hazard Mitigation Plan Update Toolkit[118]

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.

[118] Oregon Partnership to Disaster Resilience, 2010.

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 assessmentsection, or 2) determine whether adequate data exists. If so, add information to plan. If not, describe why this could not be done at the time of the plan update
Did the plan identify data limitations?			If yes, the plan update must address them: either state how deficiencies were overcome or why they couldn't be addressed
Did the plan identify potential dollar losses for vulnerable structures?			1) Update existing data in risk assessmentsection, or 2) determine whether adequate data exists. If so, add information to plan. If not, describe why this could not be done at the time of the plan update
Are the plan goals still relevant?			Document any updates in the plan goal section
What is the status of each mitigation action?			Document whether each action is completed or pending. For those that remain pending explain why. For completed actions, provide a 'success' story.
Are there new actions that should be added?			Add new actions to the plan. Make sure that the mitigation plan includes actions that reduce the effects of hazards on both new and existing buildings.

Is there an action dealing with continued compliance with the National Flood Insurance Program?			If not, add this action to meet minimum NFIP planning requirements
Are changes to the action item prioritization, implementation, and/or administration processes needed?			Document these changes in the plan implementation and maintenance section
Do you need to make any changes to the plan maintenance schedule?			Document these changes in the plan implementation and maintenance section
Is mitigation being implemented through existing planning mechanisms (such as comprehensive plans, or capital improvement plans)?			If the community has not made progress on process of implementing mitigation into existing mechanisms, further refine the process and document in the plan.

Addendum: City of Prineville

City of Prineville Addendum to the 2025 Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan

City of Prineville Addendum to the Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan
Prineville, Oregon

Introduction

Purpose

This is the City of Prineville's Addendum to the Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP). This addendum supplements information contained in the Crook County NHMP, which serves as the NHMP foundation and Appendices, which provide additional information. This addendum meets the following requirements:

- Multi-Jurisdictional **Plan Adoption** §201.6(c)(5),
- Multi-Jurisdictional **Participation** §201.6(a)(3),
- Multi-Jurisdictional **Mitigation Strategy** §201.6(c)(3)(iv), and
- Multi-Jurisdictional **Risk Assessment** §201.6(c)(2)(iii).

The City of Prineville adopted their addendum to the Crook County Multi-Jurisdictional NHMP on INSERT DATE. FEMA Region INSERT REGION approved the Crook County NHMP on INSERT DATE and the City's addendum on INSERT DATE. With approval of this NHMP the City is now eligible for non-disaster and disaster mitigation project grants through INSERT DATE.

NHMP Process, Participation, and Adoption

This section of the NHMP addendum addresses 44 CRF 201.6(c)(5), *Plan Adoption* and 44 CFR 201.6(a)(3), *Participation*.

In addition to establishing a comprehensive city-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in Title 44 CFR Part 201, require that jurisdictions maintain an approved NHMP to receive federal funds for mitigation projects. Local adoption, and federal approval of this NHMP ensures that the City of Prineville will gain eligibility for non-disaster and disaster mitigation project grants. The City of Prineville was included as an addendum in the 2018 Crook County NHMP process.

Central Oregon Intergovernmental Council partnered with Crook County and Crook County Fire & Rescue to develop this NHMP. Members of the City of Prineville NHMP Steering Committee also participated in the County NHMP update process.

By creating an NHMP, locally adopting it, and having it approved by FEMA, Crook County Fire & Rescue will gain eligibility for FEMA Hazard Mitigation Assistance grant program funds.

The Crook County NHMP and City of Prineville addendum are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector and regional organizations. A project Steering Committee guided the process of developing the NHMP.

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

This addendum supports mitigation actions that are found within the Crook County NHMP. The City's Natural Hazard Mitigation effort is nested within the overall Crook County NHMP. Prineville considers itself a partner in the implementation of the plan, its mission, goals and mitigation actions. This City's role in this partnership is to reduce the risks posed by natural hazards through education and outreach programs, the development of partnerships, and the implementation of preventative activities such as land use or watershed management programs.

The actions described in the addendum are intended to be implemented through existing and new plans and programs within the district.

Convener and Committee

The City of Prineville Planning Director served as the designated convener of the City of Prineville addendum development and will take the lead in implementing, maintaining, and updating the addendum to the Crook County NHMP in collaboration with the designated convener of the Crook County NHMP (Emergency Manager).

City of Prineville Steering Committee members met formally once in October 2024 to review and update the 2018 addendum in the NHMP. The Steering Committee reviewed each section of the addendum, specifically focusing on updating the mitigation strategy and the risk assessment. After collecting and incorporating community input on the first draft of the addendum, the Steering Committee finalized the addendum.

The City of Prineville's Steering Committee was comprised of the following representatives:

- Convener, Josh Smith, City of Prineville Planning Department
- Russ Deboodt, Crook County Fire & Rescue
- Casey Kaiser, City of Prineville Public Works

- Thomas Vollmer, Prineville Police Department
- James Wilson, City of Prineville
- Jack Colpitt, Crook County GIS

The Steering Committee was closely involved throughout the development of the NHMP and served as the local oversight body for the NHMP's development. Steering Committee members possessed familiarity with Prineville's community and how it is affected by natural hazard events. Members of the City of Prineville Steering Committee also served as Steering Committee members during the update process for the 2025 Crook County NHMP.

NHMP Implementation and Maintenance

Prineville City Council will be responsible for adopting the Prineville addendum to the Crook County NHMP. This addendum designates a Steering Committee and a convener to oversee the development and implementation of action items. Because the city addendum is part of the County's multi-jurisdictional NHMP, the city will look for opportunities to partner with the County. The City of Prineville Steering Committee will convene after adoption of the NHMP addendum on an annual schedule and in conjunction with the County NHMP update meetings. The convener (Planning Director) will be responsible for assembling the Steering Committee.

Regular plan maintenance and updating allows this document to remain fresh and enables the City of Prineville to advance its level of preparedness through the implementation of mitigation action items. Plan maintenance and updating is a process that combines open public involvement and the collection of new data to make informed decisions that assist in mitigating the disastrous effects on natural hazards, making the county more resilient to natural disasters.

This section of this document details the process that will ensure that the City of Prineville Addendum remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the plan annually and producing a plan revision every five years. This section describes how the county will integrate public participation throughout the plan maintenance process.

Plan Adoption

Prineville City Council will be responsible for adopting the City of Prineville Addendum to the Crook County NHMP. This governing body has the authority to promote sound public policy regarding natural hazards. Once the Crook County NHMP has been adopted, the County Emergency Manager will be responsible for submitting it to the State Hazard Mitigation Officer at Oregon Emergency Management. The Oregon Department of Emergency Management will submit the updated NHMP to the Federal Emergency Management Agency (FEMA) for review. This review will address the federal criteria outlined in FEMA's Flood Mitigation Assistance program.

Ongoing Monitoring

This Addendum shall be reviewed by Steering Committee members on an annual basis in conjunction with the County NHMP. A complete review of the Addendum will occur every 5 years.

Topics that the Steering Committee could consider include:

- Ongoing prioritizing of action items and work plan
- Delegation of action item management and implementation
- Tracking and monitoring action item implementation
- Consideration of changes or appropriateness of action items
- Consideration of new information that could change assumptions, the risk assessment, or implementation actions of the Plan
- Natural hazard preparedness exercises

Crook County NHMP Review Schedule

- Year 1 (2026): Review risk assessment information and actions for implementation progress and prioritization. Document outcomes.
- Year 2 (2027): Review risk assessment information and actions for implementation progress and prioritization. Document outcomes.
- Year 3 (2028): Review risk assessment information and actions for implementation progress and prioritization. Document outcomes.
- Year 4 (2029): Begin formal 5-year update of the NHMP. Review Risk Assessment and actions to include new data if applicable.
- Year 5 (2030): Formal Update of the NHMP for FEMA review. During the five-year review, the Plan will be updated to meet current federal and state requirements through a public process that supports the mission of this Plan.

Five-Year Review of Addendum

The City of Prineville Addendum will be updated every five years in conjunction with the Crook County NHMP. During this update, the following questions will be asked to determine what actions are necessary to update the plan. The convener will be responsible for convening the city's Steering Committee to address the questions outlined below.

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

- Have there been any changes in development patterns that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the plan accurately address the impacts of this event?

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

Implementation through Existing Programs

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

Prineville's acknowledged comprehensive plan is the City of Prineville Urban Area Comprehensive Plan (2007). The Oregon Land Conservation and Development Commission first acknowledged the plan in 2007. The City implements the plan through the Community Development Code.

The City of Prineville has the following plans that relate to natural hazard mitigation. For more information, visit the City's website.

- Prineville Comprehensive Plan (2007)
- Comprehensive Plan Map (through 2022)
- Standards & Specifications (2013)
- Stormwater Facility Plan (2011)
- Transportation Systems Plan (2013)
- Wastewater Facility Plan (2024)
- Water System Master Plan (2023)
- Land Use Code
    - Land Use Code Chapter 155: Natural Features Overlay District
- Flood Prevention Code
- City Emergency Operations Plan
- Building Regulations
- Oregon Fire Code

The City of Prineville addresses statewide planning goals and legislative requirements through its Comprehensive Land Use Plan, capital improvement projects, and County building codes.

The Natural Hazard Mitigation Plan and the City of Prineville Addendum provide a series of recommendations that are closely related to the goals and objectives of existing planning programs. Crook County will have the opportunity to implement recommended mitigation action items through existing programs and procedures.

Capability Assessment

The Capability Assessment identifies and describes the ability of Prineville to implement the mitigation strategy and associated action items. Capabilities can be evaluated through an examination of broad categories, including existing authorities, policies, programs, funding, and resources.

Existing Authorities

Hazard mitigation can be executed at a local scale through three methods: integrating hazard mitigation actions into other local planning documents, adopting building and/or fire codes that account for best practices in structural hardening and fire resistance, and codifying land use regulations and zoning designations that prescribe mitigation into development requirements. The extent to which a municipality, district, or multi-jurisdictional effort leverages these approaches is an indicator of that community's capabilities.

The following provides a brief synopsis of some of the more important coordinating plans and policies of Prineville in the integration of hazard mitigation and long-range planning:

Land Use Regulations

Oregon's Statewide Planning Goal 7 requires comprehensive planning within every jurisdiction that is designed to reduce risks to people and property from natural hazards.

Planned updates to the jurisdiction's Goal 7 element or its broader comprehensive plan will reflect the data and findings within this NHMP and integrate analyses of future climate and natural hazard impacts into the community's long-range plans.

Existing land use policies that define zoning and address hazardous conditions provide a source of mitigation capability. The City of Prineville Planning Department is responsible for current and long-range planning in the City of Prineville.

Structural and Fire Building Codes

The Oregon Legislature recently adopted updated building codes for both residential (2021 adoption) and commercial structures (2022) since the last update of this Plan. These building codes are based on the 2021 version of the International Building Code, International Fire Code, and International Existing Building Code. The City of Prineville originally adopted the Uniform Building Code in 1971. It now relies upon the County to enforce the current Oregon Residential Specialty Codes for new residential and commercial construction. All new developments will be required to build according to the latest seismic and wind hardening standards in addition to requiring fire resistant building materials for those structures constructed in proximity or within the WUI.

Public Works

The City of Prineville Public Works Department provides for the management and maintenance of the city's infrastructure, including streets, sanitary water and sewer, and the wastewater treatment plant. Much of their work is associated with the reduction of hazards to the community and the implementation of resilience measures.

Oregon Residential Specialty Code

The Oregon Residential Specialty Code applies to the construction, reconstruction and repair of one- and two-family dwellings and townhouses. Crook County has locally adopted this code, which has specific provisions relating to wildfire hazard mitigation. The provisions of this code can be found here: https://codes.iccsafe.org/content/ORRC2023P1/chapter-3-building-planning#ORRC2023P1_Pt03_Ch03_SecR327

City Council

The Prineville City Council has the responsibility of developing and adopting the annual city budget. Integrating hazard mitigation goals and projects into the annual budget is key to implementing the plan. The City Council tries to broadly address resilience planning needs while it determines city and departmental priorities and looks for multiple-impact projects wherever possible. They also work with staff to apply for federal and state grant funding to pursue larger projects that are outside of general fund capacity.

Planning Department

The City of Prineville Planning Department is responsible for processing all development related land use applications within the City such as partitions, subdivisions, and site/design review. This also includes individual land use applications, zoning reviews, and signing off on building permits as well as providing information to the public on all land-related issues.

Prineville Comprehensive Plan

The City of Prineville Urban Area Comprehensive Plan is the guiding policy document for land use and growth-related planning for the City.

Policies and Programs

The City of Prineville has made significant progress in integrating the NHMP into its portfolio of planning processes and programs. The following are some of the plans and programs the city has explored, and will continue exploring, integrating the NHMP into.

National Flood Insurance Program

The City participates in the National Flood Insurance Program. The first Flood Insurance Rate Maps were developed for the city in 1989 and then updated in 2012. The City of Prineville Planning Department and Crook County Community Development are responsible for administering the day-to-day activities of the city's floodplain program. They are assisted by the Public Works Department and City Council. The jurisdiction's flood code section is based on the Oregon Model Flood Hazard Prevention code, which includes provisions addressing substantial improvement/substantial damage.

Community Wildfire Protection Plan

The Crook County Community Wildfire Protection Plan (CWPP) can be found on COIC's website as well as at local Fire Stations.

Personnel

The following personnel have assignments related to natural hazard mitigation planning and implementation for the City of Prineville:

- City of Prineville Engineering
- City of Prineville Planning Department
- City of Prineville Police Department
- City of Prineville Public Works
- Crook County Sheriff's Office / Emergency Management
- Crook County GIS
- Crook County Fire & Rescue
- Economic Development of Central Oregon

Capital Projects

The City of Prineville has implemented recommendations from the last NHMP into its capital improvement projects over the last 5 years, including:

- Water and Sewer System Resiliency Improvements (2022)
- Aquifer System Recovery Project (2021)
- Elm St Bridge Replacement (2019)
- Property Acquisitions from Properties within the Floodplain (Ongoing)
- Floodplain Feasibility Analysis (2024)
- Floodplain Code Update (2022)
- 911 Center relocated out of flood plain to category 4 building (2021)
- Prineville Renewable Energy (Biomass) Project (Ongoing)

Capital Resources

City of Prineville maintains several capital resources that have important roles to play in the implementation of the natural hazard mitigation plan, including:

- Critical facilities with generators for use during emergency blackouts (City of Prineville, Public Works, & Emergency Management)
- Three communication towers
- Crook County Airport
- Crook County Emergency Operations Center
- Crook County Fairgrounds

Findings

The findings from the capability assessment guided the design of this Plan's mitigation strategy and assisted Steering Committee members while prioritizing action items.

Staffing Limitations and Capacity

City of Prineville staff are assigned hazard mitigation responsibilities as a part of their larger job responsibilities. Limited capacity reduces the breadth of the programming the district can undertake in any year. The City relies upon its relationships with the County and other cities within its region to expand its operations.

Reliance on Outside Funding

Prineville operates on a limited budget with a small staff. This leaves few opportunities for using local financial resources to implement hazard mitigation work. They lean heavily upon state and federal grant funds as the primary means for securing mitigation funding. Hazard mitigation grants such as HMGP and BRIC require 10-25% local funding match, as well as extra staff capacity and expertise to navigate the application process and manage the funding.

Leveraging Partnerships with Public and Nonprofit Entities

Regional planning displayed in the development of the Central Oregon Community Economic Development Strategy demonstrates the City's ability to effectively share information and identified priority needs.

Mitigation Strategy

This section of the NHMP addendum addresses 44 CFR 201.6(c)(3)(iv), *Mitigation Strategy*.

The City's mitigation strategy was reviewed and updated during the 2024-25 update planning process. The Steering Committee assessed the City's risk, identified potential issues, and developed a mitigation strategy. The Steering Committee created actions specific to their community and removed 2018 actions that were no longer relevant for their community.

Mission

The mission of the City of Prineville's Addendum is:

To reduce risk, prevent loss and protect life, property and the environment from natural hazard events through coordination and cooperation among public and private partners.

The 2025 NHMP Steering Committee reviewed the mission statement and confirmed that it still accurately conveys the appropriate approach for this Plan and Addendum. This mission statement conveys the cooperative relations between the City of Prineville and Crook County. Implementation will occur through implementation of the NHMP and through existing plans and programs such as the floodplain steep slope ordinances.

Goals

The plan goals help guide the direction of future activities aimed at reducing risk and preventing loss from natural hazards. The goals listed here serve as checkpoints as agencies and organizations begin implementing mitigation action items. Through the 2024-25 Plan

Update, the Steering Committee evaluated the 2010 NHMP goals and chose to accept the 2010 goals in the seven topic areas.

As with the 2005, and 2010 and 2018 processes, the 2025 City of Prineville Steering Committee agrees that public participation has played a key role in developing plan goals. The goals were originally developed through meetings with the 2005 project Steering Committee, stakeholder interviews, and public workshops which served as methods to obtain input and priorities in developing goals for reducing risk and preventing loss for natural hazards in Crook County. Public meetings were an integral part of the 2005, 2010, and 2018, and 2025 Crook County NHMP update processes. The purpose of public meetings is to inform the public about natural hazards that occur in Crook County, and identify community priorities, and potential strategies for achieving those priorities.

Crook County citizens established community priorities for the original 2005 plans goals through a voting process that asked each participant to choose three goal statements that were most important to them (a more thorough description of this process and the outcomes can be found in the 2005 NHMP). The 2025 NHMP Steering Committee reviewed the 2010 goals of the NHMP and held a public comment meeting to allow an opportunity for public input not only on the goals, but the entire NHMP and City of Prineville addendum.

Table P-1. 2025 Crook County NHMP Goals

Goal	Goal Statement	Community Priority
Partnership and Coordination	• Identify mitigation or risk reduction measures that address multiple areas (i.e. environment, transportation, and telecommunications). • Coordinate public/private sector participation in planning and implementing mitigation projects throughout the county. • Seek partnerships in funding and resources for future mitigation efforts.	1
Emergency Services	• Minimize life safety issues. • Promote, strengthen, and coordinate emergency response plans. • Evaluate the performance of critical facilities during a natural hazard event.	2
Education and Outreach	• Further the public's awareness and understanding of natural hazards, potential risk, including economic vulnerability, and options available when natural hazard events occur.	3

Prevention	• Reduce the threat of loss of life and property from natural hazards. • Incorporate information on known hazards and provide incentives to make hazard mitigation planning in land use policies and decisions, which include plan implementation.	4
Property Protection	• Lessen impact from natural disaster on individual properties, businesses, and public facilities. • Increase awareness at the individual level and encourage activities that can prevent damage and loss of life from natural hazards.	5
Natural Resource Protection	• Preserve and rehabilitate natural systems to serve natural hazard mitigation functions (i.e. floodplains, wetlands, watersheds, and urban interface areas).	6
Structural Projects	• When applicable, utilize structural mitigation activities to minimize risks associated with natural hazards.	7

Action Items

During the 2024-25 update, the Steering Committee agreed with the 2018, 2010 and 2005 assessments that using the "goals in establishing community mitigation priorities does not negate or eliminate any goals."[119] The goals provide assistance when making determinations which risk reducing action items to fund first, should funding become available.

Table P-2 documents each action along with the lead organization, partners, timeline, status, and identifies which goal it aligns with.

Priority action items are highlighted in orange. NHMP Steering Committee members determined if an item was a priority based off the hazards HVA score, and the hazards maximum threat.

Action items in red text were removed from the City of Prineville NHMP addendum action item matrix. Steering Committee members reviewed each action and removed an item if it was too vague, too similar to the goals, or was already an identified action within the overall Crook County NHMP.
Refer to *Attachment A, Action Items* for detailed information about each action item.

[119] From Section 3 of the 2005 Prineville/Crook County Natural Hazard Mitigation Plan.

Table P-2 City of Prineville Mitigation Strategy Action Items

Multi-Hazard	LT or ST	Proposed Action Title	Lead Agency	Partner Organizations	Timeline	Status	Plan Goals						
							1	2	3	4	5	6	7
MH #1	ST	Sustain a public awareness campaign about natural hazards.	Crook County Emergency Management	Bowman Museum, Crook County Planning, Crook County Fire & Rescue, Crook County Health and Human Services, ODF, BLM, USFS	Ongoing	Removed		X	X	X			
MH #2	ST	Develop public and private partnerships to foster natural hazard program coordination and collaboration in Crook County.	Crook County Emergency Management	Crook County Planning, Crook County Fire, ODF, BLM, USFS, Crook County Health and Human Services, Jefferson County Emergency Management, Deschutes County Emergency Management	Ongoing	Removed	X		X	X			
MH #3	ST	Review the Crook County Emergency Operations Plan and the Natural Hazards Mitigation Plan on an annual basis. Conduct a complete review of	Crook County Emergency Management	City of Prineville, Crook County Emergency Management, Mitigation Plan Steering Committee, ARC, Law Enforcement Heads,	Ongoing	Removed		X					

		the plans and have them officially promulgated by the approving authorities every 5 years.		Fire Heads, OSP, ODF, ODOT, ARNAG, ARES, OEM, FEMA, Crook County Health and Human Services									
MH #4	ST	Promote natural hazards safety education.	Crook County Emergency Management	City of Prineville, Crook County Emergency Management, Crook County Planning, Crook County Fire, ODF, BLM, USFS, OEM, FEMA, Association of Safety Engineers, Media, Utility and Telecommunications Companies, Crook County Health and Human Services	Ongoing	Removed	X		X	X			
MH #5	ST	Establish partnerships to coordinate and collect geo-science and technical information for identifying potential areas of risk.	Crook County GIS	City of Prineville, Crook County Emergency Management, Crook County Planning, Crook County Fire, ODF (GIS), BLM, USFS, DOGAMI, USGS, NOAA, OEM, FEMA, Crook County	Ongoing	Removed	X		X	X			

				Health and Human Services, USFS (GIS)									
MH #6	ST	Maintain and enhance the systems that support individuals with disabilities and other access and functional needs during disaster.	Crook County Health and Human Services, County GIS, and 911 in the Tri-County Region	All Emergency Management Organizations in Crook, Deschutes and Jefferson Counties; City of Prineville; Crook County Health and Human Services; County GIS, ARC	1-2 Years	Removed	X	X	X	X			
MH #7	ST	Explore funding sources and grant opportunities for county-wide natural hazard mitigation activities.	Mitigation Plan Steering Committee	City of Prineville, Crook County Emergency Management, Crook County Administration, OEM, FEMA, Crook County Health and Human Services	Ongoing	Removed			X	X			
MH #8	ST	Evaluate security methods and processes to	Mitigation Plan Steering Committee	City of Prineville, Crook County Administration,	Ongoing	Removed			X	X			

		assess what types of data will have open public access versus restricted responder agency access.		OEM, FEMA, Crook County Health and Human Services									
MH #9	ST	Create and maintain a single GIS inventory resource of all critical facilities, large employers/public assembly areas, and lifelines, and use the GIS to evaluate their vulnerability by comparing them with hazard prone areas.	Crook County GIS	City of Prineville, Crook County Planning, Crook County Fire, ODF, BLM, USFS, ARC, QWEST, Crook County Road, Prineville Public Works, Power Companies, OID, Crook County Health and Human Services, Oregon Department of Geology and Mineral Industries (DOGAMI will be the source of information about and location of hazard-prone areas).	Ongoing	Removed		X	X	X			
MH #10	LT	Use hazard information as a basis for reviewing site-specific land use decisions.	Crook County Planning Department, Crook County Emergency Management	City of Prineville and Crook County GIS	Ongoing	Removed				X			

MH #11	LT	Improve planning, notification, and training for volunteers.	Tri-County Emergency Management (Crook, Deschutes and Jefferson Counties)	City of Prineville, Crook County Administration, Crook County SO, CERT, ARC, CCSO SAR, Crime Prevention, Crook County Health and Human Services	3-5 Years	Removed	X	X	X	X			
MH #12	LT	Promote hazard resistant utility and telecommunication construction and maintenance methods.	Oregon Office of Emergency Management	Auxiliary Communications, City of Prineville, Crook County Emergency Management, Crook County Planning, Crook County Information Technology, Prineville Information Technology	3-5 Years	Removed			X	X			
MH #13	LT	Collect data for significant non-declared natural hazard events.	Crook County Emergency Management	City of Prineville, Insurance Companies, OSU Extension, County GIS, County Building, County Planning, U.S. Forest Service, Bureau of Land Management,	Ongoing	Removed			X	X	X		

				Oregon Department of Transportation									
MH #14	LT	Develop a recovery plan for Crook County and Prineville from the effects of catastrophic hazards.	Crook County Emergency Management and Administration	City of Prineville, OEM	3-5 Years	Removed			X	X	X		
The Steering Committee, using available local resources, will study this hazard further during the implementation and maintenance phase of this NHMP, seeking to identify cost effective actions that might be implemented to reduce community vulnerability.													
Drought	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
DR #1	LT	Implement the Water Conservation Plan.	City of Prineville	BOR, OWRD, NRCS	Ongoing	NEW	X		X				
Earthquake	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**

EQ #1	ST	Develop in-depth studies to determine county and region's vulnerability to earthquake.	Crook County Emergency Management	City of Prineville, OEM, DOGAMI, FEMA, USGS, Public Environmental Health, Crook County Health and Human Services	1-2 Years	Removed	X			X			
EQ #2	LT	Partner with Crook County Emergency Management to promote building safety through non-structural improvements.	City of Prineville	Crook County, Crook County Emergency Management, Local Businesses	Ongoing	Ongoing	X			X	X		
Flood	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
FL #1	ST	Coordinate river gauge information.	NWS (Pendelton Office)	City of Prineville, Ochoco Irrigation District, Bureau of Reclamation, Watershed Councils, Cities, OSU Extension Service, USGS, WRD, USACE, BOR, Private River Gauges	Ongoing	Removed	X						

FL #2	ST	Conduct a workshop for target audiences on NFIP programs, mitigation activities, and potential assistance from FEMA's Flood Mitigation Assistance and HMGP programs.	County Planning, Crook County Community Development (Community Development Director), County Emergency Management Agencies	City of Prineville, Watershed Councils, OEM, FEMA	Annually	Removed	X		X	X	X		
FL #3	ST	Maintain Compliance with the National Flood Insurance Program (NFIP) and update the Flood Insurance Rate (FIRM) maps for the City and Crook County, currently using the 2012 FIRM Maps.	City of Prineville	Crook County Planning, Crook County GIS, FEMA, ODEM, Army Corps, DLCD	Ongoing	Ongoing	X				X	X	
FL #4	LT	Encourage private property owners to restore natural systems within the floodplain, and to manage riparian areas and wetlands	Crook County Emergency Management	City of Prineville, County Parks and Planning, FEMA, USACE, DSL	Ongoing	Removed					X	X	

		for flood abatement.											
FL #5	LT	Preserve water quality by using storm water best management practices.	County Roads, DEQ	City of Prineville, Watershed Councils, WRD, USACE	Ongoing	Removed						X	
FL #6	LT	Evaluate and assess the interest in County and City participation in the NFIP Community Rating System.	Crook County Emergency Management	City of Prineville, County Planning, Watershed Councils, OEM, FEMA	3-5 Years	Removed			X	X			X
FL #7	LT	Coordinate with Ochoco Irrigation District to evaluate the vulnerability of Ochoco Dam to natural hazards.	Crook County Emergency Management	City of Prineville, Watershed Councils, USACE, BOR, WRD	3-5 Years	Removed			X	X			X
FL #8	LT	Coordinate with BOR and OID on public engagement and educational campaigns on the purposes of controlled flooding within the County.	City of Prineville	BOR, OID	Ongoing	NEW	X		X	X		X	

FL #9	LT	Encourage public and private properties to restore natural systems within the floodplain, and to manage riparian areas and wetlands for flood abatement.	City of Prineville	Watershed Councils, NRCS, FEMA, USACE, DSL, DEQ	Ongoing	NEW				X	X	X		
Landslide	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**							
							1	**2**	**3**	**4**	**5**	**6**	**7**	
LS #1	ST	Assess Crook County's and City of Prineville's vulnerability to landslides.	Oregon Department of Emergency Management	City of Prineville, ODOT, DOGAMI, Crook County Emergency Management, ODF, County Planning, USFS, BLM	1-2 Years	Removed				X			X	
The Steering Committee, using available local resources, will study this hazard further during the implementation and maintenance phase of this NHMP, seeking to identify cost effective actions that might be implemented to reduce community vulnerability.														
Severe Weather Events	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**							
							1	**2**	**3**	**4**	**5**	**6**	**7**	

SWE #1	ST	Coordinate with local and state agencies to collect and identify data that would assist in developing a vulnerability and risk assessment related to the possible effects of future climate variability, especially as it may be associated with drought and a reduction of the water table.	Crook County Emergency Management	City of Prineville, NHMP Steering Committee, Oregon Water Master, Crook County Planning, Crook County Fire, ODF, BLM, USFS, DOGAMI, USGS, NOAA, OEM, FEMA, Crook County GIS, Crook County Health and Human Services	1-3 Years	Removed	X	X		X			
SWE #2	ST	Ensure backup systems are available and maintained for public water and sewer systems and Power for emergency services.	City of Prineville	Crook County Sheriff's Office, Crook County Emergency Management	0-5 Years	NEW	X	X			X	X	
SWE #3	LT	Maintain a list of locations for removal of the fleet equipment capable of emergency response including	City of Prineville	Pacific Power, CCR&R, Tri-County Partnership Agreement	Ongoing	NEW							

		snow removal/debris removal.											
Volcanic Event	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
VL #1	ST	Provide a volcanic ash mitigation guidebook for citizens and businesses on the city's website.	City of Prineville	Crook County, DOGAMI, Crook County Emergency Management, USGS-Cascade Volcano Observatory	0-2 Years	Ongoing	X		X				
Wildfire	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
WF #1	ST	Continue to promote public awareness campaigns for individual property owners living in interface areas.	Crook County Emergency Management	City of Prineville, Fire District, Media, County Planning, OEM, FEMA, Crook County Health and Human Services, Crook County CWPP Steering Committee, Oregon Department of Forestry, BLM, USFS	Ongoing	Removed	X		X	X	X		

WF #2	LT	Continue to reduce wildfire fuels by conducting defensible space projects.	CCR&R	Landfill, OSFM, ODF, BLM, USFS, PD	Ongoing	Ongoing	X		X	X	X	X	

Risk Assessment

This section of the NHMP addendum addresses 44 CFR 201.6(b)(2) – *Risk Assessment*. In addition, this chapter can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

Assessing natural hazard risk has three phases:

- 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 people, businesses, homes, 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.

Hazard Analysis

This section of the NHMP addendum addresses 44 CFR 201.6(b)(2) – *Risk Assessment*. The following hazards have been addressed in the Crook County NHMP. Members from the City of Prineville Steering Committee participated in the cooperative development of the County's plan throughout the 2025 NHMP update process. During this time, City of Prineville Steering Committee members considered details of the Plan at the 2025 NHMP Steering Committee meetings regarding Section 3 of the plan. The City of Prineville Steering Committee has reviewed the NHMP and has assessed how its vulnerability risks vary from the risks facing the entire planning area, which is highlighted further in the sections below.

There are seven natural hazard types which may impact the City of Prineville, these include:

1. Severe Weather Events
2. Flood
3. Drought
4. Wildfire
5. Earthquake
6. Volcano
7. Landslide

Table P-3 below shows the HVA matrix for the City of Prineville listing each hazard in order of rank from high to low.

Table P-3. The Crook County and City of Prineville Hazard Analysis Matrix
"WF" Refers to Weight Factor

Hazard	History WF: 2	Vulnerability WF: 5	Maximum Threat WF: 10	Probability WF: 7	Total Score
Drought	10	9	9	10	225
Flood	3	10	10	7	205
Wildfire	7	7	7	7	168
Severe Weather Event	4	5	8	6	155
Earthquake	3	5	10	3	152
Volcano	3	7	9	1	138
Landslide	2	2	9	4	132

Community Characteristics

The following section describes the City of Prineville from a number of perspectives in order to help define and understand the city's sensitivity and resilience to natural hazards. Sensitivity factors can be defined as those community assets and characteristics that may be impacted by natural hazards, (e.g., special populations, economic factors, and historic and cultural resources). Community resilience factors can be defined as the community's ability to manage risk and adapt to hazard event impacts (e.g., governmental structure, agency missions and directives, and plans, policies, and programs). The information in this section represents a snapshot in time of the current sensitivity and resilience factors in the City of Prineville when the plan was developed. The information documented here, along with the risk assessments located below, are used as the local level rationale for the risk reduction actions identified at the end of this addendum.

Geography & Climate

The City is located near the confluence of the Crooked River and Ochoco Creek and contains a total land area of 10.92 square miles. The City was founded in 1870 and was named after the first merchant (Barney Prine) to locate the City.

Population & Demographics

In 2023, Prineville had an estimated population of 11,598.[120] In 2023 Crook County had a population of 26,583.[121] In 2023, Prineville's population represented 43.6% of the total county population.

[120] Portland State University Population Research Center, 2024, https://www.pdx.edu/population-research/population-estimate-reports

[121] Portland State University Population Research Center, 2023, https://www.pdx.edu/population-research/population-estimate-reports

Disaster impacts disproportionately affect different population segments including those with various access and functional needs. Of the City's total population, the population of those that were 65 years of age or older in 2020 represented 24.9%.[122] 7% of the population is a minority population. 21.1% of total households had children under the age of 18.[123]

Employment & Economics

The City serves as the anchor for economic growth in Crook County with companies like Les Schwab tires, Meta, Apple, and public sector employment including the School District, County government, Bureau of Land Management, Forest Service and many others. Prineville serves as a center for both private and public sector jobs.

Median income can be used as an indicator of the strength of the region's economic stability. In 2022, the median annual household income in Prineville was $74,969 as compared to the state figure of $76,632.[124]

Government Structure

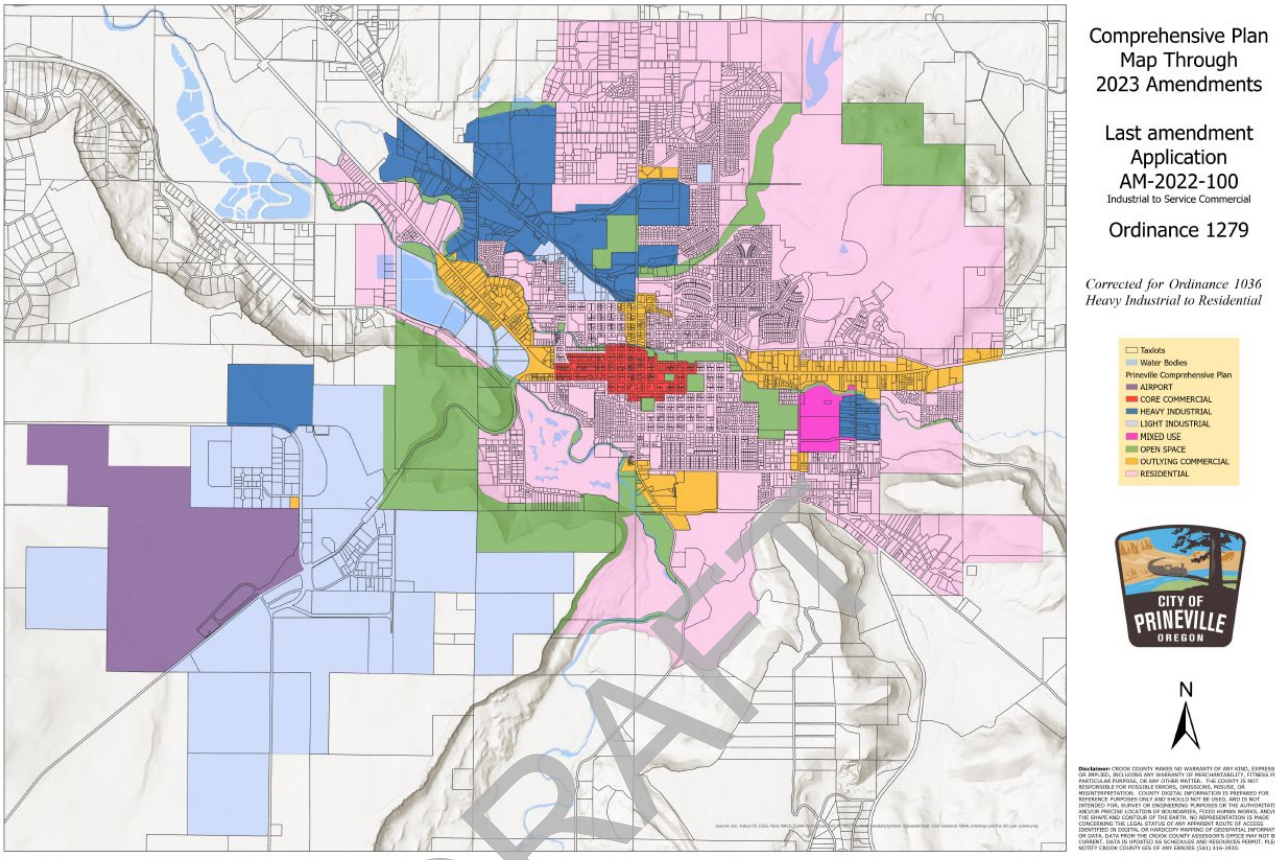
Prineville has a City Manager form of Government with the City Manager acting as the Chief Executive Officer. Policy is set by a seven-member city council. The Mayor presides at all meetings of the City Council and recommends measures he/she deems advisable. The Mayor has the power to appoint all members to city boards. The Mayor votes on all Council business and signs any ordinances passed by the Council.

Land Use & Development

Growth issues are at the forefront of discussion amongst citizens in Prineville. As vacant lands within the Urban Growth Boundary (UGB) develop with new homes and businesses the City of Prineville staff are required to make sure that development is consistent with local and state law. The City's Comprehensive Land Use Plan has many guidelines for development, which are intended to protect the values of the City. **Figure P-1** shows the City of Prineville's Comprehensive Plan Map through 2023. Included in these protection codes are regulation related to steep slope, development in the floodplain and natural hazard protections.

[122] US Census Bureau, American Community Survey 5-Year Estimates, 2020.
[123] US Census Bureau, American Community Survey, 2020.
[124] US Census Bureau, American Community Survey 5-Year Estimates, 2020.

Figure P-1. City of Prineville Boundary Annexations Since 2010



Community Assets

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of the City.

Community Lifelines are fundamental services that enable all other aspects of society to function. FEMA developed the Community Lifelines construct for objective-based response to prioritize the rapid stabilization of these facilities after a disaster. Mitigating these facilities will increase the community's resilience.

Critical Facilities

Facilities that are critical to government response and recovery activities (i.e., life, safety, property, and environmental protection) include: 911 Centers, Emergency Operations Centers, Police and Fire Stations, Public Works facilities, sewer and water facilities, hospitals, bridges, roads, shelters, and more. Facilities that, if damaged, could cause serious secondary impacts may also be considered "critical."

Fire Stations

- Crook County Fire & Rescue

Law Enforcement
- Prineville Police Department
- Crook County Sheriff's Office
- Crook County Jail
- Crook County Emergency Operations Center

Public Works
- City of Prineville Public Works
- Oregon Department of Transportation
- County Road Department

Government
- United States Forest Service
- Bureau of Land Management
- Oregon Department of Forestry

State Highways
- 126
- 26
- 380
- 370
- 27

Essential Facilities

Facilities that are essential to the continued delivery of key government services and/or that may significantly impact the public's ability to recover from the emergency may include City buildings.

Hospitals/Immediate Care Facilities
- St. Charles Hospital
- Mosaic Community Health
- Red Cross

City/County/Other
- Prineville City Hall
- Crook County Courthouse
- Crook County Public Health Department
- Crook County Airport
- Oregon Department of Human Services
- Oregon Justice Department

Schools

- Crooked River Elementary
- Crook County High School
- Crook County Middle School
- Barnes Butte Elementary
- Steins Pillar Elementary
- High Desert Christian Academy
- Pioneer
- Crook County Christian School
- Central Oregon Community College

Hazard Profiles

The following sections briefly describe relevant information for each profile hazard. For more information on the vulnerabilities of each partner jurisdiction (Crook County Fire & Rescue) please review (Volume II). More information on Crook County Hazards can be found in Volume I, Section 3 Risk Assessment and in the Risk Assessment for Region 6, Central Oregon, Oregon SNHMP (2020).

Severe Weather Events

The Steering Committee determined that the City's probability for severe weather events is high (which is the same as the County's Rating) and that their vulnerability to severe weather events is also high (which is different from the County's Rating).

Volume I, Section 3 describes the characteristics of severe weather events and their history, as well as the future conditions, location, extent and probability of a potential severe weather event.

The City of Prineville is the only city located in the entirety of Crook County and a majority of Crook County's population lives within Prineville city limits. In the circumstance of a severe weather event in the City of Prineville, residents are more vulnerable to the impacts of the event (compared to the County's vulnerability) given the City's high density. An event such as an ice storm is likely to impact a large number of City of Prineville residents over Crook County residents.

Flood

The Steering Committee determined that the City's probability for flooding is moderate (which is different from the County's Rating) and that their vulnerability to flooding is also high (which is the same as the County's Rating).

Volume I, Section 3 describes the characteristics of floods and their history, as well as the future conditions, location, extent and probability of a potential severe weather event.

A high percentage of the total City falls within the designated floodplain (see FEMA's Flood Map Service Center for a copy of City of Prineville's FIRM map), putting the City of Prineville at high risk for flooding. Flooding in the City of Prineville is predicted to interrupt commerce, residents ability to access services, and emergency personnels ability to reach not only City of Prineville residents, but all Crook County residents as well.

The Community Repetitive Loss record for Prineville identifies zero (0) Repetitive Loss Properties and zero (0) Severe Repetitive Loss Properties.

Drought

The Steering Committee determined that the City's probability of drought is moderate (which is different from the County's Rating) and that their vulnerability to drought is also moderate (which is different from the County's Rating).

Volume I, Section 3 describes the characteristics of droughts and their history, as well as the future conditions, location, extent and probability of a potential severe weather event.

All water for the City of Prineville comes from deep aquifers. The City of Prineville has constructed an Aquifer Storage and Recovery System (ASR) that allows the city to store water from cooler months, and is accessible for use during periods of high demand in warmer months. This system allows for City residents to access the water needed during warmer months, without putting additional strain on the natural flows of surrounding rivers. In the event of a long-term drought, aquifer levels will drop drastically and will have a great impact on the amount of water available to the City of Prineville and its residents.

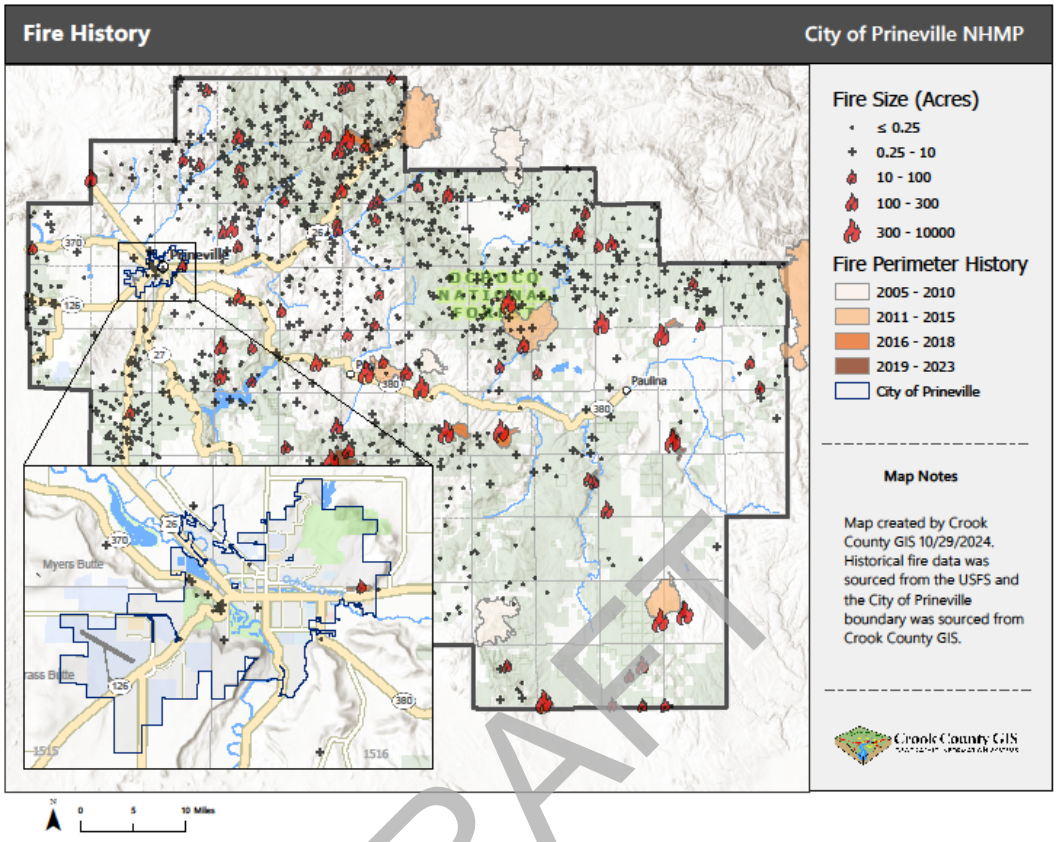
Wildfire

The Steering Committee determined that the City's probability of wildfire events is moderate (which is different from the County's Rating) and that their vulnerability to wildfire is also moderate (which is the same as the County's Rating).

Volume I, Section 3 describes the characteristics of wildfires and their history, as well as the future conditions, location, extent and probability of a potential severe weather event.

A majority of the City of Prineville is not located within the wildland-urban interface (WUI). Most hazardous ladder fuels within the city have been removed, and staff from Crook County Fire & Rescue work with community members to conduct defensible space work around private property so that in a wildfire event, resident property is properly prepared.

Figure P-2. Prineville Fire History from 2005-2023



Earthquake

The Steering Committee determined that the City's probability for earthquakes is low (which is the same as the County's Rating) and that their vulnerability to earthquakes is moderate (which is the same as the County's Rating).

Volume I, Section 3 describes the characteristics of earthquakes and their history, as well as the future conditions, location, extent and probability of a potential severe weather event. Generally, an event that affects the County is likely to affect the City of Prineville as well. The County's (and therefore the City's) probability of an earthquake event are low. In a worst case scenario event (such as the Cascadia Subduction Zone event, CSZ), the County's and City's vulnerability is higher than normal. The City is dedicated to working with Emergency Managers around the Central Oregon regional to prepare and respond to the CSZ event.

Volcano

The Steering Committee determined that the City's probability for a volcanic event is low (which is the same as the County's Rating) and that their vulnerability to a volcanic event is moderate (which is the same as the County's Rating).

Volume I, Section 3 describes the characteristics of volcanoes and their history, as well as the future conditions, location, extent and probability of a potential severe weather event. Generally, an event that affects the County is likely to affect the City of Prineville as well. It is very unlikely that the City of Prineville will experience anything more than volcanic ash during a volcanic event.

Landslide

The Steering Committee determined that the City's probability for landslides is low (which is different from the County's Rating) and that their vulnerability to landslides is low (which is the same as the County's Rating). Generally, an event that affects the County is likely to affect the City of Prineville. Landslides that occur within Crook County typically occur in mountainous areas, not in the City of Prineville. Most landslides that have occurred within Prineville were within the Pleistocene era. There is likely to be little change to the occurrence of landslides within the City of Prineville.

Attachment A: Action Item Worksheets

Action Item: REMOVED ST Multi Hazard #1	Alignment with Plan Goals:	High Priority Action Item?
Sustain a public awareness campaign about natural hazards.	1 ☐ 2 ☒ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☒	

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
N/A due to being removed
Rationale for Proposed Action Item:
Education and Outreach, Prevention, Emergency Service

Ideas for Implementation:	Actions Taken Since 2018:
Inform and educate the public about potential natural hazards in Crook County, personal preparedness, mitigation activities and opportunities, and options available when natural hazard events occur. The public awareness campaign *may* take many forms: • Present hazard specific information at public workshops; • Disseminate the Crook County Emergency Operations Plan for families and county residents; • Use Public Service Announcements to educate the public about emergency procedures; Develop a hazard information website that contains scientific facts about natural hazards, information on building codes, list of companies that provide insurance for specific hazards, and educational information on damage prevention.	Individual agencies have been engaging with Crook County community members to provide education on natural hazards that exist within the County.

Potential Funding Sources:	Estimated Cost:	Timeline:
N/A	N/A	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
Crook County Planning, Crook County Fire, Crook County Health and Human Services	Bowman Museum, City of Prineville Planning, ODF, BLM, USFS

Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	Removed due to not being specific enough and is too similar to goals.

Action Item: REMOVED ST Multi Hazard #2	Alignment with Plan Goals:	High Priority Action Item?
Develop public and private partnerships to foster natural hazard program coordination and collaboration in Crook County.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:	
Crook County	
Alignment with Existing Plans/Policies:	
N/A due to being a removed action item.	
Rationale for Proposed Action Item:	
Education and Outreach, Prevention, Partnership and Coordination	
Ideas for Implementation:	**Actions Taken Since 2018:**
• Coordination and implementation of county-wide and tri-county emergency management policies and procedures; • Enhancing emergency operations preparedness, resources and facilities; • Disseminating information from Oregon Emergency Management and the Federal Emergency Management Agency.	Crook County and the agencies within Crook County continually work to develop partnerships to strengthen coordination and collaboration.

Potential Funding Sources:	Estimated Cost:	Timeline:
N/A	N/A	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
Crook County Planning, Crook County Fire & Rescue, Crook County Health and Human Services	ODF, BLM, USFS, Jefferson County Emergency Management, Deschutes County Emergency Management, City of Prineville
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	This action item has been removed because it lacks specificity and is captured more accurately within the NHMP goals.

Action Item: REMOVED Multi Hazard #3	Alignment with Plan Goals:	High Priority Action Item?
Review the Crook County Emergency Operations Plan and the Natural Hazards Mitigation Plan on an annual basis. Conduct a complete review of the plans and have them officially promulgated by the approving authorities every 5 years.	1 ☐ 2 ☒ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Crook County NHMP and Emergency Operations Plan		
Rationale for Proposed Action Item:		
Emergency Services		
Ideas for Implementation:	**Actions Taken Since 2018:**	
Crook County Emergency Management will coordinate a plan review annually and a plan update at least every five years. During the complete reviews, the plans will be evaluated with respect to the coordination of existing plans, new requirements and action items. Endeavor to incorporate the requirements of the mitigation plan into other planning mechanisms.	The Crook County NHMP will have a completed update in 2025. The Crook County EOP was updated in the fall of 2024.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
FEMA Hazard Mitigation Grant Program	$25K-$50K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Emergency Management and Central Oregon Intergovernmental Council	
Internal Partners:	**External Partners:**	
Crook County Planning Department	ARC, Law Enforcement Heads, Fire Heads, OSP, ODF, ODOT, ARNAG, ARES, OEM, FEMA, City of Prineville	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP Addendum.	

Action Item: REMOVED ST Multi Hazard #4	Alignment with Plan Goals:	High Priority Action Item?
Promote natural hazard safety education throughout the County.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County

Alignment with Existing Plans/Policies:
Aligns with goals included in the statewide NHMP, and goals and missions of Crook County agencies.

Rationale for Proposed Action Item:
Education and Outreach, Prevention, Partnership and Coordination

Ideas for Implementation:	Actions Taken Since 2018:
Natural Hazards Safety Education includes earthquake duck-and-cover drills, fire safety training, facility lock down drills, evacuations drills, hazardous materials training, and hug-a-tree presentations. Natural hazards safety education may take place in schools, hospitals and businesses, as well as preparedness fairs and community events.	A number of Crook County organizations have been participating in Hug-A-Tree programs and table top drills. Crook County Fire & Rescue promotes hazard safety education. Crook County Schools participates in the statewide shakedown event.

Potential Funding Sources:	Estimated Cost:	Timeline:
County budget, school budgets, already existing budgets	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
Crook County Planning, Crook County Fire & Rescue, Crook County Health and Human Services	School Districts, Facility Safety Personnel, Search and Rescue, City of Prineville, ODF, BLM, USFS, OEM, FEMA, Association of Safety Engineers, Media, Utility and Telecommunications Companies
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP Addendum.

Action Item: REMOVED ST Multi Hazard #5	Alignment with Plan Goals:	High Priority Action Item?
Establish partnerships to coordinate and collect geo-science and technical information for identifying and mapping potential areas of risk.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Crook County Community Wildfire Protection Plan, Crook County GIS Goals
Rationale for Proposed Action Item:
Education and Outreach, Prevention, Partnership and Coordination

Ideas for Implementation:	**Actions Taken Since 2018**
Many public agencies in Crook County collect geo-science and technical for their own internal needs. Often these agencies contract with County GIS to work with their data and create specialized maps. With these agencies' permission, County GIS could use the data to develop hazard maps for Emergency Management and mitigation purposes. One key outcome would be the coordination of disparate vegetation mapping. This would allow wildland fire risk assessment to be done at large scale, rather than an individual parcel scale.	No new updates at the time of this NHMP update.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Existing agency budgets	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County GIS
Internal Partners:	**External Partners:**
Crook County Planning, Crook County Emergency Management Crook County Fire, Crook County Health and Human Services	City of Prineville, ODF (GIS), BLM, USFS, DOGAMI, USGS, NOAA, OEM, FEMA
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP Addendum.

Action Item: REMOVED ST Multi Hazard #6	Alignment with Plan Goals:	High Priority Action Item?
Maintain and enhance the systems that support individuals with disabilities and other access and functional needs during disasters.	1 ☒ 2 ☒ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County

Alignment with Existing Plans/Policies:
ADA Compliance Policies, Structural Building Codes

Rationale for Proposed Action Item:
Education and Outreach, Prevention, Partnership and Coordination, Emergency Services.

Ideas for Implementation:	Actions Taken Since 2018
Crook County and partner public and private organizations have developed a system that will serve people who have access and functional needs that affect their ability to independently respond to disasters. The system currently includes an initial database available to 911 and Emergency Operations Center that shows the location of vulnerable populations. It will be important to: • Coordinate with public and private organizations to continue to identify vulnerable populations; • Establish and maintain protocols to update and maintain the database; • Develop plans and exercises to integrate vulnerable populations with disaster response.	• Central Oregon Disability Support Network Provides Emergency Preparedness Kit trainings to individuals and families with disabilities. • Oregon Department of Human Services – Office of Resilience and Emergency Management (OREM) has been identified to coordinate services for mass care in the case of an emergency, including services to individuals with disabilities

Potential Funding Sources:	Estimated Cost:	Timeline:
BRIC, CBDG	$25K - $100K	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
Crook County Health and Human Services, County GIS, Crook County Planning	Jefferson & Deschutes County, City of Prineville, ARC Central Oregon Disability Support Network (CODSN), ODHS OREM
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP

	Addendum Steering Committee members created individual goals for the Prineville NHMP Addendum.

Action Item: ST Multi Hazard #7	Alignment with Plan Goals:	High Priority Action Item?
Explore funding sources and grant opportunities for county-wide natural hazard mitigation activities.	1 ☐ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Rationale for Proposed Action Item:
Education and Outreach, Prevention

Ideas for Implementation:	**Actions Taken Since 2018**
Identify grants and appropriate loans for local governments, agencies, organizations and property owners to take a proactive role in hazards mitigation. There are different types of mitigation grant programs, for example, federal fire money for wildfire hazard mitigation, Hazard Mitigation Grant Program for various types of hazard mitigation, and flood mitigation assistance program.	This is an ongoing effort of Crook County. The County has submitted applications for an Emergency Management Performance Grant and a State Homeland Security Program grant.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Existing budgets, Emergency Management Performance Grant, State Homeland Security Grant Program	$25K - $50K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management and Mitigation Plan Steering Committee
Internal Partners:	**External Partners:**
Crook County Administration, Crook County Health and Human Services	City of Prineville, OEM, FEMA
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP Addendum.

Action Item: REMOVED ST Multi Hazard #8	Alignment with Plan Goals:	High Priority Action Item?
Evaluate security methods and processes to assess what types of data will have open public access versus restricted responder agency access.	1 ☐ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Mission and goals of the Crook County Sheriff's Office
Rationale for Proposed Action Item:
Education and Outreach, Prevention

Ideas for Implementation:	**Actions Taken Since 2018**
• Coordinate with local and state legal representatives to evaluate Oregon law; • Develop protocols for access and distribution of sensitive data.	Crook County Sheriff's Office continually works with Crook County Planning Department and the IT department to maintain security of restricted agency data.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Existing agency budgets, Homeland Security funding sources	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Sheriff's Office / Crook County IT
Internal Partners:	**External Partners:**
Crook County Health and Human Services, Crook County Administration, Crook County Emergency Management	City of Prineville, OEM, FEMA
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP Addendum.

Action Item: REMOVED ST Multi Hazard #9	Alignment with Plan Goals:	High Priority Action Item?
Create and maintain a single GIS inventory resource of all critical facilities, large employers/public assembly areas, and lifelines, and use the GIS to evaluate their vulnerability by comparing them with hazard-prone areas.	1 ☐ 2 ☒ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	Yes

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Crook County Community Wildfire Protection Plan
Rationale for Proposed Action Item:
Education and Outreach, Prevention, Emergency Services

Ideas for Implementation:	Actions Taken Since 2018
Expanding and maintaining data on the County GIS databases containing information about natural hazards, land development, community infrastructure, and demographics. These data sets may be used to create hazard maps, assess risk and develop plans. Public facilities and infrastructure to be included: government buildings (City of Prineville, Crook County), fire stations, law enforcement buildings, school district buildings, hospitals, Apple, Facebook, Les Schwab, cellular communication towers.	A list of Crook County critical infrastructure was updated as part of the 2024 Crook County Community Wildfire Protection Plan update. New critical infrastructure maps were created as part of this update. A specific GIS inventory of this list is being scoped internally.

Potential Funding Sources:	Estimated Cost:	Timeline:
Hazard Mitigation Grant Program, Homeland Security Grant Programs	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County GIS
Internal Partners:	**External Partners:**
Crook County Emergency Management, Crook County Planning, Crook County Fire & Rescue, Crook County Health and Human Services, Crook County Road Department	City of Prineville, ODF, BLM, USFS, ARC, QWEST, Prineville Public Works, Power Companies, OID Oregon Department of Geology and Mineral Industries (DOGAMI will be the source of information about and location of hazard-prone areas)
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP

	Addendum Steering Committee members created individual goals for the Prineville NHMP Addendum.

Action Item: REMOVED LT Multi Hazard #10	Alignment with Plan Goals:	High Priority Action Item?
Use hazard information as a basis for reviewing site-specific land use decisions.	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Crook County and the State of Oregon land use codes and regulations		
Rationale for Proposed Action Item:		
Prevention		
Ideas for Implementation:	**Actions Taken Since 2018**	
Continually implement hazard mitigation policies and regulations.	Land use decisions have taken into account hazard information and the County continually reviews these decisions to make sure they are incorporating the most up to date hazard information available.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
State funding sources: DLCD, DSL	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Planning Department & City of Prineville Planning	
Internal Partners:	**External Partners:**	
Crook County Emergency Management, Crook County GIS	State of Oregon, DLCD	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP Addendum.	

Action Item: REMOVED LT Multi Hazard #11	Alignment with Plan Goals:	High Priority Action Item?
Improve planning, notification, and training for volunteers.	1 ☒ 2 ☒ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Individual agency codes and missions.
Rationale for Proposed Action Item:
Education and Outreach, Partnership and Coordination, Emergency Services

Ideas for Implementation:	**Actions Taken Since 2018**
• Identify and prioritize how volunteers can assist during different types of disaster; • Train volunteers about their roles and include them in community disaster exercises; • Develop a notification process for volunteers that incorporates different thresholds of activation; • Establish protocols for the registration and training of emergent volunteers; • Evaluate the creation of a Community Emergency Response Team (CERT) countywide; • Actively work to expand and encourage City and County government to expand community neighborhood watch programs.	Crook County Search & Rescue holds a yearly academy. There are regular meetings with the tri-county emergency managers to improve this planning.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Mix of existing agency budgets, Oregon Community Foundation	<$25K	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Tri-county Emergency Management (Crook, Deschutes and Jefferson counties
Internal Partners:	**External Partners:**
Crook County Administration, Crook County Sheriff's Office, Crook County Health and Human Services	City of Prineville, CERT, ARC, CCSO SAR
Form Submitted By:	City of Prineville NHMP Steering Committee

Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP Addendum.

Action Item: REMOVED LT Multi Hazard #12	Alignment with Plan Goals:	High Priority Action Item?
Promote hazard resistant utility and telecommunication construction and maintenance methods.	1 ☐ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Prineville Comprehensive Plan, City of Prineville Public Works Policies		
Rationale for Proposed Action Item:		
Education Outreach, Prevention		
Ideas for Implementation:	**Actions Taken Since 2018**	
Support and encourage utility and telecommunications companies to use construction and maintenance methods that are aligned with natural hazard preparedness practices.	The City has worked with utility companies to set up redundant systems for communications, and has buried infrastructure underground to mitigate risk of failure during wildfire and severe weather events.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Special Public Works Fund, BRIC	$50K +	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	City of Prineville	
Internal Partners:	**External Partners:**	
Crook County Fire & Rescue, Crook County Planning, Crook County Emergency Management, Crook County IT	Auxiliary Communications, City of Prineville, Prineville Information Technology, private utilities	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP Addendum.	

Action Item: REMOVED LT Multi Hazard #13	Alignment with Plan Goals:	High Priority Action Item?
Collect data for significant non-declared natural hazard events.	1 ☐ 2 ☐ 3 ☒ 4 ☒ 5 ☒ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Goals withing both Crook County and City of Prineville Planning Departments		
Rationale for Proposed Action Item:		
Education and Outreach, Partnerships and Coordination, Emergency Services		
Ideas for Implementation:	**Actions Taken Since 2018**	
Damage information should be collected and stored locally for significant non-declared natural disasters. This information can include countywide damage totals for each event, with the idea that over time this data will show the geographic patterns of occurrence and vulnerability.	Crook County Planning and GIS lead these efforts within their own departments.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
FEMA post disaster events grant programs	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Emergency Management	
Internal Partners:	**External Partners:**	
County GIS, County Building, County Planning	City of Prineville, Insurance Companies, OSU Extension, U.S. Forest Service, Bureau of Land Management, Oregon Department of Transportation	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP Addendum.	

Action Item: REMOVED LT Multi Hazard #14	Alignment with Plan Goals:	High Priority Action Item?
Develop a recovery plan for Crook County and Prineville from the effects of catastrophic hazards.	1 ☒ 2 ☐ 3 ☒ 4 ☐ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:	
Crook County	
Alignment with Existing Plans/Policies:	
Crook County Emergency Operations Plan	
Rationale for Proposed Action Item:	
Partnership and Coordination, Emergency Services	
Ideas for Implementation:	**Actions Taken Since 2018**
Develop a scenario based long-term recovery plan (Continuity of Government plan) that identifies how Crook County and the City of Prineville will recover from a catastrophic event. Refer to Crook County Emergency Operations Plan for additional information and progress.	The Crook County Emergency Operations plan is currently being updated.

Potential Funding Sources:	Estimated Cost:	Timeline:
A mix of federal and state grant funding	$50K-$100K	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
City of Prineville	OEM, Crook County Administration
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP Addendum.

Action Item: REMOVED ST Severe Weather Events #1	Alignment with Plan Goals:	High Priority Action Item?
Coordinate with local and state agencies to collect and identify data that would assist in developing a vulnerability and risk assessment related to the possible effects of future climate variability, especially as it may be associated with drought and a reduction of the water table.	1 ☒ 2 ☒ 3 ☐ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Statewide hazard planning
Rationale for Proposed Action Item:
This information could assist in developing a vulnerability and risk assessment related to the possible effects of future climate variability for Crook County.

Ideas for Implementation:	Actions Taken Since 2018
• Expand the conversation of natural hazards to include discussions on future climate variability and drought; • Coordinate with local and state agencies and review data as it becomes available; • Coordinate with the Oregon Water Master to review and evaluate historic water table data and compare to current conditions; • Determine if sufficient data is available to conduct a vulnerability and risk assessment	This action item has been deferred.

Potential Funding Sources:	Estimated Cost:	Timeline:
FEMA grants	$25K - $50K	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
City of Prineville	Crook County Planning, Crook County Fire, Crook County GIS, Crook County Health and Human Services, Oregon Water Master, ODF, BLM, USFS, DOGAMI, USGS, NOAA, OEM, FEMA
Form Submitted By:	City of Prineville NHMP Steering Committee

Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP addendum.

Action Item: ST Severe Weather Events #2	Alignment with Plan Goals:	High Priority Action Item?
Ensure backup systems are available and maintained for public water and sewer systems and power for emergency services.	1 ☒ 2 ☒ 3 ☐ 4 ☐ 5 ☒ 6 ☒ 7 ☐	Yes

Affected Jurisdictions:
City of Prineville, Crook County
Alignment with Existing Plans/Policies:
City of Prineville Water and Sewer Facility Plans
Rationale for Proposed Action Item:
The primary issue with severe weather events is loss of power. Backup generators, spare pumps and electrical equipment can keep the water and wastewater systems online and emergency communication services active.

Ideas for Implementation:	Actions Taken Since 2018
• Acquire and maintain backup power generation for pumps and wells. • Acquire and maintain backup power generation for emergency services; • Ensure systems are standardized so parts are interchangeable. • Maintain an inventory of spare parts for emergency repair.	• Backup generation is provided on several wells and booster pumps. • Public Works is systematically standardizing and modernizing City systems. • Emergency Services continually modernize and coordinate systems with other agencies.

Potential Funding Sources:	Estimated Cost:	Timeline:
Utility Bills, General Fund, Grants	$50K+	☒ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	City of Prineville
Internal Partners:	**External Partners:**
City of Prineville Public Works, City of Prineville Police	Crook County Sherriff, Crook County Emergency Management
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	New

Action Item: LT Severe Weather Events #3	Alignment with Plan Goals:	High Priority Action Item?
Maintain a list of locations for removal of the fleet equipment capable of emergency response including snow removal/debris removal.	1 ☒ 2 ☒ 3 ☐ 4 ☐ 5 ☒ 6 ☒ 7 ☐	Yes

Affected Jurisdictions:
City of Prineville, Crook County
Alignment with Existing Plans/Policies:
Transportation Systems Plan, City Emergency Operations Plan
Rationale for Proposed Action Item:
Partnership & coordination, emergency services, property protection, prevention.

Ideas for Implementation:	Actions Taken Since 2018
• Coordinate with Public Works, Crook County Emergency Management and the Police Department to create this list	None to date – this is a new action item for 2025.

Potential Funding Sources:	Estimated Cost:	Timeline:
Planning Grants, HMGP funds	<$5K	☒ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	City of Prineville
Internal Partners:	**External Partners:**
City of Prineville Public Works, City of Prineville Police	Crook County Sherriff, Crook County Emergency Management
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	New

Action Item: REMOVED ST Flood #1	Alignment with Plan Goals:	High Priority Action Item?
Coordinate river gauge information that is tied into National Weather Service flood forecasting.	1 ☒ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
NFIP		
Rationale for Proposed Action Item:		
Partnership and Coordination		

Ideas for Implementation:	Actions Taken Since 2018
Crook County Emergency Management, Ochoco Irrigation District, Bureau of Reclamation, National Weather Service, and all watershed councils, can benefit from coordinated river gauge information that is tied into National Weather Service flood forecasting activities.	No new updates since 2018.

Potential Funding Sources:	Estimated Cost:	Timeline:
Flood Mitigation Assistance Program, OWEB grants	$50K - $100K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	NWS (Pendleton Office)
Internal Partners:	**External Partners:**
City of Prineville	Crook County Emergency Management, Ochoco Irrigation District, Bureau of Reclamation, Watershed Councils, Cities, OSU Extension Service, USGS, WRD, USACE, BOR, private river gauges
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP addendum.

Action Item: REMOVED ST Flood #2	Alignment with Plan Goals:	High Priority Action Item?
Conduct a workshop for target audiences on National Flood Insurance Programs, mitigation activities, and potential assistance from FEMA's Flood Mitigation Assistance and Hazard Mitigation Grant Programs.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☒ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
NFIP		
Rationale for Proposed Action Item:		
Property Protection, Education and Outreach, Prevention, Partnership and Coordination		
Ideas for Implementation:	**Actions Taken Since 2018**	
Include information about the financial aspects of building (and rebuilding) in the floodplain. Present information on how other communities have addressed building in the floodplain. Selected target audiences can include: townhalls, realtors, lending institutions, surveyors, engineers, and government agencies. Refer to Crook County Emergency Operations Plan for supplementary resources.	City and County staying up to date on opportunities, no workshop yet.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Flood Mitigation Assistance and Hazard Mitigation Grant Programs, OWEB grants	<$50K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	County Planning, Crook County Community Development (Community Development Director), County Emergency Management Agencies	
Internal Partners:	**External Partners:**	
City of Prineville	Watershed Councils, OEM, FEMA	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP addendum.	

Action Item: ST Flood #3	Alignment with Plan Goals:	High Priority Action Item?
Maintain compliance with the National Flood Insurance Program (NFIP) and Update the Flood Insurance Rate (FIRM) Maps for Crook County using the 2010 FIRM maps.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 6 ☒ 7 ☐	Yes
Affected Jurisdictions:		
City of Prineville, Crook County		
Alignment with Existing Plans/Policies:		
City code Chapter 151 Flood Damage Prevention		
Rationale for Proposed Action Item:		
Maintaining Compliance with NFIP allows communities to receive flood insurance and disaster relief funds. Updating maps provides the most accurate model of potential floodwaters.		
Ideas for Implementation:	**Actions Taken Since 2018**	
Work with FEMA to fund updates to 2012 FIRM maps. Maintain compliance with the NFIP through local land use and building codes.	City has completed a floodplain feasibility study that was commissioned to better understand flood potential and provide options to reduce the floodplain through the City of Prineville.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
FEMA, OEM, Army Corps of Engineers	$400,000 (map update)	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	City of Prineville	
Internal Partners:	**External Partners:**	
City of Prineville Planning Department	County Planning, County GIS, FEMA, ODEM, Army Corps, DLCD	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	Ongoing	

Action Item: REMOVED LT Flood #4	Alignment with Plan Goals:	High Priority Action Item?
Encourage private property owners to restore natural systems within the floodplain, and to manage riparian areas and wetlands for flood abatement.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 6 ☒ 7 ☐	No

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
NFIP, nature-based solutions
Rationale for Proposed Action Item:
Property Protection, Natural Resource Protection

Ideas for Implementation:	**Actions Taken Since 2018**
In addition to encouraging private property owners, managing publicly owned riparian and floodplain areas for conversion to open space/parkland/greenway is key to restoring natural floodwater absorption capacities (i.e. Ochoco Creek Flood mitigation projects, Striker Field).	The Crook County Watershed Council has been working on this and City of Prineville has been promoting this by implementing the redo a site identified by the Deschutes Land Trust.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Regional foundation grants, OWEB and FEMA grants	$25K - $50K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Planning and the City of Prineville
Internal Partners:	**External Partners:**
County Parks	Watershed Councils, Cities, Natural Resource Conservation Service, City of Prineville, FEMA, USACE, DSL
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP addendum.

Action Item: REMOVED LT Flood #5	Alignment with Plan Goals:	High Priority Action Item?
Preserve water quality by using storm water best management practices.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☒ 7 ☐	Yes
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
City of Prineville Stormwater Management Plan, Central Oregon Stormwater Manual		
Rationale for Proposed Action Item:		
Natural Resource Protection		
Ideas for Implementation:	**Actions Taken Since 2018**	
Model standards could be the National Pollution Discharge Elimination System (NPDES).	The County continually seeks out ways to preserve and enhance water quality when working on water projects.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
OWEB grants	$25K - $100K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	County Roads, DEQ	
Internal Partners:	**External Partners:**	
Crook County Roads Department	City of Prineville, Watershed Councils, WRD, USACE	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP addendum.	

Action Item: REMOVED LT Flood #6	Alignment with Plan Goals:	High Priority Action Item?
Evaluate and assess the interest in County and City participation in the NFIP Community Rating System.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☒ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
NFIP Community Rating System		
Rationale for Proposed Action Item:		
Property Protection, Education and Outreach, Prevention, Partnership and Coordination		
Ideas for Implementation:	**Actions Taken Since 2018**	
Since participation in the NFIP Community Rating System could save residents considerable amounts money on insurance premiums the County will promote this program to residents.	The County makes community members aware of this program by including information on it on the County website. To date, there has been no interest in Crook County residents.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
FEMA funding opportunities	<$25K	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Emergency Management	
Internal Partners:	**External Partners:**	
City of Prineville	Ochoco Irrigation District, Bureau of Reclamation, Watershed Councils, OEM, FEMA, Crook County Planning	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP addendum.	

Action Item: LT Flood #7	Alignment with Plan Goals:	High Priority Action Item?
Coordinate with Ochoco Irrigation District to evaluate the vulnerability of Ochoco Dam to natural hazards.	1 ☐ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☒	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
OWRD High Hazard Potential Dams		
Rationale for Proposed Action Item:		
Education and Outreach, Prevention, Structural		

Ideas for Implementation:	Actions Taken Since 2018
• Share technical data as it becomes available; • Consider the impacts of earthquake, flood and other natural hazards.	There was a tabletop scheduled for 2024 that ended up being cancelled because it fell right in the middle of wildfire season. The last full EAP Exercise for Ochoco was completed in January of 2023. Additionally, the US Bureau of Reclamation has been studying Ochoco Dam for both Seismic and Static Risk. Significant progress has been made since 2018 with an expected report to the Dam Safety Administration Team due in 2025.

Potential Funding Sources:	Estimated Cost:	Timeline:
EPA grants, BOR grants, FEMA grants, state funding	$50K - $100K+	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
City of Prineville	Ochoco Irrigation District, Bureau of Reclamation, Watershed Councils, USACE, BOR, OWRD
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP addendum.

Action Item: LT Flood #8	Alignment with Plan Goals:	High Priority Action Item?
Coordinate with BOR and OID on public engagement and educational campaigns on the purposes of controlled flooding within the County.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☒ 7 ☐	Yes

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
OWRD High Hazards Potential Dams
Rationale for Proposed Action Item:
Education and outreach, prevention, hazard mitigation, protection

Ideas for Implementation:	Actions Taken Since 2018
• Share technical data as it becomes available • Post information on when controlled flooding events will be happening to social media pages, newspapers, and other sources • Coordinate with OWRD on outreach events they host for this topic	N/A – New item

Potential Funding Sources:	Estimated Cost:	Timeline:
OWRD grant programs, EPA grants, BOR grants	<$25K	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	City of Prineville
Internal Partners:	**External Partners:**
	OID, BOR, CCF&R
Form Submitted By:	City of Prinveille NHMP Steering Committee
Action Item Status:	New

Action Item: LT Flood #9	Alignment with Plan Goals:	High Priority Action Item?
Encourage public and private properties to restore natural systems within the floodplain, and to manage riparian areas and wetlands for flood abatement.	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☒ 6 ☒ 7 ☐	Yes
Affected Jurisdictions:		
City of Prineville, Crook County		
Alignment with Existing Plans/Policies:		
Natural Features Overlay District (NFOD), Riparian & wetland Setbacks, Chapter 151 Flood Damage Prevention		
Rationale for Proposed Action Item:		
Property and Natural Resource Protection		
Ideas for Implementation:	**Actions Taken Since 2018**	
In addition to encouraging private property owners, managing publicly owned riparian and floodplain areas for conversion to open space/parkland/greenway is key to restoring natural floodwater absorption capacities (i.e. Ochoco Creek Flood mitigation projects, Striker Field).	The City has conducted a Floodplain feasibility study. Property purchases within the floodplain and designated wetlands.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
	$5K+	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	City of Prineville	
Internal Partners:	**External Partners:**	
	Watershed Councils, NRCS, FEMA, USACE, DSL, DEQ	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	New	

Action Item: LT Drought #1	Alignment with Plan Goals:	High Priority Action Item?
Implement the Water Conservation Plan.	1 ☒ 2 ☐ 3 ☒ 4 ☐ 5 ☐ 6 ☐ 7 ☐	Yes
Affected Jurisdictions:		
City of Prineville		
Alignment with Existing Plans/Policies:		
2017 Water Conservation Plan; Drought Resiliency		
Rationale for Proposed Action Item:		
Water conservation is the most cost-effective way to maximize the use of the water the City already produces.		
Ideas for Implementation:	**Actions Taken Since 2018**	
System-wide metering, Meter testing and maintenance, Water Rate Structure, Leak Detection program, Water Reuse, non-potable opportunities, Aquifer Storage and Recovery, alternative landscaping and irrigation systems.	All of these ideas are being implemented in some form.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Utility Billing State and Federal Grant Programs	$1 Million+	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	City of Prineville	
Internal Partners:	**External Partners:**	
City of Prineville	BOR, OWRD, NRCS, OID	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	New	

Action Item: REMOVED ST Wildfire #1	Alignment with Plan Goals:	High Priority Action Item?
Continue to promote public awareness campaigns for individual property owners living in interface areas.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☒ 6 ☒ 7 ☐	No

Affected Jurisdictions:
City of Prineville, Crook County
Alignment with Existing Plans/Policies:
Crook County Community Wildfire Protection Plan
Rationale for Proposed Action Item:
Education & outreach, public safety, hazard mitigation, property protection

Ideas for Implementation:	Actions Taken Since 2018
Focus on individual community outreach efforts through: • Working demonstrations of risk reduction measures (i.e. survivable space around structures; driveway, road and bridge specifications; and landscaping); • Voluntary site visits by fire crews to consult with landowners about specific ways to reduce risk to their property and to identify properties that would not be saved if a wildfire event occurred; • Mailings; • Public service announcements in the media; • Warn prospective buyers to ask about the level of fire protection available and fire insurance rating for properties in Crook County; • Noxious weed abatement.	Crook County Fire & Rescue holds public meetings to discuss community member safety. Crook County Fire & Rescue provides home risk assessments through their Fire Ready program.

Potential Funding Sources:	Estimated Cost:	Timeline:
OSFM, ODF, USFS grants	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	City of Prineville, Crook County
Internal Partners:	**External Partners:**
	Crook County Landfill, CCFR, State Fire Marshal, ODF, DEQ, BLM, USFS
Form Submitted By:	City of Prineville NHMP Steering Committee

Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP addendum.

Action Item: LT Wildfire #2	Alignment with Plan Goals:	High Priority Action Item?
Continue to reduce wildfire fuels by conducting defensible space projects.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☒ 6 ☒ 7 ☐	No

Affected Jurisdictions:		
Crook County, City of Prineville		
Alignment with Existing Plans/Policies:		
Crook County CWPP		
Rationale for Proposed Action Item:		
Hazard mitigation, property protection, partnership and coordination, prevention		
Ideas for Implementation:	**Actions Taken Since 2018**	
Identify and implement methods of disposal or utilization of fire fuels removed from individual properties (i.e. prescribed fire application, fuel reduction through grass/timber/brush removal, small diameter forest product based industries, chipping etc.).	Crook County Landfill has been hosting free yard debris days. Five Firewise communities have been developed. The City of Prineville is pursuing the development of a 43-megawatt biomass facility. The biomass facility will use the removed hazardous fuels as a source of feed.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Oregon State Fire Marshal grants, Title III funding, HMGP, ODF funding	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	City of Prineville, Crook County	
Internal Partners:	**External Partners:**	
	Crook County Landfill, CCFR, State Fire Marshal, ODF, DEQ, BLM, USFS	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	Ongoing	

Action Item: REMOVED ST Earthquake #1	Alignment with Plan Goals:	High Priority Action Item?
Develop in-depth studies to determine county and region's vulnerability to earthquake.	1 ☒ 2 ☐ 3 ☐ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:	
Crook County	
Alignment with Existing Plans/Policies:	
Statewide hazard planning	
Rationale for Proposed Action Item:	
Prevention, Partnership and Coordination	
Ideas for Implementation:	**Actions Taken Since 2018**
• Work with OEM, DOGAMI, FEMA and USGS and expand existing studies to address scope of vulnerability; • Communicate study findings with key stakeholders affiliated with public awareness, education, policy and mitigation strategies identified in study; • If needed, make policy and procedure changes that support study results that mitigate earthquake hazards.	DOGAMI began a detailed hazard risk analysis for Crook County in 2024. This report, which includes other hazards like flood, landslide, and wildfire, will be complete in late 2025. Additionally, DOGAMI is updating critical facilities for the county to support Rapid Visual Screening to assess seismic vulnerability of critical structures. This is also anticipated to be complete in 2025.

Potential Funding Sources:	Estimated Cost:	Timeline:
OEM and FEMA grants	$50K - $100K	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
City of Prineville	OEM, DOGAMI, FEMA, USGS, Public Environmental Health, Crook County Health and Human Services
Form Submitted By:	City of Prineville NHMP Steering Committee
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP addendum.

Action Item: LT Earthquake #2	Alignment with Plan Goals:	High Priority Action Item?
Partner with Crook County Emergency Management to promote building safety through non-structural improvements.	1 ☒ 2 ☐ 3 ☐ 4 ☒ 5 ☒ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
City of Prineville, Crook County		
Alignment with Existing Plans/Policies:		
Rationale for Proposed Action Item:		
Minimize damage in the event of an earthquake.		
Ideas for Implementation:	**Actions Taken Since 2018**	
• Publicize information on securing water heaters, book cases, filing cabinets, light fixtures and other items that can cause injuries and block exits; • Partner with Crook County Emergency Management to provide public outreach at local building supply outlets and Emergency Services booth at Crook County Fair.	No new action items have been taken on this goal since the adoption of the 2018 NHMP.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
OEM & FEMA funding opportunities	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)
Coordinating Organization:	City of Prineville	
Internal Partners:	**External Partners:**	
City of Prineville Planning Department	Crook County, Emergency Management, Local Businesses	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	Ongoing	

Action Item: ST Volcano #1	Alignment with Plan Goals:	High Priority Action Item?
Provide a Volcanic Ash Mitigation Guidebook on the County Website for Citizens and Businesses.	1 ☒ 2 ☐ 3 ☒ 4 ☐ 5 ☐ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
City of Prineville, Crook County		
Alignment with Existing Plans/Policies:		
Crook County Planning		
Rationale for Proposed Action Item:		
Education and Outreach, Partnership and Coordination		
Ideas for Implementation:	**Actions Taken Since 2018**	
• Update City web links to include broader information related to volcanic ash mitigation. • Coordinate with Crook County Emergency Management on a single hazard mitigation site that would include volcanic ash mitigation.	Crook County Health Department has created a Volcanic Ash Preparedness Plan which was incorporated into the Oregon 2024 Climate Adaptation Plan.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
This will be provided by USGS.	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)
Coordinating Organization:	Crook County Emergency Management, USGS-Cascade Volcano Observatory	
Internal Partners:	**External Partners:**	
City of Prineville	Crook County Planning, DOGAMI	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	Ongoing	

Action Item: REMOVED LT Landslide #1	Alignment with Plan Goals:	High Priority Action Item?
Assess Crook County's and City of Prineville's Vulnerability to Landslides	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☒ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
DOGAMI statewide hazard planning		
Rationale for Proposed Action Item:		
Property Protection, Prevention		
Ideas for Implementation:	**Actions Taken Since 2018**	
After sufficient data is compiled about the landslide hazard in Crook County a more detailed vulnerability assessment should be completed.	Crook County has been working with DOGAMI to understand landslide history, extent, and locations for Crook County. The Emergency Operations Plan (EOP) is currently being updated and landslide history will be incorporated to the final EOP.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
DOGAMI is working to assess Crook County's and the City of Prineville's vulnerability to landslides.	<$10K	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)
Coordinating Organization:	Oregon Department of Emergency Management	
Internal Partners:	**External Partners:**	
City of Prineville	Crook County Emergency Management, County Planning, ODOT, DOGAMI, ODF, USFS, BLM	
Form Submitted By:	City of Prineville NHMP Steering Committee	
Action Item Status:	Removed; this is an action item for the Crook County NHMP. City of Prineville NHMP Addendum Steering Committee members created individual goals for the Prineville NHMP addendum.	

Addendum: Crook County Fire & Rescue

Addendum to the 2025 Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan

Fire & Rescue Addendum to the Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan
Crook County Fire & Rescue, Oregon

Introduction

Purpose

This is the first iteration of the Crook County Fire & Rescue addendum to the Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP). This addendum supplements information contained in the Crook County NHMP, which serves as the NHMP foundation and Appendices, which provide additional information. This addendum meets the following requirements:

- Multi-Jurisdictional **Plan Adoption** §201.6(c)(5),
- Multi-Jurisdictional **Participation** §201.6(a)(3),
- Multi-Jurisdictional **Mitigation Strategy** §201.6(c)(3)(iv), and
- Multi-Jurisdictional **Risk Assessment** §201.6(c)(2)(iii).

Crook County Fire & Rescue adopted their addendum to the Crook County Multi-Jurisdictional NHMP on INSERT DATE. FEMA Region INSERT REGION approved the Crook County NHMP on INSERT DATE and the District's addendum on INSERT DATE. With approval of this NHMP the District is now eligible for non-disaster and disaster mitigation project grants through INSERT DATE.

NHMP Process, Participation, and Adoption

This section of the NHMP addendum addresses 44 CRF 201.6(c)(5), Plan Adoption and 44 CFR 201.6(a)(3), Participation.

In addition to establishing a comprehensive District level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in Title 44 CFR Part 201, require that jurisdictions maintain an approved NHMP to receive federal funds for mitigation projects. Local adoption, and federal approval of this NHMP ensures that Crook County Fire & Rescue (CCFR) will gain eligibility for non-disaster and disaster mitigation project grants.

Central Oregon Intergovernmental Council partnered with Crook County and Crook County Fire & Rescue to develop this NHMP. Members of the Crook County Fire & Rescue NHMP Steering Committee also participated in the County NHMP update process.

By creating a NHMP, locally adopting it, and having it approved by FEMA, Crook County Fire & Rescue will gain eligibility for FEMA Hazard Mitigation Assistance grant program funds.

The Crook County NHMP and Crook County Fire & Rescue addendum are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector and regional organizations. A project Steering Committee guided the process of developing the NHMP.

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

This addendum supports mitigation actions that are found within the Crook County NHMP. Crook County Fire & Rescue's Natural Hazard Mitigation effort is nested within the overall Crook County NHMP.

The actions described in the addendum are intended to be implemented through existing and new plans and programs within the district.

Convener and Committee

The CCFR Division Chief served as the designated convener of the NHMP development and will take the lead in implementing, maintaining, and updating the addendum to the Crook County NHMP in collaboration with the designated convener of the Crook County NHMP (Emergency Manager).

The CCFR NHMP Steering Committee met in October 2024 to discuss the development of their addendum. The Steering Committee developed the addendum with particular focus on the NHMP's risk assessment and mitigation strategy.

Crook County Fire & Rescue's Steering Committee was comprised of the following representatives:

- Russ Deboodt, Crook County Fire & Rescue, Division Chief
- Amber Blanchard, Crook County Fire & Rescue, Fire Prevention Technician
- Will VanVactor, County Manager, Crook County
- Sheldon Rhoden, Fire Management Specialist, Prineville District BLM

The Steering Committee was closely involved throughout the development of the NHMP and served as the local oversight body for the NHMP's development.

NHMP Implementation and Maintenance

The Crook County Fire & Rescue Board of Directors will be responsible for adopting the CCFR addendum to the Crook County NHMP. Because the district addendum is part of the County's multi-jurisdictional NHMP, the district will look for opportunities to partner with the County. The CCFR Steering Committee will convene after adoption of the NHMP addendum on an annual schedule and in conjunction with the County NHMP update meetings. The convener (Division Chief) will be responsible for assembling the Steering Committee.

Regular plan maintenance and updating allows this document to remain fresh and enables CCFR to advance its level of preparedness through the implementation of mitigation action items. Plan maintenance and updating is a process that combines open public involvement and the collection of new data to make informed decisions that assist in mitigating the disastrous effects on natural hazards, making the county more resilient to natural disasters.

This section of this document details the process that will ensure that the Crook County Fire & Rescue Addendum and the Crook County Natural Hazards Mitigation Plan remain active and relevant documents. The plan maintenance process includes a schedule for monitoring and evaluating the plan annually and producing a plan revision every five years. This section describes how the county will integrate public participation throughout the plan maintenance process.

Plan Adoption

The Crook County Fire & Rescue Board will be responsible for adopting the CCFR addendum to the Crook County NHMP. This governing body has the authority to promote sound public policy regarding natural hazards. Once the Crook County NHMP has been adopted, the County Emergency Manager will be responsible for submitting it to the State Hazard Mitigation Officer at the Oregon Department Emergency Management. The Oregon Department of Emergency Management will submit the updated NHMP to the Federal Emergency Management Agency (FEMA) for review. This review will address the federal criteria outlined in FEMA's Flood Mitigation Assistance program.

Ongoing Monitoring

This Addendum shall be reviewed by Steering Committee members on an annual basis in conjunction with the Crook County NHMP. The County will provide an opportunity for community members or participate in annual reviews during Steering Committee review meetings. A complete review of this addendum will happen every 5 years.

Topics that the Steering Committee could consider include:

- Ongoing prioritizing of action items and work plan
- Delegation of action item management and implementation
- Tracking and monitoring action item implementation
- Consideration of changes or appropriateness of action items

- Consideration of new information that could change assumptions, the risk assessment, or implementation actions of the Plan
- Discussing methods for continued public involvement
- Evaluating effectiveness of the NHMP at achieving its purpose and goals
- Natural hazard preparedness exercises

Crook County NHMP Review Schedule

- Year 1 (2026): Review risk assessment information and actions for implementation progress and prioritization. Document outcomes.
- Year 2 (2027): Review risk assessment information and actions for implementation progress and prioritization. Document outcomes.
- Year 3 (2028): Review risk assessment information and actions for implementation progress and prioritization. Document outcomes.
- Year 4 (2029): Begin formal 5-year update of the NHMP. Review Risk Assessment and actions to include new data if applicable.
- Year 5 (2030): Formal Update of the NHMP for FEMA review. During the five-year review, the Plan will be updated to meet current federal and state requirements through a public process that supports the mission of this Plan.

Five-Year Review of Addendum

The Crook County Fire & Rescue Addendum will be updated every five years in conjunction with the Crook County NHMP. During this update, the following questions will be asked to determine what actions are necessary to update the plan. The convener will be responsible for convening the Steering Committee to address the questions outlined below.

- Are the plan's goals still applicable?
- Do the plan's priorities align with state priorities?
- Are there new partners that should be brought to the table?
- Are there new local, regional, state or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the plan was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Do existing actions need to be reprioritized for implementation?
- Are the actions still appropriate, given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the plan accurately address the impacts of this event?

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

Implementation through Existing Programs

Many of the Natural Hazards Mitigation Plan's recommendations are consistent with the goals and objectives of CCFR's existing plans and policies. Where possible, Crook County Fire & Rescue will implement the NHMP's recommended actions through existing plans and policies. Plans and policies already exist with support from local residents, businesses, and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, allowing them to adapt to changing conditions and needs. Implementing the NHMP's action items through such plans and policies increases their likelihood of being supported and implemented.

Crook County Fire & Rescue currently has the following plans that relate to natural hazard mitigation:

- 2024 Standard of Cover
- 4-20-23 Strategic Business Plan
- 2024 Crook County Community Wildfire Protection Plan

For more information, visit Crook County Fire & Rescue's website.

During the development of this NHMP, CCFR strategic and fire plans were reviewed to identify possible natural hazard mitigation strategies.

Capability Assessment

The Capability Assessment identifies and describes the ability of Crook County Fire & Rescue to implement the mitigation strategy and associated action items. Capabilities can be evaluated by looking at a range of categories, including existing authorities, policies, programs, funding, and resources.

Existing Authorities

Hazard mitigation can be executed at a local scale through three methods: integrating hazard mitigation actions into other local planning documents, adopting building and/or fire codes that account for best practices in structural hardening and fire resistance, and codifying land use regulations and zoning designations that prescribe mitigation into development requirements. The extent to which a municipality, district, or multi-jurisdictional effort leverages these approaches is an indicator of that community's capabilities.

Strategic Business Plan

The purpose of the strategic business plan is to institutionalize the drive to maintain and improve services in a financially stable fashion. The plan is oriented to achieve the Fire Board's "end statements" in alignment with the District's mission, vision, and values. The ten functional categories of the strategic business plan will assist the public, Fire Board and staff to maintain a global view of how the District functions to accomplish its core service.

Standard of Cover

These adopted written policies and procedures determine the distribution, concentration, and reliability of fixed and mobile response forces for fire, emergency medical services, hazardous materials, and other technical responses. Key components include agency goals, services provided, community risk assessment (including hazard analysis), and performance objectives.

Fire Codes

The Oregon Legislature recently adopted updated building codes for both residential (2021 adoption) and commercial structures (2022). These building codes are based on the 2021 version of the International Building Code, International Fire Code, and International Residential Code. Crook County Fire & Rescue administers the 2022 edition of the Oregon Fire Code.

The Oregon State Fire Marshal established minimum defensible space requirements for wildfire reduction and applies to areas in the wildland-urban interface (WUI) that are at high or extreme risk of wildfire. CCFR administers the Oregon Defensible Space Code.

Policies and Programs

This Plan will support Crook County Fire & Rescue and Crook County in exploring integration into other existing programs, documents and processes. CCFR will make every effort to integrate the NHMP into its portfolio of planning processes and programs.

Wildland Risk Assessment / Fire Ready

CCFR staff help property owners better understand how to protect their homes from wildfire by conducting wildland risk assessments on private property.

After the Fire Program

CCFR has created an After the Fire Program that provides guidance for what steps homeowners should take after a fire.

Community Wildfire Protection Plan

The 2024 Crook County CWPP identifies priority actions to mitigate and reduce the County's risk to wildfire.

CPR Certification Classes

Crook County Fire & Rescue is an American Heart Association (AHA) Training Center. Currently both Heartsaver First Aid CPR/AED (Adult, Child & Infant) along with Healthcare Provider BLS courses are provided.

Firewise USA

Crook County Fire & Rescue has recognized and supported the development and maintenance of four new Firewise communities, including:

- Brasada Ranch (became a Firewise community in 2022)

- Dry Creek Airpark (became a Firewise community in 2018)
- Red Cloud Ranch (became a Firewise community in 2022)
- Sunset Hills (became a Firewise community in 2019)

Personnel

Crook County Fire & Rescue

Crook County Fire & Rescue, established in 1884, is the oldest fire department in Central Oregon. They operate as a Special District and are directly accountable to a five-member elected board. Crook County Fire & Rescue provides fire suppression, prevention, investigation, inspection, and emergency medical services to a community of approximately 26,583 residents (PSU Population Research Center). CCFR responds from three fire stations and provides fire protection to a 450 square mile area of Crook County including the City of Prineville and the communities of Powell Butte, Juniper Canyon, and Lone Pine. Their Ambulance Service Area encompasses the majority of the 3,000 square miles of Crook County. CCFR has 50 emergency responders including 24 career staff.

Crook County Fire & Rescues has Career Employees and Volunteer Firefighters. Career Employees include:

- Fire Chief
- Division Chief (2)
- Finance Manager
- Ambulance Billing
- (3) Battalion Chiefs
- (9) Lieutenants
- (12) Career Firefighters/Paramedics
- (2) Firefighter/EMS Workers
- Fire Prevention Technician

Volunteer Firefighters include:

- (12) Student Volunteer Firefighters
- (12) Pain On Call Firefighters

These personnel integrate hazard mitigation and resilience planning into their greater work programs to the best of their abilities. However, there is limited capacity to expand upon their capabilities or workloads.

CCFR Board of Directors - Administration

The Board of Directors for Crook County Fire & Rescue consists of five residents or property owners who are elected by the public. They are responsible for establishing fire district policy through the passage of resolutions and ordinances. The Board of Directors also adopts the district budget, approves appropriations and levies taxes.

Capital Projects

In 2024, Crook County Fire & Rescue completed a seismic upgrade project of their 1201 Main Station with funding from Business Oregon.

Capital Resources

Crook County Fire & Rescue maintains three stations: the Main-Station 1201 (located in Prineville), Station 1202 (located in Powell Butte) and Station 1203 (located in Juniper Canyon).

Findings

Several important findings from this capability assessment informed the design of the Plan's mitigation strategy and aided in prioritizing action items.

Staffing Limitations & Capacity

Crook County Fire & Rescue staff are assigned hazard mitigation responsibilities as a part of their larger job responsibilities. Limited capacity reduces the breadth of the programming the district can undertake in any year. The District relies upon its relationships with the County and other fire agencies within its region to expand its operations.

Reliance Upon Outside Funding Streams and Local Match Requirements

Grants and limited annual revenue are directed to sustain the marketing of resiliency programs. But there are few opportunities for using local financial resources to implement more extensive hazard mitigation work. They lean heavily upon state and federal grant funds as the primary means for securing mitigation funding.

Leveraging Partnerships with Public and Nonprofit Entities

Regional planning displayed in the Community Wildfire Protection Planning process demonstrates the District's ability to effectively share information and identified priority needs.

Mitigation Strategy

This section of the NHMP addendum addresses 44 CFR 201.6(c)(3)(iv), *Mitigation Strategy*.

CCFR's Mitigation Strategy was developed during the 2025 NHMP planning process. The Steering Committee created the mitigation strategy action items after assessing risk and identifying potential risks. CCFR developed actions specific to their community after first reviewing the County's NHMP action items.

Mission

The mission of Crook County Fire & Rescue's Addendum is:

To reduce risk, prevent loss and protect life, property and the environment from natural hazard events through coordination and cooperation among public and private partners.

Goals

The plan goals help guide the direction of future activities aimed at reducing risk and preventing loss from natural hazards. The goals listed below in **Table C-1** serve as checkpoints as agencies and organizations begin implementing mitigation action items. The Crook County Fire & Rescue Steering Committee reviewed the County's NHMP Plan goals and adopted the same goals.

Table C-1. 2025 Crook County NHMP Goals

Goal	Goal Statement	Community Priority
Partnership and Coordination	• Identify mitigation of risk reduction measures that address multiple areas (i.e. environment, transportation, and telecommunications). • Coordinate public/private sector participation in planning and implementing mitigation projects throughout the county. • Seek partnerships in funding and resources for future mitigation efforts.	1
Emergency Services	• Minimize life safety issues. • Promote, strengthen, and coordinate emergency response plans. • Evaluate the performance of critical facilities during a natural hazard event.	2
Education and Outreach	• Further the public's awareness and understanding of natural hazards, potential risk, including economic vulnerability, and options available when natural hazard events occur.	3
Prevention	• Reduce the threat of loss of life and property from natural hazards. • Incorporate information on known hazards and provide incentives to make hazard mitigation planning in land use policies and decisions, which include plan implementation.	4
Property Protection	• Lessen impact from natural disaster on individual properties, businesses, and public facilities. • Increase awareness at the individual level and encourage activities that can prevent damage and loss of life from natural hazards.	5
Natural Resource Protection	• Preserve and rehabilitate natural systems to serve natural hazard mitigation functions (i.e. floodplains, wetlands, watersheds, and urban interface areas).	6
Structural Projects	• When applicable, utilize structural mitigation activities to minimize risks associated with natural hazards.	7

Mitigation Successes

- Business Oregon – Seismic Rehabilitation Grant (2024)
- Oregon State Fire Marshal - (Oregon Fire Service Capacity Grant), 2023 - Funding to hire a Fire Prevention Technician to work with community members on defensible space projects
- Oregon Department of Forestry - Community Wildfire Defense Grants - Funding for community engagement on defensible space

Action Items

Table C-2 below documents each action along with the lead organization, partners, timeline, status, and identifies which goal it aligns with.

Priority action items are highlighted in orange. NHMP Steering Committee members determined if an item was a priority based off the hazards HVA score, and the hazards maximum threat.

Refer to *Attachment A, Action Items* for detailed information about each action item.

Table C-2. Crook County Fire & Rescue Mitigation Strategy Action Items

Multi-Hazard	LT or ST	Proposed Action Title	Lead Agency	Partner Organizations	Timeline	Status	Plan Goals						
							1	2	3	4	5	6	7
MH #1	ST	Continue furthering programs and efforts for community risk reduction and community safety.	CCF&R	Crook County Emergency Management, Crook County, City of Prineville, Firewise Communities, NHMP Steering Committee Members	Ongoing	NEW	X		X	X			
MH #2	LT	Build a fire station near Crook County Airport for redundancy and to improve services to residents and private businesses.	CCF&R	Crook County Emergency Management, Crook County, Crook County Airport	6+ Years	NEW							X
MH #3	LT	Collaborate with Crook County and the City of Prineville efforts in addressing NHMP priority goals.	CCF&R	City of Prineville, NHMP Steering Committee members, Crook County Emergency Management, Crook County, City of Prineville	Ongoing	NEW	X						
MH #4	ST	Work with Pacific Power to create public information notifications on scheduled power outages, and to coordinate timing for these outages.	CCF&R	Pacific Power, Central Electric Co-Op, City of Prineville, Crook County Emergency Management, Crook County	0-2 Years	NEW	X	X	X				
MH #5	LT	As new development is built, coordinate with the County to ensure buildings meet state requirements.	CCF&R	Crook County, Crook County Emergency Management, City of Prineville, Central Oregon	2-5 Years	NEW	X						X

				Disability Support Network									
Drought	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
DR #1	LT	Develop alternative water sources across the County for fire suppression efforts.	CCF&R	Crook County, Crook County Emergency Management, City of Prineville, Ochoco Irrigation District, Central Oregon Irrigation, Private Purveyors	2-6+ Years	NEW		X			X		
Earthquake	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
EQ #1	LT	Develop and maintain strong relationships and communication channels with neighboring Emergency Managers and local jurisdictions to enhance preparedness and response to the Cascadia Subduction Zone Event.	CCF&R	Deschutes County Emergency Management, Jefferson County Emergency Management, Crook County Health Department, Crook County Emergency Management, Crook County	Ongoing	NEW	X						
EQ #2	ST	Partner with Crook County Emergency Management to promote building safety through non-structural improvements.	CCF&R	Crook County Emergency Management, Crook County, City of Prineville, Local Businesses	Ongoing		X			X	X		X
Flood	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**

FL #1	LT	Develop a Flatwater Ice and Rescue Program.	CCF&R	Crook County Sheriff's Department, Crook County Emergency Management, City of Prineville Police Department, City of Prineville, OWRD	2-6 Years	NEW		X					
FL #2	ST	Create education materials and Public Information Notices for Ochoco Irrigation Districts maintained flooding events.	CCF&R	OID, City of Prineville Police Department, Crook County Sheriff's Department, Crook County Emergency Management	0-2 Years	NEW	X			X			
Landslide	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
The Steering Committee, using available local resources, will study this hazard further during the implementation and maintenance phase of this NHMP, seeking to identify cost effective actions that might be implemented to reduce community vulnerability.													
Severe Weather Events	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
SWE #1	ST	Develop outreach and educational materials on how to stay safe when severe weather events threaten power lines.	CCF&R	Crook County Sheriff's Department, Prineville Police Department, Crook County Health Department, Central Electric, Pacific Power, BLM, USFS, ODF	0-2 Years	NEW			X				

SWE #2	ST	Ensure CCF&R is well staffed and prepared with the resources needed for when severe weather events are predicted.	CCF&R	Crook County, Crook County Emergency Management County GIS, Crook County Public Health, City of Prineville, Ochoco Irrigation District	Ongoing	NEW		X					
Volcanic Event	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
VL #1	ST	Provide a Volcanic Ash Mitigation Guidebook for citizens and businesses on the CCF&R's website.	CCF&R	USGS, DOGAMI, Crook County Health Department, Crook County Emergency Management	0-2 Years	NEW	X		X				
Wildfire	**LT or ST**	**Proposed Action Title**	**Lead Agency**	**Partner Organizations**	**Timeline**	**Status**	**Plan Goals**						
							1	**2**	**3**	**4**	**5**	**6**	**7**
WF #1	LT	Sustain and expand defensible space assessment work for private landowners.	CCF&R	Crook County, City of Prineville, ODF, OSFM, ODF, BLM, COFMS	Ongoing	NEW	X			X	X		
WF #2	LT	Support communities interested in going through the process of becoming a Firewise community and support communities to maintain their Firewise credential.	CCF&R	Local Residents, ODF, NFPA	Ongoing	NEW	X			X	X		
WF #3	LT	Coordinate with federal and state lands to reduce ladder fuels throughout the County.	CCF&R	BLM, USFS, Crook County	Ongoing	NEW	X			X	X	X	

WF #4	ST	Work with appropriate partners to implement the strategies identified in the Crook County Community Wildfire Protection Plan.	CCF&R	Crook County Emergency Management, City of Prineville, Crook County, BLM, COFMS, Crook County CWPP Steering Committee, ODF	2-5 Years	NEW	X	X	X	X	X	X	X

Risk Assessment

This section of the NHMP addendum addresses 44 CFR 201.6(b)(2) – *Risk Assessment*. The following hazards have been addressed in the Crook County NHMP. Members from the Crook County Fire & Rescue Steering Committee participated in the cooperative development of the County's plan throughout the 2025 NHMP update process. During this time, CCFR Steering Committee members considered details of the Plan at the 2025 NHMP Steering Committee meetings regarding Section 3 of the plan. The CCFR Steering Committee has reviewed the NHMP and has assessed how its vulnerability risks vary from the risks facing the entire planning area, which is highlighted further in the sections below.

Assessing natural hazard risk has three phases:

- 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 people, businesses, homes, 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.

There are seven natural hazard types which may impact Crook County Fire and Rescue, these include:

1. Drought
2. Flood
3. Wildfire
4. Earthquake
5. Severe Weather Events
6. Volcano
7. Landslide

Hazard Analysis

Crook County Fire & Rescue developed their hazard vulnerability assessment (HVA) using the County's HVA as a reference. CCFR services most of Crook County and responds to every emergency the County faces. Given that CCFR's service boundaries and the boundaries of the County are similar, there has been no change to the HVA.

The **Table C-3** below shows the HVA matrix for CCFR listing each hazard listed in order of rank from high to low. For local governments, conducting the hazard analysis is a useful step in planning for hazard mitigation, response, and recovery. The method provides the jurisdiction with a sense of hazard priorities but does not predict the occurrence of a particular hazard.

Table C-3. The Crook County Fire & Rescue Hazard Analysis Matrix.
"WF" Refers to Weight Factor

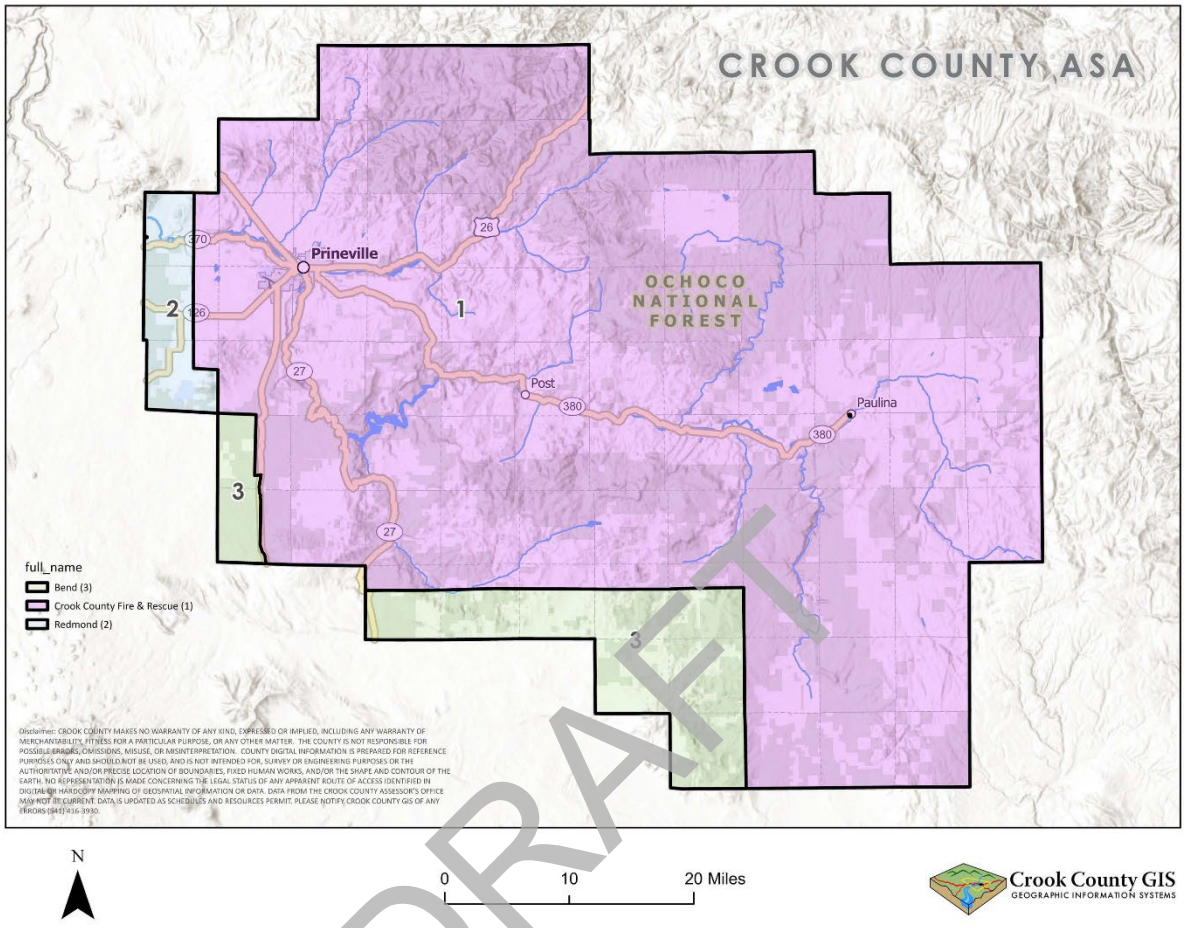
Hazard	History WF: 2	Vulnerability WF: 5	Maximum Threat WF: 10	Probability WF: 7	Total Score
Drought	10	10	10	10	240
Flood	10	9	9	10	225
Wildfire	10	7	7	10	195
Severe Weather Event	10	5	6	10	175
Earthquake	3	5	10	3	152
Volcano	3	7	9	1	138
Landslide	2	2	9	4	132

Community Characteristics

Crook County Fire & Rescue serves a community that is experiencing rapid growth. In the last 10 years CCFR has seen an increase in taxable valuation of nearly $900 million and an increase in non-taxable valuation of over $5 billion in industrial growth. CCFR serves the public out of three fire stations and provides fire protection to a 450 square mile fire district and an ambulance service area of approximately 3,000 square miles.

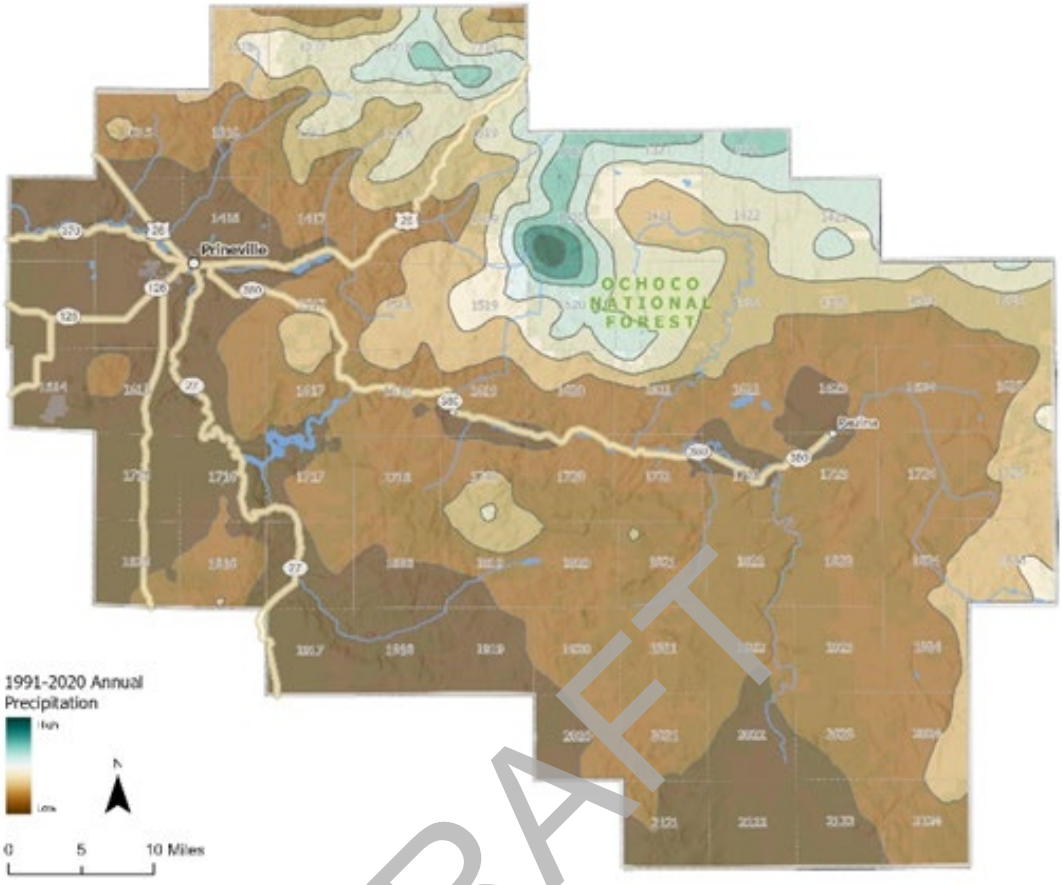
Crook County Fire and Rescue provides fire suppression, prevention, investigation, inspection and emergency medical services to a community of 26,583 residents (PSU Research Population Center). CCFR responds from three fire stations and provide fire protection to a 450 square mile area of Crook County including the City of Prineville and the communities of Powell Butte, Juniper Canyon and Lone Pine. CCFR's Ambulance Service Area encompasses the majority of the 3,000 square miles of Crook County (**Figure C-1** below).

Figure C-1. Crook County ASA Map 2024



Crook County Fire & Rescue's jurisdiction, located on the east side of the Cascades Mountains, experiences gusty, turbulent, dry cold front passage that has historically contributed to high wildland fire rates of spread and spotting in many areas of the county. The rain shadow effect of the Cascades also shapes the Central Oregon high desert and is readily apparent in the western and southern portions of Crook County. These portions are located at 3000 feet in elevation and are dominated by Western Juniper and a variety of sagebrush and grass species with an annual average precipitation of 8 to 10 inches. **Figure P-2** below illustrates County precipitation patterns, the rain shadow effect from the Cascades and the precipitation effect of the higher elevation Ochoco Mountains.

Figure C-2. Crook County Precipitation Patterns.



Community Assets

This section outlines the resources, facilities (including fire stations), and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of CCFR.

Community Lifelines are fundamental services that enable all other aspects of society to function. FEMA developed the Community Lifelines construct for objective-based response to prioritize the rapid stabilization of these facilities after a disaster. Mitigating these facilities will increase the community's resilience.

Critical Facilities

Facilities that are critical to government response and recovery activities (i.e., life, safety, property, and environmental protection) include: 911 Centers, Emergency Operations Centers, Police and Fire Stations, Public Works facilities, sewer and water facilities, hospitals, bridges, roads, shelters, and more. Facilities that, if damaged, could cause serious secondary impacts may also be considered "critical."

Fire Stations

- Crook County Fire & Rescue
  - Main Station 1201 – Prineville
  - Station 1202 – Powell Butte
  - Station 1203 – Juniper Canyon

Law Enforcement

- Prineville Police Department
- Crook County Sheriff's Office
- Crook County Jail
- Crook County Emergency Operations Center

Public Works

- City of Prineville Public Works
- Oregon Department of Transportation
- Crook County Road Department

Government

- United States Forest Service
- Bureau of Land Management
- Oregon Department of Forestry

State Highways

- 126
- 26
- 380
- 370
- 27

Essential Facilities

Facilities that are essential to the continued delivery of key government services and/or that may significantly impact the public's ability to recover from the emergency may include City buildings.

Hospitals/Immediate Care Facilities

- St. Charles Hospital
- Mosaic Community Health
- Red Cross

City/County/Other

- Prineville City Hall
- Crook County Courthouse
- Crook County Public Health Department

- Crook County Airport
- Oregon Department of Human Services
- Oregon Justice Department

Schools

- Crooked River Elementary
- Crook County High School
- Crook County Middle School
- Barnes Butte Elementary
- Steins Pillar Elementary
- High Desert Christian Academy
- Pioneer High School
- Crook County Christian School
- Central Oregon Community College

Hazard Profiles

The following sections briefly describe relevant information for each profile hazard. For more information on the vulnerabilities of each partner jurisdiction (City of Prineville) please review the applicable addendum in (Volume II).More information on Crook County Hazards can be found in Volume I, Section 3 Risk Assessment and in the Risk Assessment for Region 6, Central Oregon, Oregon SNHMP (2020).

Drought

The Steering Committee determined that CCFR's probability for drought is high (which is the same as the County's Rating) and that their vulnerability to severe weather events is also high (which is the same as the County's Rating).

Volume I, Section 3 describes the characteristics of severe weather events and their history, as well as the future conditions, location, extent and probability of a potential severe weather event.

Water available for CCFR comes from groundwater. The City of Prineville has constructed an Aquifer Storage and Recovery System (ASR) that allows the city to store water from cooler months and is accessible for CCFR to use for firefighting. In the event of a long-term drought, aquifer levels will drop drastically and will have a great impact on the amount of water available to the CCFR.

Flood

The Steering Committee determined that CCFR's probability for flooding is high (which is the same as the County's Rating) and that their vulnerability to flooding is also high (which is the same as the County's Rating).

Volume I, Section 3 describes the characteristics of floods and their history, as well as the future conditions, location, extent and probability of a potential severe weather event.

CCFR serves the entirety of the City of Prineville. A high percentage of the City of Prineville falls within the designated floodplain (see FEMA's Flood Map Service Center for a copy of City of Prineville's FIRM map), putting the City of Prineville at high risk for flooding. Flooding in the City of Prineville is predicted to interrupt commerce, residents' ability to access services, and CCFR's ability to serve City of Prineville residents.

The Community Repetitive Loss record for Prineville identifies zero (0) Repetitive Loss Properties and zero (0) Severe Repetitive Loss Properties.

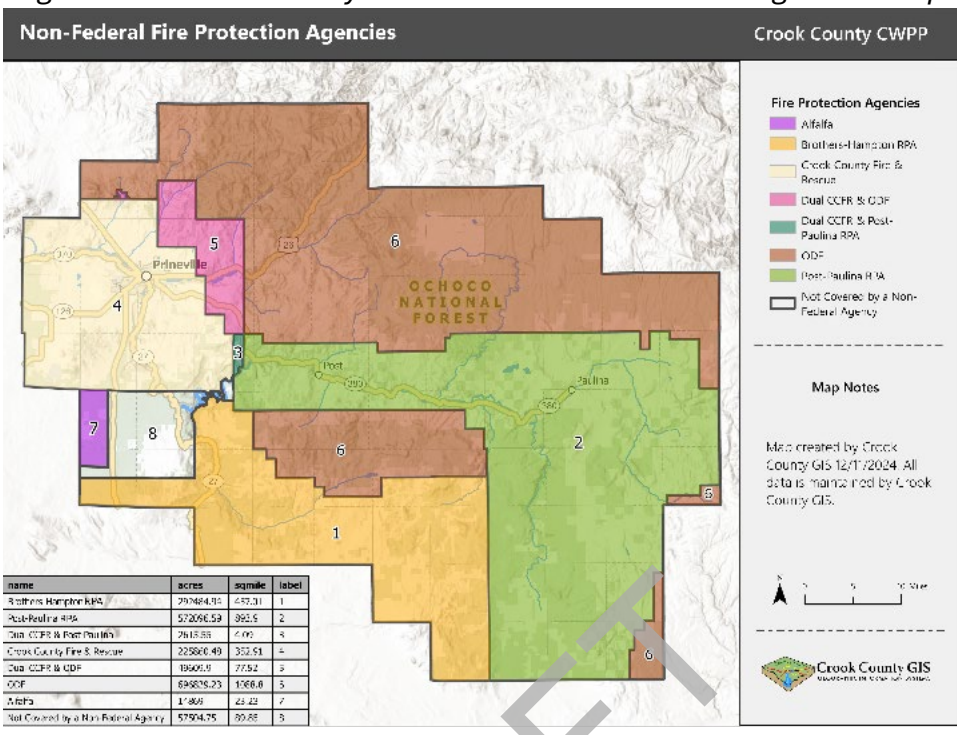
Wildfire

The Steering Committee determined that CCFR's probability of wildfire events is high (which is the same as the County's Rating) and that their vulnerability to wildfire is moderate (which is the same as the County's Rating).

Volume I, Section 3 describes the characteristics of wildfires and their history, as well as the future conditions, location, extent and probability of a potential severe weather event.

The majority of Crook County has some level of wildland fire protection. A smaller portion of the county has structural fire protection from Crook County Fire & Rescue and Alfalfa Fire District. A small, 4 square mile section of the County is truly unprotected with no wildland or structural fire protection.

Figure C-3. Crook County Non-Federal Fire Protection Agencies Map



CCFR works with community members to conduct defensible space work around private property so that in a wildfire event, resident property is properly prepared.

Earthquake

The Steering Committee determined that CCFR's probability for earthquakes is low (which is the same as the County's Rating) and that their vulnerability to earthquakes is moderate (which is the same as the County's Rating).

Volume I, Section 3 describes the characteristics of earthquakes and their history, as well as the future conditions, location, extent and probability of a potential severe weather event. Generally, an event that affects the County is likely to affect Crook County Fire & Rescue as well. The County's (and therefore the CCFR's) probability of an earthquake event are low. In a worst-case scenario event (such as the Cascadia Subduction Zone event, CSZ), the County's and CCFR's vulnerability is higher than normal. CCFR is dedicated to working with Emergency Managers around the Central Oregon region to prepare and respond to the CSZ event.

Severe Weather Event

The Steering Committee determined that CCFR's probability for severe weather events is high (which is the same as the County's Rating) and that their vulnerability to severe weather events is moderate (which is the same as the County's Rating).

Volume I, Section 3 describes the characteristics of severe weather events and their history, as well as the future conditions, location, extent and probability of a potential severe weather event.

Generally, an event that affects the County is likely to affect CCFR as well. CCFR works closely with the County to prepare and respond to severe weather events that take place.

Volcano

The Steering Committee determined that CCFR's probability for a volcanic event is low (which is the same as the County's Rating) and that their vulnerability to a volcanic event is moderate (which is the same as the County's Rating).

Volume I, Section 3 describes the characteristics of volcanoes and their history, as well as the future conditions, location, extent and probability of a potential severe weather event. Generally, an event that affects the County is likely to affect CCFR as well. It is very unlikely that Crook County, and therefore CCFR will experience anything more than volcanic ash during a volcanic event.

Landslide

The Steering Committee determined that CCFR's probability for landslides is low (which is different from the County's Rating) and that their vulnerability to landslides is low (which is the same as the County's Rating). Generally, an event that affects the County is likely to affect CCFR. Landslides that occur within Crook County typically occur in mountainous areas. Most landslides that have occurred within Prineville were within the Pleistocene era. There is likely to be little change to the occurrence of landslides within CCFR's district.

Attachment A: Action Item Worksheets

Action Item: ST Multi Hazard #1	Alignment with Plan Goals:	High Priority Action Item?
Continue furthering programs and efforts for community risk reduction and community safety.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County Fire & Rescue
Alignment with Existing Plans/Policies:
Community Wildfire Protection Plan (CWPP)
Rationale for Proposed Action Item:
Community resiliency, partnership & coordination, education & outreach, prevention

Ideas for Implementation:	**Actions Taken Since 2018:**
• Offer in-person courses for Heartsaver First Aid CPR/AED (adult, child, and infant) as well as CPR skill verification assessments. • Coordinate with partner agencies to create public information notices for community members on purpose and intent of controlled flooding; emphasizing safety precautions • Defensible Space Assessments • Car Seat Installations • Smoke Alarm Installation/battery changing	New action item for 2025.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
OSFM funding, Title III funds, HMGP funds	<$10K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	Crook County Fire & Rescue
Internal Partners:	**External Partners:**
Crook County Emergency Management, Crook County, City of Prineville, Firewise communities	NHMP Steering Committee members
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee
Action Item Status:	New

Action Item: LT Multi Hazard #2	Alignment with Plan Goals:	High Priority Action Item?
Build a Fire Station near the Crook County Airport for redundancy, and to improve services to residents and private businesses.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☒	No

Affected Jurisdictions:
Crook County Fire & Rescue

Alignment with Existing Plans/Policies:
CCFR's Master Development Plan CCFR's Future Growth and Needs Document

Rationale for Proposed Action Item:
Increased industrial presence changes risk profile due to millions of square feet of data center space in the western portion of Prineville above the grade.

Ideas for Implementation:	Actions Taken Since 2018:
CCFR's Master Development Plan Design and evaluate Fire Station location opportunities	New action item for 2025.

Potential Funding Sources:	Estimated Cost:	Timeline:
Tax Revenue	$15 Million	☐ Ongoing ☒ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Fire & Rescue
Internal Partners:	**External Partners:**
Crook County Emergency Management, Crook County, Crook County Airport	City of Prineville, Private Businesses
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee
Action Item Status:	New

Action Item: LT Multi Hazard #3	Alignment with Plan Goals:	High Priority Action Item?
Collaborate with Crook County and the City of Prineville efforts in addressing NHMP priority goals.	1 ☒ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Natural Hazard Mitigation Plan (NHMP)
Rationale for Proposed Action Item:
Collaboration with local partners towards common goals to educate and help reduce risks of Natural Hazards.

Ideas for Implementation:	**Actions Taken Since 2018:**
Participate in annual reviews of the NHMP.	New Action Item for 2025.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
HMGP Funds	Unknown	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Fire & Rescue
Internal Partners:	**External Partners:**
Crook County Emergency Management, Crook County	City of Prineville, NHMP Steering Committee members
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee
Action Item Status:	New

Action Item: ST Multi Hazard #4	Alignment with Plan Goals:	High Priority Action Item?
Work with Pacific Power and Central Electric Co-Op to create public information notifications on scheduled power outages, and to coordinate timing for these outages.	1 ☒ 2 ☒ 3 ☒ 4 ☐ 5 ☐ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Natural Hazards Mitigation Plan		
Rationale for Proposed Action Item:		
Provide community members with timely information regarding planned power outages in emergencies.		
Ideas for Implementation:	**Actions Taken Since 2018:**	
Collaborate with individuals on home oxygen and other power-dependent medical equipment (Durable Medical Equipment). Educate individuals on how and when planned power outages may occur.	New Action Item for 2025.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Local foundation grants, utility funding	<$5K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)
Coordinating Organization:	Crook County Fire & Rescue	
Internal Partners:	**External Partners:**	
Crook County Emergency Management, Crook County	Pacific Power, Central Electric Co-Op, City of Prineville	
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee	
Action Item Status:	New	

Action Item: LT Multi Hazard #5	Alignment with Plan Goals:	High Priority Action Item?
As new development is built, coordinate with the County to ensure buildings meet state ADU requirements.	1 ☒ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☒	No
Affected Jurisdictions:		
Crook County Fire & Rescue and Crook County		
Alignment with Existing Plans/Policies:		
Oregon Residential Specialty Code Chapter 3, Section R327 ORS 215.495		
Rationale for Proposed Action Item:		
Protecting an increased population density in the Wildland Urban Interface Adequate addressing for emergency response access		
Ideas for Implementation:	**Actions Taken Since 2018**	
Develop a pre-application process where site plans are reviewed and approved per state guidelines.	New Action Item for 2025.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Title III funding	$5K+	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Fire & Rescue	
Internal Partners:	**External Partners:**	
Crook County, Crook County Emergency Management	City of Prineville, Central Oregon Disability Support Network	
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee	
Action Item Status:	New	

Action Item: ST Severe Weather Events #1	Alignment with Plan Goals:	High Priority Action Item?
Develop outreach and educational materials on how to stay safe when severe weather events threaten power lines.	1 ☐ 2 ☐ 3 ☒ 4 ☐ 5 ☐ 6 ☐ 7 ☐	Yes

Affected Jurisdictions:
Crook County Fire & Rescue, Crook County Sheriff's Department, Prineville Police Department
Alignment with Existing Plans/Policies:
Crook County Fire & Rescue's Standard of Cover Crook County Fire & Rescue's Strategic Plan
Rationale for Proposed Action Item:
Being an emergency response entity in both fire and EMS services, downed power lines could impact health, safety, and fire-prone fuels.

Ideas for Implementation:	**Actions Taken Since 2018**
Educate on safety surrounding downed powerlines. Educate on the importance of tree maintenance around powerlines. Educate on Emergency Alerts, Oregon Evacuation Levels, and building Emergency Preparedness stay/go kits.	New Action Item for 2025.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Crook County Fire & Rescue General Funds	<$5K	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	Crook County Fire & Rescue
Internal Partners:	**External Partners:**
Crook County Health Department, Crook County Sheriff's Office	Central Electric, Pacific Power BLM, USFS, ODF
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee
Action Item Status:	New

Action Item: ST Severe Weather Events #2	Alignment with Plan Goals:	High Priority Action Item?
Ensure CCF&R is well staffed and prepared with the resources needed for when severe weather events are predicted.	1 ☐ 2 ☒ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐	Yes

Affected Jurisdictions:
Crook County Fire & Rescue
Alignment with Existing Plans/Policies:
CCFR's Standard of Cover CCFR's Strategic Plan
Rationale for Proposed Action Item:
Maintaining adequate resources during times where there may be a predicted severe weather event.

Ideas for Implementation:	Actions Taken Since 2018
Maintaining adequate training and equipment for response during severe weather events. Enhancing and maintaining staffing, especially during times of predicted severe weather events.	New Action Item for 2025.

Potential Funding Sources:	Estimated Cost:	Timeline:
CCFR's General Fund Tax Revenue	$50K+	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Fire & Rescue
Internal Partners:	**External Partners:**
Crook County, Crook County Emergency Management County GIS, Crook County Public Health	City of Prineville, Ochoco Irrigation District
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee
Action Item Status:	New

Action Item: LT Flood #1	Alignment with Plan Goals:	High Priority Action Item?
Develop a Flatwater Ice and Rescue Program.	1 ☐ 2 ☒ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐	Yes
Affected Jurisdictions:		
Crook County Fire & Rescue		
Alignment with Existing Plans/Policies:		
CCFR's Strategic Plan		
Rationale for Proposed Action Item:		
Planning and preparing for emergencies that may occur resulting from freezing winter conditions in Crook County		
Ideas for Implementation:	**Actions Taken Since 2018**	
Develop Standard Operating Procedures for flatwater ice and rescue emergency response Purchase appropriate personal protective equipment and emergency response equipment for flatwater ice rescue Train employees	New Action Item for 2025.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
General CCFR Revenue	$10K+	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Fire & Rescue	
Internal Partners:	**External Partners:**	
Crook County Sheriff's Department, Crook County Emergency Management	City of Prineville Police Department, City of Prineville, OWRD	
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee	
Action Item Status:	New	

Action Item: LT Flood #2	Alignment with Plan Goals:	High Priority Action Item?
Create education materials and Public Information Notices for Ochoco Irrigation Districts maintained flooding events.	1 ☒ 2 ☐ 3 ☒ 4 ☐ 5 ☐ 6 ☐ 7 ☐	Yes
Affected Jurisdictions:		
Crook County Fire & Rescue, Ochoco Irrigation District, City of Prineville, Crook County		
Alignment with Existing Plans/Policies:		
Ochoco Irrigation District Policies and Procedures		
Rationale for Proposed Action Item:		
Awareness from all emergency response entities (Crook County Fire & Rescue, Crook County Sheriff's Department, and Prineville Police Department) of maintained flood events to enhance coordinated efforts to notify the public of such events.		
Ideas for Implementation:	**Actions Taken Since 2018**	
Coordinated social media notices between emergency response entities in Crook County Press releases Linking the Bureau of Reclamation Deschutes River Basin webpage Cubic Feet per Second data onto Crook County Fire & Rescue's Website	New Action Item for 2025.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Unknown	Unknown	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)
Coordinating Organization:	Crook County Fire & Rescue	
Internal Partners:	**External Partners:**	
Crook County Sheriff's Department, Crook County Emergency Management	OID, City of Prineville Police Department	
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee	
Action Item Status:	New	

Action Item: LT Drought #1	Alignment with Plan Goals:	High Priority Action Item?
Develop alternative water sources across the County for fire suppression efforts.	1 ☐ 2 ☒ 3 ☐ 4 ☐ 5 ☒ 6 ☐ 7 ☐	Yes
Affected Jurisdictions:		
Crook County Fire & Rescue		
Alignment with Existing Plans/Policies:		
CCFR's Standard of Cover Community Wildfire Protection Plan		
Rationale for Proposed Action Item:		
Robust and redundant water resources for firefighting.		
Ideas for Implementation:	**Actions Taken Since 2018**	
Develop solutions for land use and fire code with subdivision creation; determine appropriate water sources to adequately protect proposed uses	New Action Item for 2025.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Grants Development Fees	$10K+	☐ Ongoing ☒ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Fire & Rescue	
Internal Partners:	**External Partners:**	
Crook County, Crook County Emergency Management	City of Prineville, Ochoco Irrigation District, Central Oregon Irrigation, Private Purveyors	
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee	
Action Item Status:	New	

Action Item: ST Wildfire #1	Alignment with Plan Goals:	High Priority Action Item?
Sustain and expand defensible space assessment work for private landowners.	1 ☒ 2 ☐ 3 ☐ 4 ☒ 5 ☒ 6 ☐ 7 ☐	Yes

Affected Jurisdictions:
Crook County, Crook County Fire & Rescue, City of Prineville, US Forest Service, Bureau of Land Management, Oregon State Fire Marshal's Office, Oregon Department of Forestry
Alignment with Existing Plans/Policies:
CCFR's Strategic Plan Community Wildfire Protection Plan (CWPP)
Rationale for Proposed Action Item:
Create resilient landscapes to fire and empower homeowners to enhance their preparedness for wildfire events.

Ideas for Implementation:	Actions Taken Since 2018
Continued outreach to provide landowners Provide defensible space assessments Coordinate resources, connect homeowners with grants and fuels reduction assistance opportunities Enhance awareness of Firewise Communities	New Action Item for 2025.

Potential Funding Sources:	Estimated Cost:	Timeline:
Title III Funding, OSFM grants, ODF grants, USFS grants	Unknown	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Fire & Rescue
Internal Partners:	**External Partners:**
Crook County	County, City of Prineville, ODF, OSFM, ODF, BLM, COFMS
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee
Action Item Status:	New

Action Item: LT Wildfire #2	Alignment with Plan Goals:	High Priority Action Item?
Support communities interested in going through the process of becoming a Firewise community and support communities to maintain their Firewise credential.	1 ☒ 2 ☐ 3 ☐ 4 ☒ 5 ☒ 6 ☐ 7 ☐	Yes

Affected Jurisdictions:
Crook County Fire & Rescue
Alignment with Existing Plans/Policies:
CCFR's Standard of Cover
Rationale for Proposed Action Item:
National Fire Protection Association (NFPA) credentialing to empower neighbors to work together in reducing wildfire risk. Residential hazard reduction on a larger scale than individual Defensible Space, with volunteer hours to maintain credentialing.

Ideas for Implementation:	Actions Taken Since 2018
Educate on Firewise throughout the community, specifically focusing on established HOAs Firewise presentations to Firewise communities, tailored to that community Provide resources to the community throughout the year, including thoughts on future projects Create fire adapted communities, as an enhancement from individual tax lots	New Action Item for 2025.

Potential Funding Sources:	Estimated Cost:	Timeline:
NFPA funding Title III funds County Funds ODF grants	$5K+	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Fire & Rescue
Internal Partners:	**External Partners:**
	Residents, ODF, NFPA
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee
Action Item Status:	New

Action Item: LT Wildland Fire #3	Alignment with Plan Goals:	High Priority Action Item?
Coordinate with the Prineville Bureau of Land Management and Ochoco National Forest to enhance fuels treatments throughout the County.	1 ☒ 2 ☐ 3 ☐ 4 ☒ 5 ☒ 6 ☒ 7 ☐	Yes
Affected Jurisdictions:		
Crook County Fire & Rescue, Prineville BLM, Ochoco National Forest, Crook County		
Alignment with Existing Plans/Policies:		
Natural Hazards Mitigation Plan, Community Wildfire Protection Plan, CCFR's Strategic Plan, BLM and USFS Fuels reduction goals and policies		
Rationale for Proposed Action Item:		
Reducing Structural Ignitability throughout Crook County Fire & Rescue's Fire District • Fire Ignition Prevention • Reducing wildfire hazard in the Wildland Urban Interface • Establishment of and maintenance of Defensible Space surrounding structures		
Ideas for Implementation:	**Actions Taken Since 2018**	
Ground cover substantially non-flammable or fire-resistant Reduction in continuous fuels sources leading to structures/WUI Reduction of ladder fuels (⅓ the height of the tree, increased spacing between surface fuels and tree canopy) Creation of fire breaks around communities or groups of homes	New Action Item for 2025.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
BLM grants USFS grants	$5K+	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Fire & Rescue	
Internal Partners:	**External Partners:**	
Crook County	BLM, USFS	
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee	
Action Item Status:	New	

Action Item: LT Wildland Fire #4	Alignment with Plan Goals:	High Priority Action Item?
Work with appropriate partners to implement the strategies identified in the Crook County Community Wildfire Protection Plan.	1 ☒ 2 ☒ 3 ☒ 4 ☒ 5 ☒ 6 ☒ 7 ☒	Yes

Affected Jurisdictions:
Crook County Fire & Rescue
Alignment with Existing Plans/Policies:
Community Wildfire Protection Plan
Rationale for Proposed Action Item:
Reducing Structural Ignitability throughout Crook County Fire & Rescue's Fire District • Fire Ignition Prevention • Reducing wildfire hazard in the Wildland Urban Interface • Establishment of and maintenance of Defensible Space surrounding structures

Ideas for Implementation:	Actions Taken Since 2018
Ground cover substantially non-flammable or fire-resistant Reduction in continuous fuels sources leading to structures/WUI Reduction of ladder fuels (⅓ the height of the tree, increased spacing between surface fuels and tree canopy) Creation of fire breaks around communities or groups of homes Education to the public around NFPA's firewise program	New Action Item for 2025.

Potential Funding Sources:	Estimated Cost:	Timeline:
ODF grants, OSFM funding, BLM funding, USFS grants, FEMA grants, ODEM grants	$5K+	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Fire & Rescue
Internal Partners:	**External Partners:**
Crook County Emergency Management, Crook County CWPP Steering Committee, Crook County	City of Prineville, BLM, COFMS, OSFM, ODF
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee

Action Item Status:	New

Action Item: LT Earthquake #1	Alignment with Plan Goals:	High Priority Action Item?
Develop and maintain strong relationships and communication channels with neighboring Emergency Managers and local jurisdictions to enhance preparedness and response to the Cascadia Subduction Zone event.	1 ☒ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County, Jefferson County, Deschutes County, City of Prineville		
Alignment with Existing Plans/Policies:		
Natural Hazards Mitigation Plan		
Rationale for Proposed Action Item:		
Cohesive and robust response in the event of a major earthquake		
Ideas for Implementation:	**Actions Taken Since 2018**	
Integrated tri-county emergency response plan	New Action Item for 2025.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
FEMA funding, state grants	<$5K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Fire & Rescue	
Internal Partners:	**External Partners:**	
Crook County Emergency Management, Crook County	Deschutes County Emergency Management Jefferson County Emergency Management Crook County Health Department	
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee	
Action Item Status:	New	

Action Item: ST Earthquake #2	Alignment with Plan Goals:	High Priority Action Item?
Partner with Crook County Emergency Management to promote building safety through non-structural improvements.	1 ☒ 2 ☐ 3 ☐ 4 ☒ 5 ☒ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
City of Prineville, Crook County		
Alignment with Existing Plans/Policies:		
Natural Hazards Mitigation Plan		
Rationale for Proposed Action Item:		
Minimize damage in the event of an earthquake.		
Ideas for Implementation:	**Actions Taken Since 2018**	
Publicize information on securing water heaters, book cases, filing cabinets, light fixtures and other items that can cause injuries and block exits; Partner with Crook County Emergency Management to provide public outreach at local building supply outlets and Emergency Services booth at Crook County Fair.	New Action Item for 2025.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
State grants, ODEM grants, FEMA funding	<$5K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Fire & Rescue	
Internal Partners:	**External Partners:**	
Crook County Emergency Management, Crook County	Local Businesses, City of Prineville	
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee	
Action Item Status:	New	

Action Item: ST Volcano #1	Alignment with Plan Goals:	High Priority Action Item?
Provide a Volcanic Ash Mitigation Guidebook for citizens and businesses on the CCF&R's Website.	1 ☒ 2 ☐ 3 ☒ 4 ☐ 5 ☐ 6 ☐ 7 ☐	Yes

Affected Jurisdictions:		
Crook County Fire & Rescue		
Alignment with Existing Plans/Policies:		
Natural Hazards Mitigation Plan		
Rationale for Proposed Action Item:		
Protect residence against health impacts of volcanic eruptions (ash).		
Ideas for Implementation:	**Actions Taken Since 2018**	
Educate on health safety surrounding volcanic ash inhalation/prevention of such. Adding ash mitigation guidance from local volcanic research on Crook County Fire & Rescue's Website	Crook County Health Department has created a Volcanic Ash Preparedness Plan which was incorporated into the Oregon 2024 Climate Adaptation Plan.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
This will be provided by USGS.	<$5K	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)
Coordinating Organization:	Crook County Fire & Rescue	
Internal Partners:	**External Partners:**	
Crook County Health Department, Crook County Emergency Management	USGS, DOGAMI, City of Prineville	
Form Submitted By:	Crook County Fire & Rescue NHMP Steering Committee	
Action Item Status:	Ongoing	

Appendix A: Action Item Worksheets

2025 Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan

Action Item: REMOVED ST Multi Hazard #1	Alignment with Plan Goals:	High Priority Action Item?
Sustain a public awareness campaign about natural hazards.	1 ☐ 2 ☒ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☒	

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
N/A due to being removed
Rationale for Proposed Action Item:
Education and Outreach, Prevention, Emergency Service

Ideas for Implementation:	**Actions Taken Since 2018:**
Inform and educate the public about potential natural hazards in Crook County, personal preparedness, mitigation activities and opportunities, and options available when natural hazard events occur. The public awareness campaign *may* take many forms: • Present hazard specific information at public workshops; • Disseminate the Crook County Emergency Operations Plan for families and county residents; • Use Public Service Announcements to educate the public about emergency procedures; Develop a hazard information website that contains scientific facts about natural hazards, information on building codes, list of companies that provide insurance for specific hazards, and educational information on damage prevention.	Individual agencies have been engaging with Crook County community members to provide education on natural hazards that exist within the County.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
N/A	N/A	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Emergency Management	

Internal Partners:	External Partners:
Crook County Planning, Crook County Fire, Crook County Health and Human Services	Bowman Museum, City of Prineville Planning, ODF, BLM, USFS
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Removed due to not being specific enough and is too similar to goals.

Action Item: REMOVED ST Multi Hazard #2	Alignment with Plan Goals:	High Priority Action Item?
Develop public and private partnerships to foster natural hazard program coordination and collaboration in Crook County.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
N/A due to being a removed action item.
Rationale for Proposed Action Item:
Education and Outreach, Prevention, Partnership and Coordination

Ideas for Implementation:	**Actions Taken Since 2018:**
• Coordination and implementation of county-wide and tri-county emergency management policies and procedures; • Enhancing emergency operations preparedness, resources and facilities; • Disseminating information from Oregon Emergency Management and the Federal Emergency Management Agency.	Crook County and the agencies within Crook County continually work to develop partnerships to strengthen coordination and collaboration.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
N/A	N/A	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
Crook County Planning, Crook County Fire & Rescue, Crook County Health and Human Services	ODF, BLM, USFS, Jefferson County Emergency Management, Deschutes County Emergency Management, City of Prineville
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	This action item has been removed because it lacks specificity and is captured more accurately within the NHMP goals.

Action Item: ST Multi Hazard #3	Alignment with Plan Goals:	High Priority Action Item?
Review the Crook County Emergency Operations Plan and the Natural Hazards Mitigation Plan on an annual basis. Conduct a complete review of the plans and have them officially promulgated by the approving authorities every 5 years.	1 ☐ 2 ☒ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐	Yes

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Crook County NHMP and Emergency Operations Plan
Rationale for Proposed Action Item:
Emergency Services

Ideas for Implementation:	**Actions Taken Since 2018:**
Crook County Emergency Management will coordinate a plan review annually and a plan update at least every five years. During the complete reviews, the plans will be evaluated with respect to the coordination of existing plans, new requirements and action items. Endeavor to incorporate the requirements of the mitigation plan into other planning mechanisms.	The Crook County NHMP will have a completed update in 2025. The Crook County EOP was updated in the fall of 2024.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
FEMA Hazard Mitigation Grant Program	$25K-$50K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management and Central Oregon Intergovernmental Council
Internal Partners:	**External Partners:**
Crook County Planning Department	ARC, Law Enforcement Heads, Fire Heads, OSP, ODF, ODOT, ARNAG, ARES, OEM, FEMA, City of Prineville
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Ongoing

Action Item: ST Multi Hazard #4	Alignment with Plan Goals:	High Priority Action Item?
Promote natural hazard safety education throughout the County.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	Yes

Affected Jurisdictions:
Crook County

Alignment with Existing Plans/Policies:
Aligns with goals included in the statewide NHMP, and goals and missions of Crook County agencies.

Rationale for Proposed Action Item:
Education and Outreach, Prevention, Partnership and Coordination

Ideas for Implementation:	Actions Taken Since 2018:
Natural Hazards Safety Education includes earthquake duck-and-cover drills, fire safety training, facility lock down drills, evacuations drills, hazardous materials training, and hug-a-tree presentations. Natural hazards safety education may take place in schools, hospitals and businesses, as well as preparedness fairs and community events.	A number of Crook County organizations have been participating in Hug-A-Tree programs and table top drills. Crook County Fire & Rescue promotes hazard safety education. Crook County Schools participates in the statewide shakedown event.

Potential Funding Sources:	Estimated Cost:	Timeline:
County budget, school budgets, already existing budgets	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
Crook County Planning, Crook County Fire & Rescue, Crook County Health and Human Services	School Districts, Facility Safety Personnel, Search and Rescue, City of Prineville, ODF, BLM, USFS, OEM, FEMA, Association of Safety Engineers, Media, Utility and Telecommunications Companies
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Ongoing

Action Item: ST Multi Hazard #5	Alignment with Plan Goals:	High Priority Action Item?
Establish partnerships to coordinate and collect geo-science and technical information for identifying and mapping potential areas of risk.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Crook County Community Wildfire Protection Plan, Crook County GIS Goals
Rationale for Proposed Action Item:
Education and Outreach, Prevention, Partnership and Coordination

Ideas for Implementation:	**Actions Taken Since 2018**
Many public agencies in Crook County collect geo-science and technical for their own internal needs. Often these agencies contract with County GIS to work with their data and create specialized maps. With these agencies' permission, County GIS could use the data to develop hazard maps for Emergency Management and mitigation purposes. One key outcome would be the coordination of disparate vegetation mapping. This would allow wildland fire risk assessment to be done at large scale, rather than an individual parcel scale.	No new updates at the time of this NHMP update.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Existing agency budgets	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County GIS
Internal Partners:	**External Partners:**
Crook County Planning, Crook County Emergency Management Crook County Fire, Crook County Health and Human Services	City of Prineville, ODF (GIS), BLM, USFS, DOGAMI, USGS, NOAA, OEM, FEMA
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Deferred

Action Item: ST Multi Hazard #6	Alignment with Plan Goals:	High Priority Action Item?
Maintain and enhance the systems that support individuals with disabilities and other access and functional needs during disasters.	1 ☒ 2 ☒ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	Yes

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
ADA Compliance Policies, Structural Building Codes
Rationale for Proposed Action Item:
Education and Outreach, Prevention, Partnership and Coordination, Emergency Services.

Ideas for Implementation:	Actions Taken Since 2018
Crook County and partner public and private organizations have developed a system that will serve people who have access and functional needs that affect their ability to independently respond to disasters. The system currently includes an initial database available to 911 and Emergency Operations Center that shows the location of vulnerable populations. It will be important to: • Coordinate with public and private organizations to continue to identify vulnerable populations; • Establish and maintain protocols to update and maintain the database; • Develop plans and exercises to integrate vulnerable populations with disaster response.	• Central Oregon Disability Support Network Provides Emergency Preparedness Kit trainings to individuals and families with disabilities. • Oregon Department of Human Services – Office of Resilience and Emergency Management (OREM) has been identified to coordinate services for mass care in the case of an emergency, including services to individuals with disabilities

Potential Funding Sources:	Estimated Cost:	Timeline:
BRIC, CBDG	$25K - $100K	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
Crook County Health and Human Services, County GIS, Crook County Planning	Jefferson & Deschutes County, City of Prineville, ARC Central Oregon Disability Support Network (CODSN), ODHS OREM
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Deferred

Action Item: ST Multi Hazard #7	Alignment with Plan Goals:	High Priority Action Item?
Explore funding sources and grant opportunities for county-wide natural hazard mitigation activities.	1 ☐ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Rationale for Proposed Action Item:
Education and Outreach, Prevention

Ideas for Implementation:	**Actions Taken Since 2018**
Identify grants and appropriate loans for local governments, agencies, organizations and property owners to take a proactive role in hazards mitigation. There are different types of mitigation grant programs, for example, federal fire money for wildfire hazard mitigation, Hazard Mitigation Grant Program for various types of hazard mitigation, and flood mitigation assistance program.	This is an ongoing effort of Crook County. The County has submitted applications for an Emergency Management Performance Grant and a State Homeland Security Program grant.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Existing budgets, Emergency Management Performance Grant, State Homeland Security Grant Program	$25K - $50K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management and Mitigation Plan Steering Committee
Internal Partners:	**External Partners:**
Crook County Administration, Crook County Health and Human Services	City of Prineville, OEM, FEMA
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Ongoing

Action Item: ST Multi Hazard #8	Alignment with Plan Goals:	High Priority Action Item?
Evaluate security methods and processes to assess what types of data will have open public access versus restricted responder agency access.	1 ☐ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Mission and goals of the Crook County Sheriff's Office
Rationale for Proposed Action Item:
Education and Outreach, Prevention

Ideas for Implementation:	**Actions Taken Since 2018**
• Coordinate with local and state legal representatives to evaluate Oregon law; • Develop protocols for access and distribution of sensitive data.	Crook County Sheriff's Office continually works with Crook County Planning Department and the IT department to maintain security of restricted agency data.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Existing agency budgets, Homeland Security funding sources	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Sheriff's Office / Crook County IT
Internal Partners:	**External Partners:**
Crook County Health and Human Services, Crook County Administration, Crook County Emergency Management	City of Prineville, OEM, FEMA
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Ongoing

Action Item: ST Multi Hazard #9	Alignment with Plan Goals:	High Priority Action Item?
Create and maintain a single GIS inventory resource of all critical facilities, large employers/public assembly areas, and lifelines, and use the GIS to evaluate their vulnerability by comparing them with hazard-prone areas.	1 ☐ 2 ☒ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	Yes
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Crook County Community Wildfire Protection Plan		
Rationale for Proposed Action Item:		
Education and Outreach, Prevention, Emergency Services		
Ideas for Implementation:	**Actions Taken Since 2018**	
Expanding and maintaining data on the County GIS databases containing information about natural hazards, land development, community infrastructure, and demographics. These data sets may be used to create hazard maps, assess risk and develop plans. Public facilities and infrastructure to be included: government buildings (City of Prineville, Crook County), fire stations, law enforcement buildings, school district buildings, hospitals, Apple, Facebook, Les Schwab, cellular communication towers.	A list of Crook County critical infrastructure was updated as part of the 2024 Crook County Community Wildfire Protection Plan update. New critical infrastructure maps were created as part of this update. A specific GIS inventory of this list is being scoped internally.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Hazard Mitigation Grant Program, Homeland Security Grant Programs	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County GIS	
Internal Partners:	**External Partners:**	
Crook County Emergency Management, Crook County Planning, Crook County Fire & Rescue, Crook County Health and Human Services, Crook County Road Department	City of Prineville, ODF, BLM, USFS, ARC, QWEST, Prineville Public Works, Power Companies, OID Oregon Department of Geology and Mineral Industries (DOGAMI will be the source of information about and location of hazard-prone areas)	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Deferred	

Action Item: LT Multi Hazard #10	Alignment with Plan Goals:	High Priority Action Item?
Use hazard information as a basis for reviewing site-specific land use decisions.	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Crook County and the State of Oregon land use codes and regulations		
Rationale for Proposed Action Item:		
Prevention		
Ideas for Implementation:	**Actions Taken Since 2018**	
Continually implement hazard mitigation policies and regulations.	Land use decisions have taken into account hazard information and the County continually reviews these decisions to make sure they are incorporating the most up to date hazard information available.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
State funding sources: DLCD, DSL	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Planning Department & City of Prineville Planning	
Internal Partners:	**External Partners:**	
Crook County Emergency Management, Crook County GIS	State of Oregon, DLCD	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Ongoing	

Action Item: LT Multi Hazard #11	Alignment with Plan Goals:	High Priority Action Item?
Improve planning, notification, and training for volunteers.	1 ☒ 2 ☒ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Individual agency codes and missions.		
Rationale for Proposed Action Item:		
Education and Outreach, Partnership and Coordination, Emergency Services		
Ideas for Implementation:	**Actions Taken Since 2018**	
• Identify and prioritize how volunteers can assist during different types of disaster; • Train volunteers about their roles and include them in community disaster exercises; • Develop a notification process for volunteers that incorporates different thresholds of activation; • Establish protocols for the registration and training of emergent volunteers; • Evaluate the creation of a Community Emergency Response Team (CERT) countywide; • Actively work to expand and encourage City and County government to expand community neighborhood watch programs.	Crook County Search & Rescue holds a yearly academy. There are regular meetings with the tri-county emergency managers to improve this planning.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Mix of existing agency budgets, Oregon Community Foundation	<$25K	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Tri-county Emergency Management (Crook, Deschutes and Jefferson counties	
Internal Partners:	**External Partners:**	
Crook County Administration, Crook County Sheriff's Office, Crook County Health and Human Services	City of Prineville, CERT, ARC, CCSO SAR	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Ongoing	

Action Item: LT Multi Hazard #12	Alignment with Plan Goals:	High Priority Action Item?
Promote hazard resistant utility and telecommunication construction and maintenance methods.	1 ☐ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☐	Yes
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Prineville Comprehensive Plan, City of Prineville Public Works Policies		
Rationale for Proposed Action Item:		
Education Outreach, Prevention		
Ideas for Implementation:	**Actions Taken Since 2018**	
Support and encourage utility and telecommunications companies to use construction and maintenance methods that are aligned with natural hazard preparedness practices.	The City has worked with utility companies to set up redundant systems for communications, and has buried infrastructure underground to mitigate risk of failure during wildfire and severe weather events.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Special Public Works Fund, BRIC	$50K +	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	City of Prineville	
Internal Partners:	**External Partners:**	
Crook County Fire & Rescue, Crook County Planning, Crook County Emergency Management, Crook County IT	Auxiliary Communications, City of Prineville, Prineville Information Technology, private utilities	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Ongoing	

Action Item: LT Multi Hazard #13	Alignment with Plan Goals:	High Priority Action Item?
Collect data for significant non-declared natural hazard events.	1 ☐ 2 ☐ 3 ☒ 4 ☒ 5 ☒ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Goals withing both Crook County and City of Prineville Planning Departments		
Rationale for Proposed Action Item:		
Education and Outreach, Partnerships and Coordination, Emergency Services		
Ideas for Implementation:	**Actions Taken Since 2018**	
Damage information should be collected and stored locally for significant non-declared natural disasters. This information can include countywide damage totals for each event, with the idea that over time this data will show the geographic patterns of occurrence and vulnerability.	Crook County Planning and GIS lead these efforts within their own departments.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
FEMA post disaster events grant programs	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Emergency Management	
Internal Partners:	**External Partners:**	
County GIS, County Building, County Planning	City of Prineville, Insurance Companies, OSU Extension, U.S. Forest Service, Bureau of Land Management, Oregon Department of Transportation	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Deferred	

Action Item: LT Multi Hazard #14	Alignment with Plan Goals:	High Priority Action Item?
Develop a recovery plan for Crook County and Prineville from the effects of catastrophic hazards.	1 ☒ 2 ☐ 3 ☒ 4 ☐ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Crook County Emergency Operations Plan		
Rationale for Proposed Action Item:		
Partnership and Coordination, Emergency Services		
Ideas for Implementation:	**Actions Taken Since 2018**	
Develop a scenario based long-term recovery plan (Continuity of Government plan) that identifies how Crook County and the City of Prineville will recover from a catastrophic event. Refer to Crook County Emergency Operations Plan for additional information and progress.	The Crook County Emergency Operations plan is currently being updated.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
A mix of federal and state grant funding	$50K-$100K	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Emergency Management	
Internal Partners:	**External Partners:**	
Crook County Administration	City of Prineville, OEM	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Ongoing	

Action Item: LT Drought #1	Alignment with Plan Goals:	High Priority Action Item?
Educate the public on alternative landscaping possibilities.	1 ☐ 2 ☐ 3 ☒ 4 ☐ 5 ☒ 6 ☐ 7 ☐	No

Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Water Conservation is a statewide and nationwide goal.		
Rationale for Proposed Action Item:		
Watering less and watering appropriately saves water.		
Ideas for Implementation:	**Actions Taken Since 2018**	
Zero scape landscaping and planting native plants.	None- New Item	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
OWRD and OWEB grants	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	OID and Planning for City and County	
Internal Partners:	**External Partners:**	
Crook County Planning Department	The State of Oregon Water Resources Commission, BOR, City of Prineville Planning and Zoning, OSU-Extension	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	New	

Action Item: LT Drought #2	Alignment with Plan Goals:	High Priority Action Item?
Study and implement alternative irrigation water sources and other surface water and groundwater storage projects(s).	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☒ 7 ☒	Yes
Affected Jurisdictions:		
Crook County, Ochoco Irrigation District, Central Oregon Irrigation District		
Alignment with Existing Plans/Policies:		
Crook County Aquifer Storage and Recovery System		
Rationale for Proposed Action Item:		
Finding additional sources for irrigation water or increasing stored water will help decrease drought impacts.		
Ideas for Implementation:	**Actions Taken Since 2018**	
Water Reuse, expanded storage or new storage, Aquifer Storage and Recovery.	None - New	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
State and Federal Grant Programs: OWEB, OWRD	+$1 Million	☒ Ongoing ☒ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County, OID	
Internal Partners:	**External Partners:**	
County, City, OID	BOR, OWRD, NRCS, City of Prineville	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:		

Action Item: Drought LT #3	Alignment with Plan Goals:	High Priority Action Item?
Improve irrigation efficiency by piping/lining canals, metering deliveries and automating systems.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☒ 7 ☒	Yes
Affected Jurisdictions:		
Crook County, Ochoco Irrigation District, Central Oregon Irrigation District		
Alignment with Existing Plans/Policies:		
Drought Resiliency for Crook County & the City of Prineville		
Rationale for Proposed Action Item:		
Improved irrigation efficiency, decreased seepage loss, decreased evaporation, increased water measurement accuracy and improved control results in water conservation.		
Ideas for Implementation:	**Actions Taken Since 2018**	
Pipe leaky canals, meter deliveries for accurate water measurement, automated canal gates quickly respond to changes in flow and result in conserved water.	None - New	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
State and Federal Grant Programs, NRCS grant opportunities	$400M	☒ Ongoing ☒ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County, OID	
Internal Partners:	**External Partners:**	
County, City, OID	BOR, OWRD, NRCS	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:		

Action Item: ST Flood #1	Alignment with Plan Goals:	High Priority Action Item?
Coordinate river gauge information that is tied into National Weather Service flood forecasting.	1 ☒ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
NFIP		
Rationale for Proposed Action Item:		
Partnership and Coordination		
Ideas for Implementation:	**Actions Taken Since 2018**	
Crook County Emergency Management, Ochoco Irrigation District, Bureau of Reclamation, National Weather Service, and all watershed councils, can benefit from coordinated river gauge information that is tied into National Weather Service flood forecasting activities.	No new updates since 2018.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Flood Mitigation Assistance Program, OWEB grants	$50K - $100K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	NWS (Pendleton Office)	
Internal Partners:	**External Partners:**	
Crook County Emergency Management	City of Prineville, Ochoco Irrigation District, Bureau of Reclamation, Watershed Councils, Cities, OSU Extension Service, USGS, WRD, USACE, BOR, private river gauges	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Ongoing	

Action Item: ST Flood #2	Alignment with Plan Goals:	High Priority Action Item?
Conduct a workshop for target audiences on National Flood Insurance Programs, mitigation activities, and potential assistance from FEMA's Flood Mitigation Assistance and Hazard Mitigation Grant Programs.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☒ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
NFIP		
Rationale for Proposed Action Item:		
Property Protection, Education and Outreach, Prevention, Partnership and Coordination		
Ideas for Implementation:	**Actions Taken Since 2018**	
Include information about the financial aspects of building (and rebuilding) in the floodplain. Present information on how other communities have addressed building in the floodplain. Selected target audiences can include: townhalls, realtors, lending institutions, surveyors, engineers, and government agencies. Refer to Crook County Emergency Operations Plan for supplementary resources.	City and County staying up to date on opportunities, no workshop yet.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Flood Mitigation Assistance and Hazard Mitigation Grant Programs, OWEB grants	<$50K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	County Planning, Crook County Community Development (Community Development Director), County Emergency Management Agencies	
Internal Partners:	**External Partners:**	
	City of Prineville, Watershed Councils, OEM, FEMA	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Deferred	

Action Item: ST Flood #3	Alignment with Plan Goals:	High Priority Action Item?
Maintain compliance with the National Flood Insurance Program (NFIP) and Update the Flood Insurance Rate (FIRM) Maps for Crook County using the 2010 FIRM maps.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 6 ☒ 7 ☐	Yes
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Crook County and the City of Prineville Comprehensive Plan, Land Use Regulations, Flood Prevention Code		
Rationale for Proposed Action Item:		
Property Protection, Prevention, Partnership and Coordination		
Ideas for Implementation:	**Actions Taken Since 2018**	
Work with FEMA to adopt the 2010 FIRM maps. Maintain compliance with the NFIP through a local compliance review that occurs during each annual review of the Crook County NHMP.	The County continually works to ensure the floodplain maps are consistent with FIRM maps. The maps were adopted in 2012 and these are the ones being used for the County.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Flood Mitigation Assistance Program, OWEB funding opportunities	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Planning	
Internal Partners:	**External Partners:**	
Crook County Emergency Management, County GIS	City of Prineville, FEMA, DLCD, City of Prineville	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Ongoing	

Action Item: LT Flood #4	Alignment with Plan Goals:	High Priority Action Item?
Encourage private property owners to restore natural systems within the floodplain, and to manage riparian areas and wetlands for flood abatement.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 6 ☒ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
NFIP, nature based solutions		
Rationale for Proposed Action Item:		
Property Protection, Natural Resource Protection		

Ideas for Implementation:	Actions Taken Since 2018
In addition to encouraging private property owners, managing publicly owned riparian and floodplain areas for conversion to open space/parkland/greenway is key to restoring natural floodwater absorption capacities (i.e. Ochoco Creek Flood mitigation projects, Striker Field).	The Crook County Watershed Council has been working on this and City of Prineville has been promoting this by implementing the redo a site identified by the Deschutes Land Trust.

Potential Funding Sources:	Estimated Cost:	Timeline:
Regional foundation grants, OWEB and FEMA grants	$25K - $50K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Planning and the City of Prineville
Internal Partners:	**External Partners:**
County Parks	Watershed Councils, Cities, Natural Resource Conservation Service, City of Prineville, FEMA, USACE, DSL
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Deferred

Action Item: LT Flood #5	Alignment with Plan Goals:	High Priority Action Item?
Preserve water quality by using storm water best management practices.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☒ 7 ☐	Yes
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
City of Prineville Stormwater Management Plan, Central Oregon Stormwater Manual		
Rationale for Proposed Action Item:		
Natural Resource Protection		
Ideas for Implementation:	**Actions Taken Since 2018**	
Model standards could be the National Pollution Discharge Elimination System (NPDES).	The County continually seeks out ways to preserve and enhance water quality when working on water projects.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
OWEB grants	$25K - $100K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	County Roads, DEQ	
Internal Partners:	**External Partners:**	
Crook County Roads Department	City of Prineville, Watershed Councils, WRD, USACE	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Deferred	

Action Item: LT Flood #6	Alignment with Plan Goals:	High Priority Action Item?
Evaluate and assess the interest in County and City participation in the NFIP Community Rating System.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☒ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
NFIP Community Rating System		
Rationale for Proposed Action Item:		
Property Protection, Education and Outreach, Prevention, Partnership and Coordination		
Ideas for Implementation:	**Actions Taken Since 2018**	
Since participation in the NFIP Community Rating System could save residents considerable amounts money on insurance premiums the County will promote this program to residents.	The County makes community members aware of this program by including information on it on the County website. To date, there has been no interest in Crook County residents.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
FEMA funding opportunities	<$25K	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)
Coordinating Organization:	Crook County Emergency Management	
Internal Partners:	**External Partners:**	
County Planning	Ochoco Irrigation District, Bureau of Reclamation, City of Prineville, Watershed Councils, OEM, FEMA	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Ongoing	

Action Item: LT Flood #7	Alignment with Plan Goals:	High Priority Action Item?
Coordinate with Ochoco Irrigation District to evaluate the vulnerability of Ochoco Dam to natural hazards.	1 ☐ 2 ☐ 3 ☒ 4 ☒ 5 ☐ 6 ☐ 7 ☒	Yes
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
OWRD High Hazard Potential Dams		
Rationale for Proposed Action Item:		
Education and Outreach, Prevention, Structural		

Ideas for Implementation:	Actions Taken Since 2018
• Share technical data as it becomes available; • Consider the impacts of earthquake, flood and other natural hazards.	There was a tabletop scheduled for 2024 that ended up being cancelled because it fell right in the middle of wildfire season. The last full EAP Exercise for Ochoco was completed in January of 2023. Additionally, the US Bureau of Reclamation has been studying Ochoco Dam for both Seismic and Static Risk. Significant progress has been made since 2018 with an expected report to the Dam Safety Administration Team due in 2025.

Potential Funding Sources:	Estimated Cost:	Timeline:
EPA grants, BOR grants, FEMA grants, state funding	$50K - $100K+	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
	Ochoco Irrigation District, Bureau of Reclamation, City of Prineville, Watershed Councils, USACE, BOR, OWRD
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Ongoing

Action Item: ST Flood #8	Alignment with Plan Goals:	High Priority Action Item?
Improve readiness in the event of catastrophic breach potential at Barnes Butte dam by exercising the Emergency Action Plan (EAP).	1 ☒ 2 ☒ 3 ☒ 4 ☒ 5 ☒ 6 ☐ 7 ☐	Yes
Affected Jurisdictions:		
Crook County, City of Prineville, Ochoco Irrigation District		
Alignment with Existing Plans/Policies:		
Requirement of Oregon Revised Statute ORS 540.482 with detail provided in rule. OWRD dam safety provides a Template for high hazard EAP's, provides an exercise plan and can facilitate EAP exercises.		
Rationale for Proposed Action Item:		
Emergency Action Plans (EAP) provide guidance for actions needed if unusual conditions or potential or actual failure may be occurring at the dam. Exercises are essential to assure all responsible parties understand the actions they would need to take, and how to effectively communicate conditions so that people can get to safe locations if conditions warrant.		
Ideas for Implementation:	**Actions Taken Since 2018**	
OWRD dam safety engineers will develop an exercise plan and can facilitate the exercise. Dam safety staff have successful experience with exercises on other high hazard dams. The exercise needs participation by the dam owner, the County Emergency and local first responders with an evacuation role (police and or fire).	N/A – New item	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
The only cost is the time of the participants	<$25K	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)
Coordinating Organization:	Private Dam Owner & OWRD	
Internal Partners:	**External Partners:**	
Crook County Emergency Manager, Crook County Fire & Rescue	City of Prineville Planning Department, Ochoco Irrigation District	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	New	

Action Item: ST Flood #9	Alignment with Plan Goals:	High Priority Action Item?
Install a reservoir level gage for Barnes Butte dam and develop an Operations and Maintenance Plan with safe reservoir levels at times when flooding could occur.	1 ☒ 2 ☒ 3 ☐ 4 ☒ 5 ☒ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County, City of Prineville, Ochoco Irrigation District
Alignment with Existing Plans/Policies:
Dam determined to be Unsafe/Potentially Unsafe under Oregon Revised Statute ORS 540.443 and dam safety rules. Owner received formal notice of dam condition and requirement for corrective action.
Rationale for Proposed Action Item:
This action would allow for early warning if the reservoir level was approaching to crest of the dam. Overtopping of this dam is likely to cause catastrophic failure and major life loss. A remote gage monitored by OWRD and local emergency managers would provide much more reliable advance warning.

Ideas for Implementation:	**Actions Taken Since 2018**
The staff gage would not be expensive and the owner could install. A real time gage would be more expensive and would require technical maintenance.	Recommended by OWRD dam safety annual dam inspection letters.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
FEMA BRIC funding	$10K-$15K	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	OWRD Dam Safety Program & Private dam owner
Internal Partners:	**External Partners:**
City of Prineville, Ochoco Irrigation District	FEMA and ODEM
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	New

Action Item: LT Flood #10	Alignment with Plan Goals:	High Priority Action Item?
Mitigate risk of failure by constructing a sufficient spillway on the Barnes Butte dam, a high hazard dam eligible for the FEMA High Hazard Potential Dam (HHPD) program funding. The spillway must safely pass an extreme flood without dam overtopping or spillway chute failure.	1 ☒ 2 ☒ 3 ☐ 4 ☒ 5 ☒ 6 ☐ 7 ☒	No
Affected Jurisdictions:		
Crook County, City of Prineville, Ochoco Irrigation District		
Alignment with Existing Plans/Policies:		
Dam determined to be Unsafe/Potentially Unsafe under Oregon Revised Statute ORS 540.443 and dam safety rules. Owner received formal notice of dam condition and requirement for corrective action.		
Rationale for Proposed Action Item:		
OWRD dam safety completed a FEMA HHPD funded semi quantitative risk assessment of this dam in 2023. Dam has second highest risk (annualized human life loss) of Oregon dams, and exceeds FEMA P-1025 risk guidelines by a factor of about 100 due to overtopping risk from undersized spillway. Consulting engineers nearly finished with flood magnitude and spillway alternatives analysis. A sufficient spillway will reduce risk by a factor of approximately 100.		
Ideas for Implementation:	**Actions Taken Since 2018**	
Owner not currently convinced of level of risk and therefore need for much larger spillway. Meeting with dam owner and consulting engineers to explain analysis and risk planned for October 2024. Owner to construct or reconstruct properly sized spillway for the dam. When corrected spillway must pass a Probable Maximum Flood, or a flood that will reduce risk to FEMA P-1025 guidelines.	Formal Notice of Unsafe Dam delivered to owner, notice dated March 12, 2024. Information provided in all annual OWRD dam safety inspections since 2018. Analysis of spillway capacity requirements and alternative designs funded and nearly complete.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**

FEMA HHPD funding for 65 percent of project costs if local sponsor. OID recommended for local sponsor. Owner may choose self-funding for entire project.	$500,000 for new spillway. No cost to sponsor, FEMA can pay 5% for sponsor paper work.	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	OWRD Dam Safety Program & Private dam owner
Internal Partners:	**External Partners:**
County Sheriff (Emergency Manager)	FEMA, City of Prineville, Ochoco Irrigation District
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	New

Action Item: ST Wildland Fire #1	Alignment with Plan Goals:	High Priority Action Item?
Continue to promote public awareness campaigns for individual property owners living in interface areas.	1 ☒ 2 ☐ 3 ☒ 4 ☒ 5 ☒ 6 ☐ 7 ☐	Yes

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Crook County Community Wildfire Protection Plan
Rationale for Proposed Action Item:
Education & outreach, public safety, hazard mitigation, property protection

Ideas for Implementation:	Actions Taken Since 2018
Focus on individual community outreach efforts through: • Working demonstrations of risk reduction measures (i.e. survivable space around structures; driveway, road and bridge specifications; and landscaping); • Voluntary site visits by fire crews to consult with landowners about specific ways to reduce risk to their property and to identify properties that would not be saved if a wildfire event occurred; • Mailings; • Public service announcements in the media; • Warn prospective buyers to ask about the level of fire protection available and fire insurance rating for properties in Crook County; • Noxious weed abatement.	Crook County Fire & Rescue holds public meetings to discuss community member safety. Crook County Fire & Rescue provides home risk assessments through their Fire Ready program.

Potential Funding Sources:	Estimated Cost:	Timeline:
OSFM, ODF, USFS grants	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
County Planning, Crook County Health and Human Services, Crook County CWPP Steering Committee	City of Prineville, Fire District, Media, Oregon Department of Forestry, BLM, USFS

Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Ongoing

Action Item: ST Wildland Fire #2	Alignment with Plan Goals:	High Priority Action Item?
Identify and implement methods of disposal or utilization of fire fuels removed from individual properties.	1 ☒ 2 ☐ 3 ☐ 4 ☒ 5 ☒ 6 ☒ 7 ☐	Yes
Affected Jurisdictions:		
Crook County, City of Prineville		
Alignment with Existing Plans/Policies:		
Crook County CWPP		
Rationale for Proposed Action Item:		
Natural resource protection, partnership & coordination, prevention, property protection		

Ideas for Implementation:	Actions Taken Since 2018
Identify and implement methods of disposal or utilization of fire fuels removed from individual properties (i.e. prescribed fire application, fuel reduction through Grass/timber/brush removal, small diameter forest product based industries, chipping etc.).	The City of Prineville is pursuing a 43 megawatt biomass facility which property owners and Crook County agencies can take natural feed (such as cut juniper limbs) to remove from their private property. Crook County Fire & Rescue currently disposes fire fuels by chipping and burning, and taking fuel to the landfill.

Potential Funding Sources:	Estimated Cost:	Timeline:
Oregon State grants, HMGP, OSFM & ODF funding	$50K+	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☐ Short (0-2 Years)

Coordinating Organization:	Tri-County Emergency Management (Crook, Deschutes, and Jefferson Counties)
Internal Partners:	**External Partners:**
Crook County Administrators, County Planning, Crook County Health and Human Services, Crook County Landfill	City of Prineville, State Fire Marshal, BLM, ODF, USFS
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Ongoing

Action Item: ST Earthquake #1	Alignment with Plan Goals:	High Priority Action Item?
Develop in-depth studies to determine county and region's vulnerability to earthquake.	1 ☒ 2 ☐ 3 ☐ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:	
Crook County	
Alignment with Existing Plans/Policies:	
Statewide hazard planning	
Rationale for Proposed Action Item:	
Prevention, Partnership and Coordination	
Ideas for Implementation:	**Actions Taken Since 2018**
• Work with OEM, DOGAMI, FEMA and USGS and expand existing studies to address scope of vulnerability; • Communicate study findings with key stakeholders affiliated with public awareness, education, policy and mitigation strategies identified in study; • If needed, make policy and procedure changes that support study results that mitigate earthquake hazards.	DOGAMI began a detailed hazard risk analysis for Crook County in 2024. This report, which includes other hazards like flood, landslide, and wildfire, will be complete in late 2025. Additionally, DOGAMI is updating critical facilities for the county to support Rapid Visual Screening to assess seismic vulnerability of critical structures. This is also anticipated to be complete in 2025.

Potential Funding Sources:	Estimated Cost:	Timeline:
OEM and FEMA grants	$50K - $100K	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
Crook County Health and Human Services	City of Prineville, OEM, DOGAMI, FEMA, USGS, Public Environmental Health
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Ongoing

Action Item: ST Earthquake #2	Alignment with Plan Goals:	High Priority Action Item?
Promote building safety through nonstructural improvements	1 ☒ 2 ☐ 3 ☐ 4 ☒ 5 ☒ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Rationale for Proposed Action Item:		
Prevention, Partnership and Coordination, Property Protection		

Ideas for Implementation:	Actions Taken Since 2018
• Publicize information on securing water heaters, book cases, filing cabinets, light fixtures and other items that can cause injuries and block exits; • Work with local building supply outlets to feature checklist/retrofit kits for reducing nonstructural risk; • Partner with Deschutes and Jefferson County Emergency Management to coordinate a booth at the Redmond Home Show to promote non-structural strategies and mitigation information. Will conduct general public outreach at Emergency Services booth at Crook County Fair.	No new action items have been taken on this goal since the adoption of the 2018 NHMP.

Potential Funding Sources:	Estimated Cost:	Timeline:
OEM & FEMA funding opportunities	<$25K	☒ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	Crook County Planning and Zoning
Internal Partners:	**External Partners:**
Crook County Emergency Management	City of Prineville, Local Businesses, Jefferson and Deschutes County Emergency Management
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Deferred

Action Item: ST Severe Weather Events #1	Alignment with Plan Goals:	High Priority Action Item?
Assess the impacts of severe weather events on Crook County.	1 ☒ 2 ☒ 3 ☐ 4 ☒ 5 ☐ 6 ☐ 7 ☐	No

Affected Jurisdictions:
Crook County
Alignment with Existing Plans/Policies:
Statewide hazard planning
Rationale for Proposed Action Item:
This information could assist in developing a vulnerability and risk assessment related to the possible effects of future climate variability for Crook County.

Ideas for Implementation:	**Actions Taken Since 2018**
• Expand the conversation of natural hazards to include discussions on future climate variability and drought; • Coordinate with local and state agencies and review data as it becomes available; • Coordinate with the Oregon Water Master to review and evaluate historic water table data and compare to current conditions; • Determine if sufficient data is available to conduct a vulnerability and risk assessment	This action item has been deferred.

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
FEMA grants	$25K - $50K	☐ Ongoing ☐ Long (6+ Years) ☒ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management
Internal Partners:	**External Partners:**
Crook County Planning, Crook County Fire, Crook County GIS, Crook County Health and Human Services	City of Prineville, Oregon Water Master, ODF, BLM, USFS, DOGAMI, USGS, NOAA, OEM, FEMA
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Ongoing

Action Item: ST Volcano #1	Alignment with Plan Goals:	High Priority Action Item?
Provide a Volcanic Ash Mitigation Guidebook on the County Website for Citizens and Businesses.	1 ☐ 2 ☐ 3 ☒ 4 ☐ 5 ☐ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
Crook County Planning		
Rationale for Proposed Action Item:		
Education and Outreach, Partnership and Coordination		

Ideas for Implementation:	Actions Taken Since 2018
• Develop public awareness through workshops and publications. During this process, Crook County will refer to 1980 Mt. St. Helens eruption outreach and education materials lessons learned (what worked and what didn't work). • Update the County web links include broader information related to volcanic ash mitigation.	Crook County Health Department has created a Volcanic Ash Preparedness Plan which was incorporated into the Oregon 2024 Climate Adaptation Plan.

Potential Funding Sources:	Estimated Cost:	Timeline:
This will be provided by USGS.	<$5K	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)

Coordinating Organization:	Crook County Emergency Management, USGS-Cascade Volcano Observatory
Internal Partners:	**External Partners:**
Crook County Planning	City of Prineville, DOGAMI
Form Submitted By:	Crook County NHMP Steering Committee
Action Item Status:	Ongoing

Action Item: LT Landslide #1	Alignment with Plan Goals:	High Priority Action Item?
Assess Crook County's and City of Prineville's Vulnerability to Landslides	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☒ 6 ☐ 7 ☐	No
Affected Jurisdictions:		
Crook County		
Alignment with Existing Plans/Policies:		
DOGAMI statewide hazard planning		
Rationale for Proposed Action Item:		
Property Protection, Prevention		
Ideas for Implementation:	**Actions Taken Since 2018**	
After sufficient data is compiled about the landslide hazard in Crook County a more detailed vulnerability assessment should be completed.	Crook County has been working with DOGAMI to understand landslide history, extent, and locations for Crook County. The Emergency Operations Plan (EOP) is currently being updated and landslide history will be incorporated to the final EOP.	
Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
DOGAMI is working to assess Crook County's and the City of Prineville's vulnerability to landslides.	<$10K	☐ Ongoing ☐ Long (6+ Years) ☐ Medium (2-5 Years) ☒ Short (0-2 Years)
Coordinating Organization:	Oregon Department of Emergency Management	
Internal Partners:	**External Partners:**	
Crook County Emergency Management, County Planning	City of Prineville, ODOT, DOGAMI, ODF, USFS, BLM	
Form Submitted By:	Crook County NHMP Steering Committee	
Action Item Status:	Ongoing	

Appendix B: Acronyms

2025 Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan

B1.0 Acronyms

The following acronyms are used in the action plan and are provided here for clarification.

ARC	American Red Cross
ARES	Amateur Radio Emergency Services
BLM	Bureau of Land Management
CCFR	Crook County Fire and Rescue
CCSO	Crook County Sheriff's Office
CDBG	Community Development Block Grant
CERT	Community Emergency Response Team
COIC	Central Oregon Intergovernmental Council
CPW	Community Planning Workshop (University of Oregon)
CVO	Cascade Volcano Observatory (USGS)
DEQ	Department of Environmental Quality (State of Oregon)
DLCD	Department of Land Conservation & Development (State of Oregon)
DOGAMI	Department of Geology & Mineral Industries (State of Oregon)
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance (FEMA Program)
FTE	Full Time Equivalent
GIS	Geographic Information System
HMGP	Hazard Mitigation Grant Program
HUD	Housing & Urban Development (United States)
IISOI	Insurance and Information Services of Oregon & Idaho
LEPC	Local Emergency Planning Committees
MCIC	Mass Casualty Incident Committee
NCDC	National Climate Data Center
NFIP	National Flood Insurance Program
NHMP	Natural Hazard Mitigation Plan
NOAA	National Oceanic & Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
ODF	Oregon Department of Forestry
ODOT	Oregon Department of Transportation
OEM	Oregon Department of Emergency Management
OID	Ochoco Irrigation District
OIT	Oregon Institute of Technology
OSP	Oregon State Police

OSSPAC	Oregon Seismic Safety Policy Advisory Commission
PPD	Prineville Police Department

Appendix C: Planning and Public Process

2025 Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan

C1.0 Public Process Overview

Crook County initiated an update to the 2018 Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP) in 2024-25. This effort was called the Crook County NHMP 2025 update process. Crook County, the City of Prineville and Crook County Fire & Rescue are dedicated to involving the public directly in the continual review and updates of the NHMP and addendas. In addition, Federal law requires that the update includes documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved. This Appendix describes the public process and documents the steps used for public involvement in the update process.

Crook County contracted with Central Oregon Intergovernmental Council (COIC) to facilitate and assist with the 2024-25 update process. The update of the plan was managed through Crook County Emergency Management. This process focused primarily on identifying new data (since 2018) which would improve or refine the Crook County and the City of Prineville's addendum and create a new addendum for Crook County Fire & Rescue.

Crook County believes that an open public process is essential to the development of an effective NHMP. COIC is a council of governments for the tri-county Central Oregon region (Crook, Deschutes, and Jefferson Counties), and has expertise in facilitation and technical assistance with over 50 years of experience working with local governments. Crook County and COIC designed the update process to specifically include an opportunity for public involvement and public input on the NHMP. This 2025 update of the NHMP is the result of these efforts.

C1.1 Steering Committee

The 2024-25 Crook County NHMP Review Steering Committee consisted of stakeholders and City and County officials of various disciplines. The Crook County Emergency Planning Committee (CCEPC), which is a multi-disciplinary emergency management standing committee within the county, served as the base of the Steering Committee. The membership of the CCEPC was expanded to include additional disciplines and stakeholders to assist in the update effort. The 2024-25 Crook County NHMP Steering Committee was made up of 33 people, representing 19 discipline groups. The following discipline groups were represented on the committee:

- Chamber of Commerce
- Elected Officials
- Emergency Management
- Fire District

- Oregon Department of Forestry
- United States Forest Service
- Bureau of Land Management
- Information Technology/GIS
- Law Enforcement
- Ochoco Irrigation District/Dams
- Private Sector/Business
- Public Administration/Planning
- Public Health/Environmental Health
- Public Works/Roads
- School District
- Education
- Health Services
- Communications

Steering Committee Meetings

There were five meetings held with the NHMP Steering Committee during the 2024-25 update process. These meetings were held on:

- April 1, 2024
- May 13, 2024
- August 19, 2024
- September 30, 2024
- February 4, 2025

C1.3 Community Input Review Process

2024 Crook County NHMP Public Opinion Survey

To better understand Crook County communities' risk to natural hazards, and the communities' perceptions and opinions regarding the risk of and vulnerability to natural hazards in Crook County and its cities, COIC posted a Public Opinion Survey on their website. This survey was available online for 8 weeks during the beginning of the update process (May 2024 – June 2024). The information collected from this survey was used to guide the 2024-25 Crook County NHMP Steering Committee in developing the Mitigation Strategy, and guided community outreach practices throughout the 2024-25 MNMP update process. Results from the survey can be found in Appendix D – 2024 Crook County NHMP Public Opinion Survey.

Information on how to participate in the survey was posted on Crook County's website. The City of Prineville - Crook County Chamber also posted information on how to participate in their newsletter and Facebook page.

Below is a list of local non-profit organizations, academia, religious groups, service providers, and businesses that were sent information on the survey via email:

- Crook County School District
- High Desert Education Services District
- Crook County Foundation
- Crook County on the Move
- Rotary Club of Crook County
- Central Oregon Community College
- Crook County 4-H
- OSU Extension Services
- Mosaic Medical
- Crook County Library
- Crook County Senior Services

- Family Access Network
- Kiwanis Club of Prineville
- The Prineville Center Foundation
- The First Baptist Church Food Pantry
- Ascent Christian Church
- Calvary Baptist Church
- Prineville Church of Christ
- Eastside Church
- First Assembly of God
- Crook County Veterans Services
- Latino Community Association
- Redemption House Ministries
- St. Vincent de Paul of Crook County
- Drycreek Airpark HOA
- Brasada Ranch HOA
- Sunset Hills HOA
- Red Cloud Ranch HOA
- Crooked River Watershed Council

Draft Review

Once the first draft of the 2025 Crook County NHMP was complete, COIC posted a copy of the document on their website for community members to review for 8 weeks. A Google Form was available for community members to provide feedback. Community members were encouraged to review the draft and provide feedback prior to the April 7th community input meeting. The NHMP first draft and the Google Form for feedback stayed available on COIC's website until April 14th.

Information on how to review the draft and provide feedback, and information on the community input meeting, were posted on Crook County's website, the City of Prineville - Crook County Chamber's newsletter, COIC's Facebook page, and the Cascade Business News E-Headlines newsletter. COIC staff advertised community input involvement on the 2025 NHMP on a local radio station (99.7 The Bull). Additionally, notices were sent to the list of local businesses, academia and other private and non-profit organizations mentioned above.

Review Process

A public input meeting was held on April 7, 2025, in Prineville to collect public feedback and input on the 2025 NHMP update during the drafting stage and prior to plan approval. Staff incorporated community input before submitting the final plan to FEMA for review.

C1.4 Meetings of the Crook County Board of Commissioners, the City of Prineville City Council, and Crook County Fire & Rescue Board

The FEMA approved and final document of the Crook County NHMP will be presented to the Crook County Board of County Commissioners for approval and adoption. Subsequently, the City of Prineville and Crook County addenda will be presented to their respective governing boards for their final approval and adoption. The Crook County NHMP Convener will be responsible for ensuring local adoption of the NHMP and providing the support necessary to ensure NHMP implementation. Once the resolution is executed at the local level and documentation is provided to FEMA, the NHMP is formally acknowledged by FEMA and the

County (and participating jurisdictions) will maintain eligibility for the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds, and the Flood Mitigation Assistance program funds.

C1.5 Contacts with Agencies

The 2024-25 NHMP update process also included the review and incorporation of data and information which were updated since 2018. This was accomplished through coordination with the Steering Committee and specific notice and contacts to city, county, state, and federal agencies and institutions, including:

- City of Prineville
    - Planning Department
    - Public Works Department
    - Police Department
- Crook County
    - Community Development Department
    - GIS Department
    - Planning Department
    - Sheriff's Office
- Federal Emergency Management Agency
- National Oceanic and Atmospheric Administration
- Oregon Department of Emergency Management
- Oregon Department of Forestry
- Oregon Department of Geology and Mineral Industries
- Oregon Department of Land Conservation and Development
- Oregon Department of Transportation
- Oregon State University – Cascades
    - Natural Resources Department
- Oregon Water Resources Department
- United States Geological Survey – Cascades Volcano Observatory

Appendix D: 2024 Crook County NHMP Public Opinion Survey

2025 Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan

Appendix E: Economic Analysis of Natural Hazard Mitigation Projects

2025 Crook County Multi-Jurisdictional Natural Hazard Mitigation Plan

This appendix was developed by the Oregon Partnership for Disaster Resilience at the University of Oregon's Community Service Center. It has been reviewed and accepted by the Federal Emergency Management Agency as a means of documenting how the prioritization of actions shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs. The appendix outlines three approaches for conducting economic analyses of natural hazard mitigation projects. It describes the importance of implementing mitigation activities, different approaches to economic analysis of mitigation strategies, and methods to calculate costs and benefits associated with mitigation strategies. Information in this section is derived in part from: The Interagency Hazards Mitigation Team, State Hazard Mitigation Plan, (Oregon Department of Emergency Management, 2000), and Federal Emergency Management Agency Publication 331, Report on Costs and Benefits of Natural Hazard Mitigation. This section is not intended to provide a comprehensive description of benefit/cost analysis, nor is it intended to evaluate local projects. It is intended to (1) raise benefit/cost analysis as an important issue, and (2) provide some background on how an economic analysis can be used to evaluate mitigation projects

Why Evaluate Mitigation Strategies?

Mitigation activities reduce the cost of disasters by minimizing property damage, injuries, and the potential for loss of life, and by reducing emergency response costs, which would otherwise be incurred. Evaluating possible natural hazard mitigation activities provides decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Evaluating mitigation projects is a complex and difficult undertaking, which is influenced by many variables. First, natural disasters affect all segments of the communities they strike, including individuals, businesses, and public services such as fire, police, utilities, and schools. Second, while some of the direct and indirect costs of disaster damages are measurable, some of the costs are non-financial and difficult to quantify in dollars. Third, many of the impacts of such events produce "ripple-effects" throughout the community, greatly increasing the disaster's social and economic consequences.

While not easily accomplished, there is value, from a public policy perspective, in assessing the positive and negative impacts from mitigation activities, and obtaining an instructive benefit/cost comparison. Otherwise, the decision to pursue or not pursue various mitigation

options would not be based on an objective understanding of the net benefit or loss associated with these actions.

What are Some Economic Analysis Approaches for Evaluating Mitigation Strategies?

The approaches used to identify the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into three general categories: benefit/cost analysis, cost- effectiveness analysis and the STAPLE/E approach. The distinction between the three methods are outlined below:

Benefit/Cost Analysis

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

Benefit/cost analysis is used in natural hazards mitigation to show if the benefits to life and property protected through mitigation efforts exceed the cost of the mitigation activity. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster related damages later. Benefit/cost analysis is based on calculating the frequency and severity of a hazard, avoided future damages, and risk. In benefit/cost analysis, all costs and benefits are evaluated in terms of dollars, and a net benefit/cost ratio is computed to determine whether a project should be implemented. A project worth pursuing will have a benefit/cost ratio greater than 1 (i.e., the net benefits will exceed the net costs) to be eligible for FEMA funding.

Cost-Effectiveness Analysis

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. This type of analysis, however, does not necessarily measure costs and benefits in terms of dollars. Determining the economic feasibility of mitigating natural hazards can also be organized according to the perspective of those with an economic interest in the outcome. Hence, economic analysis approaches are covered for both public and private sectors as follows.

Investing in Public Sector Mitigation Activities

Evaluating mitigation strategies in the public sector is complicated because it involves estimating all of the economic benefits and costs regardless of who realizes them, and potentially to a large number of people and economic entities. Some benefits cannot be evaluated monetarily, but still affect the public in profound ways. Economists have developed methods to evaluate the economic feasibility of public decisions which involve a diverse set of beneficiaries and non-market benefits.

Investing in Private Sector Mitigation Activities

Private sector mitigation projects may occur on the basis of one of two approaches: it may be mandated by a regulation or standard, or it may be economically justified on its own merits. A building or landowner, whether a private entity or a public agency, required to conform to a mandated standard may consider the following options:

1. Request cost sharing from public agencies;
2. Dispose of the building or land either by sale or demolition;
3. Change the designated use of the building or land and change the hazard mitigation compliance requirement; or
4. Evaluate the most feasible alternatives and initiate the most cost effective hazard mitigation alternative.

The sale of a building or land triggers another set of concerns. For example, real estate disclosure laws can be developed which require sellers of real property to disclose known defects and deficiencies in the property, including earthquake weaknesses and hazards to prospective purchasers. Correcting deficiencies can be expensive and time consuming, but their existence can prevent the sale of the building. Conditions of a sale regarding the deficiencies and the price of the building can be negotiated between a buyer and seller.

STAPLE/E Approach

Conducting detailed benefit/cost or cost-effectiveness analysis for every possible mitigation activity could be very time consuming and may not be practical. There are some alternate approaches for conducting a quick evaluation of the proposed mitigation activities which could be used to identify those mitigation activities that merit more detailed assessment. One of these methods is the STAPLE/E Approach.

Using STAPLE/E criteria, mitigation activities can be evaluated quickly by Steering Committees in a systematic fashion. This criteria requires the committee to assess the mitigation activities based on the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLE/E) constraints and opportunities of implementing the particular mitigation item in your community. The second chapter in FEMA's April How-To Guide "Developing the Mitigation Plan – Identifying Mitigation Actions and Implementation Strategies" as well as the "State of Oregon's Local Natural Hazard Mitigation Plan: An Evaluation Process" outline some specific considerations in analyzing each aspect. The following are suggestions for how to examine each aspect of the STAPLE/E Approach from the "State of Oregon's Local Natural Hazard Mitigation Plan: An Evaluation Process".

Social: Community development staff, local non-profit organizations, or a local planning board can help answer these questions.

- Is the proposed action socially acceptable to the community?
- Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- Will the action cause social disruption?

Technical: The city or county public works staff, and building department staff can help answer these questions.

- Will the proposed action work?
- Will it create more problems than it solves?
- Does it solve a problem or only a symptom?
- Is it the most useful action in light of other community goals?

Administrative: Elected officials or the city or county administrator, can help answer these questions.

- Can the community implement the action?
- Is there someone to coordinate and lead the effort?
- Is there sufficient funding, staff, and technical support available?
- Are there ongoing administrative requirements that need to be met?

Political: Consult the mayor, city council or county planning commission, city or county administrator, and local planning commissions to help answer these questions.

- Is the action politically acceptable?
- Is there public support both to implement and to maintain the project?

Legal: Include legal counsel, land use planners, risk managers, and city council or county planning commission members, among others, in this discussion.

- Is the community authorized to implement the proposed action? Is there a clear legal
- basis or precedent for this activity?
- Are there legal side effects? Could the activity be construed as a taking?
- Is the proposed action allowed by the comprehensive plan, or must the comprehensive plan be amended to allow the proposed action?
- Will the community be liable for action or lack of action?
- Will the activity be challenged?

Economic: Community economic development staff, civil engineers, building department staff, and the assessor's office can help answer these questions.
Environmental: Watershed councils, environmental groups, land use planners and natural resource managers can help answer these questions.

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.

Implementing the Approaches

Benefit/cost analysis, cost-effectiveness analysis, and the STAPLE/E are important tools in evaluating whether or not to implement a mitigation activity. A framework for evaluating mitigation activities is outlined below. This framework should be used in further analyzing the feasibility of prioritized mitigation activities.

1. **Identify the Activities**

Activities for reducing risk from natural hazards can include structural projects to enhance disaster resistance, education and outreach, and acquisition or demolition of exposed properties, among others. Different mitigation project can assist in minimizing risk to natural hazards, but do so at varying economic costs.

2. **Calculate the Costs and Benefits**
   Choosing economic criteria is essential to systematically calculating costs and benefits of
   mitigation projects and selecting the most appropriate activities. Potential economic criteria to evaluate alternatives include:
   - *Determine the project cost.* This may include initial project development costs, and repair and operating costs of maintaining projects over time.
   - *Estimate the benefits.* Projecting the benefits or cash flow resulting from a project can be difficult. Expected future returns from the mitigation effort depend on the correct specification of the risk and the effectiveness of the project, which may not be well known. Expected future costs depend on the physical durability and potential economic obsolescence of the investment. This is difficult to project. These considerations will also provide guidance in selecting an appropriate salvage value. Future tax structures and rates must be projected. Financing alternatives must be researched, and they may include retained earnings, bond and stock issues, and commercial loans.
   - *Consider cost and benefits to society and the environment.* These are not easily measured, but can be assessed through a variety of economic tools including existence value or contingent value theories. These theories provide quantitative data on the value people attribute to physical or social environments. Even without hard data, however, impacts of structural projects to the physical environment or to society should be considered when implementing mitigation projects.
   - *Determine the correct discount rate.* Determination of the discount rate can just be the risk-free cost of capital, but it may include the decision maker's time preference and also a risk premium. Including inflation should also be considered.

3. **Analyze and Rank the Activities**
   Once costs and benefits have been quantified, economic analysis tools can rank the possible mitigation activities. Two methods for determining the best activities given varying costs and benefits include net present value and internal rate of return.
   - *Net present value.* Net present value is the value of the expected future returns of an investment minus the value of expected future cost expressed in today's dollars. If the net present value is greater than the project costs, the project may be determined feasible for implementation. Selecting the discount rate, and identifying the present and future costs and benefits of the project calculates the net present value of projects.

- *Internal Rate of Return*. Using the *internal rate of return* method to evaluate mitigation projects provides the interest rate equivalent to the dollar returns expected from the project. Once the rate has been calculated, it can be compared to rates earned by investing in alternative projects. Projects may be feasible to implement when the internal rate of return is greater than the total costs of the project. Once the mitigation projects are ranked on the basis of economic criteria, decision makers can consider other factors, such as risk, project effectiveness, and economic, environmental, and social returns in choosing the appropriate project for implementation.

Economic Returns of Natural Hazard Mitigation

The estimation of economic returns, which accrue to building or landowner as a result of natural hazard mitigation, is difficult. Owners evaluating the economic feasibility of mitigation should consider reductions in physical damages and financial losses. A partial list follows:

- Building damages avoided
- Content damages avoided
- Inventory damages avoided
- Rental income losses avoided
- Relocation and disruption expenses avoided
- Proprietor's income losses avoided

These parameters can be estimated using observed prices, costs, and engineering data. The difficult part is to correctly determine the effectiveness of the hazard mitigation project and the resulting reduction in damages and losses. Equally as difficult is assessing the probability that an event will occur. The damages and losses should only include those that will be borne by the owner. The salvage value of the investment can be important in determining economic feasibility. Salvage value becomes more important as the time horizon of the owner declines. This is important because most businesses depreciate assets over a period of time.

Additional Costs from Natural Hazards

Property owners should also assess changes in a broader set of factors that can change as a result of a large natural disaster. These are usually termed "indirect" effects, but they can have a very direct effect on the economic value of the owner's building or land. They can be positive or negative, and include changes in the following:

- Commodity and resource prices
- Availability of resource supplies
- Commodity and resource demand changes
- Building and land values
- Capital availability and interest rates
- Availability of labor
- Economic structure

- Infrastructure
- Regional exports and imports
- Local, state, and national regulations and policies
- Insurance availability and rates

Changes in the resources and industries listed above are more difficult to estimate and require models that are structured to estimate total economic impacts. Total economic impacts are the sum of direct and indirect economic impacts. Total economic impact models are usually not combined with economic feasibility models. Many models exist to estimate total economic impacts of changes in an economy. Decision makers should understand the total economic impacts of natural disasters in order to calculate the benefits of a mitigation activity. This suggests that understanding the local economy is an important first step in being able to understand the potential impacts of a disaster, and the benefits of mitigation activities.

Additional Considerations

Conducting an economic analysis for potential mitigation activities can assist decision-makers in choosing the most appropriate strategy for their community to reduce risk and prevent loss from natural hazards. Economic analysis can also save time and resources from being spent on inappropriate or unfeasible projects. Several resources and models are listed on the following page that can assist in conducting an economic analysis for natural hazard mitigation activities. Benefit/cost analysis is complicated, and the numbers may divert attention from other important issues. It is important to consider the qualitative factors of a project associated with mitigation that cannot be evaluated economically. There are alternative approaches to implementing mitigation projects. Many communities are looking towards developing multi-objective projects. With this in mind, opportunity rises to develop strategies that integrate natural hazard mitigation with projects related to watersheds, environmental planning, community economic development, and small business development, among others. Incorporating natural hazard mitigation with other community projects can increase the viability of project implementation.

Resources[125]

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Impact Analysis, Prepared by University of California, Berkeley Team, Robert A. Olson, VSP Associates, Team Leader; John M. Eidinger, G&E
Engineering Systems; Kenneth A. Goettel, Goettel and Associates Inc.; and Gerald L. Horner, Hazard Mitigation Economics Inc., 1997.

[125] This section adopted by Crook County/Prineville with permission from City of Portland Emergency Management

Federal Emergency Management Agency, *Benefit/Cost Analysis of Hazard Mitigation Projects*, Riverine Flood, Version 1.05, Hazard
Mitigation Economics Inc., 1996.
This reference was updated in 2007.

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Publication 331, 1997.

Goettel & Horner Inc., *Earthquake Risk Analysis Volume III: The Economic Feasibility of Seismic Rehabilitation of Buildings in The City of Portland*, Submitted to the Bureau of Buildings, City of Portland, August 30, 1995.

Horner, Gerald, *Benefit/Cost Methodologies for Use in Evaluating the Cost Effectiveness of Proposed Hazard Mitigation Measures*, Robert Olson Associates, Prepared for Oregon State Police, Office of Emergency Management, July 1999.

Interagency Hazards Mitigation Team, *State Hazard Mitigation Plan*, (Oregon Department of Emergency Management, 2000).

Risk Management Solutions, Inc., *Development of a Standardized Earthquake Loss Estimation Methodology*, National Institute of Building Sciences, Volume I and II, 1994.

VSP Associates, Inc., *A Benefit/Cost Model for the Seismic Rehabilitation of Buildings*, Volumes 1 & 2, Federal Emergency Management Agency, FEMA Publication Numbers 227 and 228, 1992.

VSP Associates, Inc., *Benefit/Cost Analysis of Hazard Mitigation Projects: Section 404 Hazard Mitigation Program and Section 406 Public Assistance Program*, Volume 3: Seismic Hazard Mitigation Projects, 1993.

VSP Associates, Inc., *Seismic Rehabilitation of Federal Buildings: A Benefit/Cost Model,* Volume 1, Federal Emergency Management Agency, FEMA Publication Number 255, 1994.

Appendix F: Grant Programs and Resources

2025 Crook County Natural Hazard Mitigation Plan

Introduction

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 and program descriptions.

Post-Disaster Federal Programs

Hazard Mitigation Grant Program

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

Physical Disaster Loan Program

When physical disaster loans are made to homeowners and businesses following disaster declarations by the U.S. Small Business Administration (SBA), up to 20% of the loan amount can go towards specific measures taken to protect against recurring damage in similar future disasters. http://www.sba.gov/category/navigation-structure/loans-grants/small-businessloans/disaster-loans

Non-Disaster Federal Programs

Flood Mitigation Assistance Program

The overall goal of the Flood Mitigation Assistance (FMA) Program is to fund cost-effective measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other National Flood Insurance Program (NFIP) insurable structures. This specifically includes:

- Reducing the number of repetitively or substantially damaged structures and the associated flood insurance claims;
- Encouraging long-term, comprehensive hazard mitigation planning;

- Responding to the needs of communities participating in the NFIP to expand their mitigation activities beyond floodplain development activities; and
- Complementing other federal and state mitigation programs with similar, long-term mitigation goals.

http://www.fema.gov/flood-mitigation-assistance-program
Detailed program and application information for federal post-disaster and non-disaster programs can be found in the FY15 Hazard Mitigation Assistance Unified Guidance. Flood mitigation assistance is usually offered annually; applications are submitted online. Applicants need a user profile approved by the State Hazard Mitigation Officer, 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: shmo@mil.state.or

State Programs

Special Public Works Fund

The Special Public Works Fund (SPWF) provides funds for publicly owned facilities that support economic and community development in Oregon. Funds are available to public entities for: | Jackson County Natural Hazards Mitigation Plan 2024: Grant Programs and Resources Page | F-3 planning, designing, purchasing, improving and constructing publicly owned facilities, replacing publicly owned essential community facilities, and emergency projects as a result of a disaster. Public agencies that are eligible to apply include: cities, counties, county service districts, (organized under ORS Chapter 451), tribal councils, ports, districts as defined in ORS 198.010, and airport districts (ORS 838). Facilities and infrastructure projects that are eligible for funding are: airport facilities, buildings and associated equipment, levee accreditation, certification, and repair, restoration of environmental conditions on publicly-owned industrial lands, port facilities, wharves, and docks, the purchase of land, rights of way and easements necessary for a public facility, telecommunications facilities, railroads, roadways and bridges, solid waste disposal sites, storm drainage systems, wastewater systems, and water systems. https://www.orinfrastructure.org/Infrastructure-Programs/SPWF/

Seismic Rehabilitation Grant Program

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

Community Development Block Grant Program

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. Under special circumstances, CDBG funds also can be used to meet urgent community development needs arising in the last 18 months which pose immediate threats to health and welfare.
http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevel opment/programs

Oregon Watershed Enhancement Board

While OWEB's primary responsibilities are implementing projects addressing coastal salmon restoration and improving water quality statewide, these projects can sometimes also benefit efforts to reduce flood and landslide hazards. In addition, OWEB conducts watershed workshops for landowners, watershed councils, educators, and others, and conducts a biennial conference highlighting watershed efforts statewide. Funding for OWEB programs comes from the general fund, state lottery, timber tax revenues, license plate revenues, angling license fees, and other sources. OWEB awards approximately $20 million in funding annually. More information at: http://www.oregon.gov/OWEB/Pages/index.aspx

Federal Mitigation Programs, Activities & Initiatives

Basic & Applied Research/Development

National Earthquake Hazard Reduction Program (NEHRP), National Science Foundation
Through broad based participation, the NEHRP attempts to mitigate the effects of earthquakes. Member agencies in NEHRP are the US Geological Survey (USGS), the National Science Foundation (NSF), the Federal Emergency Management Agency (FEMA), and the National Institute for Standards and Technology (NIST). The agencies focus on research and development in areas such as the science of earthquakes, earthquake performance of buildings and other structures, societal impacts, and emergency response and recovery. http://www.nehrp.gov/

Decision, Risk, and Management Science Program, National Science Foundation

Supports scientific research directed at increasing the understanding and effectiveness of decision making by individuals, groups, organizations, and society. Disciplinary and interdisciplinary research, doctoral dissertation research, and workshops are funded in the areas of judgment and decision making; decision analysis and decision aids; risk analysis, perception, and communication; societal and public

policy decision making; management science and organizational design. The program also supports small grants for exploratory research of a time critical or high-risk, potentially transformative nature.
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5423

Hazard ID and Mapping

National Flood Insurance Program: Flood Mapping; FEMA

Flood insurance rate maps and flood plain management maps for all NFIP communities.
http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping

National Map: Orthoimagery, DOI – USGS

Develops topographic quadrangles for use in mapping of flood and other hazards.
https://nationalmap.gov/ortho.html

Mapping Standards Support, DOI-USGS

Expertise in mapping and digital data standards to support the National Flood Insurance
Program. http://ncgmp.usgs.gov/standards.html

Soil Survey, USDA-NRCS

Maintains soil surveys of counties or other areas to assist with farming, conservation, mitigation or related purposes. http://soils.usda.gov/survey/printed_surveys/

Project Support

Coastal Zone Management Program, NOAA

Provides grants for planning and implementation of non-structural coastal flood and hurricane hazard mitigation projects and coastal wetlands restoration.
http://coastalmanagement.noaa.gov/

Community Development Block Grant Entitlement Communities Program, US Department of Housing and Urban Development

Provides grants to entitled cities and urban counties to develop viable communities (e.g., decent housing, a suitable living environment, expanded economic opportunities), principally for low and moderate- income persons.
http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevel opment/programs/entitlement

National Fire Plan (DOI – USDA)

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. http://www.forestsandrangelands.gov/

Assistance to Firefighters Grant Program, FEMA

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). http://www.fema.gov/welcomeassistance-firefighters-grant-program

Emergency Watershed Protection Program, USDA-NRCS

Provides technical and financial assistance for relief from imminent hazards in small watersheds, and to reduce vulnerability of life and property in small watershed areas damaged by severe natural hazard events. http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp

Rural Development Assistance – Utilities, USDA

Direct and guaranteed rural economic loans and business enterprise grants to address utility issues and development needs. http://www.rurdev.usda.gov/Utilities_Programs_Grants.html

Rural Development Assistance – Housing, USDA

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 necessary. http://www.rurdev.usda.gov/HAD-HCFPGrants.html

Public Assistance Grant Program, FEMA

The objective of FEMA Public Assistance (PA) Grant Program is to aid State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President. http://www.fema.gov/public-assistance-local-state-tribal-and-nonprofit

National Flood Insurance Program, FEMA

The NFIP makes available flood insurance to residents of communities that adopt and enforce minimum floodplain management requirements. http://www.fema.gov/national-floodinsurance-program

HOME Investments Partnerships Program, HUD

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.
http://www.hud.gov/offices/cpd/affordablehousing/programs/home/

Disaster Recovery Initiative, HUD

The DRI provides grants to fund gaps in available recovery assistance after disasters (including mitigation).
http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs/dri

Emergency Management Performance Grants, FEMA

EMPG grants help state and local governments to sustain and enhance their all-hazards emergency management programs. http://www.fema.gov/fy-2012-emergency-managementperformance-grants-program

Partners for Fish and Wildlife, DOI – FWS

The PFW program provides financial and technical assistance to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats.
http://www.fws.gov/partners/

North American Wetland Conservation Fund, DOI-FWS NAWC

fund provides cost-share grants to stimulate public/private partnerships for the protection, restoration, and management of wetland habitats.
http://www.fws.gov/birdhabitat/Grants/index.shtm

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

Identifies, assesses, and transfers available federal real property for acquisition for State and local parks and recreation, such as open space.
http://www.nps.gov/ncrc/programs/flp/index.htm

Wetlands Reserve program, USDA-NCRS

The WR program provides financial and technical assistance to protect and restore wetlands through easements and restoration agreements.
http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/wetlands

Secure Rural Schools and Community Self-Determination Act of 2000, US Forest Service

Originally enacted in 2000 to provide five years of transitional assistance to rural counties affected by the decline in revenue from timber harvests on federal lands. Congress reauthorized Secure Rural Schools payments for fiscal years 2021-2023. Funds have been used for improvements to public schools, roads, and stewardship projects. Money is also available for maintaining infrastructure, improving the health of watersheds and ecosystems, protecting communities, and strengthening local economies. http://www.fs.usda.gov/pts/

Community Wildfire Defense Grant Program

The Community Wildfire Defense Grant Program provides to communities at risk of wildfire to plan for and reduce the risk of wildfire. The program provides funding to at-risk communities for the purposes of developing/revising their Community Wildfire Protection Plans (CWPP) and/or implementing mitigation activities identified within their CWPPs. The Program also helps communities in the wildland urban interface (WUI) implement activities related to restoring and maintaining the landscape, creating fire adapted communities, and improving wildfire responses.
https://www.fs.usda.gov/managing-land/fire/grants

Appendix G: Update Tracking Matrix

2025 Crook County Natural Hazard Mitigation Plan

Crook County Multi-Jurisdictional MNHMP Sections	Significant Updates in 2025
Approval Letters and Resolutions	Approval letters for 2025 will be included.
Acknowledgements	The Steering Committee and partner lists were updated with 2025 information.
Table of Contents	The Table of Contents updated.
Executive Summary	• Participants list was updated with 2025 Steering Committee representation. • Risk assessment summary table updated with 2025 scores. • Mitigation plan mission and goals updated with 2025 Steering Committee mission and goals. • Plan adoption dates updated for 2025.
Section 1: Introduction	• Section 1 was completely reformatted for the 2025 update. • A list of the 2025 Crook County MNHMP Steering Committee members was added. • A list of the 2025 City of Prineville Addendum Steering Committee members was added. • A list of the 2025 Crook County Fire & Rescue Addendum Steering Committee members was added. • Project Managers and Project Support Staff was updated. • Information on COIC was added. • The Table of Contents was updated.
Section 2: A Tour of Crook County	• Information on the Crook County Landscape was updated. • Crook County Climate information was updated. • Figure 2-1, a map of Crook County, was updated. • Figure 2-2, Annual Precipitation in Crook County (1896-2025) was included.

	• Figure 2-3, Land Management in Crook County, was included. • Figure 2-4, Crook County Population Growth from 2020-2025, was added. • Land Cover and Vegetation was included as a section to the Geographic Conditions of Crook County. • Crook County Populations and Demographics were updated. • Severe Weather Events and Wildfire Events were identified as Chronic Natural Hazard Events for Crook County. • A Crook County Capabilities Assessment, and a section for the Capabilities Assessment Findings, was added. • A Crook County Vulnerability Assessment was incorporated during the 2025 update. • This entire section is new.
Section 3: Natural Hazard Identification and Risk Assessment	• Figure 3-1 was added. • Drought and was identified as an additional hazard for Crook County during this update. • High Hazards Potential Dams was added as a sub hazard to Flood for Crook County during this update. • Extreme heat was included as a sub hazard to Severe Weather Events for Crook County during this update. • Information regarding air quality during a wildfire event was included. • Table 3-1 was changed to the Crook County Hazard Identification Compared to the State of Oregon. • Table 3-2, Crook County Hazard Analysis Matrix, was updated to reflect the HVA for the 2025 update. • "Hazard History 2016-2025" was incorporated into each hazards profile. Included in this section was the most up to date information and data available for each hazard's history. • A Future Conditions section was incorporated into each hazards profile.

	• Included in this section was the most up to date information and data available for hazard future conditions. • Tables, figures & maps were updated to reflect the most up to date information and data available according to hazard history. • Sources used for information and data were included within the footnotes.
Section 3: Hazard Profiles	
Drought	This hazard profile was a new addition in 2025; the whole hazard profile is new.
Flood	• Table 3-4 was updated to represent the monthly and annual 30-year average precipitation accumulation in Crook County from 1991-2020. • Table 3-5 was updated to represent the mean 30-year snow water equivalent in Crook County from 1991-2020. • Flood Location and Extent was updated to reflect current understanding of floods location and extent within Crook County. • Crook County's flood Hazard History prior to 2025 was updated. • The Future Conditions section was a new addition to each hazard profile in 2025; thus the whole Flood Future Conditions section is new. • A High Hazard Potential Dams subsection was included within the Flood hazard profile. This entire subsection is new. • The Vulnerability Assessment was updated. • A new version of the Crook County Floodplain Map was included as Figure 3-7. • The Flood Risk Assessment was updated. • Table 3-8, which shows the Crook County Flood Hazard Assessment Table, was included. • Table 3-9, which shows the Information Regarding the Participation of Crook County and the City of Prineville in FEMA's

	National Insurance Program, was included. • New sources were cited, and old ones were removed.
Wildfire	• The 2025 Crook County CWPP WUI map was included as Figure 3-9. • Wildfire Location and Extent was updated to reflect current understanding of wildfire location and extent within Crook County. • Crook County population data was updated. • Previous Figures 3-8 and 3-9 were removed due to redundancy to the Flood hazard profile. • Table 3-12 was added to show Crook County Large Fire History between 2016 and 2025. • Figure 3-10 was added to show Crook County Fire History from 2005-2023. • The Future Conditions section was a new addition to each hazard profile in 2025; thus the whole section is new. • The Vulnerability Assessment was updated. • Smoke Impacts/Air Quality was called out as a specific risk to Crook County because of wildfires. • Figure 3-11 was added to show the number of days Prineville air quality monitors identified unhealthy AQI levels. • The Risk Assessment was updated. • New sources were cited, and old ones were removed.
Earthquake	• Earthquake Location and Extent information was updated. • Earthquake Location and Extent was updated to reflect current understanding of earthquake location and extent within Crook County. • Figure 3-12, Active Fault Lines for Oregon, was added. • The previous Table 3-3 was updated to Table 3-13. This table now shows

	significant earthquakes in the Central Oregon region. • The Future Conditions section was a new addition to each hazard profile in 2025; thus the whole Earthquake Future Conditions section is new. • The Vulnerability Assessment was updated. • The previous Table 3-2 was updated to Table 3-13. This table shows the 2025 map for earthquake-induced liquefication hazard in Central Oregon. • Figure 3-14, Probability of Damage from Shaking in Central Oregon, was added. • The earthquake Risk Assessment was updated. • New sources were cited, and old ones were removed.
Severe Weather Events	• Location and Extent for Crook County Severe Weather Events was updated. • The Future Conditions section was a new addition to each hazard profile in 2025; thus the whole Severe Weather Events Future Conditions section is new. • Extreme Heat was added as a specific severe weather event in Crook County. • Figures 3-15, 3-16 and 3-17 were added. • Severe Weather Events Risk Assessment was updated. • New sources were cited, and old ones were removed.
Volcano	• Figure 3-18, which shows the NVEWS threat ratings of volcanoes in the NW, was added. • Volcano Location and Extent was updated to reflect current understanding of volcanoes location and extent within Crook County. • Volcano Hazard History was updated to include the history of volcanoes in Crook County from 2005-2025. • The Future Conditions section was a new addition to each hazard profile in 2025;

	thus the Volcano Future Conditions section is new. • The Volcano Vulnerability Assessment was updated. • The Volcano Risk Assessment was updated. • New sources were cited, and old ones were removed.
Landslide	• Landslide Location and Extent was updated. • Figure 3-19, which shows historic landslide record for Crook County from 1849 – 2019, was added. • The Future Conditions section was a new addition to each hazard profile in 2025; thus the Landslide Future Conditions section is new. • The Vulnerability Assessment was updated. • The previous Figure 3-9 was replaced with Figure 3-20. • The Landslide Risk Assessment was updated. • New sources were cited, and old ones were removed.
Section 4: Mitigation Strategy	• Mitigation Plan and Action Item Development was updated to reflect the 2025 process. • Section 4.5 Action Item Development Process was incorporated to provide context on the action item development process. • Action items for drought were added to the action item matrix since drought was a new hazard for this update. • The Steering Committee reviewed each action item included in the Mitigation Strategy. Action items that were too vague or too similar to the Plan goals were removed (MH #1 and MH #2). • Six new action items for Crook County were identified (DR #1, DR #2, DR #3, FL #8, FL #9 and FL #10).

	New priority action items were identified (MH #3, MH #4, DR #2, DR #3, FL #3, FL#7, FL#8, SF #1, and WF #2).
Section 5: Plan Maintenance and Updating	• The Crook County MNHMP Review Schedule was updated to reflect the new timeline for annual reviews and 5-year update. • Requirement codes were updated to reflect FEMA'S 2023 requirements set forth in the Local Mitigation Planning Policy Guide.
City of Prineville Addendum	• The layout of the City of Prineville Addendum was updated to ensure new requirements were met. • The Steering Committee list was updated. • The Crook County MNHMP Review Schedule was updated. • The City of Prineville MNHMP Steering Committee summarized their existing capabilities through a Capability Assessment. From this process, a list of Prineville's Existing Programs, Existing Authorities, Personnel, Capital Projects and Capital Resources were added. The Steering Committee summarized the findings from this assessment in the Findings section. • The Steering Committee reviewed each action item included in the Mitigation Strategy. Action items that were too vague, too similar to the goals of the addendum, or were identified as an action item within the overall Crook County MNHMP were removed (MH #1-M H#14, EQ #1, FL #1, FL #2, F L#4, FL #5-FL #7, LS #1, SWE #1, WF#1). • Five new action items for the City of Prineville were identified (DR #1, FL #8, FL #9, SWE #2, SWE #3). • New priority action items were identified (DR #1, FL #3, FL#8, FL#9, SWE #2, SWE #3). • The Steering Committee conducted a hazard analysis and ranked each hazard

	based on their history, vulnerability, maximum threat and probability. Scores and rankings of identified hazards were updated from the last update. • Figure P-1, which shows the City of Prineville boundaries and their annexations since 2010, was incorporated. • Figure P-2, which shows the City's Fire History from 2005-2023, was incorporated. • A list of the City of Prineville's Community Assets was incorporated. • Information relating to each hazard within the hazard profiles were updated. For those City of Prineville hazards that ranked differently on the HVA from Crook County's HVA, an explanation was given as to why they're different. New sources were cited within this section. • A Public Involvement Summary was added.
Crook County Fire & Rescue Addendum	The Crook County Fire & Rescue addendum was a new addition in 2025 thus the entire addendum is new.
Appendix A: Action Item Worksheets	• All existing action items were updated to reflect status changes in 2025. • Six new action items were included (DR#1, DR#2, DR#3, FL#8, FL#9, FL#10). • Two action items were removed (MH#1, MH#2) because they were too vague and matched too closely with the MNHMP goals.
Appendix B: Acronyms	• The 2025 acronym appendix was updated with this version of the MNHMP and includes common words and their acronyms found throughout the Plan. • The previous Appendix B, Hazard Background Information, was removed because it was out of date. All of the information that was included here was incorporated into the Risk Assessment.

Appendix C: Planning & Public Process	• The previous Appendix C, Benefit Cost Analysis was renamed Economic Analysis and moved to Appendix E. • The new Appendix C includes information regarding the Planning & Public Process for the 2025 NHMP update.
Appendix D: 2025 Crook County NHMP Community Input Survey	This survey was administered during the development of the MNHMP as part of the community engagement process. This survey was utilized to inform the development of mitigation strategies and identification of community vulnerabilities. This is a new appendix for this update.
Appendix E: Economic Analysis of Natural Hazard Mitigation Projects	The newest template was adopted from OPDR (2020).
Appendix F: Grant Program and Resources	The newest template was added from OPDR (2020) and additional resources were identified and included by the Steering Committee.
Appendix G: Update Tracking Matrix	The update tracking matrix was updated to capture every change made in the 2025 Crook County NHMP.