

# Medford Water Addendum to the Jackson County NHMP

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*Photos courtesy of Oregon State Archives*

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Prepared for  
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# Introduction

## Purpose

This is the first iteration of the Medford Water addendum to the Jackson County Multi-Jurisdictional Natural Hazard Mitigation Plan (MNHMP, NHMP). This addendum supplements information contained in Volume I (Basic Plan), which serves as the NHMP foundation and Volume II (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).

Medford Water adopted their addendum to the Jackson County Multi-jurisdictional NHMP on [date], 2023. FEMA Region X approved the Jackson County NHMP on [date], 2023 and Medford Water's addendum on [date], 2023. With approval of this NHMP, Medford Water is now eligible for non-disaster and disaster mitigation project grants through [date-1], 2028.

## NHMP Process, Participation and Adoption

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

In addition to establishing a comprehensive 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 Medford Water will gain eligibility for non-disaster and disaster mitigation project grants.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) partnered with the Oregon Department of Emergency Management (OEM), Jackson County, and Medford Water to develop this NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program. Members of the Medford Water NHMP steering committee also participated in the County NHMP update process (Volume II, Appendix B).

By creating a NHMP, locally adopting it, and having it approved by FEMA, Medford Water will gain eligibility for FEMA Hazard Mitigation Assistance grant program funds.

The Jackson County NHMP and Medford Water addendum are the result of a collaborative effort between residents, public agencies, non-profit organizations, the private sector, and regional organizations. A project steering committee guided the process of developing the NHMP.

## Convener and Committee

The Engineering Manager served as the designated convener of the NHMP development and the Engineering Manager (or designee) will take the lead in implementing, maintaining, and updating the addendum to the Jackson County NHMP in collaboration with the designated convener of the Jackson County NHMP (Emergency Manager).

Representatives from the Medford Water steering committee met formally and informally, to discuss development of their addendum (Volume II, Appendix B). The steering committee reviewed and developed Medford Water's addendum, with particular focus on the NHMP's risk assessment (hazards, community vulnerabilities, and capabilities) and mitigation strategy (action items).

The addendum reflects decisions made at the designated meetings and during subsequent work and communication with Jackson County Emergency Management and the OPDR.

The Medford Water Steering Committee was comprised of the following representatives:

- Convener (Implementation and Maintenance), Brian Runyen Engineering Manager
- Rachel Lanigan (Plan Development), Senior Engineer
- Brad Taylor, General Manager
- Aaron Ott, City of Medford, Emergency Manager
- Delaney Huerta, Jackson County, Emergency Management

The Medford Water Leadership Team (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 Board of Water Commissioners will be responsible for adopting the Medford Water addendum to the Jackson County NHMP. This addendum designates a Steering Committee and a convener to oversee the development and implementation of action items. Because Medford Water addendum is part of the County's multi-jurisdictional NHMP, Medford Water will look for opportunities to partner with the County. Medford Water's steering committee will convene after adoption of the Medford Water NHMP addendum on an annual schedule. The County is meeting on a semi-annual basis and will provide opportunities for each participating jurisdiction to report on NHMP implementation and maintenance during their meetings. The convener will be responsible for assembling the steering committee.

The steering committee will be responsible for:

- Reviewing existing action items to determine suitability of funding;
- Reviewing existing and new risk assessment data to identify issues that may not have been identified at NHMP creation;
- Educating and training new steering committee members on the NHMP and mitigation actions in general;

- Assisting in the development of funding proposals for priority action items;
- Discussing methods for continued public involvement;
- Evaluating effectiveness of the NHMP at achieving its purpose and goals (use Table 4-1, Volume I, Section 4, as one tool to help measure effectiveness); and
- Documenting successes and lessons learned during the year.

The convener will also remain active in the County’s implementation and maintenance process (Volume I, Section 4).

The steering committee will be responsible for activities outlined in Volume I, Section 4.

Medford Water will utilize the same action item prioritization process as the County (Volume I, Section 4 and Volume II, Appendix D).

## Implementation through Existing Programs

Many of the Natural Hazard Mitigation Plan’s recommendations are consistent with the goals and objectives of Medford Water’s existing plans and policies. Where possible, Medford Water 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.

Medford Water currently has the following plans and programs that relate to natural hazard mitigation. For a complete list visit Medford Water’s [website](#).

- [Water Distribution System Facility Plan](#) (2017)
- [Big Butte Springs and Robert A. Duff Water Treatment Plant Facility Plan](#) (2016)
- [Forest Management Plan: Big Butte Springs Watershed](#) (2020)
- [Water Management and Conservation Plan](#) (2016)
- [Rogue Valley Water Supply Resiliency Program](#)

During the development of this NHMP plans, including the strategic and facility plans, were reviewed to identify possible natural hazard mitigation strategies (action items).

### **Expand and Improve Capabilities and Integration Process**

Funding and staff resource availability is the primary constraint to achieving natural hazard mitigation priorities. As such Medford Water has identified actions (Table MW-1) that seek to expand and improve capabilities to achieve natural hazard mitigation.

In addition, Medford Water will seek opportunities to integrate the plan’s data, information, and hazard mitigation goals and actions into other planning mechanisms (e.g., budgets, strategic plans, water system plans, etc.). See Volume I, Section 4 for additional information.

# Mitigation Strategy

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

Medford Water’s mitigation strategy (action items) was developed during the 2023 NHMP planning process. The steering committee assessed Medford Water’s risk, identified potential issues, and developed a mitigation strategy (action items). Medford Water developed actions specific to their community after first reviewing a list of recommended actions developed by the County or recommended by OPDR.

## Mitigation Successes

Medford Water has several examples of hazard mitigation including the following projects funded through FEMA [Hazard Mitigation Assistance](#).

### FEMA Funded Mitigation Successes

- None to date

### Other Mitigation Successes

- [Capital Hill Reservoir Replacement Project](#) (in-process, \$37 million, Medford Water and Water Infrastructure Finance and Innovation Act (WIFIA))
- [Foothill Road Waterlines Relocation](#) (in-process, \$37 million, Medford Water)
- [Academy Place Waterline Relocation Project](#) (2023, \$1.2 million, Medford Water)
- [Table Rock Road Pipeline Project](#) (ongoing, \$30million, Medford Water & WIFIA)
- SCADA Project (in-process, \$19 million, Medford Water)
- Crater Lake Ave Transmission Main (in planning, \$12 million, Medford Water)
- Duff Water Treatment Plant Expansion (under construction, \$64 million, Medford Water & WIFIA)
- Martin Control Station Backup Power (in-process, \$0.9 million, Medford Water)

## Action Items

Table MW-1 documents the title of each action along with, the lead organization, partners, timeline, cost, and potential funding resources.

**Table MW-1 Action Items**

Action Item #	Mitigation Actions	Potential Funding Resources	Lead	Partners	Timeline	Cost
<b>Multi-Hazard</b>						
1.1	Continue to construct and improve water transmission pipelines, including the Crater Lake Avenue transmission line.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	City of Medford Public Works	O	H
1.2	Secure funding for and implement projects identified in the 2022 Medford Water Distribution System Resilience Backbone Study.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Partner Cities	O	M-H
1.3	Provide back-up power throughout water distribution system.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Partner Cities	S	M
1.4	Continue to expand and build resilience at the Duff Water Treatment Plant.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County	O	L
1.5	Secure permits and begin construction on Medford Water's second Rogue River raw water intake facility.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County	S	H
1.8	Coordinate emergency response planning efforts with the City of Medford and Jackson County.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, City of Medford	M	L
1.9	Implement improvements for Medford Water's Supervisory Control and Data Acquisition (SCADA) system following recommendations from the 2023 SCADA Master Plan.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Partner Cities	S	H



Action Item #	Mitigation Actions	Potential Funding Resources	Lead	Partners	Timeline	Cost
1.10	Continue to coordinate the water rights strategy with wholesale customer Partner Cities.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Partner Cities	O	L
1.11	Work with partnering jurisdictions (e.g., Jackson County and cities in the county) on continued climate action coordination.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	M	L
1.12	Incorporate resilience in maintenance and training strategies for staff.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County Emergency Management	S	L
1.13	Update the Medford Water Distribution System Master Plan by 2025, including developing an Oregon State required Seismic Risk Assessment and Mitigation Strategy.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County, Partner Cities	M	M
1.14	Review and update the EPA-required Water System Risk and Resilience Assessment by 2026. Implement recommendations from 2020 Plan.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	M	M-H
1.15	Participate in joint training and exercises for emergency training and response.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County Emergency Management	O	L
1.16	Plan and prepare valve exercising program.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County Emergency Management	O	L
1.17	Continue to develop new policies and construction standards to mitigate the impact of natural hazards.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County Emergency Management	O	L

Action Item #	Mitigation Actions	Potential Funding Resources	Lead	Partners	Timeline	Cost
1.18	Continue water testing to ensure water quality before, during, and after a natural hazard event.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	DEQ, OHA, DWS	O	L
1.19	Finalize and publish Source Water Protection Plan to inform Medford Water's spill response strategy.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	DEQ, OHA, DWS	S	M
1.20	Sustain a public awareness and education campaign about water and natural hazards through online and mail communications, as well as in-person events.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County Emergency Management	O	L
<b>Air Quality</b>						
2.0	Not included in profiled hazards.					
<b>Drought</b>						
3.1	Complete the Rogue Valley Water Supply Resiliency Program by 2033.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	DEQ, OHA, DWS	L	H
3.2	Complete the Big Butte Springs Enhancement Project in order to improve water supply during droughts.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	DEQ, OHA, DWS	S	M-H
3.3	Continue to maintain an active Water Curtailment Plan	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	O	L
3.4	Implement annual pipeline renewal and replacement program to reduce leaks and conserve water.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	O	H

Action Item #	Mitigation Actions	Potential Funding Resources	Lead	Partners	Timeline	Cost
3.5	Continue to implement action items from Medford Water's Water Management and Conservation Plan including: Performing annual water audits; documenting unmetered water use; replacing all meters to AMI; continuing large meter calibrations; adjusting the rate structure to encourage conservation; maintain leakage to less than 10%; minimize customer side leakage; update conservation materials and improve promotion; improve educational materials; expand outdoor water use conservation efforts; providing technical and financial assistance programs; retrofitting and replacing inefficient fixtures; new construction conservation methods.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	S-L	L-H
3.6	Build Asset Management Preventative Maintenance Program	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	S	L-H
<b>Earthquake</b>						
4.0	See multi-hazard actions for applicable mitigation strategies					
<b>Emerging Infectious Disease</b>						
5.0	Not included in profiled hazards.					
<b>Flood</b>						
6.1	Participate in floodplain management in coordination with other Rogue River entities.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	S	L
<b>Landslide</b>						
7.0	See multi-hazard actions for applicable mitigation strategies					
<b>Severe Weather (Extreme Heat, Windstorm, Winter Storm)</b>						
8.1	Educate customers on pipe maintenance to prevent freezing.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	S	L

Action Item #	Mitigation Actions	Potential Funding Resources	Lead	Partners	Timeline	Cost
<b>Volcanic Event</b>						
9.0	See multi-hazard actions for applicable mitigation strategies					
<b>Wildfire</b>						
10.1	Continue to implement the Medford Water's 30-year Forest Management Plan.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	O	H
10.2	Map and assess Wildfire Vulnerability in the next Risk and Resilience Assessment update.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County Emergency Management	O	L
10.3	Continue to implement a Fire Hydrant Testing and Replacement Plan	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	O	L-H

Source: Medford Water NHMP Steering Committee, 2023

Cost: L – Low (less than \$50,000), M - Medium (\$50,000-\$100,000), H - High (more than \$100,000)

Timing: O-Ongoing (continuous), S-Short (1-2 years), M-Medium (3-5 years), L-Long (5 or more years)

Priority Actions: Identified with **bold** text and **orange** highlight

# Risk Assessment

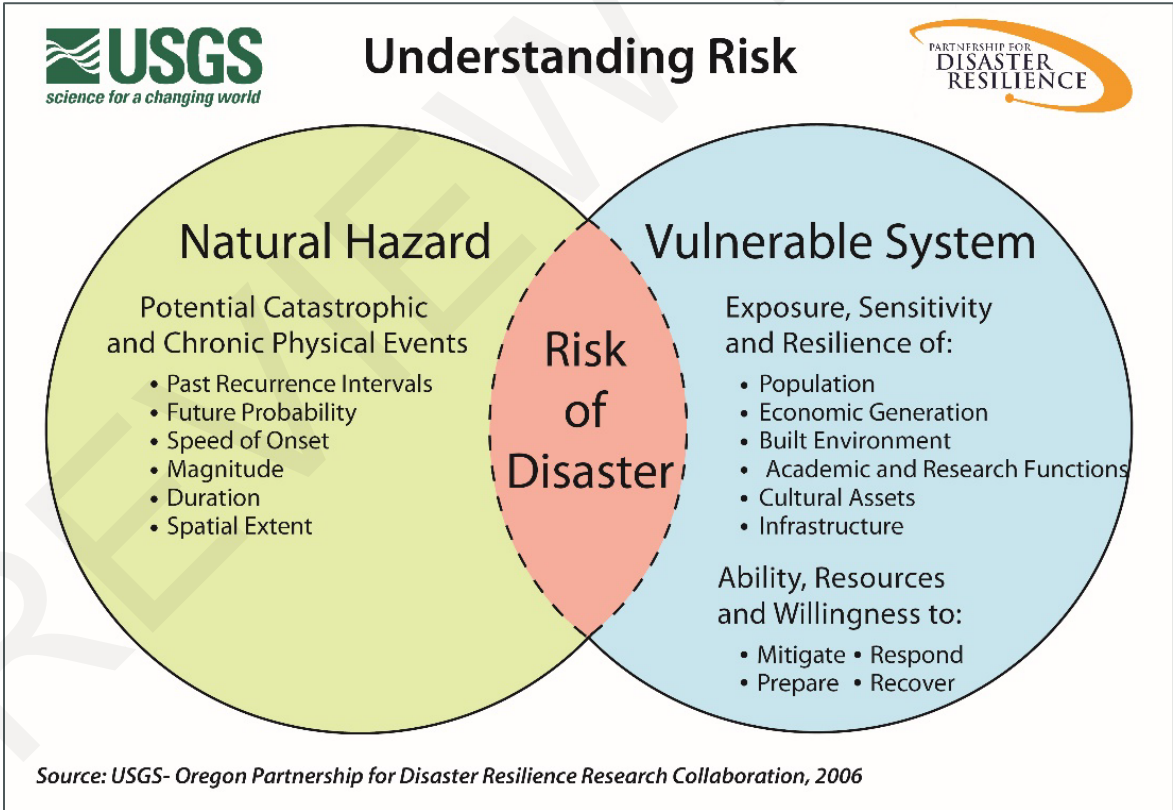
This section of the NHMP addendum addresses 44 CFR 201.6(b)(2) - Risk Assessment. In addition, this chapter can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

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.

The local level rationale for the identified mitigation strategies (action items) is presented herein and within Volume I, Sections 2 and 3. The risk assessment process is graphically depicted in Figure MW-1. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure MW-1 Understanding Risk



## Hazard Analysis

The Medford Water steering committee developed their hazard vulnerability assessment (HVA), using the County’s HVA (Volume II, Appendix C) as a reference. Changes from the County’s HVA were made where appropriate to reflect distinctions in vulnerability and risk from natural hazards unique to Medford Water, which are discussed throughout this addendum.

Table MW-2 shows the HVA matrix for Medford Water 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.

Three chronic hazards (wildfire, drought, winter storm) and a catastrophic hazard (Cascadia Subduction Zone earthquake) rank as the top hazard threats to Medford Water (Top Tier). Flood, extreme heat event, and crustal earthquake comprise the next highest ranked hazards (Middle Tier), while windstorm, landslide, and volcanic event hazards comprise the lowest ranked hazards (Bottom Tier). *Note: air quality and emerging infectious disease were not profiled in this hazard, see Volume I, Sections 2 and 3 for applicable countywide vulnerability and mitigation strategies for these hazards.*

**Table MW-2 Hazard Analysis Matrix**

Hazard	History	Vulnerability	Maximum Threat	Probability	Total Threat Score	Hazard Rank	Hazard Tiers
Wildfire	16	45	100	70	231	#1	Top Tier
Drought	20	45	100	63	228	#2	
Earthquake - Cascadia	2	50	100	49	201	#3	
Winter Storm	20	20	100	56	196	#4	
Flood	12	30	80	49	171	#5	Middle Tier
Extreme Heat Event	20	5	70	70	165	#6	
Earthquake - Crustal	2	40	100	21	163	#7	
Windstorm	12	5	70	49	136	#8	Bottom Tier
Landslide	6	30	40	28	104	#9	
Volcanic Event	2	5	50	7	64	#10	

Source: Medford Water NHMP Steering Committee, 2023.

## Community Characteristics

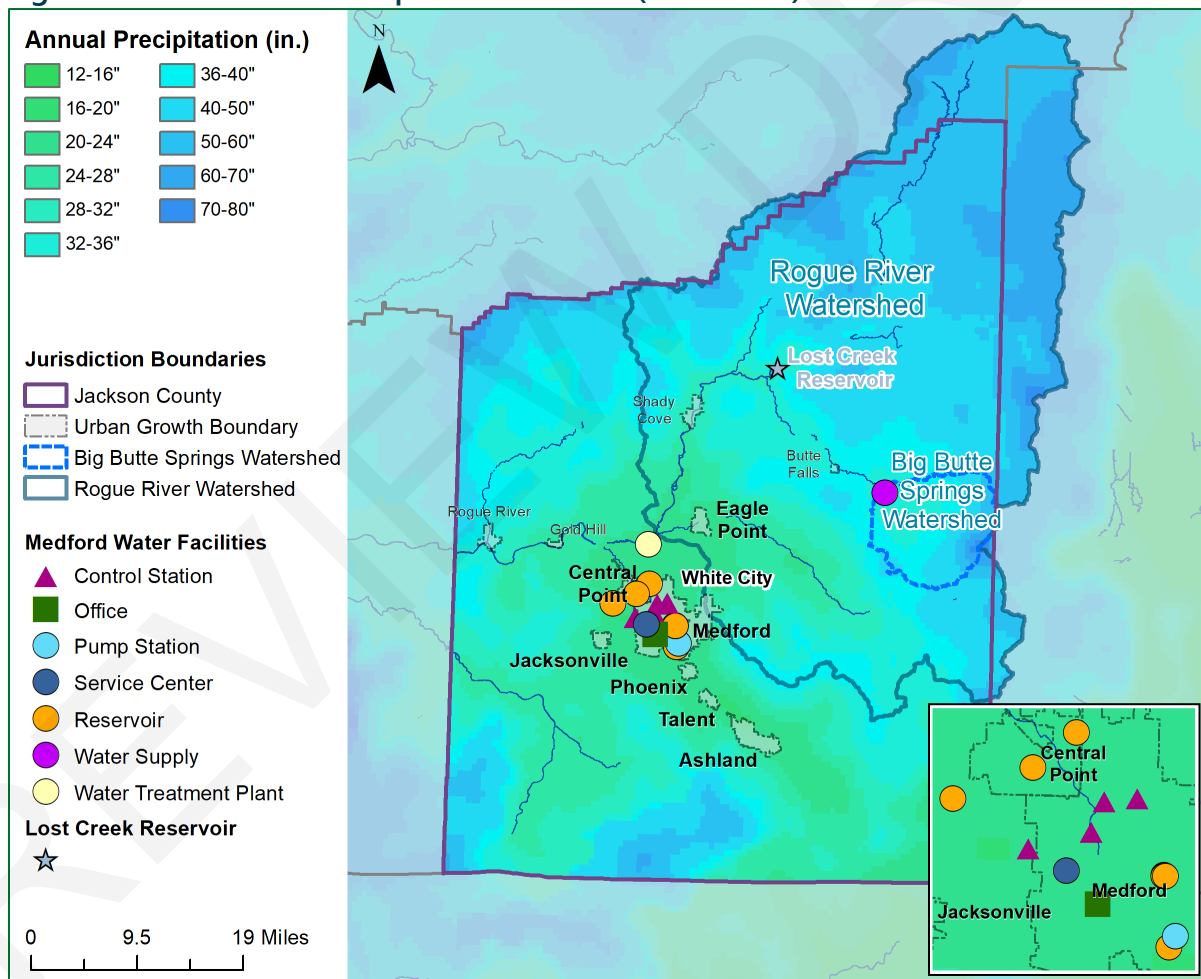
Medford Water directly services approximately 140,000 people within the Rogue Valley including customers in Medford, unincorporated White City, other unincorporated areas, and the Elk City Water District. Treated water is provided to Ashland, Central Point, Eagle Point, Jacksonville, Phoenix, and Talent on a wholesale basis (Figure MW-3).

Medford Water sources customer water from the Rogue River Watershed (surface water source) and Big Butte Springs Watershed (groundwater source). The Rogue River Watershed spans from just outside of Medford to the Cascades to the northeast near Crater Lake. The

Big Butte Springs Watershed (a smaller watershed within the Rogue River Watershed) is in the southeastern portion of the Rogue River Watershed near the base of Mt. McLoughlin and 30 miles east of Medford. Since 1923, Medford Water, has provided water from Big Butte Springs. The springs provide enough water to meet the demands of Medford Water’s customers for much of the year, during the remainder of the year water is pumped from the Rogue River. Additionally, Jacksonville, Phoenix, and Talent have water rights to water stored in Lost Creek Reservoir which is treated by Medford Water for use during summer months.

Medford Water’s territory experiences a relatively mild climate with four distinct seasons that comes from its position on the west coast of North America and within the Cascade Range mountains. The average daily high temperature in the area is between 45- and 55-degrees Fahrenheit (F) in the winter and between 80- and 95-degrees Fahrenheit (F) in the summer. The Rogue Valley has the lowest precipitation among Oregon’s western interior valleys and ranges from about 25 inches in the valley to about 80 inches in the Cascades (Figure MW-2). October through May are the wettest months.

**Figure MW-2 Normal Precipitation: Annual (1991-2020)**



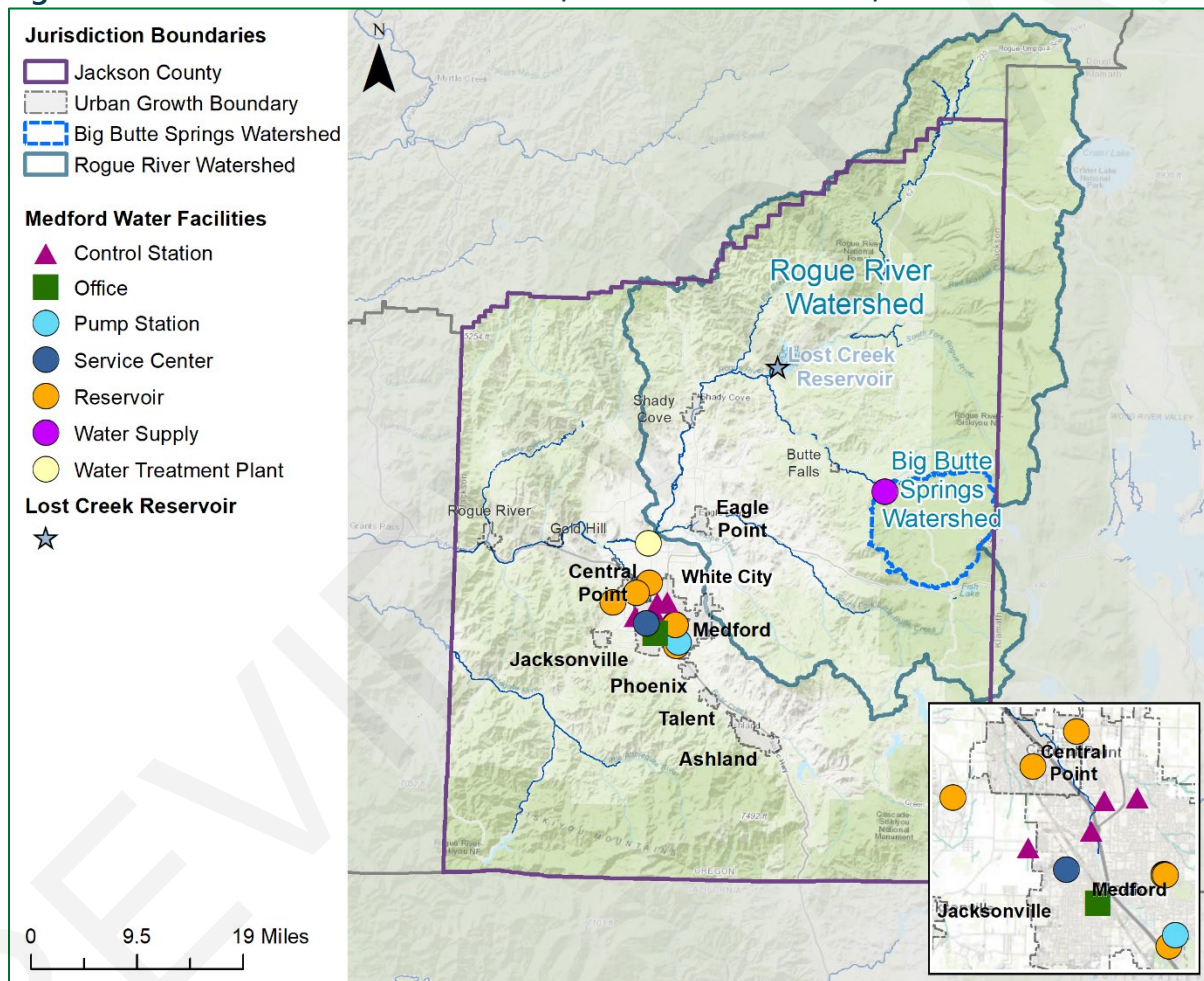
Source: OPDR, data [PRISM Climate Group](#)

For more information on the characteristics of each partner jurisdiction (Jackson County, Ashland, Central Point, Eagle Point, Jacksonville, Phoenix, and Talent) please review Volume II, Appendix C and the applicable city addenda in Volume III.

## 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 Medford Water. Medford Water Facilities are shown in Figure MW-3 and Table MW-3. Medford Water includes about 510 miles of pipeline (distribution plus transmission pipelines), 12 pump stations, and 16 distribution reservoirs.<sup>1</sup>

**Figure MW-3 Medford Water Facilities, Partner Jurisdictions, and Watersheds**



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.

Note: To view detail click this [link](#) to access Oregon HazVu

<sup>1</sup> Medford Water. [Water Management and Conservation Plan](#). 2017.



**Table MW-3 Medford Water Facilities**

Facility Name	Community Lifeline Category	Lifeline Type	Earthquake-Liquefaction Hazard	Flood Hazard	Landslide Hazard	Wildfire Hazard
181 Vilas Water Storage	food, water, and shelter	reservoir	low	minimal	low	moderate
3007 Old Stage Rd Water Storage	food, water, and shelter	reservoir	none	minimal	low	moderate
399 S 5th Street Water Storage	food, water, and shelter	reservoir	low	minimal	low	low
Barneburg Pump Station	food, water, and shelter	pump station	none	minimal	low	low
Barneburg Reservoir	food, water, and shelter	reservoir	none	minimal	moderate	low
Big Butte Springs	food, water, and shelter	water supply	none	minimal	moderate	moderate
Capital Hill 1 Reservoir	food, water, and shelter	reservoir	none	minimal	moderate	low
Capital Hill 2 Reservoir	food, water, and shelter	reservoir	none	minimal	moderate	low
Capital Hill 3 Reservoir	food, water, and shelter	reservoir	none	minimal	moderate	low
Coalmine Control Station	food, water, and shelter	control station	low	minimal	low	low
Conrad Control Station	food, water, and shelter	control station	low	500-Year	low	low
Duff Treatment Plant and Reservoir	food, water, and shelter	water treatment plant	low	minimal	low	low
Lausmann Annex - Medford Water Commission Main Office	food, water, and shelter	office	low	minimal	low	low
Martin Control Station	food, water, and shelter	control station	low	minimal	low	low
Medford Water Service Center	food, water, and shelter	service center	low	minimal	low	low
Rossanley Control Station	food, water, and shelter	control station	low	minimal	low	low

Source: Oregon Department of Geology and Mineral Industries, Medford Water NHMP Steering Committee

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.

Note: Medford Water is developing a new campus, expected to be completed in 2026. The next update of this NHMP will include more information on this site. The campus is expected to have minimal to low exposure to the hazards identified above.

## Hazard Characteristics

The following sections briefly describe relevant information for each profiled hazard. For more information on the vulnerabilities of each partner jurisdiction (Jackson County, Ashland, Central Point, Eagle Point, Jacksonville, Phoenix, and Talent) please review Volume I, Section 2 and the applicable city addenda in Volume III. More information on Jackson County Hazards can be found in Volume 1 Section 2 *Risk Assessment* and in the [Risk Assessment for Region 4, Southwest Oregon, Oregon SNHMP \(2020\)](#).

### Drought

The steering committee determined that Medford Water's probability for drought is **high** (which is the same as the County's rating) and that their vulnerability to drought is **high** (which is higher than the County's rating).

Volume I, Section 2 describes the characteristics of drought hazards, their history, and how they relate to future climate projections, as well as the location, extent, and probability of a potential event. Due to the climate of Jackson County, past and present weather conditions have shown an increasing potential for drought.

Medford Water receives its high-quality water supply from both the Rogue River and Big Butte Springs. Up to 25-35 million gallons per day (mgd) can be obtained from Big Butte Springs, however, the pipeline capacity limits withdrawal to a maximum of 26.4mgd.<sup>2</sup> In addition, Medford Water holds one water right for 100 cfs (64.6 mgd) for surface water from the Rogue River.<sup>3</sup> For more information on the future of Medford Water's water supply visit their [website](#) and/or review their [Water Management and Conservation Plan](#).

Please review Volume I, Section 2 for additional information on this hazard.

### Earthquake (Cascadia)

The steering committee determined that Medford Water's probability for a Cascadia Subduction Zone (CSZ) earthquake is **moderate** (which is the same as the County's rating) and that their vulnerability to a CSZ earthquake is **high** (which is the same as the County's rating).

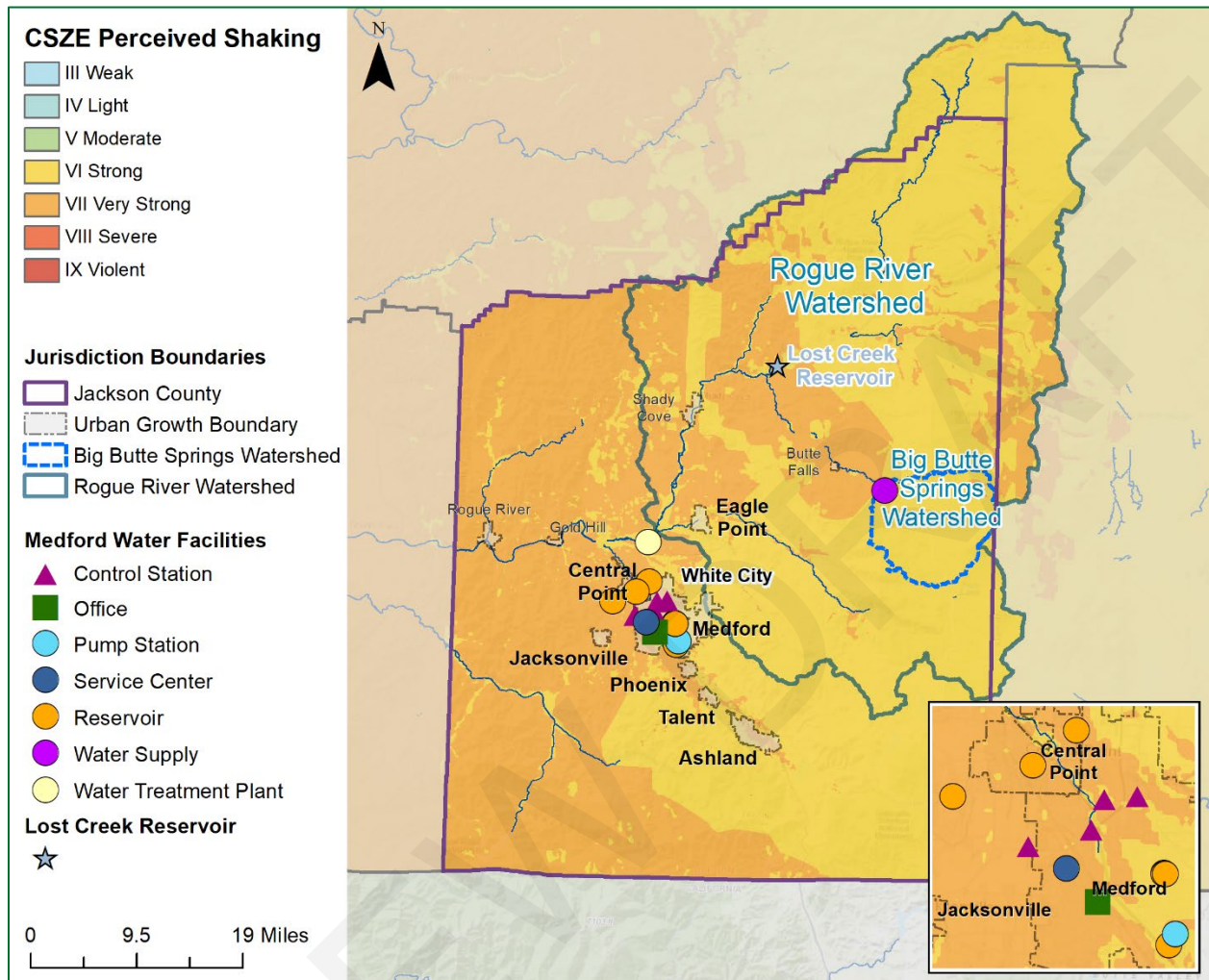
Figure MW-4 displays perceived shaking hazards from a Cascadia Subduction Zone earthquake event. As shown in the figure below, the areas of greatest concern within Medford Water are near populated areas and the Big Butte Springs water supply (darker areas).

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<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

**Figure MW-4 Cascadia Subduction Zone Perceived Shaking**



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.  
 Note: To view detail click this [link](#) to access Oregon HazVu.

Volume I, Section 2 describes the characteristics of earthquake hazards and their history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Medford Water as well. The causes and characteristics of an earthquake event are appropriately described within Volume I, Section 2, as well as the location and extent of potential hazards. Previous occurrences are well documented within Volume I, Section 2 and the community impacts described by the County would generally be the same for Medford Water as well.

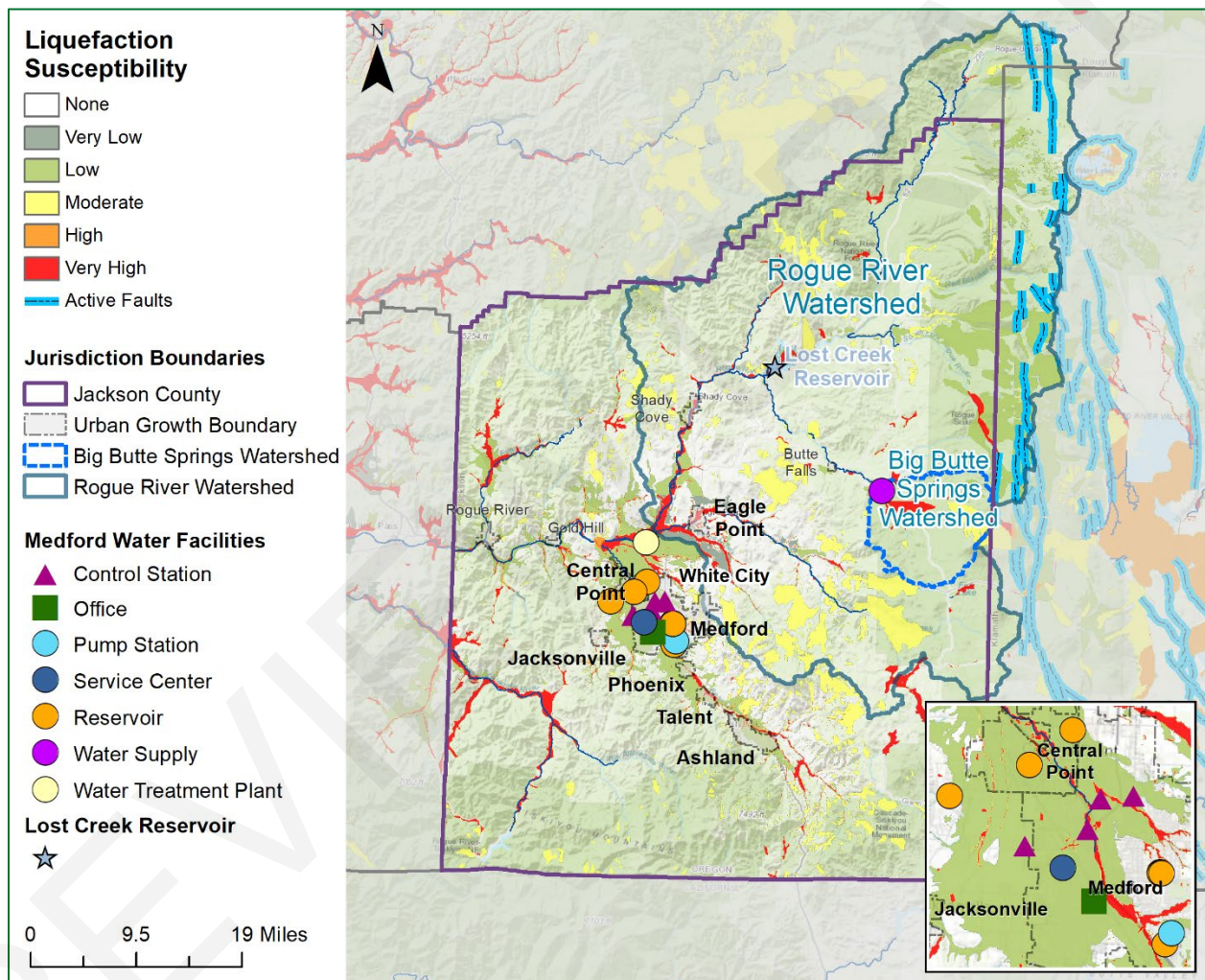
Please review Volume 1, Section 2 for additional information on this hazard.

## Earthquake (Crustal)

The steering committee determined that Medford Water’s probability for a crustal earthquake is **low** (which is the same as the County’s rating) and that their vulnerability to crustal earthquake is **high** (which is higher than County’s rating).

Figure MW-5 shows the liquefaction risk to the community lifelines that are identified in more detail in Table MW-3. As shown in the figure, the area of greatest concern near Medford Water (liquefaction hazard orange to red areas) are near populated areas.

**Figure MW-5 Liquefaction Susceptibility**



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.

Note: To view detail click this [link](#) to access Oregon HazVu.

Volume I, Section 2 describes the characteristics of earthquake hazards, history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Medford Water as well. The causes and characteristics of an earthquake event are appropriately described within Volume I, Section 2, as well as the location and extent of potential hazards. Previous occurrences are well-documented within Volume I, Section 2 and the

community impacts described by the County would generally be the same for Medford Water as well.

Earthquake-induced damages are difficult to predict and depend on the size, type, and location of the earthquake, as well as site-specific building and soil characteristics. Presently, it is not possible to accurately forecast the location or size of earthquakes, but it is possible to predict the behavior of soil at any site. In many major earthquakes, damages have primarily been caused by the behavior of the soil.

### **Vulnerability Assessment**

Due to insufficient data and resources, Medford Water is currently unable to perform a quantitative risk assessment for this hazard, however an exposure assessment was conducted. Identified Community Lifelines that are exposed to this hazard are shown in Table MW-3. Note that even if a facility has exposure, *it does not mean there is a high risk (vulnerability)*. In addition, pipelines (distribution and transmission pipelines), pump stations, and distribution reservoirs are vulnerable to earthquakes.

Please review Volume I, Section 2 for additional information on this hazard.

## **Flood**

The steering committee determined that Medford Water's probability for flood is **moderate** (which is lower than the County's rating) and that their vulnerability to flood is **moderate** (which is the same as the County's rating).

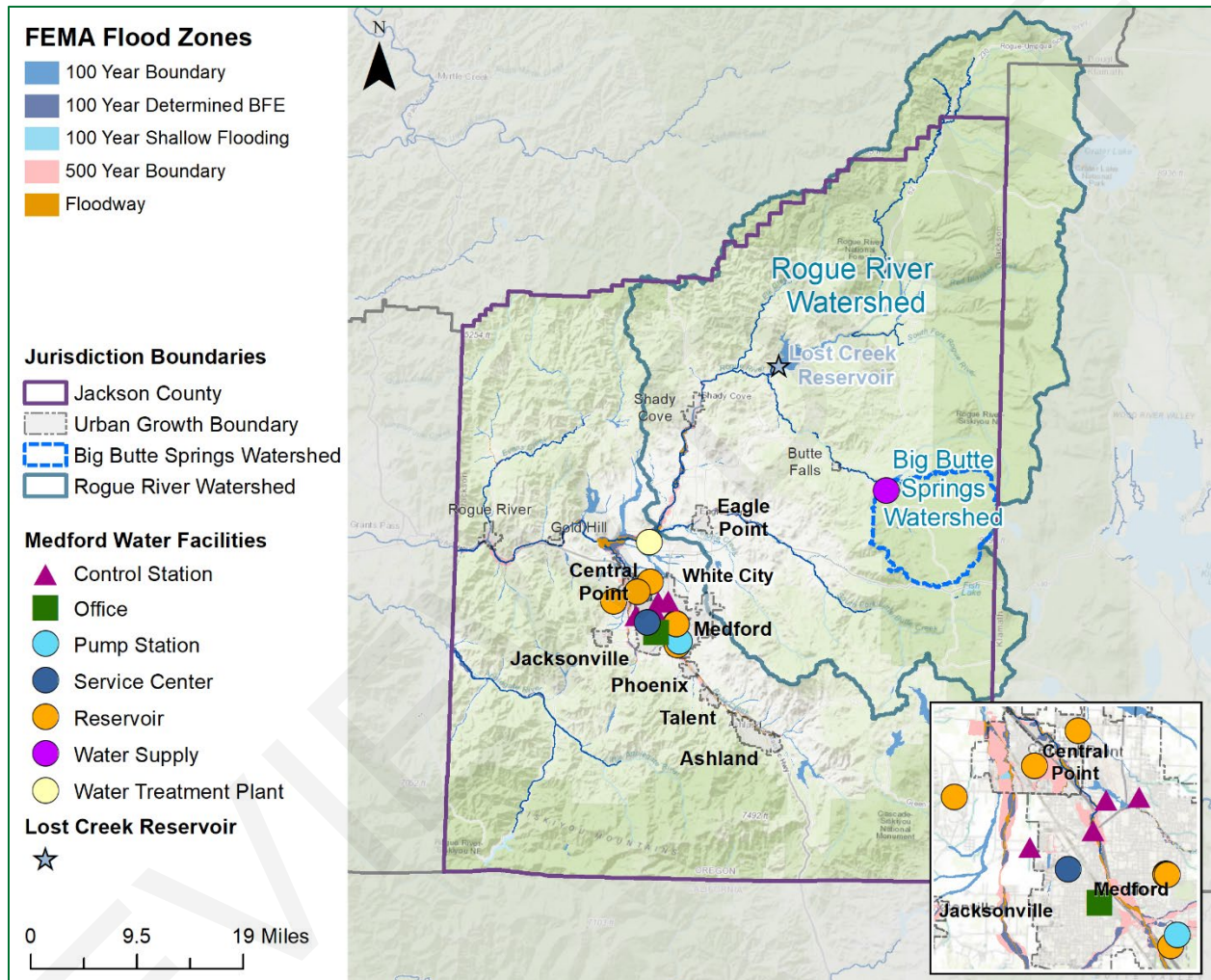
Volume I, Section 2 describes the characteristics of flood hazards, their history, and how they relate to future climate projections, as well as the location, extent, and probability of a potential event. Portions of Medford Water have mapped FEMA flood zones (Figure MW-6). Other portions of Medford Water could be subject to flooding from local storm water drainage; however, areas of known flood hazard do not impact development or infrastructure.

The two main water sources for Medford Water are the Rogue River and Big Butte Springs. Additional water is sourced from Lost Creek Reservoir for Jacksonville, Phoenix, and Talent. The Rogue River is the chief source of flooding in the Medford Water area, however, the Rogue River Watershed encompasses many of the flood sources described in the [Jackson County Flood Insurance Study](#) (2018). The Rogue River is studied with detailed methods for communities with development that is potentially impacted by its flood waters. The Lost Creek Dam was built in part to regulate flows on the Rogue River. Big Butte Creek, near Big Butte Springs, is studied with approximate methods due to a lack of development in proximity to the creek. Medford Water is above the river and has had minimal recorded flood damage. There is a low potential for flood from this water source. The major flood concern for Medford Water is the condition of the two bridges over the Rogue River that supply transportation access to Medford Water.

Medford Water generally has low to minimal risk from two types of flooding: riverine and urban. Riverine flooding occurs when streams overflow their banks and inundate low-lying areas. This is a natural process that adds sediment and nutrients to fertile floodplain areas. It usually results from prolonged periods of precipitation over a wide geographic area. Most areas are generally

flooded by low velocity sheets of water. Urban flooding occurs as land is converted to impervious surfaces and hydrologic systems are changed. Precipitation is collected and transmitted to streams at a much faster rate, causing floodwaters that rise rapidly and peak with violent force. During urban flooding, storm drains can back up and cause localized flooding of streets and basements. For more information on flood vulnerability see applicable city addenda in Volume III.

**Figure MW-6 FEMA Flood Zones**



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.

Note: To view detail click this [link](#) to access Oregon HazVu.

### Vulnerability Assessment

Due to insufficient data and resources, Medford Water is currently unable to perform a quantitative risk assessment for this hazard, however an exposure assessment was conducted. Identified community lifelines that are exposed to this hazard are shown in Table MW-3. Note that even if a facility has exposure, *it does not mean there is a high risk (vulnerability)*.

Floods can have a devastating impact on almost every aspect of the community, including private property damage, public infrastructure damage, and economic loss from business interruption. It is important for Medford Water to be aware of flooding impacts and assess its level of risk.

The economic losses due to business closures often total more than the initial property losses that result from flood events. Business owners and their employees are significantly impacted by flood events. Direct damages from flooding are the most common impacts, but indirect damages, such as diminished clientele, can be just as debilitating to a business.

The [Jackson County Flood Insurance Study](#) (January 19, 2018) has a brief history of flooding in Jackson County (Volume I, Section 2). The Conrad Control Station is within the 500-year chance flood zone while other Medford Water facilities are at minimal flood risk.

Floodwaters can affect building foundations, seep into basements or cause damage to the interior, exterior, and contents of buildings, dependent upon the velocity and depth of the water and by the presence of floating debris.

### **National Flood Insurance Program (NFIP)**

FEMA updated the Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) in 2018 (effective January 19, 2018). Medford Water is not a community which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. All partner jurisdictions (Jackson County and cities) participate in the National Flood Insurance Program (NFIP). For more information on the NFIP see applicable county (Volume I, Section 2) and city addenda (Volume III).

Please review Volume I, Section 2 for additional information on this hazard.

## **Landslide**

The steering committee determined that Medford Water's probability for landslide is **moderate** (which is lower than the County's rating) and that their vulnerability to landslide is **moderate** (which is higher than the County's rating).

Volume I, Section 2 describes the characteristics of landslide hazards, history, how they relate to future climate projections, as well as the location, extent, and probability of a potential event within the region.

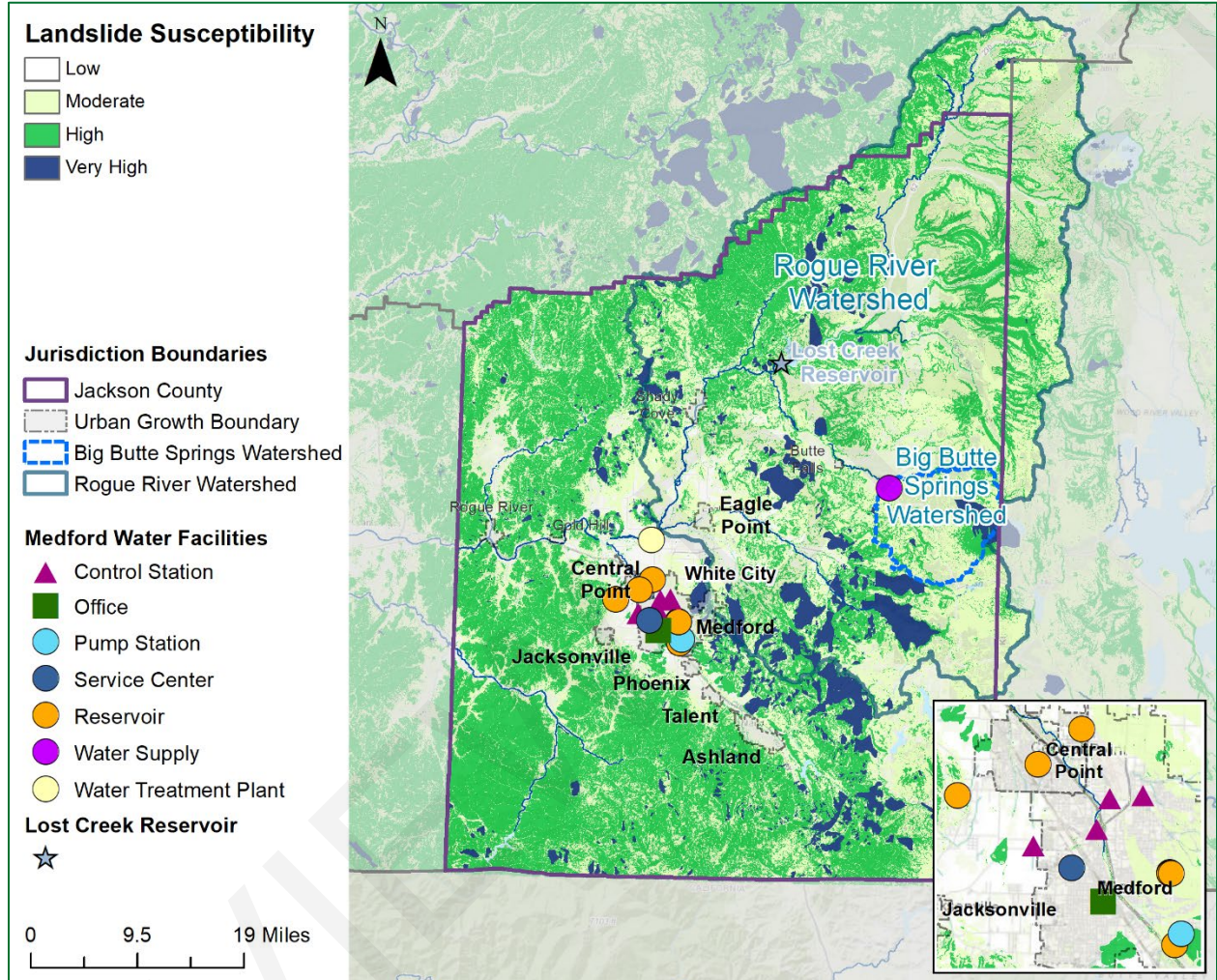
Landslide susceptibility exposure for Medford Water is shown in Figure MW-7. Most of Medford Water demonstrates a low susceptibility to landslide exposure, with corridors of moderate and high susceptibility concentrated around the upper areas of the watershed. The chief concern for landslide is along rural transportation corridors and waterways within the watershed.

### **Vulnerability Assessment**

Due to insufficient data and resources, Medford Water is currently unable to perform a quantitative risk assessment for this hazard, however an exposure assessment was conducted. Identified community lifelines that are exposed to this hazard are shown in Table MW-3. *Note*

that even if an area has a high percentage of land in a high or very high landslide exposure susceptibility zone, that does not mean there is a high risk (vulnerability), because risk is the intersection of a hazard and assets.

**Figure MW-7 Landslide Susceptibility Exposure**



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.  
 Note: To view detail click this [link](#) to access Oregon HazVu.

## Severe Weather

Severe weather can account for a variety of intense and potentially damaging weather events. These events include windstorms and winter storms. The following section describes the unique probability and vulnerability of each identified weather hazard. Other more abrupt or irregular events such as hail are also described in this section.

### Extreme Heat Event

The steering committee determined that Medford Water’s probability for extreme heat event is **high** (which is the same as the County’s Rating) and that their vulnerability to an extreme heat event is **low** (which is lower than the County’s Rating).



Jackson County’s NHMP Volume I, Section 2, adequately describes the causes and characteristics of extreme heat, as well as the history, location, extent, and probability of a potential event and how it relates to future climate projections. Generally, an event that affects the County is likely to affect Medford Water as well. A severe heat episode or “heat wave” occurs about every two to three years, and typically lasting two to three days but can last as many as five days. A severe heat episode can be defined as consecutive days of temperatures in the high 90s and above 100. Severe heat hazard in Southern Oregon can be described as the average number of days with temperatures greater than or equal to 90-degrees Fahrenheit.<sup>4</sup>

Extreme heat events can and have occurred in Medford Water, and while they typically do not cause loss of life, they are becoming more frequent and have the potential to impact economic activity as well as quality of life and have caused threat to life in some cases.

See the Risk Assessment (Volume I, Section 2) for additional information on this hazard.

## Windstorm

The steering committee determined that Medford Water’s probability for windstorm is **moderate** (which is lower than the County’s rating) and that their vulnerability to windstorm is **low** (which is lower than the County’s rating).

Volume I, Section 2 describes the characteristics of windstorm hazards, their history, and how they relate to future climate projections, as well as the location, extent, and probability of a potential event within the region. Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and snow. Other severe weather events that may accompany windstorms, including thunderstorms, hail, and lightning strikes are standard for Medford Water.

Volume I, Section 2 describes the impacts caused by windstorms, including power outages, downed trees, heavy precipitation, building damages, and storm-related debris. Additionally, transportation and economic disruptions result as well. Medford Water regularly experiences high winds. Pacific Power has mitigated the risk of power loss by trimming trees near their above ground infrastructure.

Damage from high winds generally has resulted in downed utility lines and trees but has minimal impact upon Medford Water. Electrical power can be out anywhere from a few hours to several days. Outdoor signs have also suffered damage. If the high winds are accompanied by rain (which they often are), blowing leaves, and debris clog drainage-ways, which in turn causes localized urban flooding.

Please review Volume I, Section 2 for additional information on this hazard.

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<sup>4</sup> DLCD. *Oregon State Natural Hazard Mitigation Plan*. 2020.

## Winter Storm (Snow/Ice)

The steering committee determined that Medford Water's probability for winter storm is **high** (which is the same as the County's rating) and that their vulnerability to winter storm is **moderate** (which is the same as the County's rating).

Volume I, Section 2 describes the characteristics of winter storm hazards, their history, and how they relate to future climate projections, as well as the location, extent, and probability of a potential event within the region. Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms affecting Medford Water typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from November through March.

Major winter storms can and have occurred in the Medford Water area and while they typically do not cause significant damage, they are frequent and have the potential to impact economic activity. Road closures due to winter weather are an uncommon occurrence but can interrupt commuter and commercial traffic.

Please review Volume I, Section 2 for additional information on this hazard.

## Volcanic Event

The steering committee determined that Medford Water'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 **low** (which is the same as the County's rating).

Volume I, Section 2 describes the characteristics of volcanic hazards and their history, as well as the location, extent, and probability of a potential event within the region. Generally, an event that affects the County is likely to affect Medford Water as well. Medford Water is very unlikely to experience anything more than volcanic ash during a volcanic event.

Please review Volume I, Section 2 for additional information on this hazard.

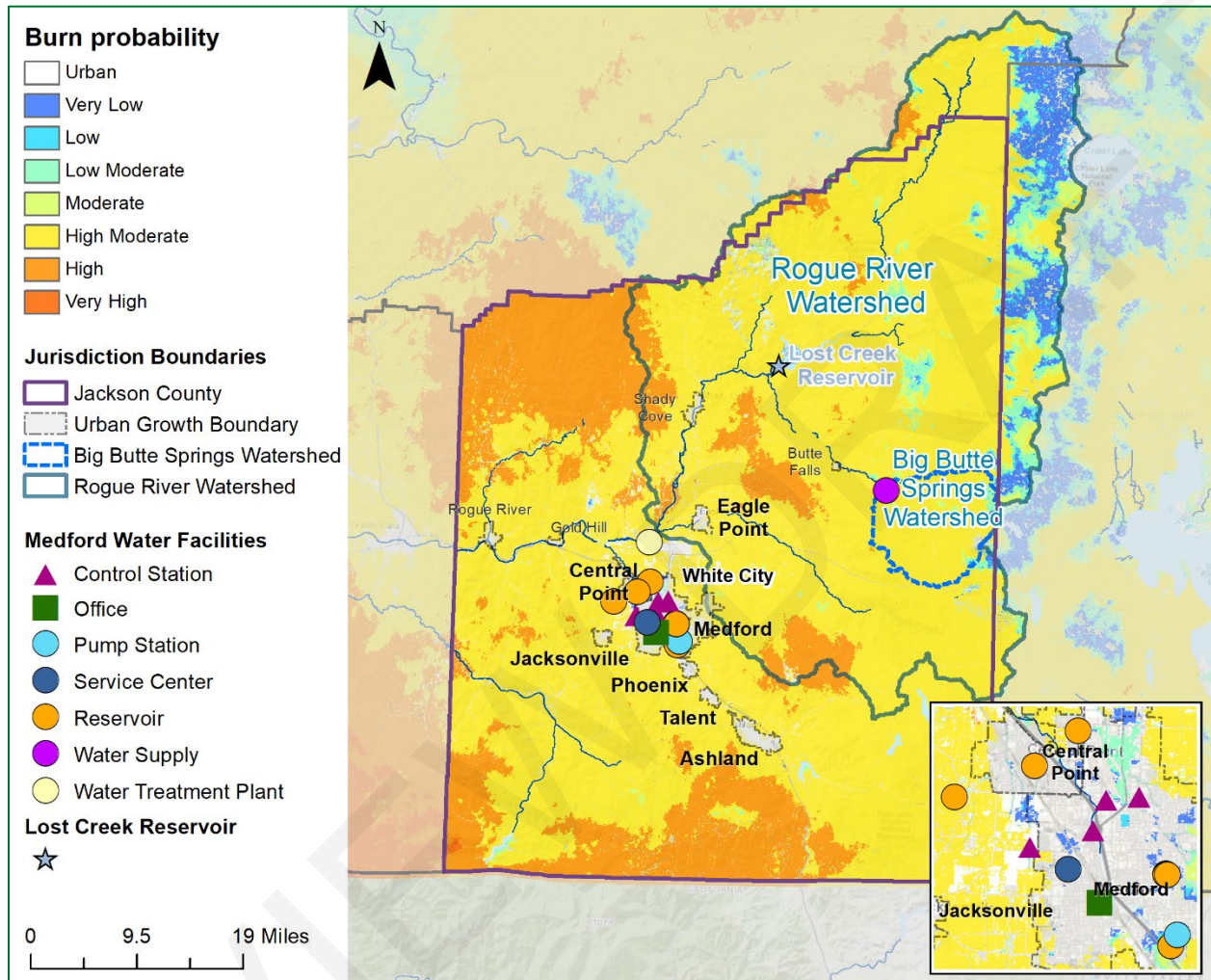
## Wildfire

The steering committee determined that Medford Water's probability for wildfire is **high** (which is the same as the County's rating) and that their vulnerability to wildfire is **high** (which is the same as the County's rating).

Volume I, Section 2 describes the characteristics of wildfire hazards, their history, and how they relate to future climate projections, as well as the location, extent, and probability of a potential event within the region. The location and extent of a wildfire vary depending on fuel, topography, and weather conditions. Weather and urbanization conditions are primarily at cause for the hazard level. Wildfires near Medford Water in recent times have included Alameda Drive (2020), South Obenchain Fire in 2020, Miles (2018), Sugar Pine (2018), Blanket Creek (2017), Broken Lookout (2017), Spruce Lake (2017), Bybee Creek (2016), Crescent (2015), Middle Fork

(2008), Nichols Gap (2006), and Timbered Rock (2002). Figure MW-8 shows burn probability in Medford Water.

**Figure MW-8 Burn Probability**



Source: Oregon Partnership for Disaster Resilience. USFS Pacific Northwest Region Wildfire Risk Assessment (PNRA)

Note: To view detail click this [link](#) to access Oregon Explorer's CWPP Planning Tool.

The potential community impacts and vulnerabilities described in Volume I, Section 2 are generally accurate for Medford Water as well. The [Rogue Valley Integrated Community Wildfire Protection Plan \(RVIFP, updated 2019\)](#) assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk. Medford Water is included in the RVIFP and will update Medford Water's wildfire risk assessment if the RVIFP presents better data during future updates (an action item is included within Volume I, Section 4 to participate in updates to the integrated fire plan and to continue to maintain and update their RVIFP). The forest service and Medford Water are actively reducing fuels in and around the watershed but anticipate an increase in wildfire risk with maturation of the forest. Medford Water hereby incorporates the RVIFP into this addendum by reference to provide greater detail to sensitivity and exposure to the wildfire hazard.

Property can be damaged or destroyed with one fire as structures, vegetation, and other flammables easily merge to become unpredictable and hard to manage. Other factors that affect ability to effectively respond to a wildfire include access to the location and to water, response time from the fire station, availability of personnel and equipment, and weather (e.g., heat, low humidity, high winds, and drought).

### **Vulnerability Assessment**

Due to insufficient data and resources, Medford Water is currently unable to perform a quantitative risk assessment for this hazard, however an exposure assessment was conducted. Identified community lifelines that are exposed to this hazard are shown in Table MW-3. Note that even if a facility has exposure, *it does not mean there is a high risk (vulnerability)*. The southern portion of the Cascades are generally drier and have relatively frequent lightning caused fires that can be severe. Additionally, fuel loads are relatively high in the Big Butte Springs Watershed due to higher precipitation that create better growing conditions for vegetation that is at risk during the dry summer season. Fire protection for the Big Butte Springs Watershed is provided by the Oregon Department of Forestry while the United States Forest Service provides additional forest management. Medford Water has a Forest Management Plan that is intended to actively manage dense understory vegetation that is present in parts of the watershed and Big Butte Springs property. The primary objective of management is to maintain and/or enhance existing conditions to reduce risk from fires and other stressors. For more information see the [Forest Management Plan](#) (2020). Applicable mitigation strategies are identified in Table MW-1.

Please review Volume I, Section 2 for additional information on this hazard.

# Attachment A: Public Involvement Summary

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Members of the steering committee provided content and edits to the NHMP prior to the public review period as reflected in the final document. In addition, a survey was distributed that included responses from residents within Medford Water boundaries (Volume III, Appendix F).

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see below) was provided from **Month Day through Month Day** on Medford Water's website. There were **XX [to be updated following public comment period]** comments provided. Additional opportunities for stakeholders and the public to be involved in the planning process are addressed in Volume III, Appendix B.

## Website Posting

Posting to be inserted

## Medford Water Steering Committee

Steering committee members possessed familiarity with the communities within Medford Water and how it is affected by natural hazard events. The steering committee guided the development process through several steps including goal confirmation and prioritization, action item development, and information sharing, to make the NHMP as comprehensive as possible. The steering committee met formally on the following date:

### **Meeting #1: Medford Water steering committee, May 3, 2023 (via Zoom)**

During this meeting, the steering committee was provided information on hazard mitigation planning, the NHMP process, and project timeline. The steering committee:

- Reviewed history of hazard events in Medford Water.
- Reviewed and confirmed the NHMP's mission and goals.
- Discussed the NHMP public outreach strategy.
- Discussed development activity and community lifelines.
- Reviewed and provided feedback on the draft risk assessment including community vulnerabilities and hazard information.
- Developed mitigation strategy (actions).
- Reviewed their implementation and maintenance program.

### **Meeting Attendees:**

- Convener, Rachel Lanigan, Senior Engineer
- Brad Taylor, General Manager
- Aaron Ott, City of Medford, Emergency Manager

- Delaney Huerta, Jackson County, Emergency Management

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