



2023 WILDFIRE MITIGATION PLAN

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V.1.2**

1	Introduction	5
1.1	WEC Profile and History	6
1.2	Mission and Vision	6
1.3	The Service Area	6
1.4	The Electric System	7
2	Overview of WEC’s Fire Prevention Strategies	9
2.1	Strategy and Program Overview	9
2.2	Timeframes of Preventative Strategies and Programs	9
3	Risk Analysis and Risk Drivers	13
3.1	Enterprise Risk Management (ERM)	13
3.2	Fire Risk Drivers	15
3.3	Aging Infrastructure	15
3.4	Foreign Contact	15
3.5	Equipment Failure	15
3.6	Drought	15
3.7	Vegetation Type/Fuels	16
3.8	High Winds/Contamination	16
3.9	Limited Accessibility	16
3.10	Lightning	16
3.11	Fire Weather/Red Flag Warning Conditions	16
3.12	Other Potential Risk Factors	17
3.13	Key Risk Impacts	17
4	WEC’s Asset Overview	17
4.1	Fire Threat Assessment in WEC Service territory	18
4.2	Wildfire Risk in the Service Area	18
4.3	Wildland Urban Interface (WUI)	19
4.4	Fire Threat Assessment Mapping	20
4.5	Assets within Wildfire Hazard Potential Tiers	20
4.6	Evaluation of Higher Risk Areas	21
5	Wildfire Prevention Strategy and Programs	22
5.1	Situational Awareness and Assessment Tools	23
5.2	Fire Precautionary Period	24
5.3	Recloser Operational Practices	24
5.4	Public Safety Power Shutoff	24
5.5	Infrastructure Inspections and Maintenance	25
5.6	Definition of Inspection Levels	26
5.7	Safety Patrol Inspections	26
5.8	Detailed T&D Inspections	27
5.9	Detailed T&D Inspection Description	27
5.10	Wood Pole Intrusive Inspection	27
5.11	Instructions to Inspectors	28
5.12	Substation Detailed Inspections	28
5.13	Standards for Record-Keeping and Reporting	29
5.14	Vegetation Management (VM)	29
5.15	Vegetation Management Trimming Standards	30
5.16	T&D System Vegetation Management Schedule	30
5.17	Pole Clearing	30
5.18	Vegetation to Conductor Clearance	30

5.19	Hazard Trees	30
5.20	Fire Season	30
5.21	WEC/Contractor Tools and Equipment	30
5.22	Fire Mitigation Construction	30
5.23	Avian Protection Program	31
5.24	Underground Conductor	31
5.25	Increased Phase Spacing	31
5.26	Electronic Vacuum Reclosers	31
5.27	GIS Mapping	32
5.28	Workforce Training	32
6	Emergency Response and Preparedness Planning	32
6.1	Crisis Communication Plan	33
6.2	Jurisdictional Structure	33
6.3	Emergency Management Communication and Coordination	33
6.4	Reporting Fires	33
6.5	Fire Response and Suppression Capabilities	34
6.6	Coordination with Stakeholders	
	356	
6.7	Work Crew Communications	35
6.8	Community Outreach	35
6.9	Defensible Space Requirements	35
6.10	Evacuation Levels	36
6.11	Restoration of Service	36
6.12	Service Restoration Process	37
6.13	Monitoring and Auditing of the WMP	37
6.14	Identify Deficiencies in the WMP	37
6.15	Programmatic QA/QC processes/T&D System Inspection QC Process	38
6.16	Vegetation Management QC Process	38
	Appendix A: Definitions	39
	Appendix B: Acronym Glossary	42
	Appendix C: Defensible Space Requirements – ORS 177.059	44
	Appendix D: Vegetation Spacing Guidelines	46
	Appendix E: Home Ignition Zone Checklist	47
	Appendix F: Fire Tools Requirements	48

Table of Tables

Table 1. Mitigation Programs/Activities	10
Table 2. Asset Description	18
Table 3. Overview of WEC's T&D Assets within WHP Tiers	21
Table 4. Activities That Address Wildfire Risk Factors	23
Table 5. Inspection Program Summary	26
Table 6. Offices of Emergency Management	35

Table of Figures

Figure 1. WEC Enterprise Risk Management Process	13
Figure 2. 5-Step Process Risk Assessment Process	14



Introduction

The Pacific Northwest experiences some of the most devastating and catastrophic wildfires in the country. Wildfires in Oregon and Washington burned more than 1.1 million acres in 2017 and another 1.3 million acres in 2018.¹ Despite a mild fire season in 2019 due to cooler temperatures, Oregon's 2020 wildfire season became the most destructive in the state's history, burning more than 1.5 million acres.² Wildfire mitigation plays an essential role in Wasco Electric Cooperative's (WEC) operational practices. The Cooperative's (co-op's) existing policies, programs and procedures directly or indirectly manage or reduce this risk. Over the years, WEC has adopted technological advances, and improved operational practices to mitigate the potential for ignitions and more effectively respond to high wildfire risk conditions.

WEC's Wildfire Mitigation Plan (WMP or Plan), takes an active approach to reduce fire-related risks for its members while allowing for retooling and improvement over time. As new technology and information emerge, WEC will assess, enhance, and refine its practices.

It is important to note that the combination of red flag conditions and high winds will not immediately result in WEC taking a facility out of service. These conditions will trigger key WEC personnel to evaluate WEC facilities in the impacted area and determine if a Public Safety Power Shutoff (PSPS) is warranted. PSPS is a measure of last resort, that will be decided based on risk considerations of the specific situation. The system design and hardening measures we employ are sufficient and allow power to continue to flow.

Purpose of the Plan

The Plan describes the co-op's strategies and programs to mitigate the threat of electrical equipment ignited wildfires and addresses the unique features of its service territory, such as topography, weather, infrastructure, grid configuration, and areas most prone to wildfire risks.

WEC's Board of Directors reviews and approves the Plan's adoption as needed, while the Operations Manager (OM) will oversee its implementation.

Objectives of the WMP

The main objective is to implement an actionable plan to increase reliability and safety while minimizing WEC assets' probability as the origin or contributing factor in a wildfire's ignition. All programs and strategies will comply with current and anticipated Oregon Public Utility Commission (OPUC) and National Electric Safety Code (NESC) regulations and guidelines. To enhance the Plan, WEC continually assesses new industry practices and technologies, which will reduce the likelihood of an interruption in service and reduce an outage's duration.

¹ The Oregonian 10/20/19

² The Oregon Department of Forestry; https://apps.odf.oregon.gov/DIVISIONS/protection/fire_protection/fires/dailyFireReps.asp

The secondary objective is to measure the wildfire mitigation strategies' effectiveness as applicable to WEC through an annual evaluation. Where a particular action, program component, or protocol proves unnecessary or ineffective, WEC will modify the Plan.

WEC Profile and History

WEC is a not-for-profit, member-owned corporation founded in 1940, with the mission to provide electricity to WEC's members at the lowest cost consistent with a sound economy and good management. In May of 1941, WEC energized its first substation and became the first utility to purchase power from Bonneville Power Administration. As of June 2020, the cooperative serves 3,100 members and 4,700 meters. WEC owns and operates its transmission and distribution system, which is critical to maintaining electric service to its members.

A nine-member elected Board of Directors governs WEC. The Board determines policy and appoints the General Manager (GM), who is responsible for the co-op's overall management and operations.

Mission and Vision

WEC's Board of Directors established the following mission and vision statement.

Mission: Wasco Electric Cooperative Inc. will provide its members with competitively priced, reliable energy and related services.

Vision: To be our members' partner in providing their energy services and the trusted source for providing; reliable and fairly priced energy, superior member service and innovative energy solutions for the future.

The Service Area

Headquartered in the city of The Dalles, WEC also operates two warehouses in Maupin, one in Grass Valley and a pole storage facility outside of Pine Grove. WEC transmits and distributes electricity within a 5,000 square-mile territory in North Central Oregon, encompassing nearly all of Wasco and Sherman Counties, while also serving portions of Jefferson, Gilliam, and Wheeler Counties. Northern Wasco PUD (NWPUD) serves the areas of The Dalles, Dufur, Tygh Valley and Wamic with WEC providing service to the many small rural towns and farms scattered throughout the outlying areas. Pacific Power and Light (PPL) serves a large area in central Sherman County as well as in the Mosier area. The Confederated Tribes of Warm Springs Reservation occupies a significant portion of the southwest corner of WEC's service area.

The expansive service territory is in a transition zone between western and eastern Gorge. Positioned along the Columbia River, it stretches out from the forested eastern slopes of the Cascade Range in the west, to the John Day River in the east, and reaches approximately 80 miles from the Columbia River to its most southern point in Jefferson County. The service area is comprised of four Ecoregions: Cascades, East Cascades Slopes and Foothills, the Columbia Plateau, and the Blue Mountains in the southern portion.

The vegetation associations for these ecoregions are as follows:

Cascades: Naturally occurring mixed conifer forests and Douglas fir forests for commercial logging.

Eastern Cascades: Grand fir mixed forests in the uplands and mixed oak/conifer forests in the foothills.

Blue Mountains: Grazing, logging, and fire suppression regimes have altered land cover throughout the region where juniper woodlands have given way to sagebrush grasslands and grand fir forests have given way to spruce fir forests.

Columbia Plateau: Sagebrush steppe, wheatgrass, sagebrush, sage grass intermixed with croplands.

Higher elevations contain Douglass fir and pine forests while the river canyons support species such as white alders and mock orange.

Major bodies of water include the Columbia River, Warm Springs River, Deschutes River, White River, and the John Day River. These rivers are accompanied by deep river breaks that crisscross the landscape

which affect accessibility to WEC assets. Elevations range from ~200 feet above mean sea level (AMSL) at the Columbia River to ~4,000feet AMSL in the Cascade Range.

Overall, the climate in the service area is temperate and semi-arid. Low annual precipitation, low winter temperatures, and high summer temperatures are typical. Wasco and Sherman Counties lie in the “rain shadow” east of the Cascade Mountain Range. Wasco County normally sees approximately 17” of rain per year. Droughts are common in the region, particularly in Sherman and Gilliam Counties. August is the hottest month for Wasco County with an average high temperature of 85°.

The Columbia Gorge is notorious for strong and sustained winds that can travel in either an easterly or westerly direction. The Dalles receives wind over fifty percent of the time and sustained westerly winds above 65 miles per hour have been recorded. The wind patterns also effect the many canyons and river drainage features along the north perimeter of the service territory. While these wind patterns are crucial for the generation of electricity from the wind turbines in Sherman County, they can also exacerbate wildfires and hinder suppression efforts.

The Electric System

WEC owns and operates an electric system including transmission and distribution facilities, which delivers more than 95% carbon emission-free energy to its members. Most of this carbon-free electricity is clean, renewable hydropower generated by the Federal Columbia River Power System’s hydroelectric dams. Power is purchased from the Bonneville Power Administration (BPA) and wheeled over BPA and PPL transmission lines. The co-op’s average annual retail sales are approximately 102 million kWhs. WEC has 94 miles of sub-transmission line, 1,495 miles of overhead (OH) distribution line, and 117 miles of underground (UG) line. The power is wheeled over WEC’s 69kV sub-transmission system to its 10 bulk power substations and then distributed via a 12.5kV overhead and underground distribution system. Joint use agreements are in place for areas where WEC shares portions of its service territory with NWPUD and PPL.

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Overview of WEC's Fire Prevention Strategies

Strategy and Program Overview

The proposed wildfire prevention strategies are comprised of five main components, which align with WEC's best practices. Together they create a comprehensive wildfire preparedness and response plan with a principal focus on stringent construction standards, ignition through system design, proactive operations, and maintenance programs specialized operating procedures and staff training.

Design & Construction: WEC's design and construction consist of system equipment, infrastructure design, and technical upgrades. These practices aim to improve system hardening to prevent contact between infrastructure and fuel sources to minimize WEC's electrical system's risk of becoming an ignition source.

Inspection & Maintenance: WEC's inspection and maintenance strategies consist of diagnostic activities and various maintenance methods and inspection schedules to ensure all equipment and infrastructure are in excellent working condition.

Operational Practices: Pro-active, day-to-day actions include safety training, emergency planning, system mapping, and alternate recloser settings. Measures to mitigate wildfire risks are taken to ensure preparedness in high-risk situations, such as dry and windy climatological conditions.

Situational & Conditional Awareness: This component consists of methods to improve system visualization and awareness of environmental conditions. The practices in this category provide tools to strengthen the Plan's other features. For example, WEC monitors numerous websites, including the National Weather Service (NWS), Oregon Department of Forestry (ODF), and the USFS Wildland Fire Assessment System.

Response & Recovery: This strategy consists of WEC's procedures in response to wildfire, de-energization, and other emergency events. This component aims to formalize protocols for these situations for thorough and efficient communications, emergency response, and recovery efforts. Table 1 summarizes WEC's mitigation programs and activities that support wildfire prevention and mitigation along with a timeframe for implementation.

Timeframes of Preventative Strategies and Programs

The five components have several strategies and programs, most already implemented. The remaining are situational and not limited to any timetable, scheduled for completion over several years, under evaluation, or in the initial stages. Targets, scheduled timeframes, and programmatic metrics are in Chapter 6. The strategies and programs below fall into one or more of the five implementation timeframes:

- A: Currently implemented
- B: Implemented before the upcoming fire season
- C: Completed annually or on schedule per relevant code
- D: In the evaluation stage / In development
- E: Implemented on as-needed basis/protocols in place
- * Ongoing program with no defined completion date

Table 1. Mitigation Programs/Activities

DESIGN AND CONSTRUCTION	TIMEFRAME
Underground distribution lines	A*
Field recloser to vacuum-type breaker change out program	A*
Increased phase spacing reduces wire to wire contact	A*
Covered jumpers and animal guards	A*
Reduced span length in high wind areas	A*
Avian protection construction guidelines	A*
INSPECTION AND MAINTENANCE	
Infrared inspections of substation equipment	C
Transmission line ground patrols	C
T&D wood pole intrusive inspections	C
T&D vegetation right-of-way maintenance	C
Distribution system line patrols and detailed inspections	C
Enhanced vegetation management prior to fire season	B
Enhanced line patrols during fire season	B

Table 1. Continued

OPERATIONAL PRACTICES	TIMEFRAME
T&D system vegetation management program	A
Work procedures and training for persons working in locations with elevated fire risk conditions	A
Increased vegetation management crews prior to wildfire season	B
Increased community outreach/wildfire safety awareness	B
Contractor/staff safety training and orientation for T&D vegetation management work	A
Alternate recloser practices during fire weather	E
SITUATIONAL AWARENESS	
Weather Monitoring (USFS-WFAS, NWS)	A
RESPONSE AND RECOVERY	
Public safety power shut-off protocols	E
Coordination with local Department of Emergency Management	A
Customer assistance programs for post-disaster recovery	A
Line patrols before re-energization	A

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Risk Analysis and Risk Drivers

To establish a baseline understanding of the risks and risk drivers involved, WEC examined its exposure to all fire-related hazards. Although inherent risks exist in operating an electric utility, there are strategies and processes to better plan and manage them. Enterprise Risk Management is a tool to help anticipate and manage risks while also considering how multiple risks can pose even more significant challenges. The overall goal seeks to determine the residual risk level after applying all mitigation factors to the initial inherent risk.

Enterprise Risk Management (ERM)

The ERM process (Figure 1) is not a periodic “Risk Assessment” but an ongoing and forward-looking management discipline enabling WEC to analyze risks continually and adapt to changing conditions. The key or critical risks affect the entire community and are interrelated. Therefore, they are managed holistically with a structured approach. Figure 2, on the next page, describes the objective of each step.

Figure 1. WEC Enterprise Risk Management Process

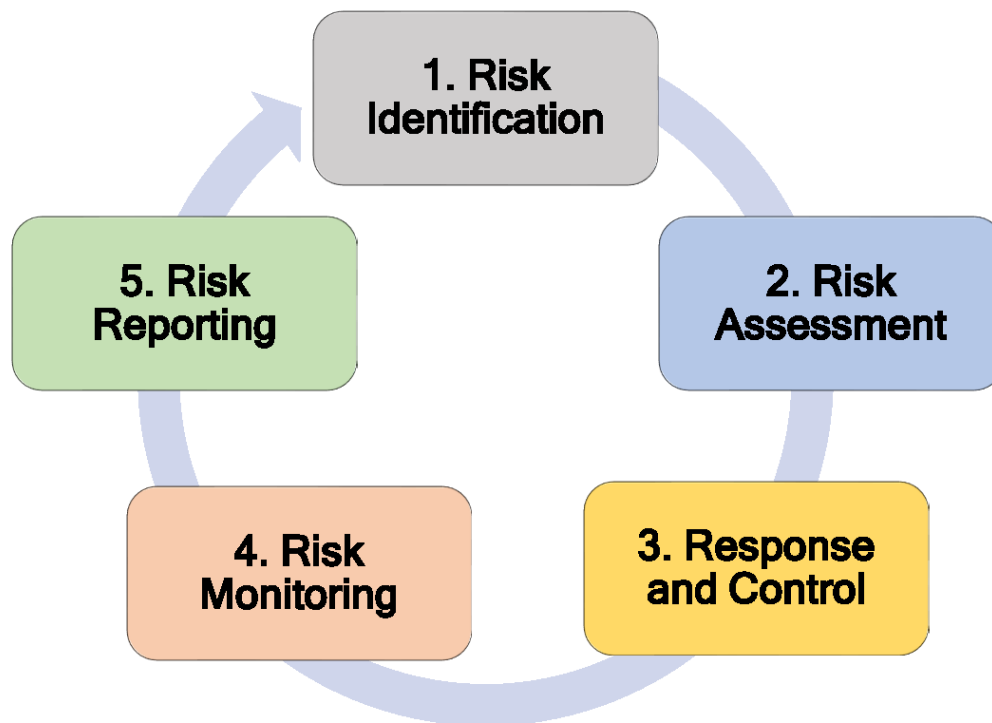


Figure 2. 5-Step Process Risk Assessment Process



The Risk Assessment process begins with the Operations Manager (OM) and key staff, and stakeholders working together to collect information on all potential and perceived risks.

Climate Change

The *Fourth Oregon Climate Change Assessment* has determined that climate change would make forests more susceptible to extreme wildfires due to overall warming in the Pacific Northwest. The years from 2016-2018 were all warmer than the 1970-1999 average, and 2015 still stands as Oregon’s warmest year on record. Fire is the most obvious impact of climate change in recent years, with extreme wildfires occurring extensively in hot and dry summers. Record-breaking catastrophic fires in California and Oregon in 2020 highlight increased vulnerability in a warming climate. The report projects fire risk will only increase across the entire state by midcentury, especially in eastern Oregon and the Willamette Valley³.

³ Fourth Oregon Climate Assessment Report 2019. Oregon Climate Change Research Institute

Fire Risk Drivers

WEC staff evaluated other utility's fire causes and applied its own field experience to determine the critical potential risk drivers. The categories listed below were identified as having the potential for causing powerline sparks and ignitions:

Aging Infrastructure

Foreign Contact

Equipment/Facility Failure

Drought

Vegetation Type/Fuels

High Winds/Contamination

Limited Accessibility

Lightning

Fire Weather/Red Flag Warning Conditions

Other Potential Risk Factors

The impacts associated with these risk drivers are discussed in the following sections.

Aging Infrastructure

WEC has been in operation since 1941. As a rural electric utility located on the east side of the Cascades, which is a relatively dry region of Oregon, some of the wood poles have been in service for over fifty years. Many of the older poles are cedar which are not as fire resistant as modern Douglas fir poles.

Foreign Contact

Utilities typically install bare wire conductors supported by insulators on overhead powerlines. Bare wire is lighter and easier to work with and a more cost-effective method to deliver energy than insulated/covered wire. However, a bare wire is susceptible to contact from foreign objects such as wildlife, vegetation, and foreign objects. Protection equipment helps isolate faults, but there are time delays associated with circuit breakers, reclosers, and fuses. These time delays are not fast enough, in many cases, to prevent sparking before tripping. Ejected molten metal, sparks, or burnt foreign objects can potentially ignite any fuels in the vicinity of the fault.

Equipment /Facility Failure

Equipment malfunction can occur during its service life for many reasons. Most equipment requires regular maintenance for optimal performance. Even though WEC's qualified personnel do regularly scheduled inspection and maintenance on all system equipment, internal defects not visible or predictable can cause destructive equipment failure resulting in the ejection of sparks and/or molten metal. The failure of hotline clamps, connectors, and insulators can result in wire failure and wire to ground contact. Transformers and capacitor banks can have internal shorts, potentially resulting in the ejection of materials, which could be an ignition source.

Drought

Oregon's interior areas and high deserts can experience abnormally dry conditions during late summer and fall, which can quickly exacerbate prolonged periods of drought. During the summer of 2020, large portions of the State of Oregon, including WEC's service territory, were categorized as having D3 (Extreme Drought) conditions. These conditions contributed to the state's record-breaking fire season in 2020.

Vegetation Type/Fuels

The service area topography ranges from dense pine forests in the Mt. Hood National Forest on the west side and vast open range areas characterized by widespread stands of dense western juniper, bitterbrush, sage, and grasses in central and eastern areas. Portions of the service area have steep and rugged terrain comprised of river valleys and eroded hillsides. Much of the service area's vegetation is shrubs and grasslands interspersed with hay fields and other agriculture. Most of Sherman County is comprised of dry-land farmlands and pastures which are prone to range fires. Tree mortality is a factor in the areas served by WEC, as most of the vegetation present is susceptible to insect damage.

High Winds/Contamination

The Columbia Gorge region can experience 30 to 65 mph winds throughout the year with sporadic higher-speed gusts. WEC's infrastructure can withstand Category 2 winds, which may exceed 56 mph, however, these winds can cause tree branches to break free and contact an electric conductor or blow trees from outside the rights-of-way (ROW) into the power lines. High wind gusts may also blow objects such as tarps and lawn furniture into the conductors. Vegetation and foreign objects in the lines can result in faults, arcing, or downed lines, sometimes causing an ignition. High wind events are also a potential cause of wire-to-wire contact. Conductors can sway under these conditions, and if extreme, wire-to-wire contact can occur. When two or more energized conductors touch, they can emit sparks or cause fuses to open emitting sparks and ejecting molten material.

Limited Accessibility

The 5,000 square mile service area is crisscrossed by steep rolling hills, sharp cliffs and hundreds of rivers and river breaks. It can take several hours to reach equipment in some remote locations, due to the indirect routes and natural barriers. Many circuits are routed cross-country over difficult terrain with no vehicle access. These factors negatively impact the inspection and outage response times for WEC line crews.

Lightning

Twenty million lightning strikes hit the ground in the U.S. every year⁴. Many possible effects of a direct strike to power lines or structures include flashovers, ignition of the wood pole, melted and broken conductor, or ground wire damage. While the flash density for the western states is comparatively low⁵, in August alone, nearly 14,000 dry lightning strikes caused almost 900 fires in California over a three-day period. Several large wildfires historically were caused by lightning.

Fire Weather/Red Flag Warning Conditions

The National Weather Service issues warnings at the onset or possible onset of critical weather and dry conditions that can rapidly increase wildfire activity. A Red Flag Warning (RFW) is the highest-level alert and is issued when weather events may result in extreme fire behavior within 24 hours. A Fire Weather Watch, one level below an RFW, goes out when weather conditions over the next 12-72 hours put fire danger at a high level. During an RFW, WEC crews limit vegetation management (VM) and construction activities. If critical work must happen in an elevated fire risk area, VM and line crews have fire suppression equipment on-site, including water backpacks, shovels, and fire rakes. After a crew has completed work in a remote or high-risk area, designated staff remain behind on fire-watch for up to three hours to ensure no ignitions have occurred.

⁴ National Lightning Detection Network (NLDN)

⁵ https://www.vaisala.com/sites/default/files/documents/2018%20Annual%20Lightning%20Report_1.pdf

Other Potential Risk Factors

Construction projects by non-WEC crews are another possible cause of ignition. Construction equipment, vehicles, and non-utility personnel working near power lines can contact conductors, causing a faulted condition. Excavation work performed without locating underground utilities is another hazard. Tools and vehicles can be sources of sparks or ignition as well. For example, a vehicle driven over dry grass/brush can cause ignition when vegetation contacts a hot surface of the vehicle's undercarriage. For these reasons, WEC equips its vehicles with fire suppression equipment and trains its staff to respond to fires and properly use fire suppression equipment.

Key Risk Impacts

The aforementioned risks have many possible outcomes. The list below outlines some of the worst-case scenarios and consequences:

Personal injuries or fatalities to the public, employees, and contractors

Damage to public and/or private property

Damage and loss of WEC owned infrastructures and assets

Impacts on reliability and operations

Damage claims and litigation costs, as well as fines from governing bodies

Damage to WEC's reputation and loss of public confidence

WEC's Asset Overview

Power is provided to WEC customers by way of bulk substations, overhead sub-transmission lines, overhead and underground distribution line assets. Table 2 depicts a high-level description of WEC's T&D assets.

Table 2. Asset Description

ASSET CLASSIFICATION	ASSET DESCRIPTION
Transmission Line Assets	Approximately 94 miles of conductor, sub-transmission structures, and switches at 69 kV.
Distribution Line Assets	<p>Approximately 1,495 miles of overhead (OH) conductor, cabling, transformers, voltage regulators, capacitors, switches, and line protective devices operating at 12.5 kV.</p> <p>Approximately 117 miles of underground (UG) conductor, cabling, transformers, voltage regulators, switches, and line protective devices operating at or below 12.5 kV</p>
Substation Assets	Major equipment such as power transformers, voltage regulators, capacitors, reclosers, relays, open-air structures, switchgear, and control houses in 10 substation facilities.

Fire Threat Assessment in WEC Service Territory

As part of the risk analysis process, WEC examined its asset locations to identify risks unique to its service area. This chapter will provide an overview of the service area properties and associated risks, which are factored into the wildfire mitigation strategy. The WEC service area is in north central Oregon along the Columbia River Gorge.

Wildfire Risk in the Service Area

The fire history represents the large fire⁶ history from 2000 through 2019. Historically, most large fires have occurred in the central and eastern regions where dry rangeland grasses and shrubs provide an easily ignitable and continuous fuel source. These grass and brush fires are a regular occurrence and tend to cover large areas very quickly. Lighting was the source of approximately 35% of all ignitions in Oregon during 2018⁷, the remainder being human caused. While lower intensity grass and rangeland fires are more common, in the summer of 2020, several intense forest fires burned in Willamette and Mt. Hood

⁶ Large Fire as defined by the National Wildland Coordinating Group, is any wildland fire in timber 100 acres or greater, and 300 acres or greater in grasslands/rangelands, or has an Incident Management Team assigned to it.

⁷ 2018 Pacific Northwest fire Season Summary

National forests. The lightning-caused White River fire of 2020 burned over 17,000 acres in the southwest corner of the WEC's service territory.

The Mid-Columbia area includes a mix of open stands of Western Juniper, conifer forests, bitterbrush, sage, and grasslands maintained by frequent low to moderate intensity fires. Effective wildland fire suppression policies over past decades, combined with increased housing development in the wildland-urban interface (WUI), has resulted in an overgrowth of trees and ladder fuels in proximity to people and infrastructure needed to support them. Large stand replacement fires and the more frequent low-intensity fires have not been allowed to burn, causing overly dense conditions and high severity fires. While the Mid-Columbia and its surrounding landscape have a relatively low strike density compared with regions of the eastern US, lightning does play a large role in the fire frequency. Data from the 2013 West Wide Wildfire Risk Assessment indicates that the Mid-Columbia region has a high percentages of wildland acres subject to Fire Risk, Wildland Development Areas, Fire Effects, or Fire Threat. Other areas of high vulnerability are within wildland-urban interface communities.

Wildland Urban Interface (WUI)

The United States Forest Service (USFS) defines the WUI as a place where humans and their development meet or intermix with wildland fuels. The development of wildland areas creates two problems related to wildfire. First, growth in WUI designated areas results in an increased chance of wildfire ignitions since electrical powerlines must traverse these wildlands to reach customers. Second, wildfires that occur will pose a greater risk to lives and homes, they will be hard to fight, and letting natural fires burn becomes impossible.

WUI perimeters were identified and mapped using the data from the United States Department of Agriculture (USDA) in conjunction with the Spatial Analysis for Conservation and Sustainability (SILVIS Lab) at the University of Wisconsin-Madison⁸. Although the idea of a wildland-urban interface is easily understood and the term widely used, a specific definition is needed to determine where it occurs and map its location. The definition we use here is based on a report prepared for the Council of Western State Foresters on WUI fire risk (Teie and Weatherford 2000) and was later published in the Federal Register⁹.

The WUI is composed of both interface and intermix communities. The distinction between these is based on the characteristics and distribution of houses and wildland vegetation across the landscape. Intermix WUI refers to areas where housing and wildland vegetation intermingle, while interface WUI refers to areas where housing is in the vicinity of a large area of dense wildland vegetation.

The USFS has established five classes of WUI in its assessment:

WUI Intermix: Areas with ≥ 16 houses per square mile and ≥ 50 percent cover of wildland vegetation

WUI Interface: Areas with ≥ 16 houses per square mile and < 50 percent cover of vegetation located < 1.5 miles of an area ≥ 2 square miles in size that is ≥ 75 percent vegetated

Non- WUI Vegetated (no housing): Areas with ≥ 50 percent cover of wildland vegetation and no houses (e.g., protected areas, steep slopes, mountain tops)

Non-WUI (very low housing density): Areas with ≥ 50 percent cover of wildland vegetation and < 16 houses per square mile (e.g., dispersed rural housing outside neighborhoods)

Non-Vegetated or Agriculture (low and very low housing density): Areas with < 50 percent cover of wildland vegetation and < 128 houses per square mile (e.g., agricultural lands and pasturelands)

⁸ <http://silvis.forest.wisc.edu/data/wui-change/>

⁹ "Urban wildland interface communities within the vicinity of federal lands that are at high risk from wildfire. Notice." 66. Federal Register 3(2001 January 4): 751-777.

Fire Threat Assessment Mapping

The Wildfire Hazard Potential (WHP) map is a raster geospatial product produced by the USDA Forest Service, Fire Modeling Institute that can help to inform evaluations of wildfire risk or prioritization of fuels management needs across very large landscapes (millions of acres). The specific objective of the WHP map is to depict the relative potential for wildfire that would be difficult for suppression resources to contain. The 2018 version was built upon spatial datasets of wildfire likelihood and intensity generated for the conterminous U.S. in 2016 with the Large Fire Simulator (FSim), as well as spatial fuels and vegetation data from LANDFIRE 2012 and point locations of past fire occurrence (ca. 1992 - 2013). Areas mapped with higher WHP values represent fuels with a higher probability of experiencing torching, crowning, and other forms of extreme fire behavior under conducive weather conditions, based primarily on landscape conditions at the end of 2012¹⁰.

On its own, WHP is not an explicit map of wildfire threat or risk, but when paired with spatial data depicting highly valued resources and assets such as communities, structures, or powerlines, it can approximate relative wildfire risk to those resources and assets. WHP is not a forecast or wildfire outlook for any season as it does not include any information on current or forecasted weather or fuel moisture conditions. It is instead intended for long-term strategic planning and fuels management tool. To determine fire threat levels within WEC's service area, the electrical system was overlaid on the WHP maps. Factors such as fire history, topography and physical access are considered in the risk analysis. Wildfire risk designations can be derived from many sources depending on the time period the data is to be applied. Analysis for this WMP is for long-term planning, therefore weather-based mapping was not included in this WMP.

Assets within Wildfire Hazard Potential Tiers

Table 3 (following) provides a high-level overview of WEC assets.

Table 3. Overview of WEC's T&D Assets within WHP Tiers

¹⁰ <https://www.fs.usda.gov/rds/archive/Catalog/RDS-2015-0046-2>

Evaluation of Higher Risk Areas

Assets	Total	Low		High		Very High	
	Line-miles	Line-miles	%	Line-miles	%	Line-miles	%
69kV Sub-Transmission	94	24	26%	70	74%	0	0%
12.5kV Distribution	1,612	232	14%	1,087	67%	293	18%
Total Transmission and Distribution	1,706	256	15%	1,157	68%	293	17%
Substations	10	2	20%	6	60%	1	10%

Regardless of their relative location to the High and Very High zones, the areas discussed below are considered high risk due to factors such as high demand loads, wildfire history, vegetation type, and topography. These circuits are given priority in the inspection and clearance work schedule. Visual inspections are performed to identify:

- Proper vegetation clearance from primary and secondary wires; and
- Condition of wood poles, cross arms, and other support structures; and
- Review and prioritize pending maintenance tags.

Seven Mile: This area has high load from large homes with large service demands. This area is typical of the WUI intermix where the distribution line traverses wide areas inaccessible by vehicle and difficult to inspect and service. Population density is higher in the areas compared to the rest of the WEC service area. Vegetation is low growing scrub brush and scrub oaks growing under the lines with a mix of deciduous and conifer trees. Located in the Very High WHP tier.

Dufur: Circuits from the Pine Hollow substation provide service to irrigated farmlands while traversing dryland farms with cross county routing of lines over undeveloped, steep terrain. No vehicle access on many line sections. Contains service to wildland development areas and located in the High and Very High WHP tiers.

Pine Hollow: This is a higher density WUI intermix area with a combination of dry rangeland fuels, oak, and conifers transitioning to pine forestland as the system enters the Mt. Hood National Forest. Located in the Very High WHP tier.

Wildfire Prevention Strategy and Programs

WEC has proactively implemented many measures to address potential wildfire risks over the years. The WMP outlines existing fire mitigation efforts and identifies new processes WEC may employ moving forward.

Generally, the WMP describes specific programs WEC has embarked on to mitigate wildfire risks. Many of the programs, however, are multi-year and programmatic. While some have an immediate startup period, full implementation may occur when processes and methods mature.

Several of WEC's current strategies and programs do not fall within any timeframe but remain situational based on certain real-world events. These conditions are predominantly weather and vegetative fuel-related and not associated with time periods (e.g., in 2020 or within five years). Similarly, WEC's emergency preparedness and response plans, post-incident recovery, restoration, and remediation activities and programs to support customers impacted by a wildfire are event-driven and are not timeframe-dependent. The co-op updates these practices as new information emerges and then adopts improved practices.

Table 4. Activities That Address Wildfire Risk Factors

RISK FACTOR	PROPOSED MITIGATION
Fuel Source	Vegetation Management Fuels Reduction Line Inspections Rights of Ways (ROW) Maintenance Enhanced inspection intervals in high-risk areas
Wire to Wire Contact	National Weather Service monitoring Increased inter-phase line spacing Undergrounding of distribution lines Reduced span length in high wind areas
Contact from Objects	Wildlife guards Increased vegetation clearances Avian protection specifications Insulated equipment
Equipment Failure	Routine maintenance Focused design and construction standards to reduce ignition sources Transmission and distribution line detailed inspections and bi-annual patrols Intrusive pole testing De-energizing of lines during certain conditions Infrared inspections of substation equipment
Field Work	WEC worker/contractor education on fire ignition sources Fire watch up to 3 hours after work completed in high-risk areas ¹¹ Tailgate meetings before fieldwork

Situational Awareness and Assessment Tools

Situational assessment is the process by which current operating conditions are determined. Situational Awareness is the understanding of the working environment, which creates a foundation for successful decision making and the ability to predict how it might change due to various factors.

For immediate and short-term situational awareness, mapping tools such as the USFS-Wildland Fire Assessment System (USFS-WFAS) help determine daily and short-term forecasted risk¹². WEC can generate daily or weekly fire weather status maps when needed to assess short-term wildfire conditions using this publicly available resource.

The National Weather Service (NWS) provide additional on-line predictive fire weather forecasting tools in the form of a current fire-weather outlook, a 2-day outlook, and a 3–8-day outlook¹³. Fire Weather Watch, Red Flag Warning announcements and real-time data from remote automated weather stations

¹¹ Oregon Revised Statute 477.665, 629-043-0030

¹² <https://www.wfas.net/index.php/fire-danger-rating-fire-potential--danger-32/fire-danger-subsets-fire-potential--danger-55>

¹³ https://www.spc.noaa.gov/products/fire_wx/

(RAWS) throughout the Pacific Northwest is also available from the NWS site¹⁴. Available RAWS data output includes minimum and maximum temperature, minimum and maximum relative humidity, fuel moisture and maximum wind gusts.

During fire season, local TV and radio broadcasts are monitored in addition to the above-named sources. WEC staff will monitor fire weather conditions and alerts from various sources to appropriately schedule work crews and prepare for immanent fire conditions.

Fire Precautionary Period

Historically, Mid-Columbia region fire season occurs between June and November, with mid-to-late August most vulnerable to extreme fire conditions. For this WMP, the Fire Precautionary Period is June 1st to October 31st. During this Fire Precautionary Period, WEC and Contractor crews shall:

Abide by the requirements of this WMP and be responsible for patrolling and preventing fires caused by vegetation management activities. Take all steps necessary to ensure co-op employees, subcontractors, and their employees prevent ignitions directly or indirectly during their work activities and operations. Permit and assist with periodic testing and inspection of required fire equipment. Operators shall certify compliance with specific fire precautionary measures in this WMP before beginning operations during the Fire Precautionary Period and shall update such certification when operations change.

Smoking is not permitted during fire season, except in a barren area or an area cleared to mineral soil at least three feet in diameter. Under no circumstances shall smoking be permitted during the Fire Precautionary Period while an employee is operating equipment or walking or working in grass and woodlands. Equipment service areas, parking areas, and gas and oil storage areas shall be cleared of all flammable material for a radius of at least 10-feet unless otherwise specified.

Recloser Operational Practices

There are reclosers on various distribution lines on WEC's system. Before line work or clearing operations, the reclosers are set to the "non-reclose" alternate setting to block the reclosing function. To disable, co-op personnel will physically go to each recloser to change the setting.

WEC is looking to incorporate more electronic vacuum reclosers into its distribution system for increased settings options and reliability with a reduction in maintenance requirements. With these recloser upgrades, WEC plan to set reclosers to "non-reclose" mode after assessing Situational & Conditional Awareness for fire weather zones affected by Red Flag Warnings, Fire Weather Watch or observed conditions during the Fire Precautionary Period described above.

Public Safety Power Shutoff

Public Safety Power Shutoffs (PSPS) are a recent development in the strategies used by electric utilities to help keep people and communities safe. A PSPS preemptively de-energizes power lines during high wind events combined with hot and dry weather conditions. WEC evaluates the efficacy of a PSPS. When considering a PSPS, WEC also examines the impacts on fire response, water supply, public safety, and emergency communications.

WEC considers the external risks and potential consequences of a PSPS while striving to meet its main priority of protecting the communities and members we serve. They include:

Potential loss of water supply to fight wildfires due to loss of production wells and pumping facilities.
Negative impacts to emergency response and public safety due to disruptions to the internet and mobile phone service during periods of extended power outages.

Loss of key community infrastructure and operational efficiency that occurs during power outages.
Medical emergencies for members of the community requiring powered medical equipment or refrigerated medication. Additionally, the lack of air conditioning can negatively impact medically vulnerable populations.

¹⁴ <https://www.weather.gov/wrh/fire?wfo=pdt&LAT=45.6486&LON=-120.0091>

Negative impacts on medical facilities.

Traffic congestion resulting from the public evacuation in de-energized areas can lengthen response times for emergency responders.

Negative economic impacts from local businesses forced to close during an outage.

The inability to open garage doors or motorized gates during a wildfire event can lead to injuries and fatalities.

Ability to obtain fuel for trucks and equipment.

The risks and potential consequences of initiating a PSPS are significant and extremely complex. Based on the above considerations, WEC reserves the option of implementing a PSPS when conditions dictate. While WEC believes the risks of implementing a PSPS far outweigh the chances of its electric overhead distribution system igniting a catastrophic wildfire, the PSPS provides a last resort tool and another option in a crisis.

On a case-by-case basis, WEC has historically and will continue to consider de-energizing a portion of its system in response to a known public safety issue or response to a request from an outside emergency management/response agency. Any de-energizing of the lines may be performed in coordination with critical local partner agencies keeping all parties' best interests in mind.

If conditions on the ground indicate that a wildfire threat is imminent, WEC's staff has the authority to recommend de-energizing select distribution circuits. A decision is based on multiple triggers accompanied with the unique understanding of the WEC system, including any enterprise risks involved. No single element is determinative. WEC relies on weather data from various sources, including the National Weather Service, NDFRS, and the USFS Wildfire Assessment System.

Risk triggers for the potential de-energizing of circuits:

Imminent fire danger

Critically dry vegetation that could serve as fuel for a wildfire

Low humidity levels

RFW declaration by the NWS

Temperatures over 100°F

Winds projected beyond 40 mph in high-risk areas

Mandatory fire orders in effect (as directed by any Agency Incident Commander)

On-the-ground observations from WEC or other agency field staff

Active wildfire in the service area

WEC will monitor the evolution of PSPS implementation by other Pacific Northwest electric utilities to refine its evaluation of this vital topic.

Infrastructure Inspections and Maintenance

Recognizing the hazards of equipment that operate high voltage lines, WEC maintains a formal inspection and maintenance program for distribution, transmission, and substation equipment. The OM and OS oversee most of the time-based system inspection programs. The Field Engineer oversees the wood pole inspection program. WEC currently patrols its system regularly and is increasing the frequency of inspections in high-risk areas. Table 5 summarizes the inspection schedule for all assets, while the following sections outline inspection practices for the utility.

Oregon Administrative Rules Chapter 860-024-0011 provides inspection schedule requirements for electric distribution and transmission facilities. These standards require that an operator of electric supply facilities to:

Construct, operate, and maintain its facilities in compliance with the Commission Safety Rules.

Conduct detailed inspections on a prescribed schedule of its overhead facilities to identify violations of the Commission Safety Rules.

Table 5. Inspection Program Summary

ASSET CLASSIFICATION	INSPECTION TYPE	FREQUENCY
Overhead Transmission	Safety Patrol Inspection	Minimum interval: Once every 2 years
	Detailed Inspection	Minimum interval: Once every 10 years*
	Intrusive Pole Test	Every 10 years
Overhead Distribution	Safety Patrol Inspection	Minimum interval: Once every 2 years
	Detailed Inspection	Minimum interval: Once every 10 years*
	Intrusive Pole Test	Every 10 years
Underground Distribution	Safety Patrol Inspection	Minimum interval: Once every 2 years
	Detailed Inspection	Minimum interval: Once every 10 years*
Substations	Detailed Inspection	Monthly
	Infrared Inspection	Annually

* OPUC required inspection rate of 10% per year for OH T&D line inspections

Definition of Inspection Levels

Safety Patrol Inspection: A simple visual inspection of applicable utility equipment and structures designed to identify obvious structural problems and hazards. Patrol inspections may occur in the course of other company business.

Detailed Inspection: Individual pieces of equipment and structures receive a careful visual examination, and using routine diagnostic testing as appropriate, and if practical and useful information can be gathered, opened and the condition of each rated and recorded.

Intrusive Pole Inspection: Involving the movement of soil, boring holes in the wood pole above and below the ground line, checking for decay, and installing a fumigant.

Safety Patrol Inspections

WEC has a system patrol process complying with OAR 860-024-0011 requirements, including bi-annual patrol inspections for the system infrastructure. Manual checks include system and vegetation patrols. WEC monitors vegetation during its system patrols and directs a VM contractor to conduct additional inspections and vegetation management. Efforts are made by line crews to identify and document all hazard trees during routine system patrols.

Electric utility operators must perform routine safety patrols of overhead electric supply lines and accessible facilities. The maximum interval between safety patrols is two years, with a recommended rate of 50 percent of lines and facilities per year. Inspection of substations must occur within a 45-day maximum schedule.

WEC personnel look for visible signs of defects, structural damage, broken hardware, sagging lines, and vegetation clearance issues. Any anomalies found are addressed based on the severity of the defect. Routine patrol inspections are conducted on a two-year cycle on all transmission and distribution lines and equipment. In the Very High Tier WHP areas, routine safety inspections occur annually before fire season.

Detailed T&D Inspections

Detailed inspections of the overhead transmission, overhead, and underground electric distribution system fall within a 10-year cycle to ensure all equipment is assessed on a regular schedule. Inspections and maintenance employ measures intended to protect the worker, the public, and the system's reliability. The inspection cycles seek to ensure safety and reliability based on standards found in Oregon Administrative Rules (OAR) 860-024-0011.

Qualified personnel perform all inspections. System equipment found in need of maintenance or repair is categorized depending on the severity of the condition. Repairs are done in order of rating per OAR 860-024-0012.

A record of the inspections and maintenance performed will be submitted to the OPUC when requested and maintained by the appropriate office personnel. The maximum interval between detailed inspections of overhead and underground facilities is ten years, with a recommended inspection rate of 10 percent per year. During the fifth year of the inspection cycle, the operator must:

Report to the Commission that 50 percent or more of its total facilities inspections are complete.

Report to the Commission that less than 50 percent of its total facilities have been inspected pursuant to this rule. Provide a plan for Commission approval to inspect the remaining percentage within the next five years. The Commission may modify the plan or impose conditions to ensure satisfactory inspection for safety purposes.

Detailed T&D Inspection Description

Detailed Line Inspections (DLI) consist of walking and driving to examine all WEC poles, conductors, and equipment. Visual aids assist with evaluating and detecting potential damage to above-ground components. "Sound" and intrusive tests on the wood poles detect decay or rot during detailed inspections. Inspectors are looking for:

Mechanical damage

Loose hardware

Guy wire and anchor condition

Disconnects and fuse holder condition

Insulators and conductor condition

Condition of transformers and reclosers

Ground conductors and moldings

Pole ID signs and other minor hardware

Raptor nests

Wood rot

Fire damage

Third-party attachments

Adherence to the National Electric Safety Code (NESC), including all clearances and safeguards.

Wood Pole Intrusive Inspection

The pole inspection work is performed by an outside contractor and overseen by WEC's Field Engineer. This inspection work is performed and tracked using Osmose pole inspection software. WEC has over 30,000 wood poles in its system, inspects approximately 10% annually, and replaces approximately 150-200 poles each year. This schedule ensures all WEC wood poles are inspected once every 10 years. This interval is in line with RUS Bulletin 1730B-121 regarding wood pole inspection and maintenance practices.

Instructions to Inspectors

WEC considers and prioritizes maintenance work by assessing the most urgent needs. The inspector will document the overhead and underground systems' condition, recording defects, deterioration, violations, safety concerns, or any other factors requiring attention on the inspection records. The inspection should focus on any hazards that could affect the system's integrity or the safety of line workers and the public. Inspection data (overhead & underground) will be prioritized and issued as follows per OAR 860-024-0012 safety standards:

Priority # 1 – Immediate hazard: A violation of the Commission Safety Rules posing imminent danger to life or property must be repaired, disconnected, or isolated by the operator immediately after its discovery. Also, any conditions that may affect the system's integrity or present a hazard to workers or the public pose an immediate hazard. All Priority #1 repairs will be responded to immediately, and appropriate action taken until the hazardous condition is remedied.

Priority # 2 – Non-emergency repair condition: Except as otherwise provided by this rule, the operator must correct violations of Commission Safety Rules no later than two years after discovery. These are conditions requiring maintenance, which can be scheduled to maintain the system's integrity. Priority #2 repairs will be prioritized by urgency and scheduled to have appropriate repairs to correct the condition within one year where practicable.

Priority # 3 – Non-emergency repair condition: An operator may elect to defer correction of violations of the Commission Safety Rules that pose little or no foreseeable risk of danger to life or property to correction during the next major work activity. Conditions that do not present a situation could jeopardize the system's safety, line workers, and the general public. Priority #3 repairs are completed within the time interval recommended.

In no event shall a deferral under section 860-024-0012 extend for more than ten years after discovery. The operator must develop a plan detailing how it will remedy each such violation. If a deferral affects more than one operator, all affected operators must agree to the plan. If any affected operators do not agree, the correction of the violation(s) may not be deferred.

Substation Detailed Inspections

The Preventive Maintenance Plan provides for regular inspections of substations. Qualified personnel will use prudent care while performing inspections following all required safety rules to protect themselves, other workers, the general public, and the system's reliability.

A "Detailed" inspection is defined as where an individual piece of equipment and or structures receives a careful visual examination and a routine diagnostic test as appropriate. Substations are inspected monthly, which exceeds OPUC regulations.

A detailed inspection involves a thorough look at the system to confirm that there are no structural or mechanical deficiencies, hazards, or tree trimming requirements. Detailed inspections of substation assets include, but are not limited to:

- Broken or loose hardware
- Vandalism or damage to any equipment
- Oil or gas leaks
- Condition of the bus
- Insulators and other hardware
- Condition of the control house

Condition of the poles/structures and lines exiting the substation
Condition of the disconnects and fuses for signs of damage and connectivity
Insulators /Bushing/Arrestors
Risers and Conduits
Transformers
Reclosers
Batteries
Capacitor Bank
Circuit Breakers
Fire Detection and Suppression System (where applicable)
Grounding System
Voltage Regulators or Tap Changers
Perimeter fence security
Lighting and security cameras

WEC uses infrared (IR) detection technology to assess the condition of substation equipment on an annual basis. Transformer cooling oil is tested annually.

Standards for Record-Keeping and Reporting

General Instructions: Facilities meeting standards and not requiring maintenance will be recorded and filed for future reference. Conditions other than satisfactory go into WEC's asset management database, and the OM generates a list of deficiencies and monitors the completion of repair work. Photos of the deficient asset accompany the inspection record. The inspector collects the following information at the time of inspection:

Item inspected
Name of inspector
Date of inspection
Location of asset
Facility ID (Pole #)
Damaged (yes/no)
Work order priority #1,2,3
Notes regarding damage (if applicable)
Pole clearing required (yes/no)
Vegetation notes (if applicable)
Height of pole
Joint owner facility
Vegetation contact with conductors (yes/no)

OAR 860-024-0011(d) establishes records retention requirements for each level of inspection. The Utility must maintain adequate written records of policies, plans, and schedules to show inspections and corrections meet compliance with this rule and OAR 860-024-0012. WEC makes these records available to the Commission upon its request.

Vegetation Management (VM)

WEC personnel and contractors perform ground-based inspections of tree and conductor clearances and hazard tree identification. When conducting routine maintenance of power lines and related equipment, WEC makes efforts to identify and remove high-risk fuel sources as needed. WEC line crews also address vegetation concerns in response to service calls. Any VM issues that cannot be immediately handled by the line crews are referred to the VM contractor for priority trimming.

WEC meets the minimum standards for conductor clearances from vegetation to provide safety for the public and utility workers, reasonable service continuity, and fire prevention. As an operator of electric supply facilities, WEC's Vegetation Management (VM) program keeps appropriate records to ensure that

timely trimming occurs to maintain the designated minimum clearances. These records are made available to the OPUC upon request.

Vegetation Management Trimming Standards

All pruning shall be performed with consideration given to the impact of that pruning on line reliability, individual tree condition, and tree aesthetics. In general, pruning adheres to the American National Standards Institute (ANSI) Std. A300 concepts and utility directional pruning, supporting proper pruning/tree health while maximizing the pruning cycle. WEC crews follow standard practices for safety, reliability, board policies, compliance with the NESC¹⁵, and OPUC OAR 860.024.0016/0017 requirements for public safety and fire prevention. Work performed to the above guidelines provide reasonable service continuity, public safety, and guard against wildfire damage caused by supply conductors.

T&D System Vegetation Management Schedule

WEC contracts with a full-time, tree trimming crew for year-round vegetation management work. Beginning in 2021 a second VMP crew will be added for 6 months of the year to address hot spots and hazard tree removal as well as assisting with enhanced trimming in high-risk areas before fire season. Scheduled patrols ensure all lines are inspected for vegetation hazards and systematically trimmed. The patrols identify targeted areas for vegetation pruning or removal. On-going, year-round ground-based field patrols ensure compliance with state and federal regulatory requirements and alignment with standards in OAR 860-024.

Pole Clearing

WEC performs ground clearing around transmission poles when identified as being an area of need.

Vegetation to Conductor Clearance

See WEC VMP.

Hazard Trees

See WEC VMP.

Fire Season

When conditions of fire hazard exist each summer, the Oregon Department of Forestry, United States Forest Service, or the Bureau of Land Management, (together “Agencies”) declare fire season to be in effect. Title 36 of CFR 261.50(a) gives each Forest Supervisor the authority to issue orders which close or restrict use of the area over which he/she has jurisdiction. As conditions warrant, the forester will issue an Industrial Fire Precaution Level¹⁶ (IFPL) at one of four levels. Because conditions vary across the state, each protection district will declare fire season separately. The declaration of fire season affects utility and other commercial operations and as well as recreational activities by the public. Fire season remains in effect until terminated by each Agency or by reducing the IFPL until conditions for fire hazard no longer exist.

WEC/Contractor Tools and Equipment

Fire Tools and Equipment: During the fire season, WEC and its contractors meet relevant OAR and Agency regulations’ minimum requirements while working on public lands. Fire tools are present on all vehicles and at operating sites per Agency requirements.

Fire Mitigation Construction

WEC is taking steps to harden the electrical system with several upgrades and design changes. These designs stem from many decades of engineering experience and the adoption of emerging technologies. WEC’s design practices continue to advance with the addition of newer safety and reliability-related

¹⁵ Rules 012,013 and 218

¹⁶ <https://www.oregon.gov/odf/fire/documents/industrial-fire-precaution-levels.pdf>

technologies. This advancement recognizes the importance of understanding and adapting to the challenges brought on by the use of public land, development in the WUI, and climate change. The following sections describe these projects.

Avian Protection Program

Since 2010, WEC has employed design and construction standards to protect raptor and migratory birds. These measures have substantially reduced the electrocution risk to raptors and the number of injured wildlife. Concurrently, these measures have reduced the incidence of fire ignitions. On all new construction, crews install wildlife protective devices on pole mounted as well as substation equipment. Insulated jumpers are used throughout the system. Current avian protective measures include:

- Raptor Framing
- Insulated Equipment
- Wildlife Protective Guards
- Nesting Platforms adjacent to Structures
- Fiberglass Crossarms
- Insulated Jumpers
- Increased Phase Spacing
- Avian Perches above Crossarms

Underground Conductor

The undergrounding of overhead distribution lines eliminates the impacts of ice loading, improves reliability in high wind areas and functions as an effective wildfire mitigation strategy. While there are great benefits to underground distribution lines, these facilities take longer and cost significantly more to construct, maintain, and repair. To date, WEC has 117 miles of 12.5kV UG distribution line on its network and will prioritize future UG projects in heavily forested and high fire-risk areas.

Increased Phase Spacing

In certain areas that see high wind events, WEC has increased the spacing of conductors to reduce the incidence of clashing and contamination. This is the condition where conductors, or phases, contact each other due to swaying which can result in arcing, strand breakage, and in extreme cases downed lines. To reduce the potential for such incidents, WEC has also employed dropped neutral, offset neutral and shorter span lengths in high wind sectors.

Electronic Vacuum Reclosers

A recloser is an automatic, high-voltage electric switch. Like a circuit breaker in a household electric panel, these devices shut off electric power when trouble occurs, such as a short circuit. Reclosers will close back multiple times to detect if the problem still exists. If the problem was temporary, the recloser automatically resets and restores power¹⁷.

Many older reclosers use oil in current interruption by taking advantage of the non-conducting nature of the oil. This allows the arc to be extinguished in the oil once the contacts are opened inside the recloser. This oil provides basic insulation, and, in some cases, the same oil is used for timing and sequencing. Newer reclosers utilize a vacuum bottle to interrupt fault current. Electronic Vacuum reclosers provide fast, low energy interruption with long contact life, are oftentimes programable, and do not require the high maintenance demands of reclosers utilizing oil to extinguish an arc. Some reclosers can use electronic controls which allow settings to be changed without invasive procedures and can have alternate settings that can be activated under unique conditions like instances of fire concerns. Vacuum reclosers used in conjunction with electronic controls may also be adapted for remote operation and monitoring through system control and data acquisition technology (SCADA). WEC is transitioning to

¹⁷ <https://www.eaton.com/content/dam/eaton/products/medium-voltage-power-distribution-control-systems/reclosers/recloser-definition-information-td280027en.pdf>

electronic vacuum type breakers (includes line and substation reclosers) to improve sectionalizing capabilities, allow for non-reclose settings during the Fire Precautionary Period and eventual remote setting capabilities once a communication system has been established.

GIS Mapping

An electrical utility uses a network of physical facilities to provide electric power and energy to customers connected to those facilities throughout a geographical area. Each component of the distribution system (i.e., asset) and each meter have an approximate physical location and associated data. To plan, construct, maintain, and operate the distribution network it is necessary to create, manage and utilize this geospatial data. WEC is looking to integrated GIS mapping technology into its inspection and maintenance program. This will provide the ability to record and map all inspections and service work to ensure all assets are inspected and repaired on a prescribed schedule.

Workforce Training

WEC has developed rules and complementary training programs for its workforce to reduce the likelihood of an ignition. All field staff are:

Trained on the content of the WMP

Trained in proper use and storage of fire extinguishers

Required, during pre-job briefings, to discuss the potential(s) for ignition, environmental conditions (current and forecasted weather that coincides with the duration of work for the day)

Required to identify the closest fire extinguisher and other fire abatement tools

Required to report all ignition events to management for follow-up

Encouraged to identify deficiencies in the WMP and bring such information to management



Emergency Response & Preparedness Planning

WEC strives to minimize any impacts of any disruptive event impacts regardless of the size or scope while consistently focusing on the community’s most critical systems and infrastructure.

Crisis Communication Plan

During emergency situations, it is imperative that communications are handled clearly and in a timely fashion. Lack of communication increases the likelihood of distorted or false information being disseminated. WEC is always seeking to improve its emergency preparedness and response planning.

The purpose of the plan:

To guide co-op management in coping more effectively with unusual situations that could cause confusion and misunderstanding.

To provide a framework for prompt, accurate and effective communications with key audiences, including employees, members, and the news media during crisis situations.

Jurisdictional Structure

WEC has considered the jurisdictional structure of the service area when developing or implementing its strategic plan, including those related to wildfires. Approximately 47% of the land in Wasco County is publicly owned¹⁸. In Sherman County, approximately 13% of the land is publicly owned. Table 6 provides contact information for the various Offices of Emergency Management. The following describes the various stakeholders or districts with management responsibilities.

WEC serves areas in the following counties:

Wasco

Sherman

Jefferson

Gilliam

Wheeler

Oregon Department of Fish and Wildlife:

Central Oregon District

The Dalles Unit Office

The National Forests in the service area are managed by the following protection districts:

Mt. Hood National Forest – Mt. Hood Ranger District

Columbia River National Scenic Area

Tribal Lands:

Confederated Tribes of Warm Springs

Emergency Management Communication and Coordination

In response to active emergencies, WEC coordinates and collaborates with the local Department of Emergency Management (DEM) and relevant state agencies as a peer partner. During such emergencies, WEC may provide a utility representative to the county and/or city DEM to ensure effective communication and coordination.

WEC’s primary coordination point is Wasco County DEM, which in Wasco County is administered by the Sheriff’s office with the county Sheriff designated as the Director of Emergency Services. WEC’s MMS contact the local DEM and establish themselves as the duty officer for coordination. The OM or MMS acts as the communications officer during an emergency.

Contact information for the Offices of Emergency Management for all counties served, including the Confederated Tribes of Warm Springs, are listed in Table 6.

Reporting Fires

¹⁸ Wasco County CPAW Report

As soon as feasible WEC or their contractors shall notify proper law enforcement, fire department entities or Forest Service of any fires in the operating area or along roads being used by operators. Operators shall report all fires as soon as possible by calling 911. The relevant land management agencies listed in Table 6 should be contacted if large wildfire occurs on public lands.

When reporting a fire, WEC staff or Contractors are to provide the following information:

Name

Call back telephone number

Project Name

Location: Descriptive location (Reference Point), Intersection, GPS position etc.

Fire information: Including Acres, Rate of Spread and Wind Conditions.

Fire Response and Suppression Capabilities

The service area consists of approximately 5000 square miles of open space prone to natural and human cause wildfires. There are unincorporated areas that are not currently protected by any fire district. Existing fire districts have limited resources to protect the expansive land areas under their protection.

Rangeland Fire Protection Associations

Since the 1990s, numerous Rangeland Fire Protection Associations (RFPAs) have emerged in Oregon to authorize landowner participation in fire suppression alongside federal Bureau of Land Management (BLM) firefighters.

RFPAs consist of all-volunteer crews of local landowners that receive legal authority and training to respond to wildfires on private and state lands in areas with no existing fire protection.

The RFPAs do not operate out of designated stations but are notified through their personal cellphones to respond to rural wildfires occurring in their jurisdiction.

Oregon Department of Forestry (ODF) supports the associations through administrative guidance, some administrative cost reimbursement, fire suppression training and facilitating access to federal grants and surplus firefighting equipment.

The following fire suppression agency acronyms are used:

RFPA = Rangeland Fire Protection Associations

Table 6. Offices of Emergency Management

Coordination with Stakeholders

WEC understands the importance of proactive planning and coordinating closely with local governments, agencies, and customers.

Work Crew Communications

WEC or its contractors maintain reliable communications (e.g., cell phone, or radio) on job sites. All WEC vehicles are equipped with radios and line crews.

Community Outreach

Public outreach with the community on the importance of wildfire mitigation helps to reduce risk and can play a significant role. WEC encourages its members to take proactive steps to safeguard their homes from wildfire danger and prepare for emergency events. To help create an awareness of fire danger in the service area, WEC provides information on prevention and mitigation in its Ruralite Magazine publications, social media accounts, and website.

Defensible Space Requirements

In 1997, The Oregon Legislature passed the Oregon Forestland-Urban Interface Fire Protection Act (Senate Bill 360). Administered by the Oregon Department of Forestry (ODF), this law recognizes that homeowners need to actively protect their home from wildfire by reducing fuel around their home and driveway. SB-360 only applies to WUI interface areas on private land within the boundary of an

Region	Agency	Contact/Title	Phone	Address
Gilliam	Office of Emergency Management	Christina Fitzsimmons, Coordinator	541-384-2851	221 S. Oregon Street, Condon OR 97823
Jefferson County	Emergency Services	David Pond, Coordinator	541-475-6520 X4345	675 NW Cherry Lane Madras, OR 97741
Sherman County	Emergency Services	Dana Pursley-Haner, Director	541-565-3100	500 Court St. Moro, OR 97039
Warm Springs	Confederated Tribes of Warm Springs	Carmen Smith, Public Safety GM	541-553-1171	PO Box C, Warm Springs, OR 97761
Warm Springs	Confederated Tribes of Warm Springs	Danny Martinez, Tribal Emergency Manager	541-553-3345	PO Box C, Warm Springs, OR 97761
Wasco County	Office of Emergency Management	Sheridan McClellan, Emergency Manager	541-506-2790 (24hr) 541-296-5454	511 Washington Street, Suite 102 The Dalles, OR 97058

Oregon State Department of Forestry District. The law requires property owners in identified areas to reduce excess vegetation around structures and along driveways. In some cases, depending on the

property's rating classification, it is also necessary to create additional fuel breaks along property lines and roadsides.

The defensible space law provides guidance on clearance around homes and structures. Proper clearance to 100 feet dramatically increases the chance of a structure surviving a wildfire. As part of its overall approach to wildfire mitigation, WEC supports and promotes public awareness and adherence to these safety requirements. A compliance checklist and vegetation clearing diagram is provided in Appendix C.

Evacuation Levels

With large wildland fire events occurring nearly every summer, evacuation from residential areas has become commonplace. Local fire agencies determine when the need for evacuation exists, and the local county sheriff's department and other law enforcement agencies carry out an ordered evacuation. The North Central Oregon area (Wasco, Sherman, and Jefferson Counties) has adopted the following evacuation levels.

Level 1: Means **"BE READY"** for potential evacuation. There is a danger in your area. Monitor emergency service websites and local media outlets for information. If conditions worsen, emergency services personnel may contact you.

Level 2: Means **"BE SET"** to evacuate. You must prepare to leave at a moment's notice. There is significant danger in your area. This may be the only notice you receive from emergency personnel. If you feel threatened by the situation, evacuate immediately.

Level 3: Means **"GO"** evacuate now. Leave immediately! Danger to your area is current or imminent, and you should evacuate immediately. If you choose to ignore this advisement, you must understand that emergency services may not be available to assist you further. DO NOT delay leaving to gather any belongings or make efforts to protect your home. This will be the last notice you receive.

Public Emergency Alert Systems

WEC's alert notification can be used to notify members with important information during an emergency. Emergencies happen with little or no notice at any time of the day or night. With CAENS, the Office of Emergency Management can relay critical information to members about natural disasters or other emergencies that require immediate attention.

When a message is issued about a potential safety hazard or concern, messages will be sent to all standard voice and text communication devices that you have registered including landline phones, cell phones and more. If you do not confirm receipt of the message, the system will try to reach your second contact number or email. The system will continue trying to contact you until it receives a confirmation from you.

CAENS's service areas includes Wasco County, Sherman County, and Gilliam County, although citizens must register for the service via for their respective county.

Wasco: <https://member.everbridge.net/453003085612392/login>

Sherman: <https://member.everbridge.net/892807736724035/login>

Gilliam: <https://member.everbridge.net/892807736724035/login>

Hood River: <https://member.everbridge.net/892807736721762/login>

In Jefferson County, CodeRED emergency notifications allows the Sheriff's Office to warn citizens of danger. With CodeRED, the Sheriff's Office can call, text, or email, multiple individuals, and businesses to warn of dangerous suspects, flood, fire, or chemical spills.

Restoration of Service

Although WEC does not have a PSPS operational practice, if an outside emergency management/emergency response agency requests a power shutdown, or if WEC elects to de-energize segments of its system due to extreme weather, WEC staff will patrol the affected portions of the system before the system can be re-energized. Suspect equipment or distribution lines that cannot

immediately be patrolled will remain de-energized. Poles and structures damaged in a wildfire must be assessed and rebuilt as needed prior to re-energization. Periodic customer and media updates of restoration status prior to full restoration will be made.

Service Restoration Process

After a wide-spread outage, WEC work crews take the following steps before restoring electrical service after a de-energization event. These measures intend to protect the worker, members, the public, and the system's reliability.

Patrol: If the de-energization was a PSPS, crews patrol every line to ensure no hazards have affected the system during the outage. If an outage is due to wildfire or other natural disasters, as soon as it is deemed safe by the appropriate officials, crews inspect lines and equipment for damage, foreign contacts and estimate equipment needed for repair and restoration. Lines located in remote and rugged terrain with limited access may require additional time for inspection. WEC personnel assist in clearing downed trees and limbs as needed.

Isolate: Isolate the outage and restore power to areas not affected.

Repair: After the initial assessment, WEC supervisors, managers, and engineers meet to plan the needed work. Rebuilding commences as soon as the affected areas become safe. Repair plans prioritize substations and transmission facilities, then distribution circuits serving the most critical infrastructure needs. While the goal to reenergize all areas is as soon as possible, emergency services, medical facilities, and utilities receive first consideration when resources are limited. Additional crew and equipment are dispatched as necessary.

Restore: Periodic customer and media updates of restoration status before full restoration are posted on social media platforms and WEC's website. After repairs are made, power is restored to homes and businesses as quickly as possible. Members, local news, and other agencies receive notification of restored electric service.

Any electrical metering equipment in need of replacement after a fire event will need to be inspected by the State Electrical Inspector or done on a letter from the State electrical inspector of the office thereof

Monitoring and Auditing of the WMP

The WMP will be included as a discussion item on the agenda of regularly scheduled management meetings. WEC monitors the WMP and reports on its effectiveness to the Board of Directors on an annual basis. Reports of the Plan's progress and risk reduction impacts are developed annually and circulated to appropriate utility staff to generate collaborative discussions. The OM monitors the WMP's implementation and audits the specified objectives. The OM, or their designee, updates leadership with recommendations or proposed actions to enhance the Plan's objectives and strategies over time.

The WMP annual review aligns with WEC's existing business planning process which includes budgeting and strategic planning for a 3-5 year planning horizon.

Identify Deficiencies in the WMP

The OM is responsible for ensuring the WMP meets all the State of Oregon guidelines to mitigate its assets' risk of becoming the source or contributing factor of a wildfire. Staff responsible for assigned mitigation areas must vet current procedures and recommend changes or enhancements to build upon the Plan's strategies. Due to unforeseen circumstances, regulatory changes, emerging technologies, or other rationales, deficiencies within the WMP are reported to the OM.

The OM or their designee are responsible for spearheading discussions on addressing deficiencies and collaborating on solutions when updating the WMP. When deficiencies are identified, the OM and designated staff evaluate each reported deficiency to determine their validity. The GM and OM record the agreed upon corrective actions, plan steps for implementation and inclusion in future iterations of the plan.

*Wildfire Hazard Potential

****Fire Precautionary Period**

Programmatic QA/QC processes/T&D System Inspection QC Process

The OM manages the T&D line and substation assets and develops comprehensive inspection and maintenance programs. These programs ensure the safe operation of the T&D line and substation facilities. Key imperatives are to:

Reduce the risk of power-related wildfire.

Meet federal and state regulatory requirements.

Achieve reliability performance within mandated limits and to optimize capital and O&M investments.

Designated managers regularly monitor inspection and corrective maintenance records and diagnostic test results to adjust maintenance plans and develop new programs. WEC follows the best industry practices to develop its maintenance programs.

WEC's Operations Department is responsible for performing the inspections by contract agencies or in house crews and suggest corrective maintenance. If deficiencies are found, work orders are created by the OM. The priority for corrective maintenance is to remove safety hazards immediately and repair minor deficiencies according to the type of defect, severity of the risk level associated with the location of the asset. Work orders are monitored throughout the year to ensure timely completion via regular internal reports.

Vegetation Management QC Process

Contracted crews perform all VM and clearing work for the utility. Distribution system related VM work is field audited by the OM WEC line crews during daily utility line and inspection work. Quality control efforts monitor program effectiveness, overall tree work performance, and determine the adequacy of the VM work schedule. Excel spreadsheets are used to track the quality assurance work to monitor the VM program. The quality control results go under review, and deficient work is reissued to the contractor for corrective action.

Appendix A: Definitions

Commission: Oregon Public Utility Commission

Fire Hazard¹⁹: “Hazard” is based on the physical conditions that give a likelihood that an area will burn over a 30 to 50-year period without considering modifications such as fuel reduction efforts.

Fire Risk: The phrase ‘Fire Risk’ can be defined as the Likelihood of a fire occurring multiplied by the Severity of the fire i.e. the ‘harm potential’ and consequences in terms of loss of life, fire spread, damage etc.

Fire Weather Watch: The National Weather Service issues Fire Weather Watches to alert fire departments of the onset, or possible onset, of critical weather and dry conditions that could lead to rapid or dramatic increases in wildfire activity. A Fire Weather Watch is issued when weather conditions could exist in the next 12-72 hours. A Fire Weather Watch is one level below a Red Flag Warning, but fire danger is still high. The type of weather patterns that can cause a watch or warning include low relative humidity, strong winds, dry fuels, the possibility of dry lightning strikes, or any combination of the above.

Flashover: A type of fault or short circuit caused by a lightning strike to a live electrical system. Faults can occur anywhere along power lines- at transformers, poles, towers, and substations. Arcing from flashovers can cause extensive damage to electrical equipment, even more so than the lightning that caused them.

Hardening: Modifications to electric infrastructure to reduce the likelihood of ignition and improve electrical assets' survivability.

Hazard Tree: Dead, dying, and diseased trees; multi-stemmed conifers with included bark; and excessively leaning trees (including those that are growing outside of the right-of-way limits) that could damage overhead electrical facilities if they failed structurally.

High Fire Threat Area (HFTA): The HFTA identifies areas of an elevated and high fire risk related to electric utility facilities.

Industrial Fire Precaution Level (IFPL): Industrial Fire Precaution Level. Activated when needed during the summer fire season, IFPL is an activity closure system to reduce wildfire risk. By law, it applies to woods workers and other industrial forest users on 13 million acres of unimproved private and state forestlands protected by the Forest Service. Levels range from Level-1 to Level-4.

Precautionary Period: The time of year when wildfire conditions are expected to occur in the service area. For this WMP, the Fire Precautionary Period is June 1st to October 31st of any year.

Raster: Raster data is any pixelated (or gridded) data where each pixel is associated with a specific geographical location. The value of a pixel can be continuous (e.g., elevation) or categorical (e.g. land use). A geospatial raster is only different from a digital photo in that it is accompanied by spatial information that connects the data to a particular location. This includes the raster's extent and cell size, the number of rows and columns, and its coordinate reference system (or CRS).

Recloser: Recloser is a device used in electric distribution systems to interrupt the circuit to clear faults. Automatic reclosers may have electronic controls and vacuum interrupters that automatically recloses to restore service if a fault is temporary. Several attempts may be made to clear and re-energize the circuit, and if the fault still exists, the recloser locks out. Reclosers are made in single-phase and three-phase versions and use oil or vacuum interrupters.

Red Flag Warning (RFW)²⁰: A term used by fire- weather forecasters to call attention to limited weather conditions of importance that may result in extreme burning conditions. It is issued when it is an on-going event, or the fire weather forecaster has a high degree of confidence that Red Flag

¹⁹ Source: http://www.fire.ca.gov/fire_protection/downloads/siege/2007/Overview_Glossary.pdf

²⁰ Source: <https://w1.weather.gov/glossary/index.php?word=Red%20Flag%20Warning>

criteria will occur within 24 hours of issuance. Red Flag criteria can happen whenever a geographical area is in a dry spell for a week or two, or a shorter period if before spring green-up or after fall color. Also, when the National Fire Danger Rating System (NFDRS) is high to extreme, and the following forecast weather parameters met:

A sustained wind average of 15 mph or greater

Relative humidity less than or equal to 25 percent; and

A temperature of greater than 75 degrees F

In some states, dry lightning and unstable air are criteria. A Fire Weather Watch may be issued before the RFW.

Readily Climbable: Vegetation having both of the following characteristics:

Low limbs, accessible from the ground and sufficiently close together so that a child or average person can climb the vegetation without using a ladder or other special equipment; and

The main stem or major branch would support a child or average person either within arm's reach of an uninsulated energized electric line or within such proximity to the electric line that the climber could be injured by direct or indirect contact with the line.

SCADA: SCADA is an acronym for Supervisory Control and Data Acquisition. SCADA generally refers to an industrial computer system that monitors and controls a process. In the transmission and distribution elements of electrical utilities, SCADA will monitor substations, transformers, and other electrical assets. It is possible to control or reset equipment remotely using SCADA.

Substation: Part of the electrical generation, transmission, and distribution system, substations transform voltage from high to low, or the reverse, or perform any other essential functions. Between the generating station and consumer, electric power may flow through several substations at different voltage levels. A substation may include transformers to change voltage levels between high transmission voltages and lower distribution voltages or at the interconnection of two different transmission voltages.

Transmission and Distribution (T&D): At WEC, for line maintenance purposes, the transmission system includes 69 kV and 115kV lines tied to points of delivery. The distribution system includes 12 kV lines not connected to points of delivery.

Utility Cooperative: A cooperative tasked to deliver utilities such as electricity, water, or telecommunications to its members. Profits are either reinvested for infrastructure or distributed to members in the form of "patronage" or "capital credits," which are dividends paid on a member's investment in the cooperative. Each customer is a member and owner of the business, meaning all members have equal individual authority, unlike investor-owned utilities. The number of shares held governs the extent of individual authority.

Vegetation: Trees, shrubs, and any other woody plants.

Vegetation Management: A broad term that includes tree pruning; brush removal using power saws and mowers; the judicious use of herbicides and tree growth regulators; hazard tree identification and removal; the implementation of strategies to minimize the establishment of incompatible species under and near power lines; and the control of weeds.

Wildfire²¹: “Also called wildland fire, uncontrolled fire in a forest, grassland, brushland or land sown to crops.” “Fire danger in a wildland setting varies with weather conditions: drought, heat, and wind participate in drying out the timber or other fuel, making it easier to ignite. Once a fire is burning, drought, heat, and wind all increase its intensity. Topography also affects wildfire, which spreads quickly uphill and slowly downhill. Dried grass, leaves, and light branches are considered flash fuels. They ignite readily, and fire spreads quickly in them, often generating enough heat to ignite heavier fuels such as tree stumps, heavy limbs, and the forest floor's organic matter. Such fuels, ordinarily slow to kindle, are difficult to extinguish. Green fuels—growing vegetation—are not considered flammable, but an intense fire can dry out leaves and needles quickly enough to allow ready ignition. Green fuels sometimes carry a special danger: evergreens, such as pine, cedar, fir, and spruce, contain flammable oils that burst into flames when heated sufficiently by the searing drafts of a forest fire.”

Wildfire Mitigation Plan (WMP or Plan): A comprehensive plan to reduce the threat and severity of wildfire within an electric utility's service area. A WMP includes preventive strategies and programs adopted by the utility to minimize the risk of its facilities causing wildfires along with its emergency response and recovery procedures.

Wildlands: forests, shrublands, grasslands, and other vegetation communities not been significantly modified by agriculture or human development*. Fire managers follow the National Wildfire Coordinating Group (which coordinates programs of participating wildfire management agencies nationwide) more specific definition. It refers to an area in which development is nearly non-existent (except for roads, railroads, power lines, and similar transportation facilities); structures, if any, are widely scattered.

²¹ Source: <https://www.britannica.com/science/wildfire>

Appendix B: Acronym Glossary

ANSI	American National Standards Institute
BIA	Bureau of Indian affairs
BMP	Best management practices
BOF	Board of Forestry
BPA	Bonneville Power Administration
WEC	Wasco Electric Cooperative
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CPUC	California Public Utilities Commission
DBH	Diameter at Breast Height
DOE	Director of Operations and Engineering
DLI	Detailed Line Inspections
EAM	Enterprise Asset Management
EOC	Emergency Operation Center
EM	Emergency Manager
ERM	Enterprise Risk Management
GF	General Foreman
GM	General Manager
HFTA	High Fire Threat Area
ICS	Incident Command System
IFPL	Industrial Fire Protection Level
KV	Kilovolt
KWH	Kilowatt Hours
LF	Line Foreman
LS	Line Superintendent
MMS	Manager of Member Services
MW	Megawatts
NESC	National Electric Safety Code
NFDRS	National Fire Danger Rating System
NF	National Forest
NWS	National Weather Service
NWPUD	Northern Wasco Public Utility District
OAR	Oregon Administrative Rules
OH	Overhead
OES	Office of Emergency Services
OEM	Office of Emergency Management
ODF	Oregon Department of Forestry
OM	Operations Manager
OPUC	Oregon Public Utility Commission
OR	Oregon
OS	Operations Specialist
PPL	Pacific Power and Light
PRC	Public Resources Code
PSPS	Public Safety Power Shutoff
PUC	Public Utilities Commission

QA	Quality Assurance
QC	Quality Control
RFPA	Rangeland Fire Protection Associations
RFW	Red Flag Warning
ROW	Rights of Ways
SB	Senate Bill
SEMS	Standardized Emergency Management System
T&D	Transmission and Distribution
UG	Underground
USFS	U.S. Forest Service
VM	Vegetation Management
WA	Washington
WEC	Wasco Electric Cooperative
WFAS	Wildland Fire Assessment System
WHP	Wildfire Hazard Potential
WMP	Wildfire Mitigation Plan

Appendix C: Defensible Space Requirements – ORS 177.059²²

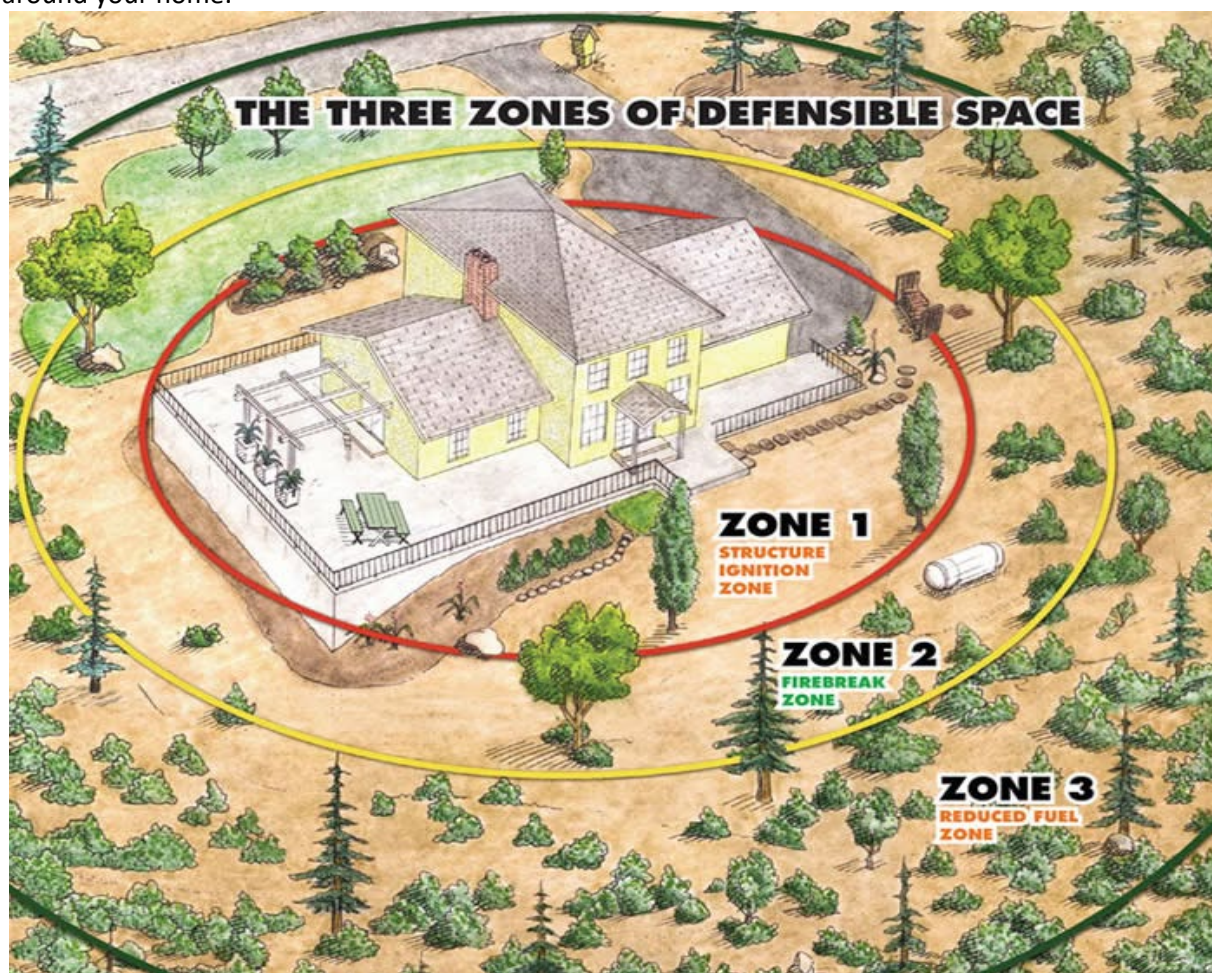
Keeping Safe from Wildfire

Wildfire is a regular and natural occurrence in Central Oregon (just like the winter snow), so we must prepare our homes and lives.

Have a “Go Kit” (for when evacuation is necessary) and sign up with the Citizen Alert Emergency Notification System for emergency notifications.

Prepare your home and property to survive a wildfire.

Below is a guide for assessing your home ignition zone and how to help limit the spread of wildfire around your home.



Immediate zone (zone 1)

The home and area 0-5' from the home's furthest attached exterior point is defined as a non-combustible area. Science tells us this is the most important zone to take immediate action on, as it is the most vulnerable to embers. **START WITH THE HOUSE ITSELF**, then move into the landscaping section of the Immediate Zone.

Clean roofs and gutters of dead leaves, debris, and pine needles that could catch embers.

²² Department of Forestry Ch.629 Div. 44

Replace or repair any loose or missing shingles or roof tiles to prevent ember penetration.
 Reduce embers that could pass through vents in the eaves by installing 1/8-inch metal mesh screening.
 Clean debris from exterior attic vents and install 1/8-inch metal mesh screening to reduce embers.
 Keep under decks and eaves clear or screened to prevent the entry of fire embers.
 Repair or replace damaged or loose window screens and any broken windows. Screen or box-in areas below patios and decks with wire mesh to prevent debris and combustible materials from accumulating.
 Limit the number of trees directly in contact with the home. Limb branches up above the eave line of the house, especially for evergreen trees. Deciduous trees don't pose as great of a threat as evergreens, especially when well maintained.
 Move any flammable material away from wall exteriors – mulch, flammable plants, leaves and needles, firewood piles – anything that can burn. Remove anything stored underneath decks or porches. The national standard now is to keep mulch at least 5 feet from combustible construction (decks, siding, etc.) At a minimum, ensure mulch and bark does not come in direct contact with combustible construction.
 Maintain suggested clearance around WEC facilities so as to not interfere with switching or gaining access to equipment.

Intermediate zone (zone 2)

5-30' from the furthest exterior point of the home. Landscaping/hardscaping- employing careful landscaping or creating breaks that can help influence and decrease fire behavior
 Clear vegetation from under large stationary propane tanks.
 Keep woodpiles at least 20 feet from structures.
 Create fuel breaks with driveways, walkways/paths, patios, and decks.
 Keep lawns and native grasses mowed to a height of four inches.
 Remove ladder fuels (vegetation under trees and branches) so a surface fire cannot reach the crowns. Prune trees up to six to ten feet from the ground; shorter trees should not exceed 1/3 of the overall tree height.
 Tree placement should be planned to ensure the mature canopy is no closer than ten feet to the edge of the structure.
 Tree and shrubs in this zone should be limited to small clusters of a few each to break up the vegetation's continuity across the landscape.

Extended zone (zone 3)

30-100 feet, out to 200 feet. Landscaping – the goal here is not to eliminate fire but to interrupt fire's path and keep flames smaller and on the ground.
 Dispose of heavy accumulations of ground litter/debris.
 Remove dead plant and tree material.
 Remove small trees growing between mature trees.
 Remove vegetation adjacent to storage sheds or other outbuildings within this area.

Considerations

The greater the slope of the property, the greater the distances of the zones. If your property is very steep, you may look to increase zone 1 to 10 feet, zone 2 to 60 feet, and zone 3 to 200 feet. With a greater slope, the zones may not be equal on all sides of your home. Uphill sides of the house may be less than the downhill sides due to the speed at which fire spreads uphill versus downhill. So much of this is a case-by-case scenario for what is best for each home. Contact your local fire department for an onsite visit and consultation.

Appendix D. Vegetation Spacing Guidelines

VERTICAL SPACING

Eliminate opportunities for a vertical “fire ladder” by:

- Remove branches beneath large trees for a 6 foot minimum clearance.
- Create proper vertical spacing between shrubs and the lowest branches of trees by using the formula shown.

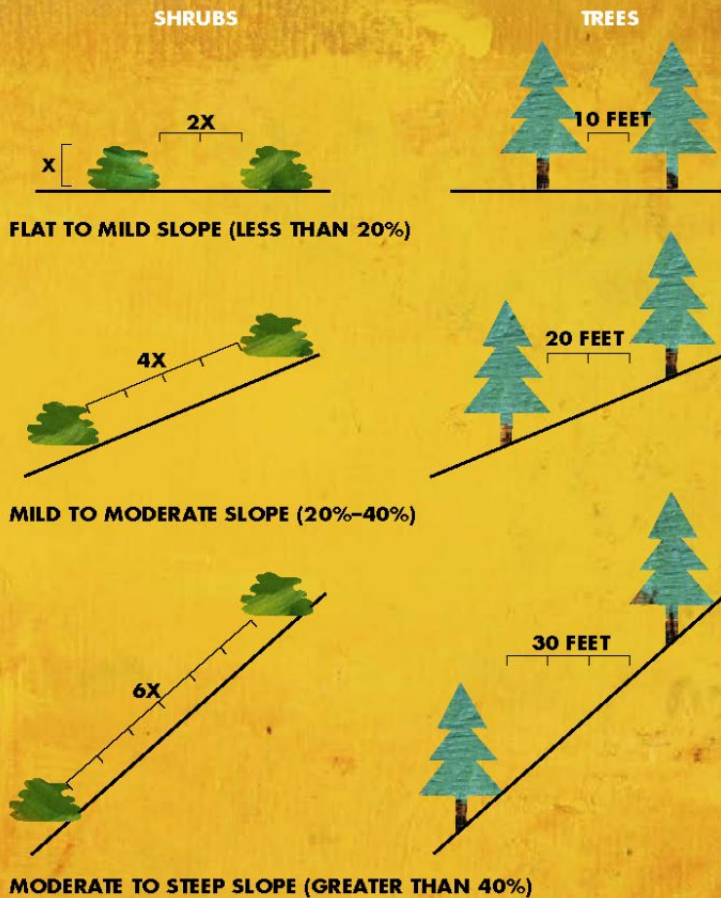


HORIZONTAL SPACING

The spacing between grass, shrubs, and trees is crucial to reduce the spread of wildfire. The spacing needed is determined by the type and size of the shrubs and trees, as well as the slope of the land. For example, a property on a steep slope with larger plant life will require greater spacing between trees and shrubs than a level property that has small, sparse vegetation.

Fire-safe landscaping

Fire-safe landscaping isn't necessarily the same thing as a well-maintained yard. Fire-safe landscaping uses fire-resistant plants that are strategically planted to resist the spread of fire to your home.



Appendix E. Home Ignition Zone Checklist

A vertical graphic with a dark red header and footer, and a light orange background. The title 'HOME IGNITION ZONE CHECKLIST' is in large, bold, dark red letters. Below it is a subtitle in smaller, bold, dark red letters. A central red box contains a list of eight items, each with a white square checkbox. At the bottom of the graphic, there is a dark red footer with white text.

HOME IGNITION ZONE CHECKLIST

SIMPLE STEPS FROM ROOF TO FOUNDATION TO MAKE A HOME SAFER FROM EMBERS AND RADIANT HEAT

- Clean roofs and gutters of dead leaves, debris and pine needles that could catch embers
- Replace or repair any loose or missing shingles or roof tiles to prevent ember penetration
- Reduce embers that could pass through vents in the eaves by installing 1/8 inch metal mesh screening
- Clean debris from exterior attic vents and install 1/8 inch metal mesh screening to reduce embers
- Repair or replace damaged or loose window screens and any broken windows
- Screen or box-in areas below patios and decks with wire mesh to prevent debris and combustible materials from accumulating
- Move any flammable material away from wall exteriors - mulch, flammable plants, leaves and needles, firewood piles - anything that can burn
- Remove anything stored underneath decks or porches

VISIT [FIREWISE.ORG](https://www.firewise.org) FOR MORE DETAILS

Image by NFPA, with funding from USDA Forest Service

Appendix F: Fire Tools Requirements

Hand Tools (ORS 477.655, OAR 629-043-0025): Supply hand tools for each operation site - 1 tool per person with a mix of pulaskis, axes, shovels, hazel hoes. Store all hand tools for fire in a sturdy box clearly identified as containing firefighting tools—supply at least one box for each operating area. Crews of 4 or less are not required to have a fire tools box as long as each person has a shovel suitable for fire-fighting and available for immediate use while working on the operation.

Fire Extinguishers (ORS 477.655, OAR 629-43-0025): Each internal combustion engine used in operation, except power saws, shall be equipped with a chemical fire extinguisher rated as not less than 2A:10BC (5 pounds). During the Fire Precautionary Period, WEC or their contractor will have access to portable water tanks.

Power Saws (ORS 477.640, OAR 629-043-0036): Power saws must meet Spark Arrester Guide specifications - a stock exhaust system and screen with < .023-inch holes. The following shall be immediately available for prevention and suppression of fire:

One gallon of water or pressurized container of fire suppressant of at least eight-ounce capacity

1 round pointed shovel at least 8 inches wide with a handle at least 26 inches long

Keep the power saw at least 20' from the place of fueling before started

Spark Arrestors and Mufflers (ORS 477.645, OAR629-043-0015): All non-turbocharged engines must meet the Spark Arrester Guide specifications except.

Fully turbocharged engines.

Engines in motor vehicles operating on improved roads equipped with an adequate muffler and exhaust system.

Engines in light trucks (26,000 GVW or less) equipped with an adequate muffler and an exhaust system.

Engines in heavy trucks (greater than 26,000 GVW) equipped with an adequate muffler and exhaust system.

If a truck engine is not fully turbo-charged, then the exhaust must extend above the cab and discharge upward or to the rear of the truck frame.

Water pumping equipment is used exclusively for fighting a fire.

Engines of 50 cubic inch displacement or less, except ATV's and motorcycles, shall be equipped with an adequate muffler and an exhaust system.

ATVs and motorcycle must be equipped with an adequate muffler and exhaust system or an approved screen, which completely encloses the exhaust system.

Power saws. (See power saw requirements)

Fire Watch Service: (ORS 477.665, 629-043-0030) Each operation area is to have a Firewatch. A fire watch shall be on duty during any breaks (up to 3 hours), and for three hours, after the operator's power-driven machinery has been shut down for the day²³. A fire watch shall:

Be physically capable and experienced to operate firefighting equipment.

Have facilities for transportation and communications to summon assistance.

Observe all portions of the operation on which activity occurred during the day. Upon discovery of fire, Firewatch personnel must: First report the fire, summon any necessary firefighting assistance, describe intended fire suppression activities, and agree on a checking system; then, after determining a safety zone and an escape route not cut off if the fire increases or changes direction, immediately proceed to control and extinguish the fire, consistent with firefighting training and safety.

WEC ensures that the following equipment is on-site during VM work:

One ax not less than 26" in length with a head weight at least two pounds.

One shovel not less than 26" in length with a blade at least 8" wide.

²³ Note: Some ODF districts waive this requirement based on the IFPL in place

One water container of at least five gallons filled or a five-pound Class A fire extinguisher fully charged.
One pumper truck with a capacity of 200 gallons and capable of pumping a minimum of 50 gallons per minute. Pumper shall include a minimum of 100' of 1.5" hose. This truck is required when using chippers, chainsaws, or when working with any spark emitting equipment.

A one-hour fire watch of the project area is required upon completion of the maintenance work.
WEC will notify Central Oregon Dispatch and respective Field Manager before dispatching maintenance crews to an area.