

Eugene Water & Electric Board

# 2023-2024 Wildfire Mitigation Plan

Adopted July 11, 2023



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# 1. Executive Summary

In response to the growing severity and frequency of dangerous wildfires, Oregon electric utilities are required to develop risk-based wildfire mitigation plans (WMP) for submission to the Oregon Public Utility Commission. The plan should be designed to protect public safety, reduce risk to utility customers and promote electrical system resilience to wildfire damage. The EWEB Board of Commissioners approved the utility's first WMP in July 2022.

Understanding areas of high wildfire potential across the electric system is the cornerstone to an effective mitigation plan. Most of EWEB's electric infrastructure is in urban areas with relatively low risk for wildfire. Areas initially deemed to have heightened risk include the McKenzie River Valley and a portion of southeast Eugene. An updated baseline wildfire risk assessment to refine the utility's High Fire Risk Zones (HFRZ) is planned for 2023.

EWEB's electric capital plan includes robust investments in grid resiliency, some with overlapping wildfire mitigation co-benefits. The utility has allocated an additional \$1 million annually to enact a comprehensive approach to wildfire risk reduction, exceeding OPUC compliance requirements. Commitments include:

- Annual vegetation management and equipment inspections in HFRZs;
- Targeted equipment upgrades and grid hardening investments; and
- Technology, tools and modified operational practices during wildfire season, including changes to electric system settings to increase sensitivity to abnormal conditions.

EWEB is adapting its strategies as risk assessment models and technologies mature, and in response to emerging best practices and changing environmental conditions. For operational readiness, the utility will conduct its first training exercise to test the PSPS decision-making framework, and contract for custom fire weather forecasting services. A load study to support installation of non-expulsive fuses and additional recloser devices is planned. If successful, EWEB's participation in two federal grid resiliency grant applications will accelerate future technology and other grid hardening investments.

EWEB recognizes the heightened public concern around wildfire danger and continues multi-pronged public outreach on resiliency and emergency preparedness topics. Messaging and imagery to alert the public of heightened wildfire potential was effectively adapted for use in EWEB's first PSPS event in September 2022. PSPS outreach efforts also included advance notification to interagency partners and critical infrastructure owners. A new program is in development to help customers with medical conditions or mobility constraints with PSPS safety plans.

Core metrics captured for 2022 demonstrate steady progress in identifying opportunities to enhance grid resiliency while improving situational awareness and response to wildfire threats.

## 2. Introduction and Background

### 2.1 Utility Profile

EWEB is the largest publicly owned electric and water utility in Oregon. The City of Eugene (the City) commenced utility operations in 1908 with the purchase of a privately owned water system. In 1911, upon completion of the City's first municipal hydroelectric power plant, the City organized the Eugene Water Board to operate the City's electric and water utilities. The name was changed from the Eugene Water Board to the Eugene Water & Electric Board in 1949.

EWEB is chartered by the City to supply electric and water service within the city limits of Eugene and to certain areas outside the city limits, including the lower McKenzie River Valley. EWEB is defined as a political subdivision of the City, a municipal corporation. The utility's principal purpose is to provide reliable water and electricity to its customers while maintaining cost-based rates. As established by City Charter, EWEB is governed by a five-member Board of Commissioners (Board) who are elected by voters residing within city limits. The Board is responsible for overall utility governance, including annual budget approval and rate-setting.

- Population served: 176,700 (2020 estimate, U.S. Census Bureau)
- Land area served: 236 square miles
- Land area owned: 44 square miles

The electric system serves over 96,000 residential, commercial, and industrial customers within the City of Eugene and in rural areas along the McKenzie River east of Springfield to Vida (upriver territory). While the approximately 5,000 upriver services are overwhelmingly residential, critical infrastructure such as the Hayden Bridge Filtration Plant, Leaburg Fire Station and several communications towers are located in this area. EWEB's service territory adjoins the Springfield Utility Board to the east, the Emerald People's Utility District to the north, the Lane Electric Cooperative system to the south and Blachly-Lane Electric Cooperative to the west. See Figures 1a and 1b for EWEB service territory maps.

Power is supplied via contracts with the Bonneville Power Administration (BPA), EWEB-owned generation resources, other contracted resources and wholesale market purchases. The utility operates two hydroelectric facilities along the McKenzie River, the smaller Walterville plant within the service territory and the Carmen-Smith Hydropower Project, located 70 miles east of Eugene in unincorporated Linn County. EWEB also owns the Stone Creek hydropower project on the Clackamas River, 45 miles southeast of Portland.

- Total electric system service area: 236 square miles
- Transmission and distribution lines: 1630 miles
- Substations: 38
- 2022 power consumption: 276 aMW with 483 MW 1-hour peak

## 2.2 Plan Context and Regulatory Framework

Wildfires play an important role in the ecological health of natural areas. However, a convergence of complex issues is making wildland fire activity more dangerous and destructive than in the past. These factors include increased vegetative fuel loads from decades of fire suppression activities, the presence of non-native species that can act as ladder fuels, more development in the wildland/urban fringe and the rising frequency of erratic climate patterns such as drought, extreme heat and severe storms. Even in the Pacific Northwest, where forests are typically too moist to burn with much intensity, wildfire risk is growing. Research shows that the largest fires in the Western Cascades are tied to short-term drought conditions coinciding with extremely dry fuels. Further, the combination of warmer, dryer summers and less residual snowpack can create annual conditions more conducive to large fires<sup>1</sup>.

The 2020 Labor Day fires burned over 1 million acres across Oregon. These wildfires prompted a call to action during the 2021 legislative session, and the subsequent passage of \$190 million Omnibus Wildfire Bill (SB 762). The bill required development of a statewide map of wildfire risk and funded numerous fire prevention, recovery and adaptation programs. SB 762 further mandated all electric utilities to file risk-based wildfire mitigation plans with the Oregon Public Utility Commission (OPUC).

The minimum standards described in SB 762 served as a framework for EWEB's initial plan:

- I. A consumer-owned utility must have and operate in compliance with a risk-based Wildfire Mitigation Plan (WMP) approved by the governing body of the utility. The plan must be designed to protect public safety, reduce risk to utility customers and promote electrical system resilience to wildfire damage.
- II. The consumer-owned utility shall regularly update the risk-based wildfire mitigation plan on a schedule the governing body deems consistent with prudent utility practices.
- III. A consumer-owned utility shall conduct a wildfire risk assessment of utility facilities. The utility shall review and revise the assessment on a schedule the governing body deems consistent with prudent utility practices.
- IV. A consumer-owned utility shall submit a copy of the wildfire mitigation plan approved by the utility governing body to the OPUC to facilitate commission functions regarding statewide wildfire mitigation planning and wildfire preparedness.

The EWEB Board approved the utility's first WMP on July 5, 2022. The OPUC completed its year-long rulemaking process delineating WMP requirements a month later and opened a separate docket for redress if a joint-user fails to address a reported safety violation in the high fire risk zones. These rules were adopted in December 2022.

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<sup>1</sup> "Projected Impact of Mid-21<sup>st</sup> Century Climate Change on Wildfire Hazard in a Major Urban Watershed outside Portland, OR", [Fire](#), December 2020.

## 2.3 Planning Approach

In creating the 2022 WMP, EWEB leveraged existing programs and policies for grid reliability and safety to advance wildfire risk mitigation work. In addition to focusing on resiliency projects with wildfire co-benefits, the initial plan sought to improve fire season situational awareness while ramping up interagency coordination and community engagement efforts. The resulting plan complied with adopted OPUC rules while incorporating several enhancements to protect public safety and promote wildfire resiliency.

While wildfires are not a novel experience, mitigation planning for electric utilities is evolving. As such, our planning efforts must be highly adaptive, building on new information as risk assessments and investment needs further define strategic priorities. Regular plan updates are crucial to track progress, integrate related work, identify gaps, and respond to emerging information and conditions. The EWEB Board agreed to an annual planning cycle to review the previous year's key metrics, measure progress towards on-going and new activities and ensure alignment with Board strategic priorities.

The 2023-2024 WMP was informed by recent operational experience, as well as best practices from other electric utilities and subject matter experts.

The overall approach to this next iteration of our WMP was to:

- Complete a comprehensive baseline risk assessment of the electric system to refine our High Fire Risk Zones and ensure mitigation actions are focused on areas with greatest wildfire potential and reliability co-benefits.
- Continuously improve operational practices and data gathering to better quantify risk-reduction activities and enable cost-benefit analyses.
- Build on community engagement and inter-agency coordination efforts to strengthen wildfire prevention partnerships, with a focus on our most at-risk customers.
- Ensure compliance by consolidating and documenting dispersed operational practices and aligning mitigation, response and recovery plans.

## 3. Plan Purpose and Policy Objectives

### 3.1 Purpose Statement

***EWEB's Wildfire Mitigation Plan will adhere to OPUC rules to protect public safety, reduce risk to utility customers and promote electric system resilience to wildfire damage. The risk-based plan, developed in coordination with key stakeholders, will provide a basis for continuous improvement to evolve our operational practices, communication plans and mitigation efforts as best practices and regulations are updated.***

The Board is responsible for adopting the WMP and determining funding levels for priority mitigation activities. The General Manager will ensure the plan meets all regulatory compliance thresholds, and the Assistant General Manager and Chief Operating Officer will oversee plan implementation.

### 3.2 Policy Objectives

While filing a Board-approved plan with the OPUC is a compliance requirement, a formal risk-based wildfire mitigation plan aligns with several other EWEB strategic priorities, policy objectives, planning documents and core values.

The safety of our workforce and community is our first organizational core value and fundamentally drives how we deliver essential utility services to the public we serve. EWEB's strategic plan prioritizes community resiliency and emergency preparedness: "With significant electricity delivery infrastructure commissioned in the 1960s and 1970s, EWEB will need to attenuate and manage the 'ballooning' need to replace this concurrently aging equipment while increasing resiliency to potentially disruptive events." These priorities are reflected in the types and level of investment in our 10-year Capital Improvement Plan.

In addition to aligning with EWEB core values and strategic priorities, the WMP builds on existing planning documents, programs and practices, such as the Incident Command Structure, as well as robust public engagement around emergency preparedness. The WMP also strives to reinforce linkages between other risk mitigation and response programs and management plans associated with our hydroelectric facility licenses. Examples of related planning documents are listed in the Table 1.

Table 1. WMP-Related Planning Documents

Electric Capital Improvement Plan (2022-2032)	Updated Annually
<a href="#">Eugene-Springfield Multi-Jurisdictional Natural Hazard Mitigation Plan</a>	2020 - 2025
Carmen-Smith Fire Response and Suppression Coordination Plan	July 2020
Carmen – Cougar Transmission Line Management Plan	April 2021
Right of Way Vegetation Management Program	June 2022
Stone Creek Transmission Line Operations and Maintenance Plan	2022

Most importantly, the WMP is an action plan that demonstrates the utility’s commitment to operate our electric equipment in a safe and reliable manner and identify opportunities to further reduce the risk of our equipment becoming involved in a wildfire. With annual metrics and reporting, it serves as tool to measure the effectiveness of actions undertaken, adjust strategies and retool practices as necessary to achieve its primary objective.



## 4. Preliminary Wildfire Risk Assessment

### 4.1 EWEB Service Territory Overall Risk Profile

Understanding wildfire risk potential for the electric system at a scale that can inform the location and types of mitigation investments is the cornerstone to an effective WMP. Lane County's 2020 [Community Wildfire Protection Plan](#) (CWPP) contains a Wildfire Risk Assessment to evaluate the potential loss of lives, property and essential infrastructure from a wildfire event. The assessment breaks Lane County into three distinct ecoregions and describes the overall wildfire risk<sup>2</sup> for the Willamette Valley Ecoregion as generally low to moderate risk. Areas of higher risk for this ecoregion include the south hills of Eugene, where there is dense residential development close to and intermixed with forestlands.

The Cascades Ecoregion, which includes the McKenzie Valley, was classified as moderate to high risk due to the predominance of forested lands with mountainous topography, frequent lightening events and limited access for firefighting resources. The assessment relied largely on the statewide [Oregon Wildfire Risk Explorer](#) tool, supplemented by information from the Oregon Department of Forestry, U.S. Forest Service and other stakeholders. Based on historical occurrences, there is a high probability of future wildfire occurrences in the Cascades region<sup>3</sup>.

Table 2. Recent History of McKenzie Valley Wildfire Activity

Event Name	Year	Location	Acres Burned
Knoll Fire	2021	7 miles NE McKenzie Bridge	544
Holiday Farm Fire	2020	3 miles W of McKenzie Bridge	173,393
Terwilliger Fire	2018	3 miles SE of Blue River	11,555
Rebel Fire	2017	13 miles S of McKenzie Bridge	8,709
Horse Creek Complex	2017	7 miles S of Belknap Springs	33,780

Most of EWEB's electric infrastructure is in urban areas with relatively low risk for wildfire. However, long portions of the electric system run through heavily forested terrain, and EWEB serves several thousand customers who live in the wildland-urban interface. About half of the distribution system is buried underground (UG).

<sup>2</sup> Overall wildfire risk is the product of the likelihood of a fire greater than 250 acres and consequence of wildfire on all mapped highly valued resources and assets (critical infrastructure, timber, housing unit density, etc.)

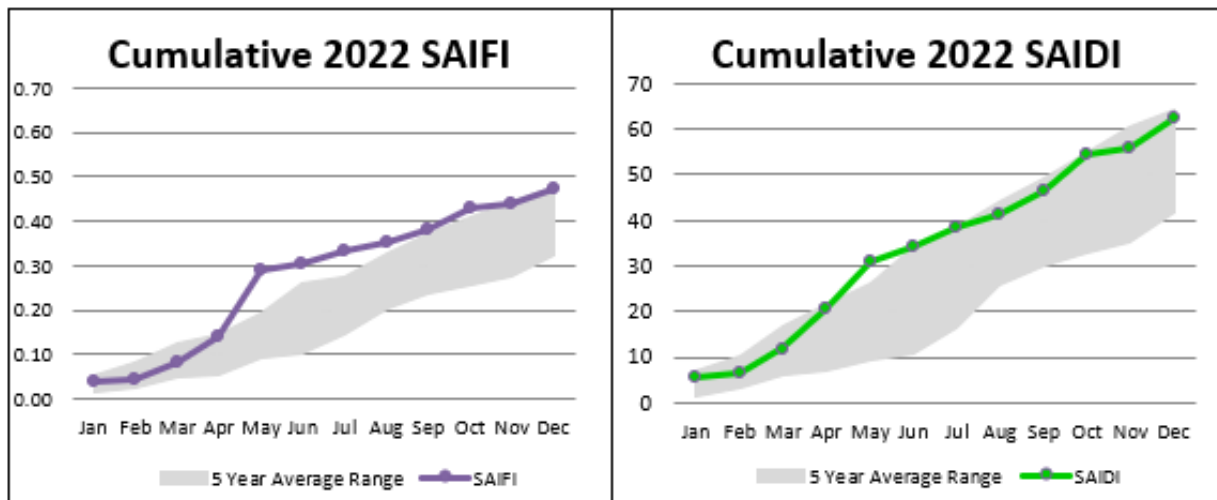
<sup>3</sup> Lane County Natural Hazard Mitigation Plan (June 2023 public draft).

Table 3. Electric System Asset Overview

Asset	Overhead Line Miles	UG Line Miles
Total Transmission Lines	114	3.6
69 kV Transmission	12	---
115 kV Transmission	102	3.6
Primary Distribution Lines	603	553
Secondary Distribution	724	799
Asset	Quantity	
Pole Structures	18,271 EWEB-owned poles	
Transmission Structures	1514 EWEB-owned	

Like most electric utilities, EWEB’s primary overhead power lines are installed as bare wire. Electric safety regulations and design standards determine clearance requirements from the ground and adjacent objects (buildings, trees), as well as spacing between lines to prevent contacts that can cause faults or sparking.

EWEB tracks outages, both planned and unplanned, by incident type and length of time. 2021 data measuring the average duration of service interruptions (SAIDI) and the average frequency of interruptions (SAIFI) showed that outages were near a five-year low. Last year’s outage data tells a different story, with the SAIDI and SAIFI values trending upwards. This change is attributed to several different factors including a December windstorm as well as more frequent and prolonged outages associated with changing system operational settings for wildfire safety (see Section 5.6 for more details).



Common causes of unplanned outages (not including storm events) are contacts with trees/vegetation, equipment failures, animal interactions (birds/squirrels) and equipment hit by vehicles. During most of the year, these types of unplanned events have little risk of ignition due to western Oregon’s temperate climate. As soils and vegetation dry out in late summer/early fall, risk conditions are elevated.

Other risk drivers include:

- Vegetation type, health and prevalence of ladder fuels such as blackberries
- Terrain/slope
- Drought
- High wind events combined with heat/low humidity

## 4.2 Areas of Higher Wildfire Risk

Adopted OPUC rules require electric utilities to identify High Fire Risk Zones (HFRZ) in their service territory, as well as within the right of way for generation and transmission assets, even if located outside their service territories. For the initial plan, EWEB engaged a third-party consultant to review 13 circuits system operators identified as having higher risk of wildfire against the Oregon Wildfire Risk Explorer tool. In general, these areas included a small area in the southeast hills of Eugene, as well as the McKenzie Valley. Except for one small span of in-town transmission, the consultant concurred with EWEB’s preliminary assessment that these circuits are in HFRZs (see Tables 4 and 5).

Table 4. Higher Risk Distribution Circuits

Substation Name and Circuit ID	Overhead Circuit Length (miles)*
Dillard 4734	4.1
Thurston 2312	21.4
Walterville 2222	27.1
Walterville 2224	26.6
Holden Creek 7124	32.8
Holden Creek 7134	9.6
Hayden Bridge 2406	6.9

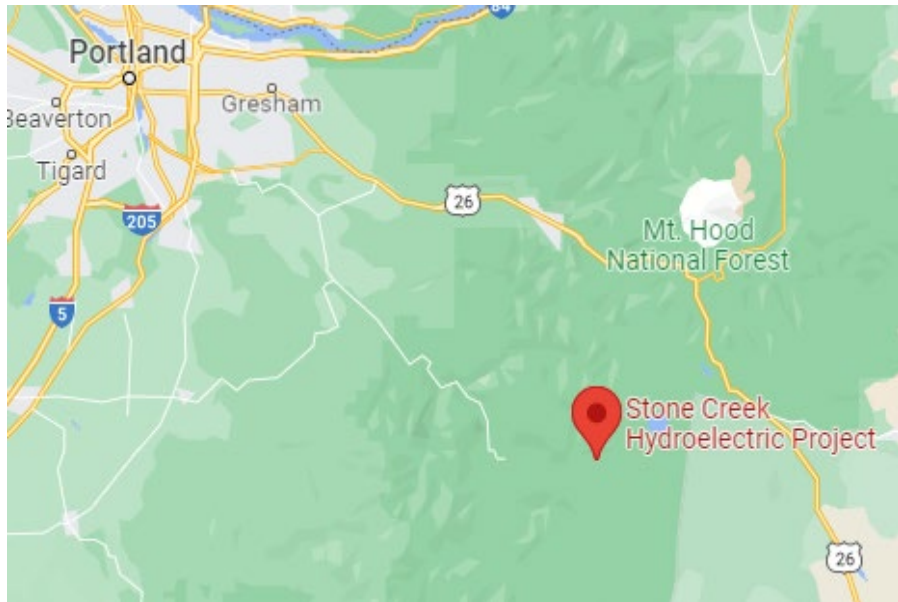
\* Length represents all primary distribution attached to breaker, not just feeder.

Table 5. Higher Risk Transmission Lines

Transmission Description	Length (miles)
115 kV Carmen Tap	18 miles EWEB-owned / 48 miles BPA-owned
69 kV Thurston – Walterville Line	5.4 miles
69 kV Walterville – Hayden Bridge Line	6.6 miles
115 kV Currin – BPA Alvey Line	5.7 miles
115 kV Dillard Tap	0.7 miles

See Figure 2 for a map of the HFRZs identified in the first Wildfire Mitigation Plan ([also available on EWEB website](#)). Note that these HFRZs were qualified as preliminary pending further analysis to refine areas of highest risk. In early 2023, EWEB requested consultant expertise to conduct an updated baseline wildfire risk assessment for its entire service territory. This Phase II assessment would include revised statewide wildfire risk maps post-Labor Day fires and give greater attention to evaluating relative risk in the wildland urban interface portions of our service territory. However, the updated Oregon Risk Explorer maps were not yet available, and this project was postponed.

EWEB owns the Stone Creek hydropower project on the Clackamas River, 45 miles southeast of Portland. Stone Creek’s hydro and transmission line facilities are located in the Mt. Hood National Forest, an area considered at high risk for wildfire. EWEB contracts with Energy Northwest to operate the hydroelectric plant and the 115 kV transmission line running to EWEB’s Harriet Lake Substation.



In a second agreement, Portland General Electric (PGE) operates the 115 kV transmission line that ties the Harriet Substation into PGE's Oak Grove Substation, where the 12 MW of output from the plant flows into the regional grid.

In 2022, EWEB and PGE agreed to new operational protocols whereby PGE will operate the EWEB-owned facilities in the same manner as its equipment during periods of high wildfire risk. This includes proactive de-energization of the EWEB transmission line when PGE declares a PSPS event in this area. These protocols are reviewed annually.

# 5. Wildfire Risk Mitigation Actions

## 5.1 Mitigation Overview

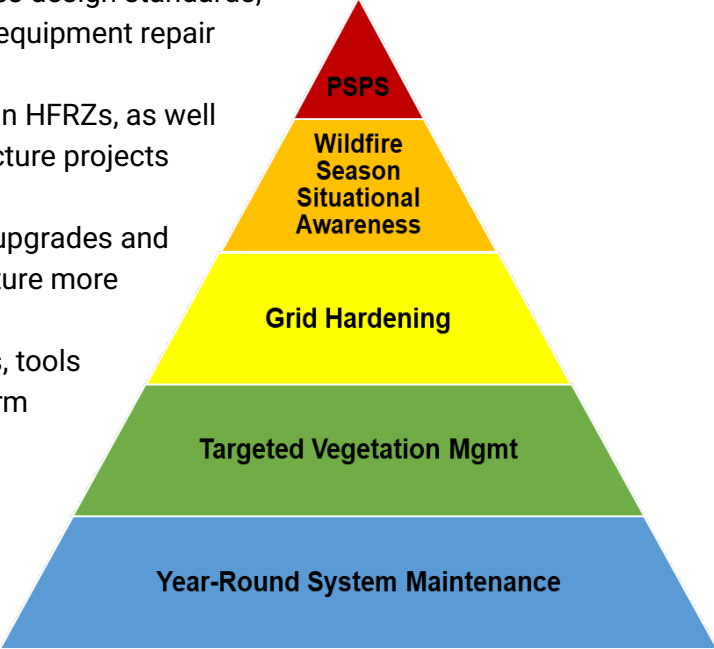
The State of Oregon Natural Hazards Mitigation Plan notes that during a typical year, more than 2,500 wildland fires are started on forest lands in Oregon. ODF and USFS estimate 66 percent of these fires are caused by human activity (1,650) and the remainder result from lightning (850).

Experience from California electric utilities indicate that of the human-caused wildfires, those linked to utility infrastructure are often the result of vegetation contacting wires and/or equipment failures during dangerous fire weather conditions combined. Thus, WMPs seek to bolster system maintenance and vegetation management as the first line of defense, focusing on portions of the electric system situated in areas with higher wildfire potential.

Other common mitigations include infrastructure investments that enhance the resiliency of the electric system to wildfires and technology such as automated sensors and localized weather monitoring for improved situational awareness during wildfire season. Finally, system operational protocols and customer communications plans are developed to support utility response and prepare customers for potential service interruptions during extreme conditions.

Likewise, EWEB’s WMP contains five main components for a comprehensive approach to wildfire prevention and response.

- **System Operations and Maintenance:** Includes design standards, inspections and equipment diagnostics, and equipment repair and replacement.
- **Vegetation Management:** Enhanced pruning in HFRZs, as well as fuels reduction and select green infrastructure projects with wildfire risk reduction co-benefits.
- **Grid Hardening:** A broad array of equipment upgrades and capital investments to make utility infrastructure more resilient to wildfires.
- **Situational Awareness:** Operational practices, tools and monitoring of weather conditions to inform field activities and utility response to wildfire threats.
- **PSPS:** Encapsulates changes to system operational settings and Public Safety Power Shutoffs (PSPS) for specific circuits during extreme fire risk conditions.



## 5.2 System Operations & Maintenance

### **Equipment Inspections**

Proactive inspection and timely system maintenance is foundational to EWEB's reliability and risk reduction objectives. As part of normal operations, a portion of the electric system is inspected and maintained for defective poles and cross arms, clearance and component issues. Consistent with NESC and OPUC requirements, these detailed inspections are completed for the entire system over a 10-year period, with at least 50% of the system inspected by year five.



EWEB contracts with a third-party vendor to perform detailed pole inspections, as well as to test and treat poles when necessary. The contractor inspects wood poles for signs of decay or damage, documents pole conditions and conducts a visual assessment of crossarms and other EWEB-owned ancillary equipment. Wood poles that pass inspection have fumigant treatment applied while defective poles are reported to EWEB to further assess for repair or replacement. Poles requiring priority attention are targeted for repair or replacement within 30 days. None of the ten-year detailed inspections involved our HFRZs in 2022.

EWEB performs annual visual patrols of all transmission and feeder circuits, including the following components:

- Poles & crossarms
- Hardware components
- Tree and vegetation encroachments
- Other notable hazards

For feeders located within HFRZs, annual safety inspections are extended to all primary distribution components, consistent with OPUC requirements for Investor-Owned Utilities. Patrols of these circuits are typically performed prior to April 1 of each calendar year. Safety inspections are documented, including any corrections needed and the priority of such repairs. See Table 6 for a comparison of 2021 and 2022 safety patrol results.

**Table 6. Safety Patrols and Accelerated Maintenance in HFRZs**

	2021	2022
Line Miles Inspected	48 line miles (feeders only)	150 line miles
Equipment Replacements/Upgrades	91 cross arms	94 cross arms 5 poles 1 transformer upgraded

In 2022, EWEB replaced over 30 poles and three insulators along 5 miles of the Stone Creek Transmission line damaged during the 2020 Riverside Fire. Also, the utility replaced old copper pilot wire along the 115 kV line between Thurston and Hayden Bridge with fiber, which is located lower on the pole in the communications space, improving safety. As part of this project, crews coordinated with the neighboring property owner to increase clearance and reduce chances for vegetation to contact the lines.

**Reliability Programs with Environmental and Risk Reduction Benefits**

Another system-wide reliability effort with fire risk reduction co-benefits involves transformer upgrades enabling conversion from mineral oil to natural ester made from soybean oil. EWEB has been upgrading to FR3<sup>4</sup> transformers for several years, originally to reduce environmental contamination risks. FR3 is less flammable than mineral oil, so these change-outs reduce wildfire risk should a transformer fail. Presently, 7.5% of the transformer fleet has been upgraded, including the Holden Creek and Carmen-Smith substation transformers.

It is worth noting that a sizable portion of the upriver distribution system was rebuilt after the Holiday Farm Fire. The rebuild effort included 173 poles and associated components, as well as 62 new FR3 transformers. An assessment prioritized 139 HFRZ transformers for upgrades, however, this work was suspended due to supply chain issues. As equipment stocks are replenished, the intent is to continue transformer change-outs in 2023/2024.

Avian protection practices offer another opportunity to increase reliability, support healthy migratory bird populations and reduce wildfire risk. Raptor nests on power poles and across wires can cause outages as well as increase electrocution risk for the birds. Complicating the problem is that ospreys have high fidelity to their chosen nesting sites. As the birds add more

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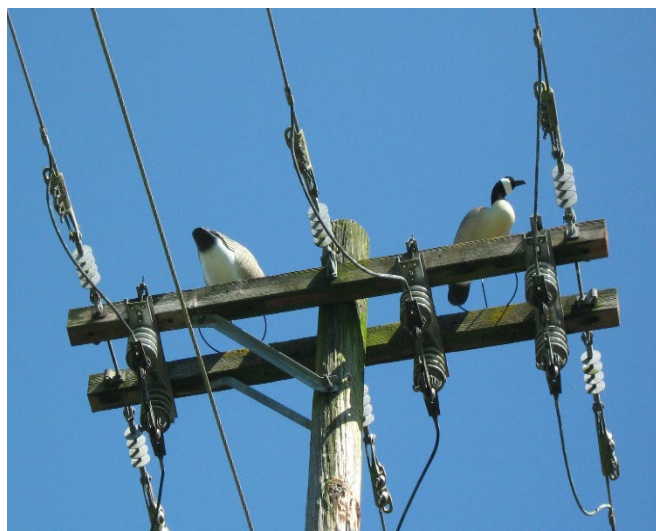
<sup>4</sup> FR3 is a natural, vegetable-based product that not only has environmental and operational benefits, is less combustible.



material over time, the nest can become very large, exceeding the design criteria of the pole structure, and creating an unstable nest. Nesting material can also get tangled in electrical equipment, particularly in high wind events, raising ignition risks.

To support healthy osprey populations while addressing reliability impacts, EWEB has built 27 osprey nesting platforms throughout our service territory, some on existing power poles and some as stand-alone structures. During the most recent assessment, staff found that 13 of the platforms were actively in use.

EWEB's avian program includes monitoring nesting platforms and cleaning out or removing inactive nests to reduce their size. Decoy geese are placed in selected areas to discourage nesting on electrical equipment, and the utility is considering raptor framing standards for new construction. Other program enhancements are now underway, including documenting EWEB nesting platforms in GIS and monitoring active pole-mounted nesting sites during fire season.



*Goose decoys on EWEB equipment*

In 2023, EWEB modified its outage management system to begin tracking bird-related outages. Prior to this change, such incidents would be generally categorized as 'animal' related. Specifying animal-related outages will allow us to audit outage data and quantify the risk associated with nesting activity by better defining the cause, location and timing of such outages. Coupled with enhanced monitoring, the goal is to target intervention strategies to site that pose the greatest risk to nesting birds and can develop into fire hazards.

### 5.3 Vegetation Management

#### **Right of Way (ROW) Vegetation Management Program**

EWEB's vegetation management program involves utility staff and contractors working year-round to maintain safe clearance around our electric facilities. Best management practices, as well as applicable OPUC rules, guide activities by vegetation and structure type. In addition to pruning specifications, the procedures address danger tree removal and lay out procedures for working with customers to manage hazard trees, and methods for chipping and brush disposal.

Routine pruning is critical to maintain clearance from electrical equipment, particularly to avoid limbs contacting wires during high wind events. EWEB's Vegetation Management Plan uses a five-year cycle to complete routine tree-trimming activities throughout the entire EWEB system.

Mid-cycle pruning is used to prevent faster-growing vegetation from encroaching into primary distribution lines. As an additional measure of safety, EWEB has prioritized resources to enable annual patrol and trimming around circuits in the high fire risk zones. One tree crew has been dedicated to responding to fast-growing 'cycle-buster' trees that pose the greatest clearance problems as identified by EWEB foresters. Altogether, this amounts to about 250 line-miles that are inspected and pruned annually.

As part of these inspections, hazard trees are identified for removal in coordination with neighboring property owners. Of note, dozens of fire-impacted trees were removed along a hillside at the end of Leashore Drive to reduce future fall-in risk with overhead power lines.



*Leashore Drive Clearance Project*

Outside the right of way, crews also ensure that defensible space is maintained around substations, with a particular focus on facilities located in the higher fire risk areas. In early 2022, crews conducted a thinning project around the Dillard Substation to remove diseased trees and invasives, trim overgrown shrubs and promote healthy growth of other trees on the property.

### **McKenzie Watershed Restoration and Fire Mitigation Efforts**

EWEB is nationally recognized for its innovative approaches to drinking water source protection. As part of our watershed restoration effort, the utility is working with numerous federal, state and nonprofit partners to implement large-scale floodplain restoration projects in the middle McKenzie Valley. The primary goal of these projects is to protect drinking water quality from the impacts of wildfires, and to improve ecological function of these complex riparian systems. These floodplain enhancement projects create wetlands and slow-water habitat that hold more water on the land, even during dry conditions, acting as fire breaks that lessen the severity of wildfire on the landscape. Major restoration projects were completed in the last few years on

the South Fork McKenzie, Deer Creek, and Gate Creek and Phase 1 of Finn Rock. Phase II of Finn Rock is now underway, and similar floodplain restoration projects are planned for Quartz and Ennis Creek using a combination of local, state and federal funding sources.

EWEB and its restoration partners were awarded multiple Oregon Department of Forestry (ODF) grants to implement fuels treatments on rural residential properties. Due to the extensive need for this support, EWEB watershed recovery funds were used to supplement this effort in 2022, resulting in over 50 projects completed on 65 acres.

Site specific treatments included:

- Removal of hazard trees (larger ones provided for in-stream wood for floodplain restoration)
- Thinning and chipping of smaller trees
- Removal and/or chemical treatment of invasive weeds that can act as ladder fuels (such as English Ivy and Himalayan blackberry)
- Clearing of downed woody debris

EWEB is actively pursuing grant funding to continue fuels reduction work with a focus on managing ladder fuels and invasive species that can quickly proliferate in a post-fire landscape.

## 5.4 System Hardening

EWEB's capital improvement plan includes a robust set of investments to replace aging equipment and upgrade infrastructure for increased resiliency. Layering on wildfire risk mitigation to these planned investments can result in different design configuration and equipment deployed. Examples include installing ductile iron poles in place of wood, transitioning to transformers with FR3 fluid, and looking for opportunities to convert to single-phase conductor. This slim distribution line format removes crossarms as potential points of failure and substantially reduces the likelihood of vegetation getting caught in the overhead lines.

In 2021, crews converted approximately 1,700 feet of distribution to single phase on North Gate Creek Road as part of the upriver rebuild effort. This past year's most high-profile project involved removing 31 miles of idle 69kV transmission in the upriver HFRZ, including 159 poles spanning five miles. By interconnecting to adjacent BPA lines, EWEB estimates the project saved \$10M in repair and replacement costs, not to mention on-going tree trimming costs.

As part of the decommissioning project, crews took the opportunity to reconfigure area distribution lines that were part of the 69kV under build. Moving to a single-phase reconfiguration allowed crews to remove 80 cross-arms while improving clearance, reducing the chances that branches contact wires during wind events.



*2022 single-phase reconfiguration work*

EWEB continues to offer financial assistance to upriver customers with undergrounding their secondary services when rebuilding for enhanced reliability and resilience to future wildfire events. This program will be in effect through 2025.

**Table 7. Secondary Service Underground Program Participation**

Year	Participation	Incentive Amount
2021	3 projects	\$12, 241
2022	6 projects	\$32, 265

**Grid Hardening Research and Development**

In 2022, the utility successfully filled a dedicated position to research and update our distribution system construction standards manual, including HFRZ equipment standards. While specific standards are a work-in-progress, overarching design guidelines have been drafted for newly installed overhead HFRZ distribution. These interim guidelines are intended to facilitate consideration of fire-resistant alternatives for poles, cross-arms and fusing, as well as overhead configuration and/or undergrounding as appropriate. The guidelines will cross-reference more specific equipment standards as they are developed over time.

An effective WMP requires a risk-based approach to target investments to projects with greatest public safety benefit. Grid hardening practices are evolving as new materials are field-tested and results are shared with industry partners. Advanced technologies such as remote fault detection show great promise in early identification, diagnosis and response to abnormal conditions that can impact grid reliability and safety. EWEB is monitoring industry best practices, seeking consultant expertise, and participating in grant funding opportunities to advance its wildfire program maturity.

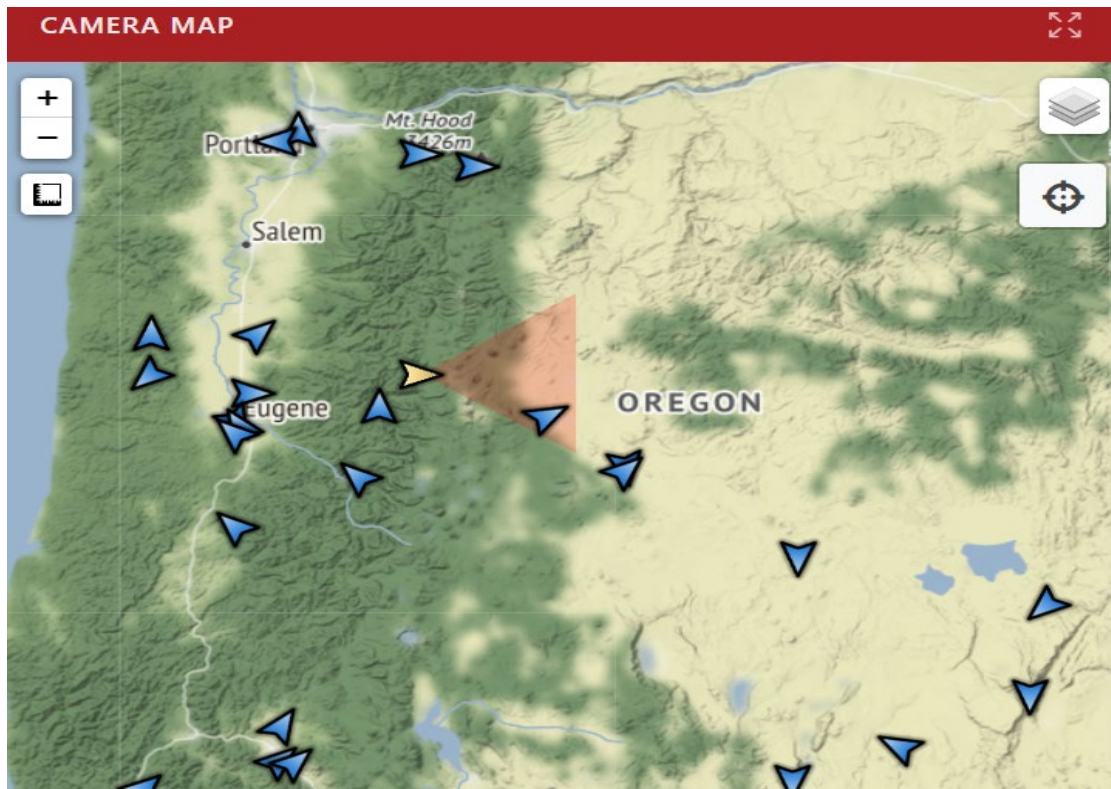
Specifically, EWEB is part of a consortium of six west coast utilities seeking federal Smart Grid grant funds in partnership with universities, national research organizations and technology providers. If funded, the “Advanced Solutions to Mitigate Wildfire Risk” project will leverage and scale machine-learning technologies for wildfire risk modeling, remote vegetation monitoring and fault/ignition risk detection. EWEB also participated in another federal Smart Grid grant application focused on high-resolution weather monitoring and fire-detection cameras led by the Electric Power Research Institute (EPRI). Both submissions are under evaluation by the US Department of Energy, with a decision expected in August 2023.

## 5.5 Situational Awareness

While some field work can be planned in advance, providing reliable electric service to our customers is a 24-7 operation that requires crews to respond to emerging safety issues. During wildfire season, EWEB and our contractors comply with the Industrial Fire Precaution Levels (IFPL) requirements. Based on published restrictions, EWEB will modify the hours, type and location of field work to limit the potential for equipment-related fire incidents. Depending on the location of the work, this may include coordination with the U.S. Forest Service and other public safety partners. IFPL waivers are requested annually to allow necessary work to proceed, with required additional precautions during IFPL levels 1 to 3. To limit fieldwork during wildfire season to the extent feasible, annual line inspections and vegetation management in the HFRZs are scheduled for completion by April 1.

With support from Oregon Department of Forestry staff, EWEB conducted two in-person wildfire prevention and response trainings for EWEB field crews and other key staff. This included inspection and certification of EWEB’s equipment readiness as required for crews to continue to work safely throughout fire season. The utility intends to offer these trainings annually.

In partnership with the University of Oregon and Elevate Technology, the first AlertWildfire camera in the McKenzie Valley was installed at the Smith Communications Tower last July. This camera was used to identify and verify a small fire created by a lightning strike adjacent to the Carmen-Smith project. Early detection helped to quickly contain the fire, avoiding operational impacts to EWEB’s facility. The [Smith Ridge camera](#) located or verified several other wildfires in 2022 as part of a growing network of early fire detection cameras being installed throughout Oregon with State funding support. The University has subsequently added another AlertWildfire camera on a City of Eugene telecommunications tower atop a South Eugene ridgeline.



*AlertWildfire cameras - Smith Ridge in yellow.*

To increase EWEB’s access to localized weather data, a new weather station was installed at the Hayden Bridge Filtration Plant in December 2022. The station maintains access to data relevant to treatment plant operators, such as precipitation, and enables user-defined notifications when certain weather conditions are detected for wildfire risk situational awareness. Data from the Hayden Bridge station was made available to the Portland National Weather Service and is now part of their [publicly accessible weather forecasting network](#). More recently, EWEB again partnered with the University of Oregon to host an experimental AI-enabled wildfire smoke sensor at the Leaburg Dam site to enhance early detection capabilities.

## 5.6 Operational Response

During weather conditions that pose extreme fire risk, utilities may elect to enact a Public Safety Power Shut Off (PSPS), preemptively de-energizing power lines to customers for several hours or longer. While a PSPS may remove a potential ignition source during dangerous fire weather, widespread power outages introduce other public safety risks. Of notable concern is the potential loss of telecommunications facilities and internet service for public safety alerts, water supplied by electric well pumps for fire suppression and consumption, as well as refrigeration and cooling for the elderly and medically fragile. The decision to enact a PSPS is an action of last resort requiring careful consideration of all risks. Coordination and communication with critical infrastructure owners, public safety partners and impacted

customers is essential to address the associated risk tradeoffs. This includes procedures for pre-event alerts, ongoing communication during the PSPS event with targeted outreach to vulnerable populations, and notifications that power has been restored.

EWEB system operators have the authority to de-energize portions of the distribution system during emergency events when requested by police or fire officials, such as if a car hits a power pole. Operators can also de-energize portions of the EWEB electric system if there is an active fire nearby or imminent fire danger in the area. The 2022 WMP also described PSPS protocols as well as procedures for initiating “power line protective settings” to increase the system’s sensitivity to irregularities in the HFRZs.

Under normal operating conditions, reclosers at the feeder breakers are programmed to open and close three times to allow temporary faults to clear and keep power flowing. In power line protective settings mode, EWEB remotely disables the reclose function so that the power trips off after sensing a fault. Additionally, instantaneous relay is used to open the breaker much faster than standard settings. Taken together, these actions increase the sensitivity to irregularities, reducing the potential for sparking that could lead to an ignition event.

Once protective settings are in place, EWEB’s procedure delineates steps to take if an outage occurs. This includes visual patrols of the entire circuit to ensure its safe to re-energize the line, and confirmation with public safety partners that there is no active fire in the area. Field staff conducting the visual patrols are responsible for ignition reporting and are outfitted with fire-suppression equipment for their own protection and public safety. Enabling protective settings is likely to increase the frequency and duration of power outages for the effected circuits. But on balance, protective settings mode is less disruptive than a PSPS and is a valuable risk reduction alternative under less than extreme fire conditions.

Note that the 115 kV transmission lines are owned by the Bonneville Power Administration (BPA). EWEB operates these lines under the direction and control of BPA, and BPA is responsible for authorizing any changes to operational settings for these facilities. BPA has authorized EWEB to place the Carmen Tap in protective settings mode during periods of high wildfire risk with proper notification. Operational changes to other segments of 115 kV transmission would occur in emergency situations. See Figure 3 for metro area transmission map.

In 2021, EWEB developed a process to place parts of its electric distribution system in protective settings when weather conditions heighten fire danger, such as Red Flag Warnings. This process included notifications to alert customers to fire weather concerns as well as the potential for extended outages. Prior to the 2022 wildfire season, EWEB planned to use protective settings intermittently in response to National Weather Service issued fire alerts and return the system to normal settings when the weather event concluded. However, in mid-July, several Red Flag Warnings were issued in a short span of time but for different parts of EWEB’s service territory, complicating operational decision-making and public outreach. Management decided to leave all the HFRZ circuits in protective settings for the remainder of the fire season,

simplifying both communications and operational practices. A post-fire season review of outage data would be conducted to evaluate reliability impacts.

Circuits were returned to normal settings on October 24, 2022 when after a rainy weekend, the fire season was declared officially over. An evaluation of HFRZ outage events identified six feeder-level trips while in this extended period of protective settings. The review found that in at least four of the outages, the system responded to a fault as expected. One outage was more likely a result of weather associated with the late October rain event, and one had an undetermined cause. On balance, EWEB determined that the risk reduction benefits outweighed the reliability impacts.

Building on this experience, the utility will place the HFRZs in protective settings when the IFPL reaches Level 2 and leave them in this setting until the IFPL returns to Level 1. This action could potentially extend the period of time the circuits de-energize instantaneously from several days in 2021 to several months. Another post-season outage evaluation will be conducted to continue to examine customer service impacts and refine practices moving forward. Table 8 summarizes EWEB’s updated wildfire season operational settings posture, while Appendix A contains more detailed response protocols.

**Table 8. Fire Safety Operational Settings Protocols**

Event	Operational Response	Notes
Red Flag Warnings (RFW) - Outside Fire Season or during IFPL 1	HFRZ circuits covered by the RFW, including BPA-owned Transmission Lines, will be placed in powerline protective settings mode for the duration of the Red Flag Warning Event. If there is a trip on the circuit, patrols will be conducted to ensure the cause of the fault has been cleared and it is safe to re-energize following a full patrol of the line in daylight.	RFW events can occur in spring/early summer and later in the fall when other fire risk conditions are relatively low (temperatures, fuel moisture contents). This operational response is intended to balance risk and reliability.
IFPL 2	IFPL 2 for East Lane County triggers moving HFRZ circuits into protective settings and leaving them in that mode until IFPL returns to Level 1.	Timing for moving in and out of this operational response will be based on local agency fire season declarations and weather forecasting for EWEB service territory.
Extreme Fire Danger	EWEB may proactively de-energize circuits to protect public safety (PSPS) in cases of high fire danger (nearby wildfire,	The number of impacted circuits and duration of the PSPS event will be determined on a case-by



	<p>impending dangerous fire weather conditions). EWEB will provide advance communication to impacted customers and critical infrastructure partners if warning is received early enough to do so. All PSPS circuits will be fully patrolled in daylight hours prior to re-energization for safety.</p>	<p>case basis considering weather forecasts, on the ground observations and emergency managers/public safety partner input.</p>
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**September 2022 PSPS Event**

EWEB’s operational response was tested in early September when National Weather Service (NWS) forecasts predicted dangerous fire weather conditions with strong easterly winds. On Wednesday, September 7, EWEB stood up its Incident Command System structure to prepare for possible de-energization of circuits in the HFRZs and began consulting with neighboring utilities, Lane County Emergency Management, and public safety partners. More localized spot forecasts were requested from the NWS and other weather monitoring ensued to inform the timing of a potential PSPS event.

With forecast weather unchanged, Management made the difficult decision to enact its first Public Safety Power Shutoff (PSPS). The decision was announced late Thursday afternoon to provide impacted residents 24-hour notice of the upcoming outage. The PSPS impacted about 3,000 EWEB customers over a 36-hour period (Friday Sept 9 – Sunday, Sept 11). Lane Electric, Pacific Corp and Consumers Power also decided to de-energize circuits in portions of Lane County, and PGE declared a PSPS event for areas of its service territory. PGE’s PSPS resulted in de-energization of the Stone Creek transmission line per our joint protocols.

EWEB conducted an internal post-event hotwash and financial analysis, debriefed with area utilities and participated in a post-event stakeholder discussion hosted by the OPUC. While the forecasted strong easterly wind did not impact the EWEB service territory as expected, activation offered valuable learnings to the utility and heightened public awareness about PSPS events. Appendix B shows the PSPS impact area and includes a summary of lessons learned from this event.

## 6. Community Engagement and Interagency Coordination

EWEB's overarching communication strategy emphasizes that wildfire risk reduction is a shared responsibility and requires the commitment and cooperation of many stakeholders. With numerous organizations involved in wildfire awareness, consistency in the core content of our information campaigns and coordination among partners is important to align messaging and amplify calls to action. 2022's multiprong wildfire season awareness public information campaign covered a host of relevant topics such as EWEB's vegetation management work and other year-round system maintenance, utility-initiation reliability investments with wildfire co-benefits, as well as wildfire safety and outage readiness messaging. Communications channels ranged from traditional news media coverage, amplified through our social media channels, to participation in community events, and an emergency preparedness e-newsletter to customers.

### 6.1 External Communications Tactics

The wildfire community engagement strategy builds on a strong foundation of effective public outreach campaigns on resiliency and emergency preparedness, such as the Pledge to Prepare and Water Reliability initiatives. A dedicated landing page for wildfire safety is in place on our [website](#), including a map of the HFRZs. A new initiative for the 2023 wildfire season is to overlay the HFRZs on the Power Outage map to reinforce awareness of the possibility of more frequent and longer outages in these areas when protective settings are in place. Any outages associated with a PSPS will be displayed on the Outage map.

The 2022 WMP campaign touched on a number of core messages around wildfire season situational awareness, personal preparedness, grid investments, and operational response. As may be expected, the September PSPS event garnered the most public attention and introduced many more residents to EWEB's wildfire safety messaging, communication channels and collateral imagery. Fortunately, much of the key public safety content had already been developed and translated into Spanish for greater accessibility.

Despite being its first planned PSPS event, EWEB was successful in providing 24-hour advance communication to impacted residents through various channels. In addition to media alerts, both traditional and social media channels, EWEB attempted to contact each impacted resident through e-mail and auto-dial phone notifications where contact information was available. Ongoing communication throughout the event and restoration updates were provided, along with a post-event review story. Commentary was largely positive, though some residents questioned why power restorations couldn't begin sooner given actual weather conditions.



Nine additional Facebook posts over the following three days regarding the Public Safety Power Shutoff Notice reached an additional 33.3k people, with 812 engagements and 938 comments.

Through an internal PSPS incident hot wash and in discussions with other utilities, many of the common lessons learned pertained to PSPS communications. Recommendations included better explanation of the power restoration process and messaging specific to summer outages, such as operating a generator safely when fire risk is high.

EWEB has since developed a PSPS communications playbook that includes additional outage preparedness tips and a phased messaging approach for 24-48 prior to a potential PSPS event, PSPS activation, and post-event patrols and re-energization (see Appendix C for a one-page brochure). A new PSPS-specific webpage is being created as well.

Lastly, EWEB participated in a state-wide effort to coordinate PSPS messaging across utilities and public safety partners for clarity and consistency, building on lessons learned from the 2022 event.

As noted in last year's WMP, EWEB is in the process of developing a targeted outreach effort to prepare vulnerable customers for potential loss of power due to PSPS events. This began with a campaign to gather updated contact information for all residents in HFRZs. Work is now underway to invite customers with special medical or mobility needs to opt-in to a new PSPS notification program. This would allow EWEB to provide direct notice of a PSPS event and connect customers with supportive resources as needed for personal safety during a prolonged power outage. Protecting the privacy of personal health data is paramount, so this effort is reliant on customers self-identifying as needing extra support and voluntarily providing personal and emergency contact information to EWEB and its partners.

Another way EWEB supports increased customer safety and resiliency during power outages is the zero-interest generator loan program. This program is eligible to all electric customers, with higher loan amounts available to customers who use domestic wells for water service. Customers who rely on electricity for medical devices may be at heightened safety risk when power goes out and could benefit from back-up power supplies as well. Future program design will consider increased financial support for backup power for this subset of customers.

## 6.2 Interagency Coordination

Wildfire mitigation and response planning requires a whole-community approach. Coordination with interagency stakeholders, including local fire agencies, ODF and other utilities, is ongoing. Of note, EWEB reached out to our fire partners to share highlights of the initial WMP and elicit their input on areas of elevated concern in and around the High Fire Risk Zones. These insights were incredibly valuable when considering the September PSPS impact boundary. Information-sharing with other utilities, through formal trainings and regional meetings, is another high-value activity to keep current with best practices. For example, EWEB participated in a recent wildfire evacuation response exercise hosted by Lane County Emergency Management and plans to observe PGE’s upcoming PSPS tabletop exercise.

Table 9. EWEB WMP and Emergency Response Stakeholder List

Stakeholder Group	Organization Description/Department
Critical Agencies/First Responders	City of Eugene Emergency Management Eugene/Springfield Fire Department Lane County Emergency Management Linn County Emergency Management (Carmen-Smith) McKenzie Fire & Rescue
Communications	Private telecommunication companies Local media (TV/radio) Lane County Emergency Communications
Utilities	Blachly-Lane Electric Cooperative Bonneville Power Administration Emerald People’s Utility District EWEB Water Operations Lane Electric Cooperative Metropolitan Wastewater Management Division Rainbow Water District Springfield Utility Board Portland General Electric (Stone Creek)
Local Government	City of Eugene Emergency Management & Public Works Oregon Department of Fish and Wildlife City of Springfield McKenzie and Springfield School District University of Oregon Emergency Management Willamette National Forest (U.S. Forest Service) Oregon Department of Forestry

As a result of our on-going interagency conversations, an external fire weather email notification list that includes about two dozen stakeholders is being used to alert our partners of the potential for electric service disruptions. The notification list includes communications providers so they can prepare any available back-up power sources should an outage ensue.

EWEB staff continue participate on several interagency teams focused on emergency preparedness and hazard mitigation planning. Of note, EWEB attends Community Wildfire Protection Plan meetings for information sharing, resource alignment and joint public outreach and education efforts. Such interagency teams have reviewed and offered letters of support for Federal grant applications to conduct wildfire education campaigns and fuels reduction projects. Additionally, EWEB and other community partners provided financial support for rebuilding the Vida Community Center, while Lane Electric helped re-establish the McKenzie Community Center. Both facilities will be vital resources to the public during PSPS and other incidents where current information, supplies like ice and water, and cell-phone charging can be made available to residents.

## 7. Performance Tracking and Future Planning Efforts

### 7.1 2022 Mitigation Plan Metrics

Plan metrics were included in the initial WMP based on compliance requirements under discussion during the OPUC rule-making process, including:

- Wildfire community education and outreach campaign metrics
- PSPS/protective settings mode events and outcomes
- Risk-based mitigation projects completed and financial investments
- Relevant training on industry best practices and tabletop/functional exercises

While the adopted rules do not require EWEB to track or report on these activities, the utility intends to provide these data and other performance measures for transparency and accountability. Community owned utilities also have the flexibility to update their WMP on a schedule they deem prudent. EWEB has elected to update its plan annually acknowledging the evolving best practices and dynamic climate forces impacting wildfire risk. With the \$1M annual budget for wildfire mitigation work, these plan and financial commitments demonstrate how EWEB continues to exceed OPUC compliance requirements.

Table 10. 2022 Public Outreach and Education Metrics

Public Outreach and Education			
Social Media	Posts: 27	Reach: 105k	Engagements: 2046
Earned Media	May 10: "EWEB invests \$1M for wildfire prevention efforts" May 12: "Power companies prepare for upcoming wildfire season" May 24: "EWEB begins cutting dead trees to reduce wildfire risk" May 26: "EWEB crews take to the treetops to thwart hazards" June 27 -30: EWEB installs new wildfire camera (4 stories/outlets) July 12: "EWEB Board approves new wildfire mitigation plan" July 27: "EWEB mitigates wildfire risk with upriver pole removal" July 28: "Hot dry weather across region sends fire restrictions upwards" Sept 8: "EWEB proactively shuts off power upriver" Nov 11: "Pole removal and powerline project wraps up"		
Targeted Outreach	Upriver EWEB Board Meeting (May) Jefferson/Westside Neighborhood Picnic (July) Friendly/South Hills Neighborhood Picnic (August) Emergency Alerts and Preparedness Newsletter (4485 recipients) Wildfire Safety and Prevention Webpage (7000+ page views)		

Note that the outreach and education metrics do not include the September National Preparedness Month campaign (27 social media posts) or employee communications.

Table 11. Extreme Weather Event Response Metrics

2022 Operational Response		
Event Type	Dates	Cause/Details
Protective Settings Mode	August 1 August 6 – October 24	RFW – Carmen Smith Tap only RFW – All HFRZs left in protective settings through remainder of fire season
Public Safety Power Shutoff	Sept 9 - 11	All HFRZ except Dillard 4734

Table 12. Mitigation Action Metrics

2022 Mitigation Actions		
Project	Description	Estimated Cost
Stone Creek T-Line Repair	31 wood pole replacements, 1 ductile iron, 3 insulators	\$800,000*
69 kV Line Removal & Distribution Reconfiguration	31 miles idle 69kV & 143 poles removed 80 cross arms removed	\$411,000 \$58,000
Accelerated HFRZ Equipment Replacements	94 crossarms 5 poles & 1 transformer	\$176,000 \$36,000
Leashore Dr Hazard Tree Project	60-70 trees removed	\$15,000
Fire Fuels Reduction Projects	65 acres on 54 upriver properties	\$1.2M**
Hayden Bridge Weather Station	Equipment and install costs	\$11,000
HFRZ Customer Incentives	6 secondary service UG projects 2 generator loans	\$32,300 \$8,000

\*Request for FEMA reimbursement is pending.

\*\*\$300k paid for by grants

## 7.2 Future WMP Investments and Planning Activities

More erratic weather is one variable contributing to the complex and dynamic landscape for wildfire in Oregon. 2022 started off with cool spring temperatures and June precipitation, delaying the start of the wildfire season. Then, July brought the start of a long dry spell that, coupled with persistent drought conditions, elevated risk conditions over the summer months, culminating in the September PSPS event. Fall rains did not return until later in October. 2023 began with higher-than-normal rain and snow, followed by a record-breaking warm, dry May. The Climate Prediction Center indicates an ‘enhanced likelihood of above average temperatures, particularly for the northern half of Oregon’, for July through September<sup>5</sup>. With these rapid fluctuations, this year’s WMP emphasizes operational readiness.

As discussed earlier, the utility will take a conservative approach to enabling protective settings in HFRZs, adjusting system settings when the IFPL moves to level 2. In addition to annual wildfire season training, EWEB is planning its first PSPS tabletop exercise to practice the decision-making framework, operational response protocols and communications plans. To augment access to current weather data, the utility has contracted for custom fire weather forecasting services beginning in mid-July. Contract meteorologists will generate an extended weather outlook as well as short-term 48-hour forecasts for key fire-weather data elements. More frequent forecasts will be available during severe weather events.

To mature our risk assessment methods, EWEB is beginning to collect more granular outage data, including ignition events and bird-related outages. The utility also plans to initiate the Phase II wildfire risk assessment work to refine our HFRZs, particularly in the wildland-urban interface area. The preferred methodology will use machine-learning tools to quantify relative risk that a circuit will fail and potentially cause an ignition based on outage data and available equipment characteristics. The goal of this analysis is to both update/validate our HFRZs based on the most recent wildfire risk maps as well as focus future investments to areas with the greatest reliability and public safety benefit.

In terms of grid-hardening investments, the utility continues to screen potential capital improvements for wildfire risk reduction co-benefit opportunities and solicit new reliability project ideas from operational staff. As a result, switching to non-expulsive fuses in the HFRZs has been identified as a high-priority mitigation action. These devices are designed to clear faults without the potential for showering sparks or emitting hot debris into nearby vegetation. A load study to identify proper sizing for fuse coordination along the upriver distribution circuits needs to be conducted prior to selecting the non-expulsive fuse type and developing the installation plan/budget. For context, this project involves changing out hundreds of devices while adjusting fuse storage and replacement practices. As part of the load study, EWEB has requested the consultant to develop recommendations for where additional reclosers could be installed to improve system segmentation for future PSPS events and outage response.

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<sup>5</sup> “Water Supply Outlook,” National Weather Service, Portland, OR., June 2023.



Several other WMP projects in the design/planning phase are carrying over from last year:

- Upriver voltage regulators: EWEB was in the process of switching out 12 kV transformers to 7.2 kV until supply chain constraints put this project on hold. The conversion was part of a larger resiliency project to bring redundant power supplies to upriver customers via the Walterville substation. Transformer change-outs are necessary to ensure voltage compatibility of the two systems that are being joined together, as well as a capacity upgrade to the Walterville feeder connection and installation of voltage regulators. It is anticipated this work will resume in 2023.
- South Hills UG Project: As originally planned, the Dillard 4724 – Monroe 3722 project consists of undergrounding portions of these South Eugene circuits as well converting from three-phase to single phase taps in other areas, providing reliability and wildfire risk reduction benefits to 1500 area customers. Due to EWEB electric design staff constraints, this \$1.5M FEMA-funded project has been delayed.
- Carmen Tap Right-of-Way (ROW) Expansion: As required in the Carmen Smith Settlement Agreement (FERC license No.2242), EWEB is expanding portions of the Carmen Smith Transmission ROW to provide for enhanced wildlife habitat. This project will also increase clearance, widening the corridor from 70' to 140' (35' each side) along the entirety of the Forest Service properties and three participating private easements. In 2022, surveys identified all trees in the expansion area with potential fall-in risk to the transmission lines. To meet EWEB's licensing requirements, 1,500 trees of these will be topped, with 500 turned into snags (girdled), and the remaining 1,000 left growing until needed as replacements for the first generation of snags. The cut tops will be limbed and left in place, with additional trees being dropped, limbed and left in place to meet requirements for down large woody debris. As these areas are harvested, smaller trees and ladder fuels will be removed to promote early seral habitat consistent with the Carmen-Smith Wildlife Management Plan.

In coordination with the City of Eugene Natural Resources team, EWEB recently enhanced clearance along the Dillard 4734 tap. The project removed 40+ diseased or dead fir trees that could fall into this HFRZ circuit adjacent to the Ridgeline Trail System. A future grid-hardening project along this same circuit is under preliminary discussion. This project would underground about 1000' of distribution circuit and reconfigure the transmission line on new ductile iron poles with other fire-resistant components.

Other future mitigation projects may be identified or accelerated should federal or state grid resiliency projects be successful. Regardless, EWEB is adapting our operations, maintenance, and training practices, while advancing data driven analyses to drive the next iteration of risk reduction and resiliency investments for the next WMP. This is in line with the utility's Continuous Improvement framework, with ongoing review and process updates as needed to meet our objectives more effectively.

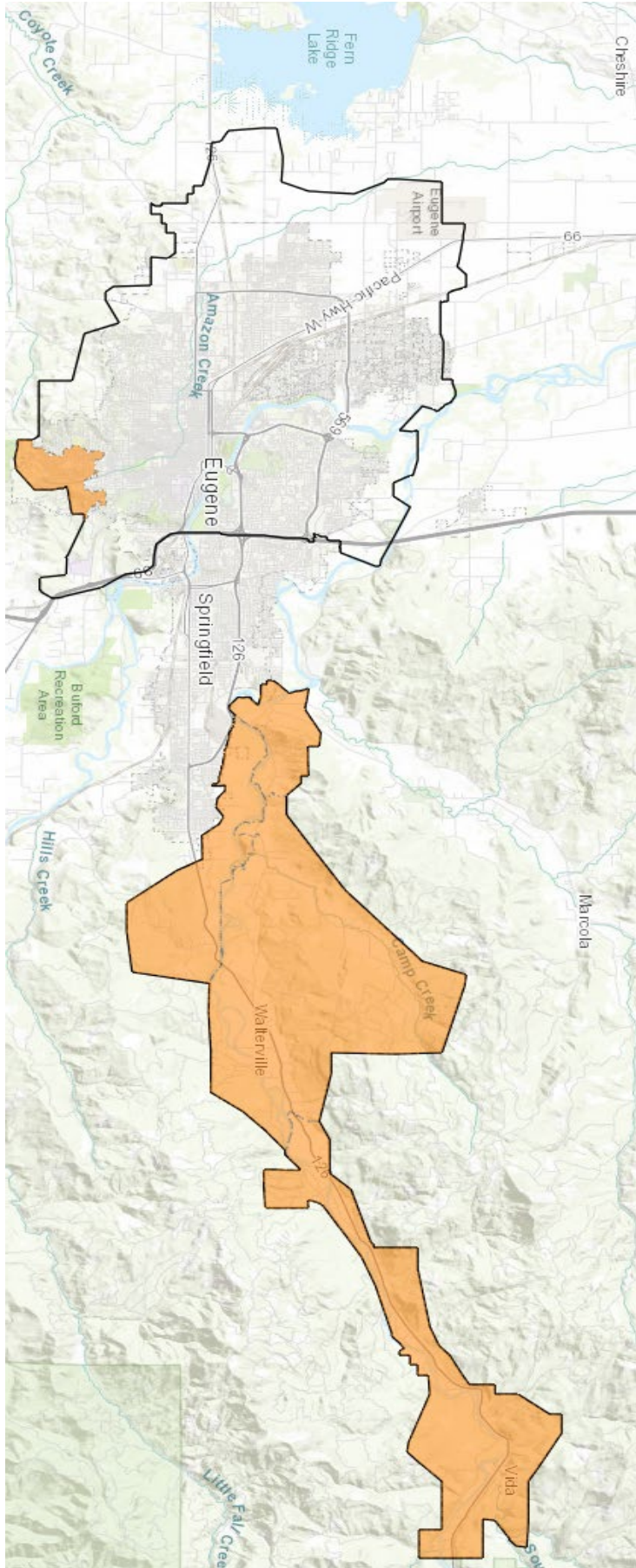
## 8. List of Figures

- Figure 1a. EWEB Metro Service Territory Map
- Figure 1b. EWEB Upriver Service Territory Map
- Figure 2. High Fire Risk Zone Map
- Figure 3. Metro Area Transmission Lines

## 9. Appendices

- Appendix A: 2023 Wildfire Season PSPS Protocols
- Appendix B: September 2022 PSPS Event Summary
- Appendix C: PSPS Information Brochure
- Appendix D: Plan Definitions

Figure 2. EWEB High Fire Risk Zone Map



**Legend**

Higher Risk Service Area



Electric Service Area



## Operational Protocols for 2023 Wildfire Season

### **1. Wildfire Season:**

- Operations Supervisors will monitor and adhere to Industrial Fire Protection Level (IFPL) restrictions and waiver requirements and communicate changes to field crews.
- Operations Supervisors in coordination with Safety coordinators will adjust tools and practices for situational awareness and provide training updates for operational readiness.
- Dispatch will ensure safety patrols are conducted as soon as practical for outages along EWEB's High Fire Risk Zone (HFRZ) circuits, even with a successful reclose, during fire season (IFPL1).
- Marketing and Communications will work with other internal stakeholders to begin wildfire preparation public education campaign in coordination with interagency partners.

### **2. Fire Weather Watch/Red Flag Warnings**

- Dispatch receives National Weather Service fire watch and/or Red Flag Warning (RFW) and sends internal notification to pre-designated team.
  - A fire weather watch/alert will trigger a meeting to evaluate staffing/resource needs and begin additional weather monitoring and enhanced situational awareness for field crews during the watch event. Meeting shall include at least: Resiliency Program Manager, Electric Dispatch Supervisor, Electric Manager
- If a RFW is received for relevant fire weather zone (604/606), Dispatch implements Red Flag Warning operational procedures (Protective Settings Mode for selected circuits).
- To support operational readiness, EWEB will begin situational awareness and internal readiness activities to prepare to stand up an ICS structure (at minimum an IC, Operations Chief and PIO). This team or its designees will:
  - Notify interagency partners/critical infrastructure operators that protective settings will be put in place during RFW.
  - Begin proactive employee and customer communications about heightened fire risk and EWEB actions through EWEB's Communications and Marketing Department.
  - Monitor weather forecasts and other relevant fire potential information throughout the event.
  - Track outages along impacted circuits for any additional customer communications, decisions re: re-energization post-patrol, and WMP reporting.
- Dispatch will track outage and re-energization information along impacted circuits, as well as return the system to standard operational settings when weather conditions improve.
- If the RFW occurs when the IFPL has moved to Level II for the Eastern Lane Region, Dispatch will leave the HFRZ circuits in protective settings for the remainder of the fire season.
- In coordination with local fire professionals, Management will determine when to return circuits in HFRZ to normal operational settings (typically IFPL 1 for Eastern Lane). Should a RFW occur once circuits are returned to normal settings, Dispatch will enable protective settings for the duration of the event.

### 3. Extreme Fire Danger

EWEB may decide to proactively de-energize power lines on a case-by-case basis in response to imminent fire danger and risks to public safety. These situations may include:

- Active wildfire in service area
- Mandatory evacuation orders in effect
- Requests from emergency service providers/wildland managers
- On-the-ground and/or real-time observations of utility operators
- Coordinated response with other area utilities

If the IC recommends activating a PSPS and it is approved by the GM or designated ET member:

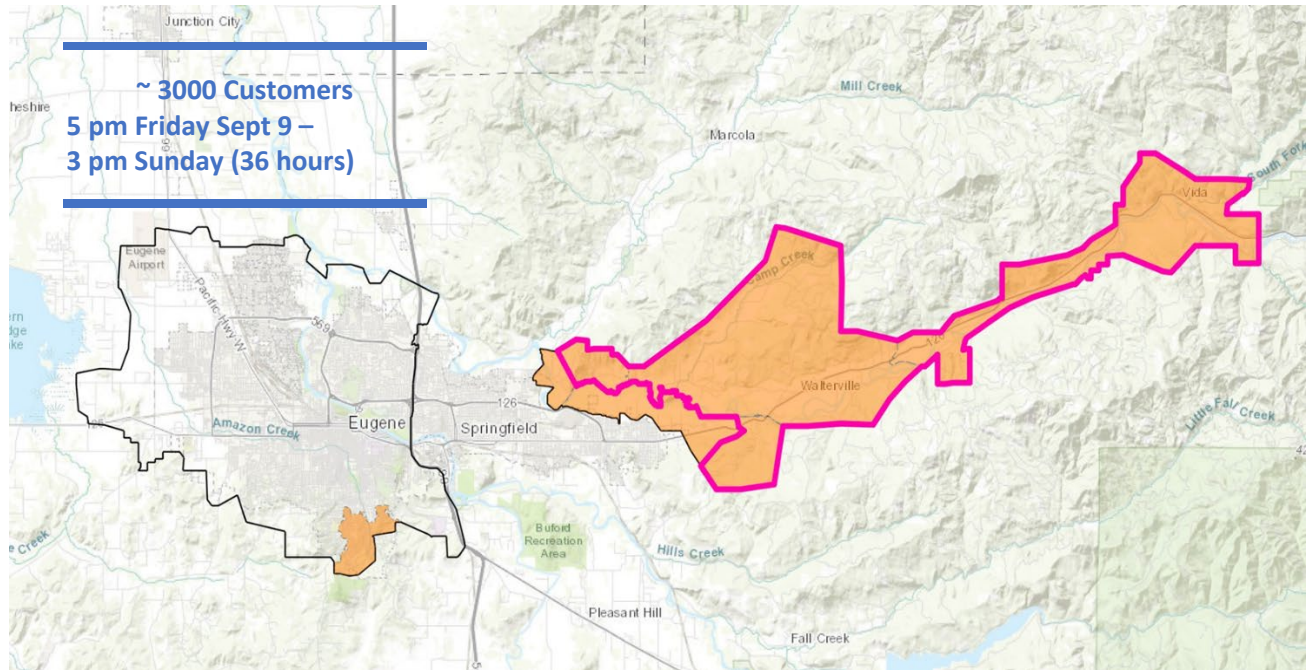
- PIO will initiate PSPS communication protocols for customers, inter-agency stakeholders and employees, including location (s) and expected duration of event.
- Dispatch and ICS Command Staff will continuously monitor real time weather, fuel and risk conditions which may include:
  - Available internal or external partner weather stations
  - Spot forecasts from NWS
  - Field Operational staff observations and measurements
  - Indication of trips or damage to the system
  - Wildfire activity in area/available fire response resources
- ICS will continue to monitor weather forecasts and maintain close communication with public safety officials and area utilities throughout the event to determine when conditions warrant re-energizing circuits. Staffing plans and any outside resources needed will be made ready so that safety patrols can proceed when PSPS is de-activated.
- IC will schedule and conduct a ‘hotwash’ to debrief the PSPS event to continuously improve response protocols and practices.

### Fire Safety Operational Settings Protocols

Event	Operational Response	Notes
Red Flag Warnings (RFW) - Outside Fire Season and IFPL 1	HFRZ circuits covered by the RFW, including BPA-owned Transmission Lines if approved by BPA, will be placed in powerline protective settings mode for the duration of the Red Flag Warning Event. If there is a trip on the circuit, patrols will be conducted to ensure the cause of the fault has been cleared and it is safe to re-energize the line following a full patrol of the line in daylight.	RFW events can occur in spring/early summer and later in the fall when other fire risk conditions are relatively low (temperatures, fuel moisture contents). This operational response is intended to balance risk and reliability.
IFPL 2	IFPL 2 for East Lane triggers moving HFRZ circuits into protective	Timing for moving in and out of this operational response will be based on local agency fire

	settings and leaving them in that mode until IFPL returns to Level 1.	season declarations (e.g., from low to moderate risk) and weather forecasting for EWEB service territory.
Extreme Fire Danger	EWEB may proactively de-energize circuits to protect public safety (PSPS) in cases of high fire danger (nearby wildfire, impending dangerous fire weather conditions). EWEB will provide advance communication to impacted customers and critical infrastructure partners if warning is received early enough to do so. All PSPS circuits will be fully patrolled in daylight hours prior to re-energization for safety.	The number of impacted circuits and duration of the PSPS event will be determined on a case-by case basis considering weather forecasts, on the ground observations and emergency managers/public safety partner input.

## September 2022 PSPS Summary and Lessons Learned



Orange Shading – EWEB High Fire Risk Zones  
Pink Outline – PPS Impact Area

**Event Summary:** EWEB initiated a PPS of all HFRZ circuits except 4734 in South Eugene and a portion of Thurston 2312, both of which remained in protective settings. About 3000 customers were without power for up to 36 hours, from 5 pm Friday September 9 until 3 pm Sunday the 11<sup>th</sup>. The forecasted weather event coincided with the expansion of the Cedar Creek Fire and evacuation of Oakridge area residents, stretching public safety response resources should another fire break out in Lane County. While high winds were registered in upper elevations in the McKenzie Valley, the weather event mostly impacted areas to the north and east of EWEB's service territory. Safety patrols conducted prior to re-energizing the circuits found no damage to EWEB's system. The cost of the PPS event was estimated at \$200k (lost electric revenue, generation, and labor costs).

<b>EWEB PSPS LESSONS LEARNED</b>	
<b>What Worked Well</b>	<b>Ideas for Improvement</b>
<p><b>Early Notice/Pre-Event Planning</b></p> <ul style="list-style-type: none"> <li>- Timely alert to EWEB from ODF re: elevated weather concern</li> <li>- Internal pre-planning including ICS roster build-out, situational awareness communications &amp; strategy meetings</li> </ul>	<p><b>Enhance Event and Contingency Planning</b></p> <ul style="list-style-type: none"> <li>- PSPS placed some circuits on single feeds, so consider what would happen if outages occurred on these circuits.</li> <li>- Engage Generation and Water formally and more directly in ICS operations &amp; planning</li> </ul>
<p><b>Stakeholder Coordination</b></p> <ul style="list-style-type: none"> <li>- Early/frequent communication with area utilities to coordinate operational changes and public messaging</li> <li>- Input from Lane County and public safety to assist with risk assessment/PSPS decision-making</li> </ul>	<p><b>Public Education Opportunities</b></p> <ul style="list-style-type: none"> <li>- Consider earlier notice that PSPS <i>may be</i> called, and include EWEB employees</li> <li>- Build out PSPS-specific preparedness messages such as generator safety when fire danger is high, keeping refrigerated foods/medicine cold, and why the restoration process takes longer than turning power off.</li> </ul>
<p><b>Multi-channel Communication for PSPS Event</b></p> <ul style="list-style-type: none"> <li>- GIS map developed/posted to website</li> <li>- 24-hour public notice via traditional and social media, e-mail blast to subscribers</li> <li>- Out-bound phone calls to impacted customers (when contact info available)</li> <li>- E-mail alerts to critical infrastructure partners</li> </ul>	<p><b>Situational Awareness and Response</b></p> <ul style="list-style-type: none"> <li>- Improve operational decision-making through real-time localized weather data and updated forecasting to initiate patrol and restoration timelines</li> <li>- Refine operational procedures to enable decision-makers to respond to changing weather conditions as appropriate.</li> </ul>
<b>What Worked Well</b>	<b>Ideas for Improvement</b>
<p><b>Restoration Process</b></p> <ul style="list-style-type: none"> <li>- After de-energization, staff quickly transitioned to building switching orders and lining up resources for restoration process.</li> <li>- Service restoration plans were executed safely and methodically.</li> <li>- On-going public communication during restoration process</li> <li>- Process documentation/planning packets from this event will reduce restoration time and allow EWEB to be more nimble re: when to re-energize circuits.</li> </ul>	<p><b>Improve Impacted Customer Data</b></p> <ul style="list-style-type: none"> <li>- Map out critical infrastructure within HRFZ by circuit</li> <li>- Gather updated contact information for customers in HRFZs, with focused outreach campaign to those at most risk during prolonged power outages.</li> </ul>





# Public Safety Power Shutoff (PSPS)

## WHAT IS A PSPS?

A Public Safety Power Shutoff (PSPS) is an operational practice an electric utility may use to preemptively shut off power in high-risk areas to help prevent wildfires during extreme and potentially dangerous weather conditions. A PSPS means EWEB will proactively shut off power and it is considered an action of last resort to help protect public safety. The risk of wildfires has changed in the Pacific Northwest and a PSPS is one way we can mitigate those risks. We recognize that it is a very serious decision to turn off the power and there are many factors we consider when determining if a PSPS is a necessary action to mitigate the risk of wildfires. A PSPS is just one tool in our wildfire mitigation toolbox.

## HOW WILL YOU BE NOTIFIED OF A PSPS EVENT?

We know advance notification is critical to help you prepare for an outage. Whenever possible, EWEB will announce a PSPS 48 hours in advance and again approximately 24 hours before the power is scheduled to be turned off. We will use multiple communication channels including email, autodial, social media, our website, and local news media. Color coded graphics will be used to signify the status of a PSPS. Weather events and wildfire situations can be dynamic, so while we will strive for at least a 24-48 hours advance warning, this may not always be possible.

For email alerts about a PSPS, sign up at [eweb.org/emergencyprep](http://eweb.org/emergencyprep).

## HOW DOES EWEB DECIDE TO TURN OFF THE POWER?

EWEB considers several variables when deciding to proactively turn off the power in response to imminent fire danger and risk to public safety. While each situation is unique, some variables include:

- Impending dangerous fire weather conditions
- Active wildfire in service area
- Mandatory evacuation in effect
- Coordinated response with other area utilities

## HOW LONG BEFORE POWER IS RESTORED?

Once the immediate threat of wildfire has passed, our crews will visually inspect the power lines to check for any damage or safety concerns before restoring power. As these inspections can only occur during daylight hours, customers should be prepared to be without power for an extended time during a PSPS.

## ADDITIONAL RESOURCES

For EWEB's Wildfire Mitigation Plan: [eweb.org/wildfire](http://eweb.org/wildfire)

For emergency preparedness: [eweb.org/emergencyprep](http://eweb.org/emergencyprep)

For Outage updates: [eweb.org/outagemap](http://eweb.org/outagemap)

To update your contact information and receive PSPS alerts call

541-685-7000 or email [eweb.answers@eweb.org](mailto:eweb.answers@eweb.org)

If you have, or care for someone with, significant health needs that require electricity, please let us know by calling 541-685-7000.

### WATCH PUBLIC SAFETY POWER SHUTOFF (PSPS)

To protect public safety, we will likely proactively and temporarily turn off power for

EXAMPLE



### WARNING PUBLIC SAFETY POWER SHUTOFF (PSPS)

To protect public safety, we will proactively and temporarily turn off power for

EXAMPLE



### NOTICE PUBLIC SAFETY POWER SHUTOFF (PSPS)

To protect public safety, we have proactively and temporarily turned off power for

EXAMPLE



### RESTORED PUBLIC SAFETY POWER SHUTOFF (PSPS)

We have safely inspected power lines in the PSPS zone and power has been fully restored for

EXAMPLE



## Glossary

Term	Definition
<b>Asset (utility)</b>	Electric lines, equipment, or supporting hardware.
<b>Circuit (distribution)</b>	A medium voltage power line (7.2kV & 12.47kV for EWEB) originating at a substation circuit breaker and connecting all the service transformers fed via that circuit breaker.
<b>Circuit (transmission)</b>	A high voltage power line (69kV & 115kV for EWEB) originating at a power station or a transmission substation circuit breaker and connecting all the subordinate substations fed via that circuit breaker.
<b>Conductor</b>	The wire that transmits power in either a Transmission or Distribution circuit.
<b>Critical facilities and infrastructure</b>	<p>Those facilities and infrastructure that provide essential public services and/or that require additional assistance and advance planning for community safety, including:</p> <ul style="list-style-type: none"> <li>• Fire/Police/Emergency Services</li> <li>• Hospitals/Critical Care Facilities</li> <li>• Energy Systems</li> <li>• Water and Wastewater Systems</li> <li>• Communications</li> <li>• Transportation</li> </ul>
<b>Fault</b>	An abnormal condition on an electrical circuit that interrupts the flow of electrical current.
<b>Feeder</b>	See distribution circuit.
<b>Fire behavior modeling</b>	A software program which simulates wildfire spread in an area based on defined variables.
<b>Grid hardening</b>	Modifications, upgrades and replacement of electrical equipment to increase resilience of the asset to wildfire events and/or reduce the likelihood the equipment is involved in an ignition event.
<b>Hazard Tree</b>	Any trees that are dead, dying, diseased, damaged, or structurally defective and the arborist determines that their direction of failure is reasonably expected to be toward the conductors, guy wire, or other facilities. These trees should be removed or pruned/crown reduced to eliminate risk to EWEB facilities.
<b>High Fire Risk Zone</b>	Geographic area identified by utility operators in the current WMP as being at elevated risk for wildfire relative to other areas in the utility's service territory.
<b>Ignition Event</b>	A utility equipment arc or spark that becomes a self-sustaining fire.

<b>Impact/consequence of ignitions</b>	The effect or outcome of a wildfire ignition, affecting objectives, which may be expressed by terms including, although not limited to health, safety, reliability, economic and/or environmental damage.
<b>Protective settings mode</b>	A risk mitigation action that changes the operational settings of a particular circuit to disable reclosing and/or make the system more sensitive to faults. Also known as powerline or wildfire safety settings.
<b>Public Safety Power Shutoff</b>	A proactive de-energization of a portion of an electrical utility's network, based on the forecasting of and measurement of extreme wildfire weather conditions.
<b>Recloser</b>	A device used in electric distribution systems to interrupt the circuit to clear faults and restore service if the 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 and the line trips off until manually restored.
<b>Red Flag Warning (RFW)</b>	A Red Flag Warning means warm temperatures, very low humidity and strong winds, as defined by the National Weather Service, are expected to combine to produce an increased risk of fire danger. Each NWS office creates local criteria for RFWs. A fire weather watch may be issued up to 72 hours before the RFW conditions are expected to occur. A watch means that fire weather conditions are possible but not imminent, while a warning means that fire conditions are expected to occur shortly or are on-going.
<b>Span</b>	The space between adjacent supporting poles or structures on a circuit consisting of electric lines and equipment. "Span level" refers to asset-scale granularity.
<b>Vegetation management</b>	Trimming and clearance of trees, branches, and other vegetation that poses the risk of contact with electric equipment.
<b>Wildfire risk</b>	The potential for the occurrence of a wildfire event typically expressed in terms of ignition probability and wildfire impact/consequence.
<b>Wildland Urban Interface (WUI)</b>	An area or zone where natural, forested areas and development meet.