Eugene Water & Electric Board

2022 Wildfire Mitigation Plan

Approved July 5, 2022

EWEB

Table of Contents

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 must be designed to protect public safety, reduce risk to utility customers and promote electrical system resilience to wildfire damage.

EWEB has numerous programs in place for grid reliability and safety that aid in wildfire risk mitigation. This first wildfire mitigation plan consolidates these existing efforts into one planning document while laying out future efforts to ramp up interagency coordination and community engagement. EWEB is committed to adapting its strategies as risk assessment models and technologies mature, and in response to emerging best practices and changing environmental conditions.

Understanding areas of high wildfire potential across the electric system is critical to effectively target the location and types of mitigation investments. 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.

This plan's comprehensive approach to risk reduction includes the following components:

- More frequent equipment inspections and prioritized maintenance
- Enhanced vegetation management, including fuel reduction projects
- Targeted equipment upgrades and grid hardening investments
- Technology, tools and modified field practices for wildfire season preparedness
- Changes to electric system operational settings (such as protective settings mode) to reduce the risk of an ignition event during extreme fire risk conditions

EWEB's 2022 budget allocates $1 million toward wildfire risk mitigation activities described in the plan.

EWEB recognizes the heightened public concern around wildfire danger and launched a focused communications strategy in 2021. The community engagement strategy builds on a strong foundation of effective public outreach on resiliency and emergency preparedness topics. As part of this effort, the utility created specific messaging and imagery for Red Flag Warnings to alert the public of heightened wildfire potential and the changes EWEB is implementing on the electric system to reduce wildfire risk. As these operational changes increase the potential for service disruptions, outreach efforts include notification of interagency partners and critical infrastructure owners so they can be prepared for possible outages.

This plan includes core metrics that will be used to report annual progress and identify gaps or deficiencies. Following initial plan adoption in summer 2022, annual reviews are planned for April or May in conjunction with EWEB's capital improvement plan and budget development processes. These reviews will direct future mitigation investments in alignment with direction from EWEB's elected Board of Commissioners.

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. Per the by-laws, the utility's principal purpose is to benefit the citizens of Eugene by providing water, electric and other physical energy services 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: 2.4 square miles

The electric system supplies service to over 96,000 residential, commercial, and industrial customers within the City of Eugene and in rural areas along the McKenzie River between Walterville and Vida (upriver territory). The approximately 5,000 upriver customers are overwhelmingly residential customers. 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 delivered to customers is supplied by Bonneville Power Administration (BPA) contracts, EWEB-owned generation resources, other contracted resources and purchases from wholesale energy markets. EWEB's power supply is made up primarily of hydropower, but also includes wind, biomass and solar. The utility operates three hydroelectric facilities along the McKenzie River, with two plants within the service territory (Walterville and Leaburg) and a third, the Carmen-Smith Hydropower Project, located 70 miles east of Eugene in unincorporated Linn County.

- Total electric system service area: 236 square miles
- Transmission and distribution lines: 1633 miles
- Substations: 38
- Utility-owned hydroelectric facilities: 4

- 2020 power consumption: 264 aMW with 416 MW 1-hour peak

The electric utility's 2021 operating budget was $217 million, with over $50 million budgeted for capital work.

2.2 Plan Context

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.

This convergence of factors was apparent in the 2020 Labor Day fires that burned over 1 million acres in Oregon, destroyed some 4,000 structures and resulted in several fatalities (see Figure 2 for a map of 2020 wildfire activity). While 10% of the state was under evacuation orders, much more of the population was exposed to dangerous air quality conditions. The unprecedented nature of the 2020 wildfire season and its direct impacts on Oregonians prompted a call to action during the 2021 legislative session, resulting in the passage of Senate Bill 762 (SB 762).

2.3 Regulatory Background

The $190 million Omnibus Wildfire Bill (SB 762) is a comprehensive package of new rulemaking efforts and programs to address increased wildfire frequency and impacts. The bill requires development of a statewide map of wildfire risk, supports community recovery from fire damage, and funds numerous fire prevention and adaptation programs. A key legislative component is a new mandate for electric utilities to file risk-based wildfire mitigation and protection plans with the Oregon Public Utility Commission (OPUC). For investor-owned utilities, these plans were submitted for OPUC review at the end of 2021. As a municipal or consumer-owned utility, EWEB's wildfire mitigation plan must be reviewed by its governing board by June 30, 2022, and then filed with the OPUC within 30 days of Board approval.

The minimum standards described in SB 762 serve 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 risk-based wildfire mitigation plan approved by the utility governing body to the Public Utility Commission to facilitate commission functions regarding statewide wildfire mitigation planning and wildfire preparedness.

2.4 Plan Approach

The EWEB WMP will adhere to adopted OPUC rules for consumer-owned utilities and, where prudent and feasible to do so, EWEB may elect to adopt more rigorous standards. Fortunately, EWEB already has multiple programs and policies in place for grid reliability and safety that also aid in wildfire risk mitigation. The utility's first WMP will formalize and consolidate these existing efforts, with particular focus on enhancements to address increased wildfire risks, while ramping up interagency coordination and community engagement efforts.

The plan will be highly adaptive, building on new information as risk assessment analyses are completed and investment needs are further defined. As such, the plan is a work in progress informed by best practices from other electric utilities, OPUC rulemaking guidance, outside consultant expertise and EWEB's strategic priorities.

The overall approach to completing this first WMP is to:

- Develop an initial baseline risk assessment of the electric system to focus mitigation actions on areas with greater wildfire potential
- Incorporate best practices that reduce wildfire risk and offer other co-benefits to utility customers, such as increased reliability during winter storms
- Enhance community engagement and inter-agency coordination efforts to strengthen wildfire prevention partnerships
- Document assessment, mitigation and response processes and strategies.

Regular plan updates are crucial to track progress, integrate related work, identify gaps and respond to emerging information and conditions. The EWEB Board of Commissioners will determine the appropriate level of investment to mitigate wildfire risk and key metrics for progress reporting, ensuring alignment with Board priorities and community values. The WMP will be reviewed yearly in late spring, around the start of wildfire season and in conjunction with our Capital Improvement Plan (CIP) update process.

3. Plan Purpose and Policy Objectives

3.1 Purpose Statement

EWEB's Wildfire Mitigation Plan will meet the legislative intent of SB 762 and related PUC 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.

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.

EWEB's Strategic Plan provides the basis for policies, decisions, and the annual goals established for the utility. 2021 Organizational Goal #4 was to: *Collaborate and align with the Board to develop directional guidelines and decision criteria on issues having long-term strategic and policy-setting impacts, including development and approval of an initial risk-based Wildfire Mitigation Plan (WMP).* The WMP framework and plan purpose statement were approved by the EWEB Board in December 2021.

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 CIP.

In addition to aligning with EWEB core values and strategic priorities, this initial plan 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 below.

Table 1. WMP-Related Planning Documents

Electric Capital Improvement Plan (2021-2031)	Updated Annually
Eugene-Springfield Multi-Jurisdictional Natural Hazard Mitigation Plan	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 that our equipment is 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.

The Board is responsible for the adoption of 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.

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. In 2020, Lane County completed its second Community Wildfire Protection Plan (CWPP). A primary component of this plan was an updated Wildfire Risk Assessment to evaluate the potential loss of lives, property and essential infrastructure from a wildfire event.

Lane County's CWPP has three distinct ecoregions and describes the overall wildfire risk[1] 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.

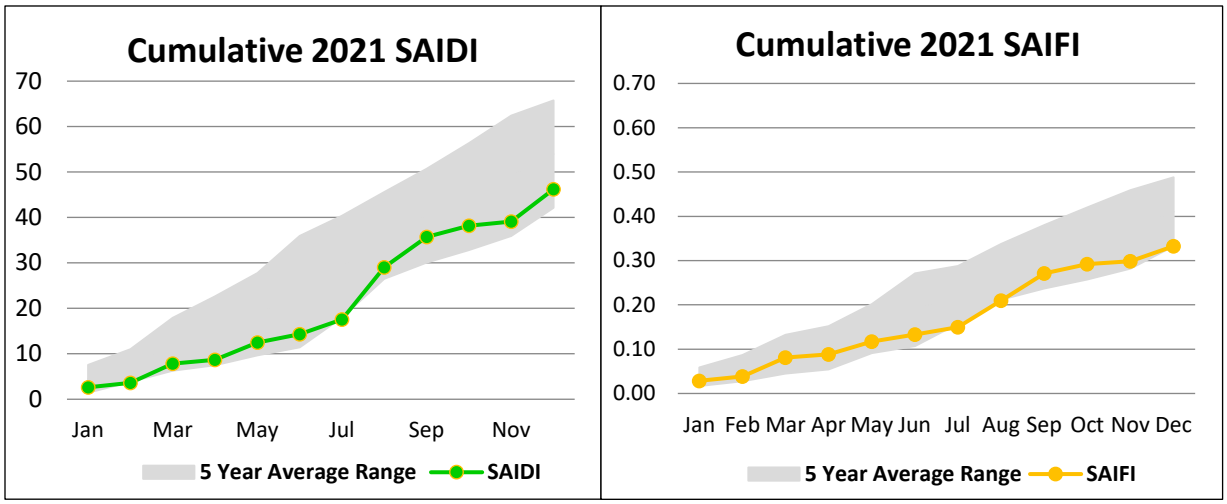
Most of EWEB's electric infrastructure is in urban areas with relatively low risk for wildfire. However, long portions of the electric system run through heavily forested terrain, and EWEB serves several thousand customers who live in the wildland-urban interface. About half of the distribution system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

Table 2. Electric System Asset Overview

Asset	Overhead Line Miles	UG Line Miles
Total Transmission Lines	129	3.6
69 kV Transmission	27	---
115 kV Transmission	97.3	3.6
Primary Distribution Lines	556	541
Secondary Distribution	167	237
Asset	**Quantity**	
Pole Structures	18,289 EWEB-owned poles	

[1] 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.)

Like most electric utilities, EWEB's 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, as measured by the average duration of the interruption (SAIDI) and the average frequency of interruptions (SAIFI) show that outages are near a five-year low.



Common causes of unplanned outages (not including storm events) are contacts with trees/vegetation, equipment failures, equipment hit by vehicles and wildlife (birds/squirrels). 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, ignition risk may increase in late summer/early fall.

Other risk drivers include:

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

4.2 Areas of Higher Wildfire Risk

Proposed OPUC rules establish stricter criteria for areas designated as High Fire Risk Zones (HFRZ) by utility operators. EWEB conducted an assessment that combined a review of the Oregon Wildfire Risk Explorer tool with on-the-ground experience of system operators, to identify a preliminary list of circuits located in terrain considered at higher risk for wildfire. In general, this includes a small area in the southeast hills of Eugene, as well as the McKenzie

Valley. Early identification of these circuits helped focus the mitigation strategies described in this plan. Equipment in HFRZ will have more frequent inspections and may be subject to operational changes to increase the sensitivity of the circuits to faults or irregularities. These changes would typically occur during hot, dry and windy conditions, such as Red Flag Warning events. For the purposes of this report, changing operational settings for fire safety is referred to as "protective settings mode."

Table 3. 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.*

Oregon utilities are required to identify HRFZ inside their service territories as well as within the right of way for generation and transmission assets, even if located outside their service territories. Table 4 lists EWEB transmission assets located in higher wildfire risk areas. Note that EWEB operates the 115 kV lines under the supervision of BPA. Therefore, any changes to operational settings require Bonneville Power Administration (BPA) permission and coordination. For the Carmen Tap, BPA has agreed that this transmission line can be placed 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.

Table 4. 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

EWEB has engaged the technical expertise of an experienced WMP consultant, ICF Incorporated, to assist in core facets of the initial WMP. The first phase of this engagement was to analyze the preliminary list of higher risk fire circuits and recommend whether these circuits should be designated as within a HRFZ. Except for one relatively short span of transmission line, ICF concurred that these circuits had higher wildfire risk potential (see Appendix A for ICF's evaluation).

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.

EWEB is working to update the joint operating agreement with PGE to include language 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.

5. Wildfire Risk Mitigation Actions

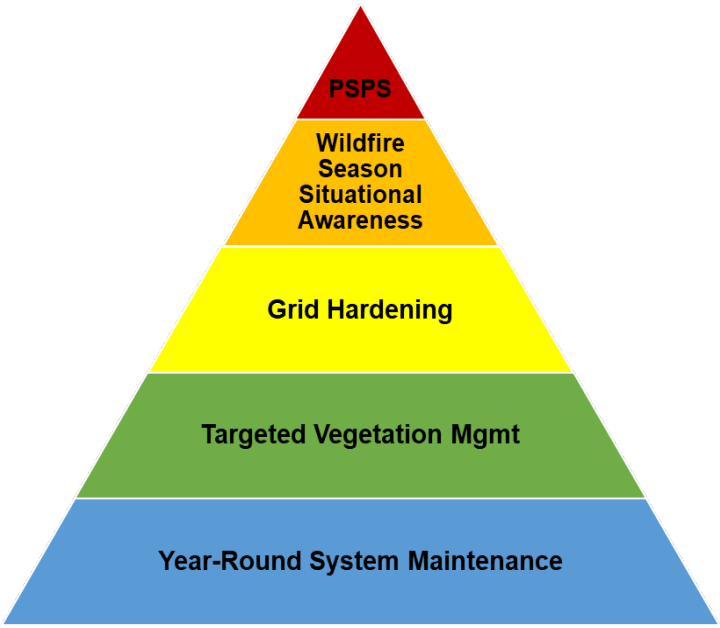
5.1 Mitigation Overview

Experience from California electric utilities indicate that wildfires linked to utility infrastructure are often associated with vegetation contacting wires and/or equipment failures. Under certain weather and fuels conditions, a resulting spark can grow into a large wildfire. Thus, WMPs seek to bolster system maintenance and vegetation management as the first line of defense, focusing on areas of the electric system 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. Current and planned actions in each of these categories were informed by EWEB's CIP and Board input, the research and recommendations of our consultant, and other subject matter experts.

- **System Operations and Maintenance**: Includes design standards, inspections and equipment diagnostics, as well as equipment maintenance and replacement.
- **Vegetation Management**: Both traditional utility programs to maintain clearance from electric facilities, as well as fuels reduction and select green infrastructure projects that have 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 operational settings and preemptive Public Safety Power Shutoffs (PSPS) for specific circuits during extreme fire risk conditions.



5.2 Current 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, clearances 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.

Beyond OPUC required inspections, EWEB has initiated annual visual patrols of all transmission and feeder circuits, including the following components:

- Poles
- Crossarms
- Hardware
- Tree and vegetation encroachments
- Other notable hazards

For feeders located within HRFZs, inspections are extended to all primary distribution components. Patrols of these circuits are typically performed prior to April 1 of each calendar year. Inspections are documented, including if any corrections are needed and the priority of such repairs. As a result of the 2021 inspections process, crews accelerated replacement of around 100 crossarms in the upriver service territory that showed signs of degradation.

In addition to annual feeder-based inspections, the utility 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. 2021 program statistics are provided below:

- 2,506 poles inspected, tested and treated
- 15 poles were rejected; 3 were for identified for priority replacement

Reliability Programs with Environmental and Risk Reduction Benefits

Other system-wide reliability work that has fire risk reduction co-benefits is the conversion from mineral oil to natural ester in transformers (both in the distribution system and at substations). EWEB has been upgrading to FR3[2] fluid made from soybean oil for a number of years, originally to reduce environmental contamination risks. However, FR3 is also classified as less flammable. Presently, 7.5% of the system has been upgraded, as well as the substation transformers at Holden Creek and Carmen-Smith. An assessment prioritized 139 transformers in the HFRZ for upgrades. EWEB has had to temporarily suspend discretionary transformer replacements due to supply chain issues.

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.

Osprey nests on power poles can cause outages and even fires, 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 material over time, the nest can become very large, exceeding the design criteria of the pole structure, and creating an unstable nest.

To support healthy osprey populations while addressing reliability impacts, EWEB has built 30 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 22 of the platforms were actively in use. EWEB's osprey nest management program includes monitoring nesting platforms and cleaning out or removing inactive nests to reduce their size.

Planning is underway to add nesting sites as a new layer to our GIS database. For areas with high activity, construction methods like raptor framing, bushing covers and/or perch diverters can be used when equipment is repaired or replaced.

[2] FR3 is a natural, vegetable-based product that not only has environmental and operational benefits, is less combustible.

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 (see Appendix B).

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 for completing 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 '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.

In 2021, helicopter trimming was used to expedite clearance along the transmission corridor from Blue River to the Carmen-Smith hydroelectric plant.

This method effectively maintained EWEB's full ROW in less than a week's time and reduced future patrol and inspection needs in an area where winter storms and lightening events are more frequent.

Holden Creek Substation

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.

McKenzie Watershed Restoration and Fire Mitigation Efforts

As part of the Holiday Farm Fire recovery effort, EWEB 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 and to improve ecological function of these complex riparian systems since the Holiday Farm Fire. 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. Two major restoration projects were completed last year (Deer Creek and Finn Rock Phase 1), and similar projects are planned for other sections of the middle McKenzie using a combination of local, state and federal funding sources.

EWEB and its restoration partners were awarded an Oregon Department of Forestry (ODF) grant in 2021 to implement fuels treatments on rural residential properties. Due to the extensive need for this support for upriver residents, additional fuels reduction work was conducted after the grant-funded projects were completed. EWEB has since applied for and been awarded another round of ODF funding for upriver fuels reduction projects.

Treatments were site-specific and included:

- 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

With separate funding, fuels reduction projects were completed on two EWEB reservoir properties in South Eugene.

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 may result in deploying more fire-resistant equipment as part of these projects, particularly where projects are in higher risk areas. For example, ductile iron poles were installed in place of wooden transmission poles in the Deer Creek area above Blue River.

Beyond transitioning to FR3 transformer fluid across the entire system, EWEB has targeted replacement of 12 kV transformers with 7.2kV transformers in the McKenzie Valley. This change cuts the number of energized distribution conductors in half, reducing the chances that falling branches get cradled in the lines, which can cause heating and sparking. Similarly, the utility looks for opportunities to reconfigure three-phase overhead distribution to single phase. 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. Crews converted approximately 1,700 feet of distribution to single phase on North Gate Creek Road as part of the Holiday Farm Fire rebuild effort.

Another component of the post-fire recovery effort is a new incentive program to encourage undergrounding of customer-owned secondary services. EWEB offers financial assistance to help customers rebuilding their homes after the Holiday Farm Fire underground their electric facilities. By reimbursing eligible expenses at up to 100 percent, the utility and homeowners can improve the design up the upriver distribution system for enhanced reliability and wildfire resilience.

Additional targeted undergrounding is proceeding using FEMA hazard mitigation grant funds for a series of projects initially proposed to improve reliability during winter storms. Two overhead conversion projects in the South Hills have already been completed, resulting in a little over a mile of high voltage (12 kV) conductor being placed underground.

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 meet relevant requirements and follow the Industrial Fire Precaution Levels (IFPL). 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.

As part of our enhanced situational awareness protocols, EWEB has equipped vehicles with additional fire suppression equipment. This includes a bed-mounted water tank, additional fire suppression tools and communications capabilities for remote areas. These trucks will be used during wildfire season to wet down areas that EWEB's water trailer cannot access, as well as for visual patrols of the upriver system during Red Flag Warnings. Additionally, these vehicles will enable field staff to access remote areas more quickly and with better maneuverability, while equipping staff to extinguish any sparks for safety.

Large, in-person safety trainings have been on pause due to COVID-19 precautions. With restrictions lifting, a wildfire prevention and response refresher for field crews, with support from USFS staff, is planned for later this spring. Training topics may include fire weather forecasting, suppression tools and tactics, and notification/response protocols.

Improving communications capabilities for utility operators, field crews and emergency responders was a focus during the Holiday Farm Fire rebuild effort. Prior to the fire, EWEB had a single communications pathway to the Carmen-Smith hydro plant via a series of microwave towers, including Mt. Hagen which suffered a complete loss. As part of the rebuild effort, Mt. Hagen facilities have improved backup power capabilities to extend off-grid run times.

Mt. Hagen Communications Facilities Post-Holiday Farm Fire

With the support of Elevate Technology, which has helped re-establish internet service for the Blue River community, EWEB tested and is now working towards a permanent backup microwave pathway to the east, providing redundant communications for system operators. EWEB has funding to upgrade other microwave links that were not damaged in the fire, with these projects planned for 2022-23.

5.6 Public Safety Power Shutoff (PSPS)

During weather conditions where fire risk is extreme, utilities may elect to preemptively de-energize certain power lines, cutting off power to customers for several hours or longer. While a preemptive power shut off can remove a potential ignition source during dangerous weather events, it also introduces other public safety risks. Of notable concern is the potential loss of telecommunications facilities and water for drinking and fire suppression that is supplied by electric pumps, as well as refrigeration and cooling for the elderly and medically fragile. As such, coordination and communication with critical infrastructure owners, public safety partners and impacted customers is essential to a fully formed PSPS program. 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 already 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 electric system if there is an active fire nearby or imminent fire danger in the area. In response to the growing wildfire threat, the utility has developed procedures to initiate power line protective settings to increase the system's sensitivity to irregularities. This extra level of protection currently applies to EWEB-operated facilities in the McKenzie Valley and a smaller section of the system in the southeast hills in Eugene. Activation of protective settings mode is triggered by Red Flag Warnings or at the discretion of system operators.

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 sparks that could lead to a fire ignition event.

Once protective settings are in place, EWEB's procedure specifies actions taken if the circuit trips off. This includes visual patrols 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 preemptive power shutoffs and is a valuable risk reduction alternative under less than extreme fire conditions.

As part of our contract with ICF, EWEB requested its expertise in assessing the potential role of a more fully formed PSPS program as part of our WMP. The review was intended to help EWEB determine if PSPS has applicability, given the performance and condition of our electric system plus historic weather patterns. The analysis also considered the availability of objective criteria that would be used when considering PSPS activation, balancing those thresholds with the real-world tradeoffs of power outages for residents who are not under mandatory evacuation orders.

Access to localized, accurate, real-time weather data is essential to make an informed PSPS decision. EWEB is pursuing options to improve weather monitoring capabilities in HRFZs beyond the alerts issued by the National Weather Service's Portland office. This may include monitoring the two Remote Automatic Weather Stations (RAWS) operated by the USFS and Bureau of Land Management (BLM) located near Vida and McKenzie Bridge and/or adding additional EWEB-owned stations.

EWEB has formalized its current wildfire season operational practices as detailed in Appendix C. These protocols will be evaluated and refined over time with operational experience, new and enhanced tools and in response to utility best practices.

5.7 Future Wildfire Mitigation Investments

This initial WMP is intended to formalize, collate and, where necessary, modify our safety and reliability practices to respond to the forthcoming OPUC requirements. Adding wildfire mitigation potential as a project criterion helps prioritize and direct investments towards activities that derive the greatest overall risk reduction benefits. Future phases of this work will incorporate more expansive risk modeling to further evolve and mature our HRFZ analyses, particularly in the wildland-urban interface, and improved asset management tools for prioritizing capital investments.

In the near term, EWEB allocated $1 million for wildfire mitigation-related activities, such as enhanced circuit inspections and resulting equipment maintenance, situational awareness tools and grid hardening efforts. Specific projects are listed in the table below.

Table 5. 2022-2023 Risk Mitigation Investments

System Reconfiguration	
69 kV Line Removal	Removing the A/B 69kV line will eliminate over five miles of older aerial equipment from Walterville to the Thurston substation. With the Holden Creek Substation in service, it will be possible for power to flow from BPA's 115kV circuit that stretches from Thurston Substation to the Carmen-Smith Project. In addition to fire risk reduction, co-benefits of this project include avoided costs of replacing lines, poles, crossarms and other components that are near end of life, as well as reduced vegetation management and equipment inspection needs.
Upriver Voltage Regulators	As discussed earlier, EWEB in the process of switching out 12 kV transformers to 7.2 kV as supplies are available. This is part of a larger resiliency project to bring additional backup power to upriver customers. In the event of longer duration BPA 115kV line trip, or an outage at the Holden Creek Substation, the two feeders at the end of EWEB's territory will be served from a backup feed out of the Walterville Substation. This will be made possible by transformer change outs that ensure the voltage compatibility of the two systems that are being joined together, a capacity upgrade to the Walterville feeder

	connection and installation of voltage regulators along the line to ensure voltage remains in the proper range for supply to customers at various loads over the whole circuit.
Grid Hardening	
South Hills Distribution Undergrounding	The Dillard 4724 – Monroe 3722 project consists of both undergrounding portions of these lines as well converting from three-phase to single phase taps in other areas (see Figure 4). This $1.6 million project will improve reliability as well as reduce wildfire risk to over 1,500 nearby residences. The project will be in design in 2022-23 with construction completed by the end of 2024.
Updated Construction Standards	The 2022 budget includes funding for a new FTE to research and update our distribution system construction standards manual, including equipment standards that would apply to circuits in HFRZs, such as covered conductor, non-expulsive fuses and mesh-wrapped poles.
Communications and Remote Sensing	
Wildfire Cameras	EWEB is partnering with the Hazards Lab at the University of Oregon to install an ALERTWildfire camera at the Smith Ridge telecommunications site. This will be the first wildfire camera with public viewing access in the McKenzie Valley. Recent statewide funding may enable additional cameras and/or weather monitoring stations in and around HRFZ.
115 kV Safety Upgrades	This project replaces 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.
Enhanced Vegetation Management	
Carmen Tap ROW Expansion	EWEB and the USFS are planning to expand the ROW to 70' for reliability as well as habitat creation. In 2022, surveys will identify trees that are tall enough to hit the transmission lines if they were to fall. One thousand of these trees will be topped and 500 turned into snags for habitat in 2023, with the remainder left growing until needed to replace first generation snags. Smaller trees and ladder fuels will be removed to promote early seral habitat consistent with the Carmen-Smith Wildlife Management Plan. Debris will either be removed or chipped and left on site to reduce potential fuels accumulation.

6. Community Engagement and Interagency Coordination

Recognizing the heightened public interest in wildfire risk and the importance of a comprehensive community engagement plan, EWEB prepared its first WMP communications plan for the 2021 wildfire season. The plan included key messages and outreach tactics for internal audiences, key community stakeholders and our customers at large (see Appendix D). The communication strategy emphasized 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. This communication plan will be refreshed annually.

6.1 External Communications Tactics

EWEB's 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 and content will grow over time as more information and resources are available. A wildfire safety brochure was created for use at community events and presentations and can be viewed and downloaded from the website. The brochure was mailed directly to customers living in the HFRZs.

During the 2021 wildfire season, EWEB launched a robust social media campaign to raise awareness of utility's risk mitigation actions as well as share related content from agency partners. Content was published on multiple platforms on two dozen different topics, garnering over 50,000 total engagements (see Attachment F for detailed campaign metrics).

The utility made significant progress in developing messaging and collateral imagery regarding the use of powerline protective settings during Red Flag Warning events. Social media was the primary channel used for these alerts, with a reach of over 10,000 customers each time. This performance is similar to the amount of engagement seen during high profile winter storm-related outage events.

In support of the Red Flag Warning alerts, a "Higher Wildfire Risk Area" map was published online to help customers determine if their residence is within an area where protective settings may be put in place. This map is preliminary and will be refined as additional risk assessment information is available. Any outages associated with a proactive de-energization due to wildfire risk will be displayed on the EWEB Power Outage Map.

A targeted outreach effort to prepare the medically fragile for potential loss of power due to utility actions to reduce wildfire risk will be addressed in future iterations of our WMP. As an initial step, the wildfire brochure encourages customers to update their contact information and alert EWEB of any life-sustaining medical equipment needs.

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 rely on domestic wells for water service.

6.2 Interagency Coordination

Wildfire mitigation and response planning requires a whole-community approach. EWEB has begun wildfire awareness and response coordination with our emergency and public safety partners, local government agencies and other critical infrastructure owners, such as private telecommunications providers. As a result of these conversations, EWEB has a Red Flag Warning email notification list that includes about two dozen stakeholders to alert our partners of the potential for electric service disruptions. Furthermore, EWEB is collecting locational data for non-EWEB owned critical infrastructure to build a GIS map that can be overlayed on the Higher Wildfire Risk Area map. This layer can be used to identify assets like communication towers that require backup sources of power to maintain operability (and/or priority restoration) if impacted by a PSPS event.

EWEB staff 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. This team is supporting a FEMA grant project to develop a county-wide wildfire communication plan, including shared key messages and a calendar of outreach events. If funded, this multi-agency wildfire communications project would kick-off later this year.

Table 6. 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 University of Oregon Emergency Management Willamette National Forest (U.S. Forest Service) Oregon Department of Forestry

Early in 2022, EWEB convened a meeting with local utility partners for general information sharing on WMP development progress and to seek opportunities for future coordination. To promote more consistent messaging around wildfire preparedness and risk mitigation from the utility perspective, it was agreed to develop a common glossary of terms for potential inclusion in utility WMPs and communication plans (see Appendix F).

Utility partners also voiced interest in ensuring County Emergency Management was informed of their mitigation efforts and wildfire season operational plans. As a result, a Lane County "Wildfire Summit" was hosted to bring local utilities, fire district chiefs, ODF staff and emergency management together to review high risk fire zones, planned fuels reduction work and to share updated contact information in advance of the upcoming fire season. EWEB plans more in-depth conversations with fire agencies and ODF staff to discuss HRFZs and other areas with heightened public safety risk due to factors such as emergency response times, poor communications coverage and/or limited evacuation routes.

7. Plan Metrics, Performance Tracking and Maintenance

Plan metrics and performance measures will be determined by OPUC requirements, EWEB operational needs and direction from the Board of Commissioners. Key metrics may include:

- Community education and outreach campaign metrics
- PSPS/protective settings mode events and outcomes
- Ignition events
- Mitigation action projects completed and associated financial investments
- Relevant training on industry best practices and tabletop/functional exercises

The initial WMP will be provided for EWEB Board review and potential approval in June 2022. This timeframe allows an opportunity for refinements based on Board feedback prior to filing the plan with the OPUC. While staff have been monitoring the rule-making process to develop this initial plan in accordance with new administrative rules, the latest timeline for final OPUC adoption is July 15. Therefore, any adjustments needed for compliance with adopted rules will be reflected in the next iteration of our WMP.

For compliance reporting and plan maintenance purposes, an annual update and Board review is recommended for April or May. Annual review ensures the levels and types of mitigation investments reflect contemporary research and current conditions. This timeframe also facilitates alignment of new investment needs with EWEB's annual CIP and budgeting process.

The following tables include metrics for 2021.

Table 7. 2021 Public Outreach and Education Metrics

Public Outreach and Education			
Social Media	Posts: 23	Reach: 50k	Engagements: 3900
Earned Media	Red Flag Warning Issued for Lane & Linn Counties	KVAL News	8/28/2021
	"EWEB Beginning State-mandated Wildfire Mitigation Planning"	Register-Guard	10/20/2021
	"Taking it off the top: EWEB completed aerial trimming of transmission line"	McKenzie River Reflections	11/04/2021
	Aerial Trimming TV reports	KVAL News KEZI News NBC 16	11/04/2021
Targeted Outreach	2 WMP presentations to neighborhood groups WMP brochure e-mailed to 1249 customers Paid placement of WMP brochure in McKenzie River Reflections		

Note that these outreach and education metrics do not include September's National Preparedness Month campaign or employee communications.

Table 8. Extreme Weather Event Response Metrics

2021 Extreme Weather Event Response		
Event Type	**Number Events/Dates**	**Cause/Details**
Public Safety Power Shutoffs	None	N/A
Emergency De-Energization at Carmen Transmission	Aug. 6 – 17	Requested by USFS due to Knoll Fire in area; No customer impacts
Protective Settings Events	April 16	Red Flag Warning with unrelated outage (car hit pole at Thurston)
	Aug. 12 – 13	Red Flag Warning/no outages
	Aug. 28	Red Flag Warning/no outages

Table 9. Mitigation Action Metrics

2021 Mitigation Actions[3]		
Project	**Quantity**	**Estimated Cost**
Deer Creek Pole Replacement	11 ductile iron poles	$55,000 (equipment only)
Transformer Upgrades (12 kV to 7.2 kV)	24 transformers replaced	$101,000
Crossarm Replacements	91 crossarms	$155,000
Heli-Trimming of Carmen Line	18 miles ROW	$125,0000
Fire Fuels Reduction Projects*	Phase 1: 17 properties/110 acres Phase 2: 58 properties/242 acres	$268,000 $284,000
Customer Incentives	3 secondary service underground incentives 11 generator loans (7 in high-risk areas)	$12,000 $31,000

*$208k paid for by grants/third parties

[3] Does not include equipment replacement and reframing in the Holiday Farm Fire area.

8. List of Figures

9. Appendices

THIS PAGE LEFT INTENTIONALLY BLANK

2022 Wildfire Mitigation Plan Figures

Figure 1a. EWEB Metro Area Electric Service Territory

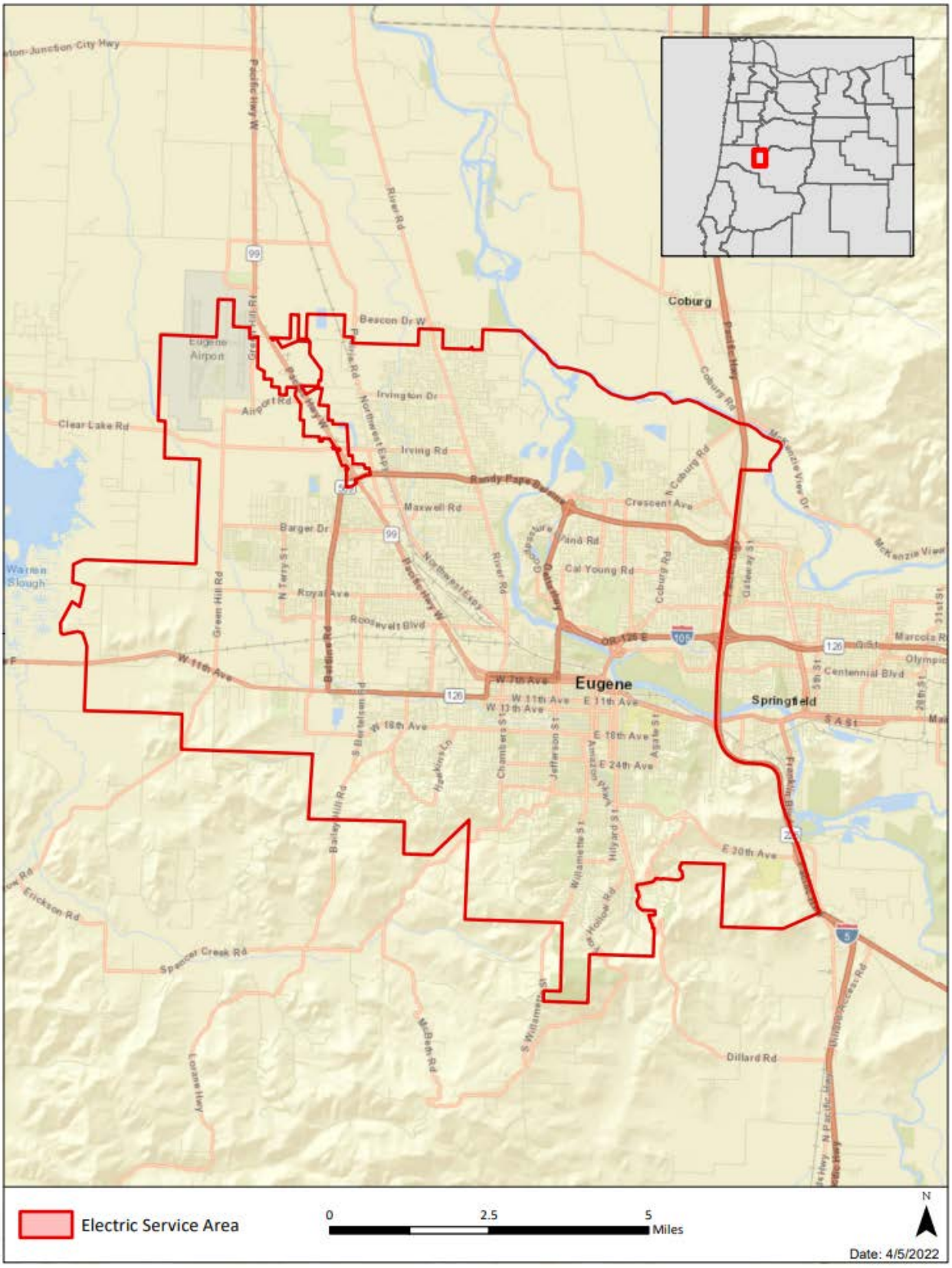


Figure 1b. EWEB Upriver Electric Service Territory

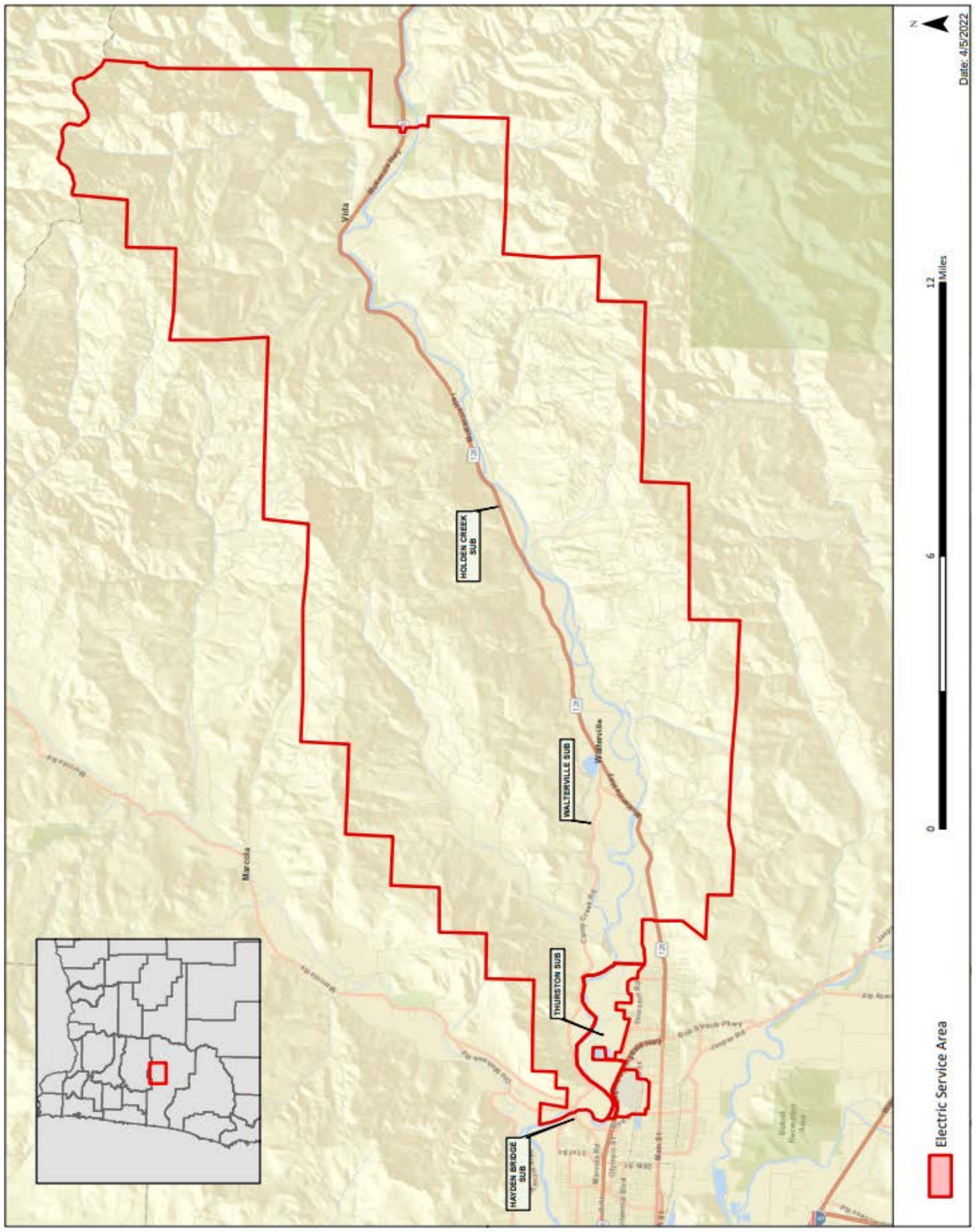
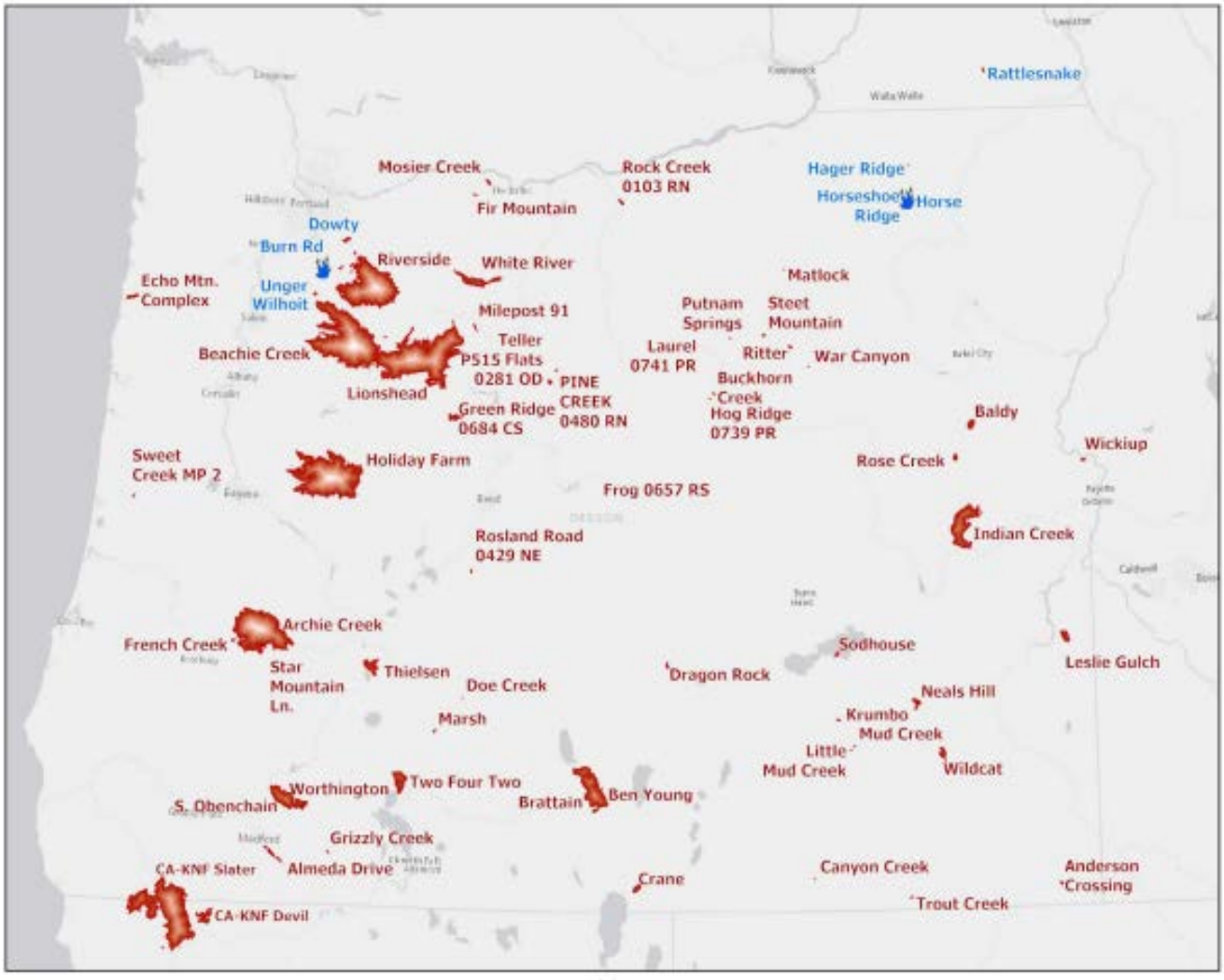


Figure 2. 2020 Oregon Wildfire Incidents



"Northwest Annual Fire Report", Northwest Interagency Coordination Center, 2020.

Figure 3. Metro Area Transmission Lines

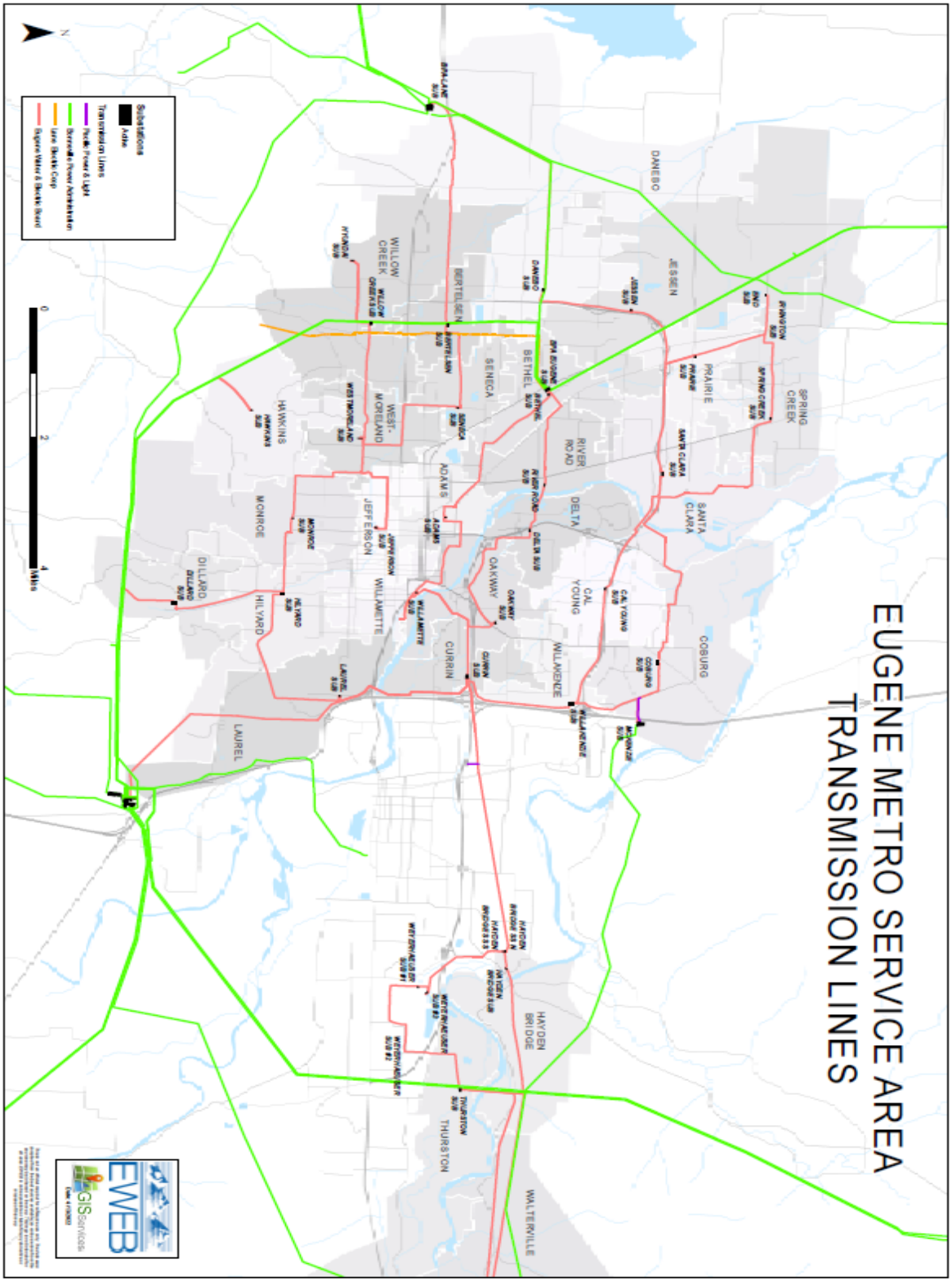


Figure 4. Dillard 4724 – Monroe 3722 Preliminary Design Map

Convert OH Feeder to UG – E47th & Willamette to Kingswood & Brookwood

2022 Wildfire Mitigation Plan Appendices

Eugene Water and Electric Board

13 Circuit Evaluation

Appendix – Wildfire Mitigation Plan

Table of Contents

1 Executive Summary

In the fall of 2020, Oregon experienced an extremely destructive wildfire season which included over one million acres burned, three thousand homes destroyed, and eleven fatalities. In response, the Oregon Legislature passed Senate Bill 762. Among other items, the bill requires consumer-owned utilities to have and operate in compliance with a risk-based wildfire mitigation plan. The information provided in this appendix demonstrates the Eugene Water & Electric Board's (EWEB's) intent to identify areas of high-fire risk within its electric service territory and transmission corridors.

1.1 Scope

EWEB management and field staff identified thirteen target circuits to evaluate during its first risk identification review. The circuits were identified based on the knowledge of its staff and using the Oregon Wildfire Risk Explorer. Created by a multi-agency collaborative and managed by the United States Forest Service, the Oregon Wildfire Risk Explorer is designed to increase wildfire awareness, give a comprehensive view of wildfire risk and local fire history, and educate users about wildfire prevention and mitigation resources.[1] The Oregon Wildfire Risk Explorer uses data from 2018 and may not reflect current conditions. The thirteen circuits include the following:

Distribution Circuits	Transmission Circuits
Dillard 4734	115KV Carmen Line Tap
Hayden Bridge 2406	115KV Currin to BPA Line
Holden Creek 7124	115KV Currin to Laurel Line
Holden Creek 7134	115KV Dillard Tap
Thurston 2312	69KV Thurston to Walterville Line
Walterville 2222	69KV Walterville to Hayden Bridge Line
Walterville 2224	

1.2 Consultant Qualifications

For this analysis, EWEB engaged ICF Incorporated LLC (ICF), a top-tier global multidisciplinary consulting firm with leading practices working within the energy sector and more than 50 years of expertise providing advisory, program implementation, analytics, digital, and engagement services to overcome complex challenges. Since 1969, ICF has worked with clients to navigate change and shape the future in an increasingly uncertain world. This includes helping organizations with emergency preparedness, risk mitigation, and resilience services before disaster strikes and implementing disaster recovery and mitigation after a catastrophic event in a way that ensures and accelerates the success of long-term rebuilding and resiliency efforts.

Beginning in the 1970's ICS started serving the energy sector through energy modeling, forecasting, and working with the Federal Government and utilities for development of energy efficiency related policy and

[1] Retrieved from: https://oregonexplorer.info/topics/wildfire-risk?ptopic=62

modeling improvements. Additionally, ICF has served government and community leaders across the disaster preparedness cycle, including planning, training, and exercise design and implementation. ICF has established a reputation for successful disaster recovery work by excelling in the design and execution of grant program management. ICF has implemented recovery efforts for over 100 state and local entities, during 53 different disaster declarations, funded by multiple federal sources. ICF brings qualified professionals with experience in identifying vulnerabilities with critical infrastructure, such as energy infrastructure. **ICF has assisted more than 40 utilities** with disaster recovery, regulatory analysis, demand-side management, energy efficiency, asset management, resource planning, and customer engagement.

Since 2018, ICF has worked with the Oregon Department of Forestry to develop its forest habitat conservation plan and environmental impact statement for 640,000 acres of state forest land in western Oregon. ICF also completed a statewide risk assessment to determine the risk to changing climate hazards, including wildfire, landslides, extreme precipitation and heat, inland and coastal flooding, and winter weather.

1.3 Evaluation Process

ICF evaluated the target circuits based on three criteria listed below. ICF reviewed Geographic Information System (GIS) data and interviewed subject matter experts (SME) to gather information

- Environment: ICF utilized GIS data from the United States Forest Service's Pacific Northwest Quantitative Wildfire Risk Assessment[2] and other public data sources to determine the severity of high-fire risk vegetation and community impacts within a one-mile zone around the target circuits.
- Infrastructure: ICF conducted SME interviews to determine if there were any unique system hardening efforts or maintenance protocols performed on the target circuits.
- Metrics: ICF conducted SME interviews to determine if there were any significant findings from inspection reports or other databases to demonstrate increased or decreased fire risk.

1.4 Results

ICF created thirteen unique fact sheets which provide an updated wildfire risk map, one-mile study area, and unique statistics related to each circuit. Below are general findings that apply to the thirteen circuits in total.

- ICF's evaluation found that 12 of 13 circuits should be considered at risk of incurring damage during a wildfire event based on the location of the circuits in areas of high-fire threat vegetation. 12 circuits have at least 40% of the area in their one-mile buffer in a strong fire potential zone. On average, 71% of the area in the one-mile buffer around all circuits are considered to be areas with strong fire potential.

[2] ICF used the "Overall Potential Impact" layer, which represents the consequence of wildfire, if it occurs, on all mapped highly valued assets and resources combined: critical infrastructure, developed recreation, housing unit density, seed orchards, sawmills, historic structures, timber, municipal watersheds, vegetation condition, and terrestrial and aquatic wildlife habitat. This data layer does not include the likelihood of a pixel burning; it shows potential impact only to characterize exposure.

- The exception--115kV Currin to Laurel line—is not located in a severe wildfire threat area relative to other circuits. Seventeen percent of the vegetation within the one-mile buffer would be considered high-risk; however, the portion of high-risk vegetation that overlaps EWEB's overhead infrastructure is almost negligible.
- EWEB deploys many notable operational strategies to reduce the likelihood that its infrastructure on the target circuits could cause an ignition. This includes modifying automatic reclosure settings on Red Flag Warning days, conducting annual vegetation inspections and pruning prior to fire season, and yearly patrols to proactively address any observed equipment issues.
- EWEB has an ambitious safety and reliability program that aids in wildfire mitigation which includes system hardening efforts such as reframing and/or moving overhead distribution lines underground. However, the majority of EWEB's overhead infrastructure in the 13 circuit study area is considered the traditional "open-wire" design and varies in its age and condition. Standard overhead electric infrastructure can be a risk for causing an ignition upon contact with vegetation. Mitigation techniques on overhead distribution lines such as the use of spacers, covered conductor, or undergrounding are known to reduce the risk of electrical equipment causing an ignition.

2 Key Statistics

The statistical tables below draw from a GIS analysis utilizing wildfire risk data from the United States Forest Service, EWEB's electrical infrastructure for the target circuits, and Lane County critical infrastructure/facilities. ICF created a one-mile buffer around EWEB's electrical infrastructure on the target circuits to calculate the statistics included in this section.

2.1 Overall Fire Potential

This table identifies the total area within the one-mile buffer around EWEB's electrical infrastructure which is located in areas more susceptible to a wildfire, as defined by the United States Forest Service. The column titled "% Circuit covered by fire potential," noted by the color gold, is displayed by fire risk severity in tables 2.2.1. *Any discrepancy between the total noted in this column and the totals in tables 2.2.1 are less than 1% and due to rounding differences.*

	Circuit Name	Total Fire Potential Acres inside buffer	Total Acres of Circuit 1 Mile Buffer	% Circuit covered by fire potential	% Circuit with no fire potential	Miles of Circuit
1	Dillard 4734	**2,916**	**4,283**	**68%**	**32%**	4.2
2	Hayden Bridge 2406	**4,985**	**7,355**	**68%**	**32%**	6.8
3	Holden Creek 7124	**19,216**	**19,972**	**96%**	**4%**	32.9
4	Holden Creek 7134	**6,783**	**7,201**	**94%**	**6%**	9.6
5	Thurston 2312	**10,517**	**14,459**	**73%**	**27%**	21.3
6	Walterville 2222	**14,963**	**17,126**	**87%**	**13%**	27.1
7	Walterville 2224	**11,653**	**13,633**	**85%**	**15%**	26.9
8	115KV Carmen Tap	**24,278**	**24,767**	**98%**	**2%**	18.0
9	115KV Currin to BPA Line	**3,833**	**9,147**	**42%**	**58%**	5.7
10	115KV Currin to Laurel Line	**753**	**4,463**	**17%**	**83%**	2.1
11	115KV Dillard Tap	**3,581**	**5,653**	**63%**	**37%**	13.5
12	69KV Thurston to Walterville Line	**6,768**	**8,727**	**78%**	**22%**	5.4
13	69KV Walterville to Hayden Bridge Line	**8,537**	**14,245**	**60%**	**40%**	18.5

2.2 Fire Risk by Category

The tables below identify the severity of fire risk by acre within the one-mile buffer around EWEB's electrical infrastructure. The acres and percentages in table 2.2.1 reflect a cumulative breakdown of fire potential data provided in table 2.1. Areas of the one-mile buffer around EWEB's infrastructure without fire potential are excluded. *Any discrepancy between the total noted in the column titled "% Circuit covered by fire potential," noted by the color gold on table 2.1, and the totals in tables 2.2.1 are less than 1% and due to rounding differences.*

The terms used to describe the categories are defined by the United States Forest Service's Pacific Northwest Quantitative Wildfire Risk Assessment:

Overall Potential Impact represents the consequence of wildfire, if it occurs, on all mapped highly valued assets and resources combined: critical infrastructure, developed recreation, housing unit density, seed orchards, sawmills, historic structures, timber, municipal watersheds, vegetation condition, and terrestrial and aquatic wildlife habitat. This data layer does not include the likelihood of a pixel burning; it shows potential impact only to characterize exposure. The values reflect a range of impacts from a very high negative rating, where wildfire is detrimental (for example, to structures, infrastructure, and early seral stage and sensitive forests), to a positive, where wildfire will produce an overall benefit (for example, to improve vegetation condition or wildlife habitat).

Very High: *Wildfire risk is very high to all mapped resources and assets combined: critical infrastructure, powerlines, developed recreation, housing unit density, timber, municipal watersheds, vegetation condition, and terrestrial and aquatic wildlife habitat. Very High represents the top 5 percent of values across the landscape.*
High: *Wildfire risk is high to all mapped resources and assets. High represents the 80th to 95th percentile of values across the landscape.*
Moderate: *Wildfire risk is moderate to all mapped resources and assets. Moderate represents the 50th to 80th percentile of values across the landscape.*
Low*: Wildfire risk Is low to all mapped resources and assets. This category represents the combination of categories labeled Low, Low Benefit, and Benefit according to the US Forest Service's terminology. This category has vegetation that is considered flammable but would likely not Impact the community if contained to this area.*

2.2.1 Fire Risk by Category: Very High, High, and Moderate

	Circuit Name	Very High Acres	Very High %	High Acres	High %	Moderate Acres	Moderate %	Low Acres	Low %

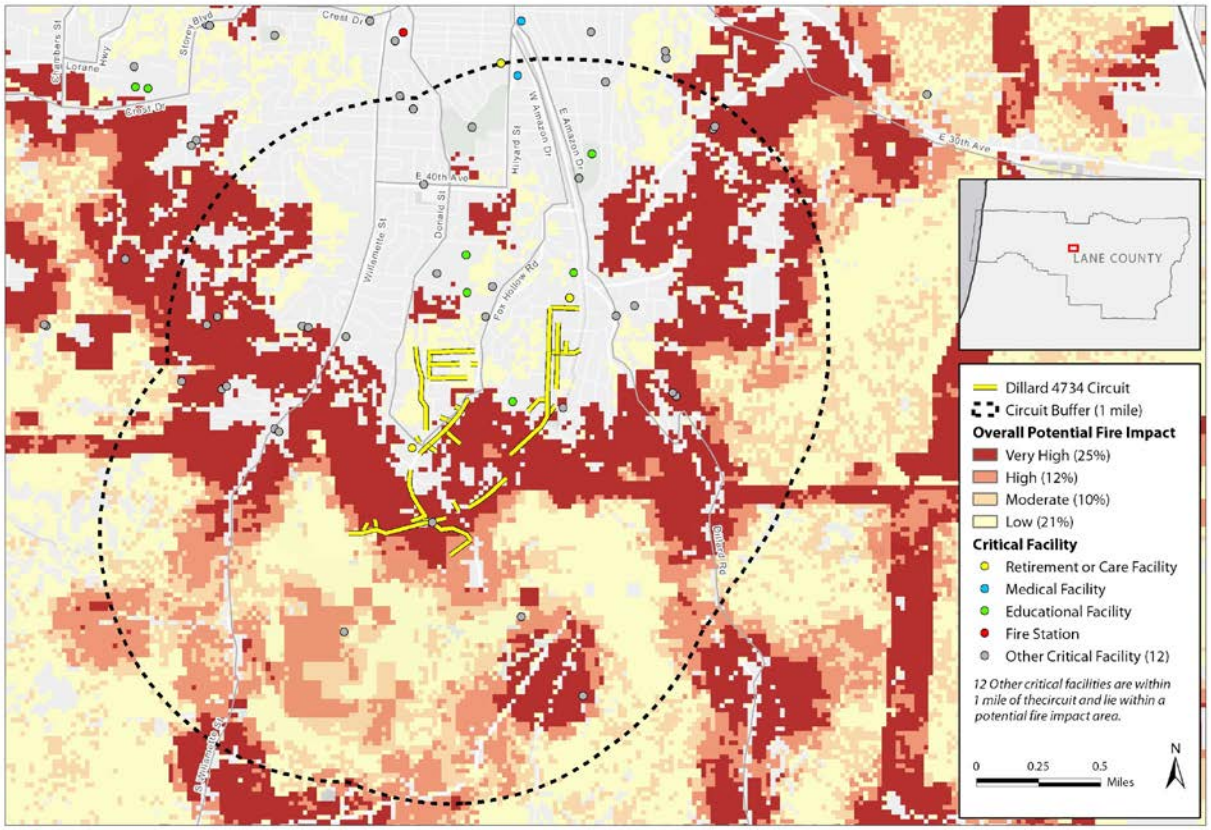
1	Dillard 4734	1,089	25%	514	12%	419	10%	894	21%
2	Hayden Bridge 2406	1,009	14%	870	12%	882	12%	2,224	30%
3	Holden Creek 7124	5,978	30%	8,151	41%	3,018	15%	2,068	11%
4	Holden Creek 7134	2,310	32%	2,632	37%	971	13%	869	13%
5	Thurston 2312	2,377	16%	2,195	15%	1,809	13%	4,135	29%
6	Walterville 2222	3,025	18%	3,936	23%	3,216	19%	4,786	28%
7	Walterville 2224	2,781	20%	3,474	25%	2,431	18%	2,965	22%
8	115KV Carmen Line Tap	4,713	19%	7,753	31%	4,671	19%	7,142	29%
9	115KV Currin to BPA Line	1,050	11%	510	6%	610	7%	1,162	18%
10	115KV Currin to Laurel Line	324	7%	58	1%	69	2%	302	7%
11	115KV Dillard Tap	1,360	24%	559	10%	495	9%	1,166	21%
12	69KV Thurston to Walterville Line	1,522	17%	1,336	15%	1,271	15%	2,639	30%
13	69KV Walterville to Hayden Bridge Line	1,940	14%	1,657	12%	1,580	11%	3,360	24%

3 Circuit Maps

The following sections contain individual maps of each circuit and a breakdown of critical infrastructure/facilities within the one-mile buffer zone. Education, Fire Service, and Residential Care facilities are noted separately due to their high impacts in a wildfire event. Other critical infrastructure facilities as noted in these charts include government functions, public areas that may need to be evacuated, and other utility infrastructure.

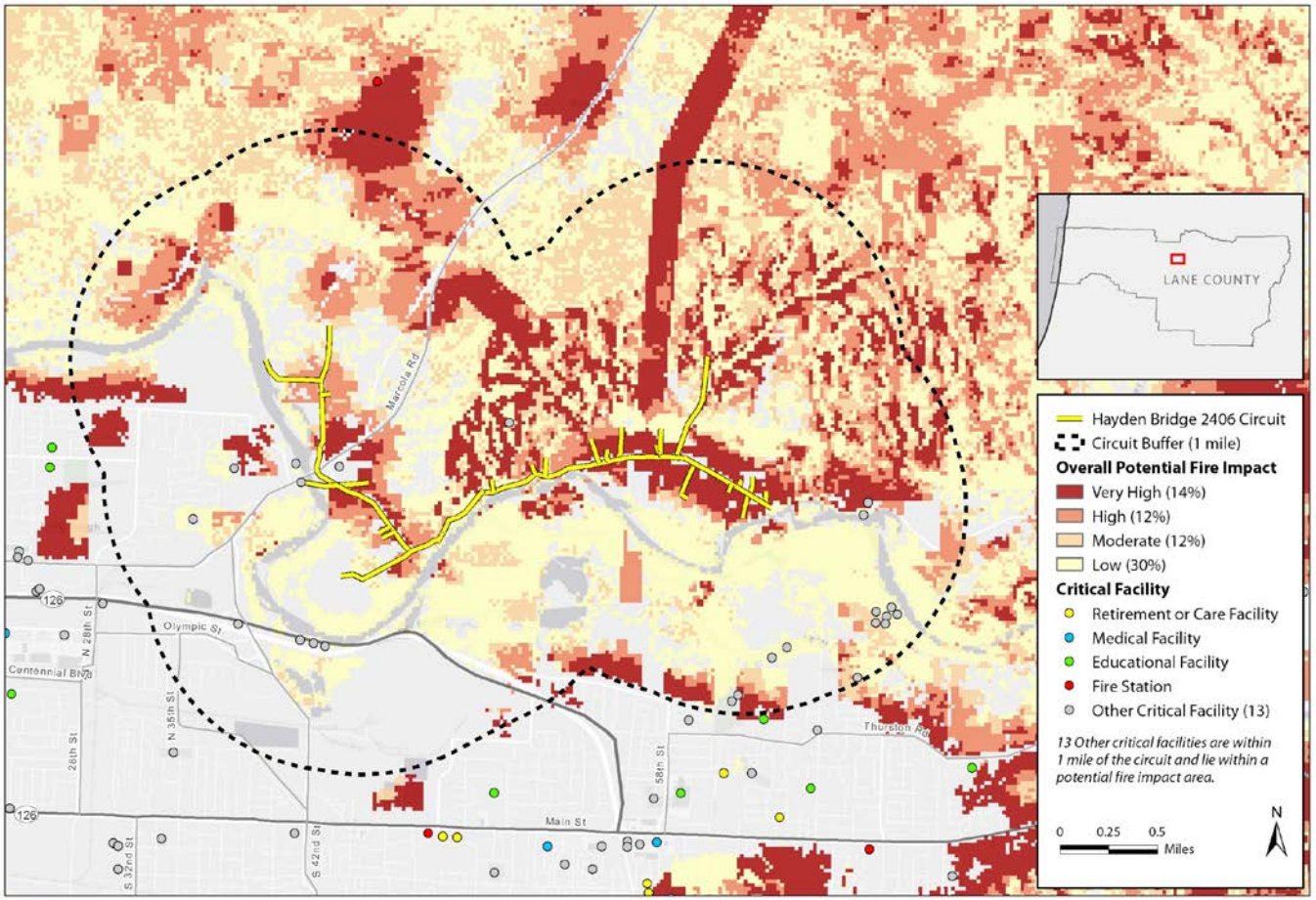
3.1 Distribution Circuits

3.1.1 Dillard 4734



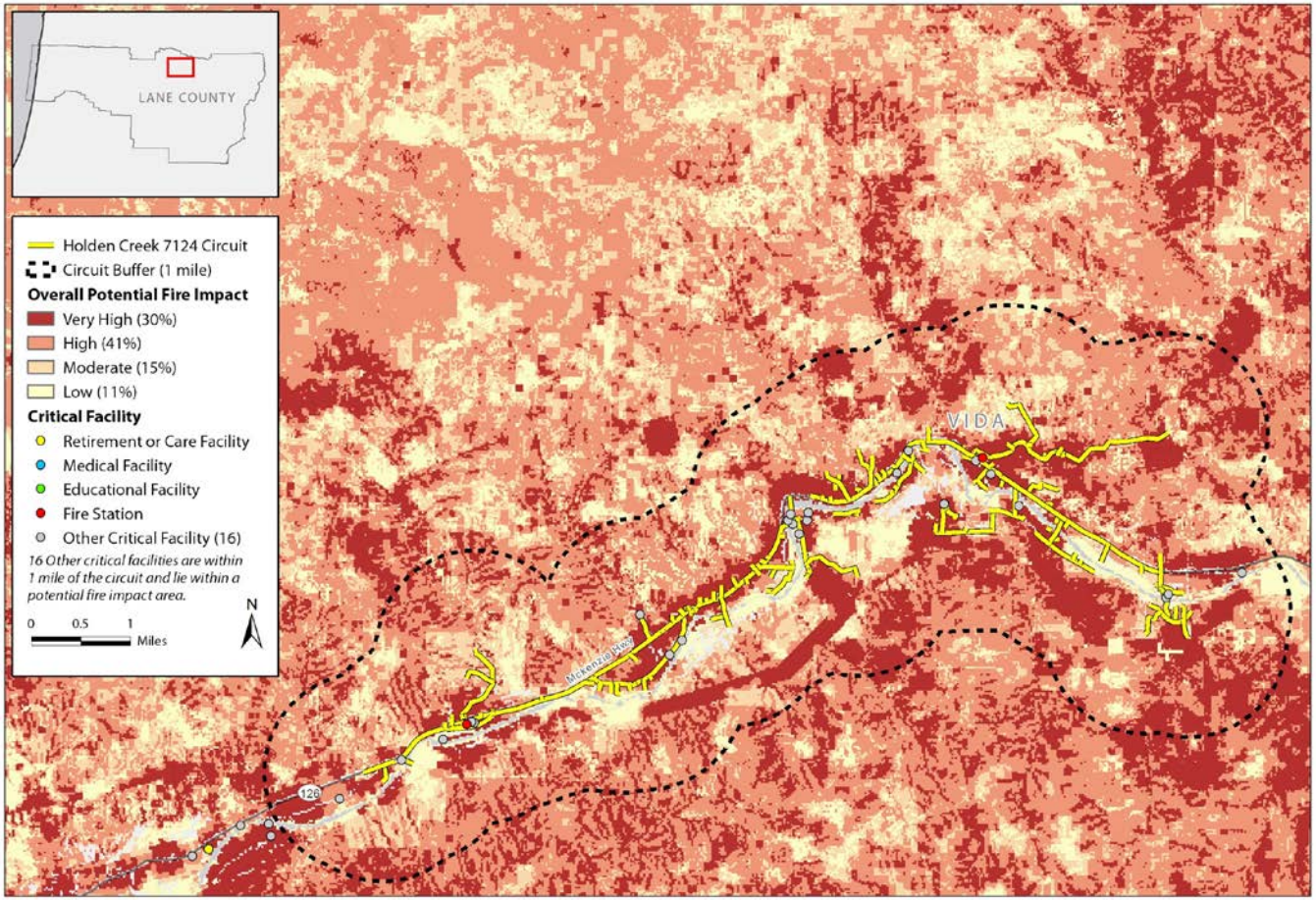
Circuit: Dillard 4734, Critical Facilities and Overall Potential Fire Impact

3.1.2 Hayden Bridge 2406



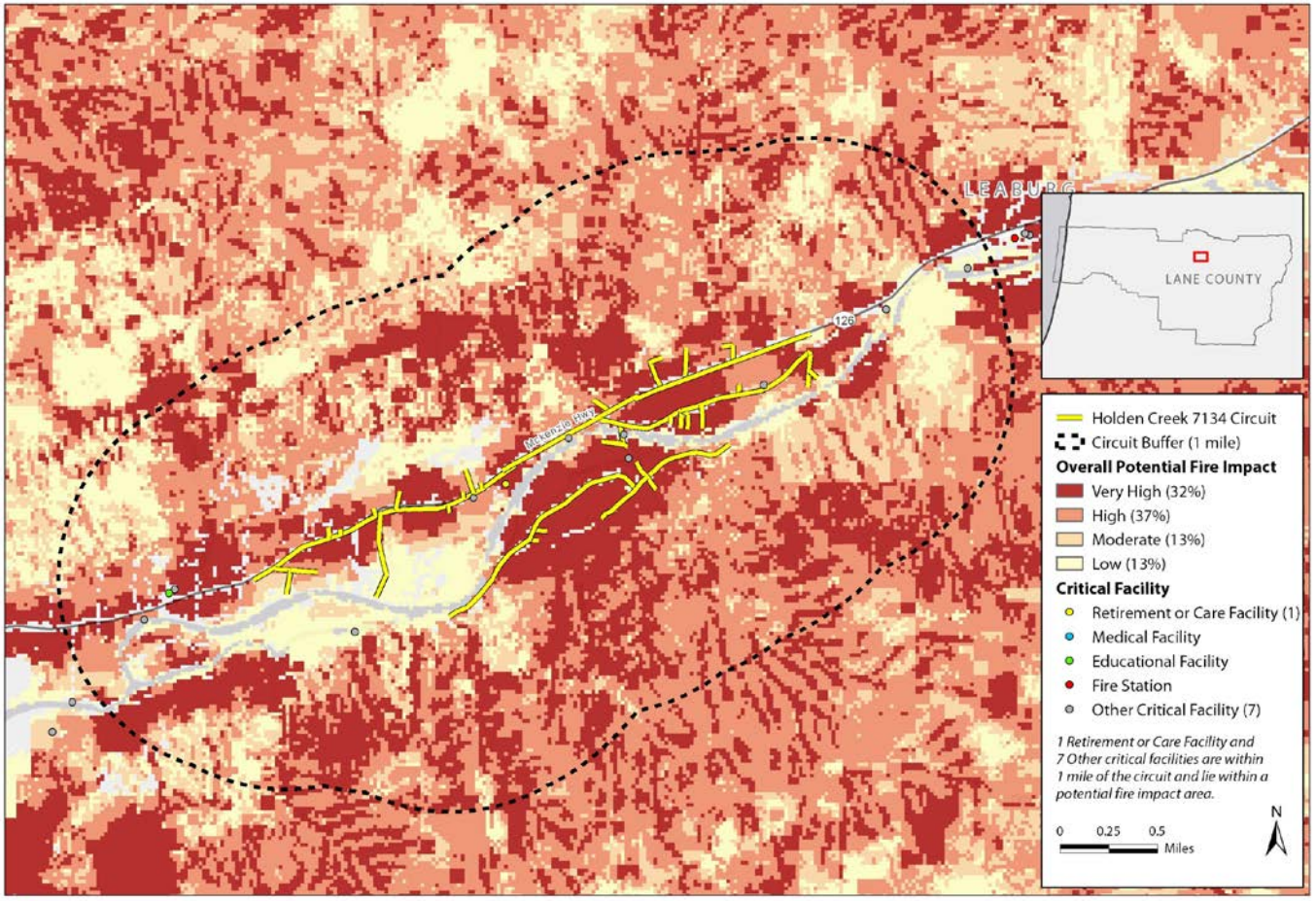
Circuit: Hayden Bridge 2406, Critical Facilities and Overall Potential Fire Impact

3.1.3 Holden Creek 7124



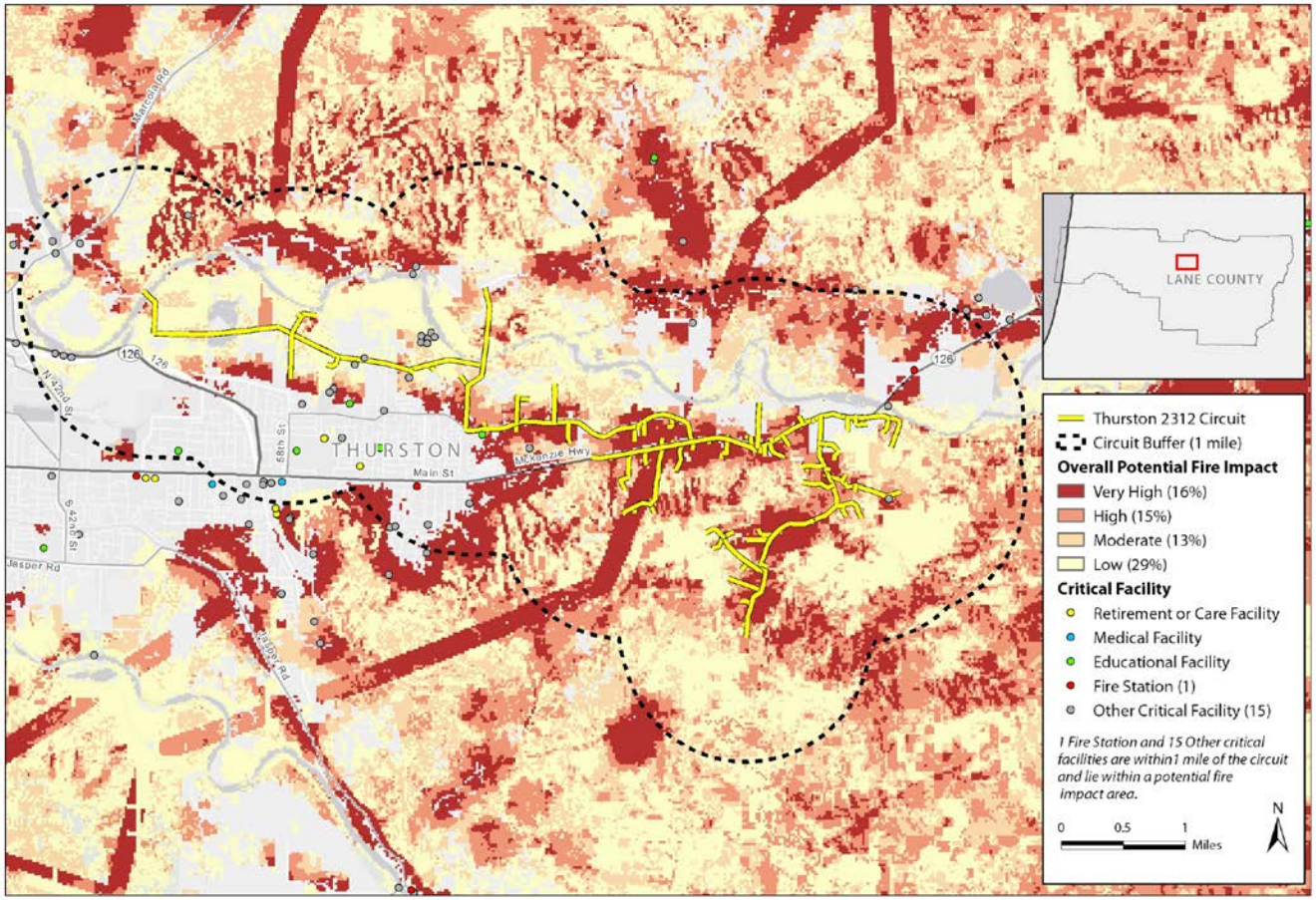
Circuit: Holden Creek 7124, Critical Facilties and Overall Potential Fire Impact

3.1.4 Holden Creek 7134



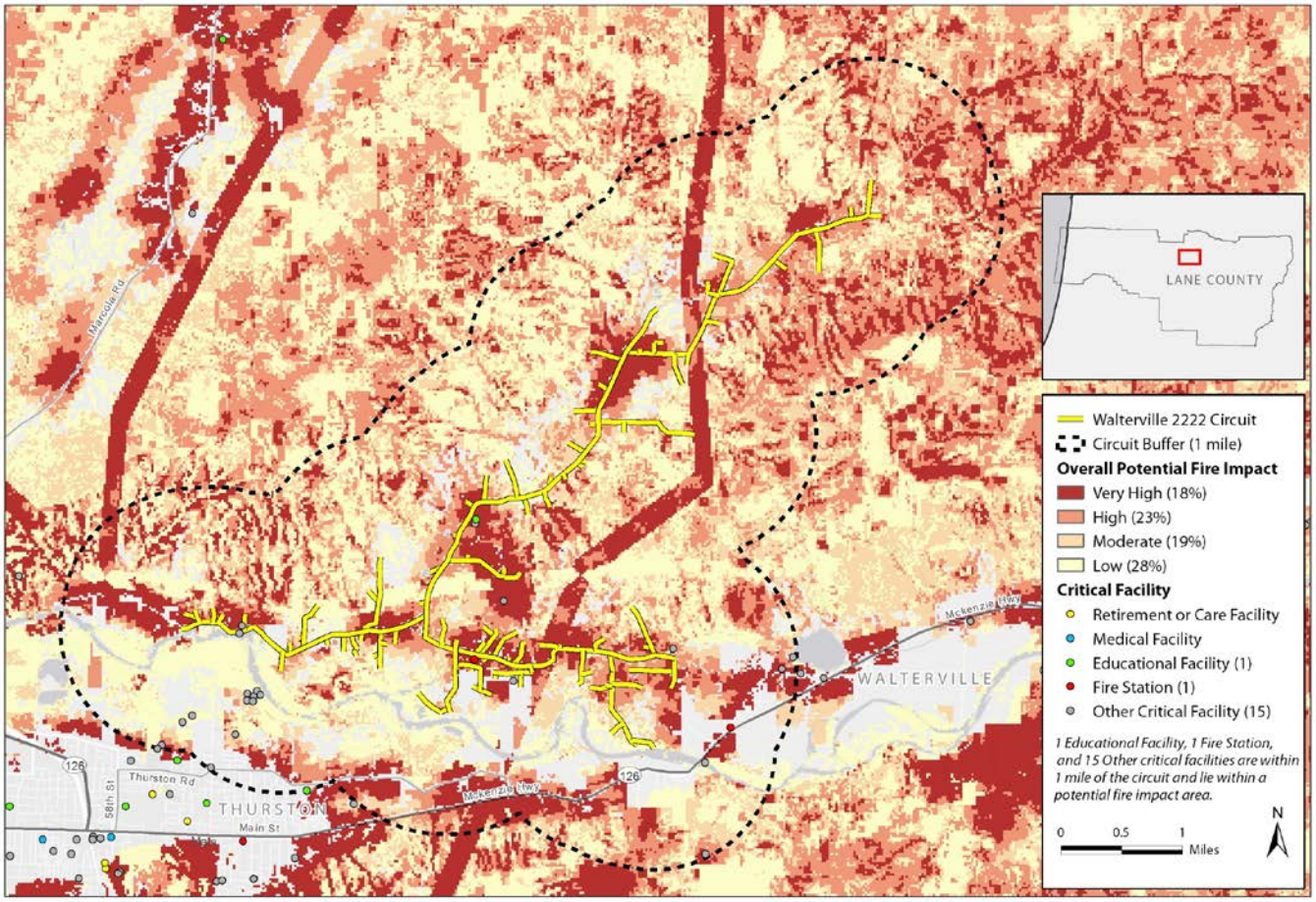
Circuit: Holden Creek 7134, Critical Facilities and Overall Potential Fire Impact

3.1.5 Thurston 2312



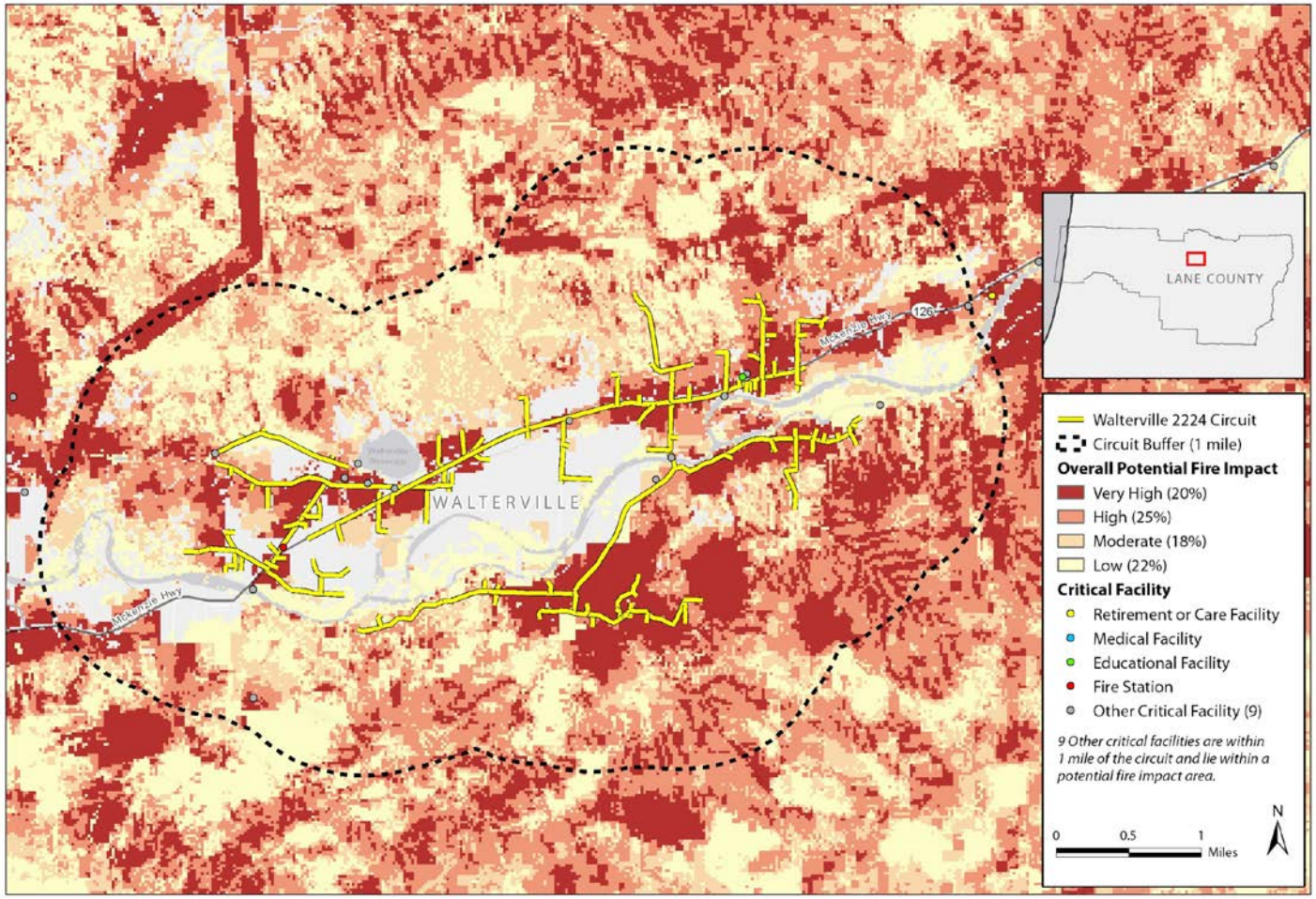
Circuit: Thurston 2312, Critical Facilities and Overall Potential Fire Impact

3.1.6 Walterville 2222



Circuit: Walterville 2222, Critical Facilities and Overall Potential Fire Impact

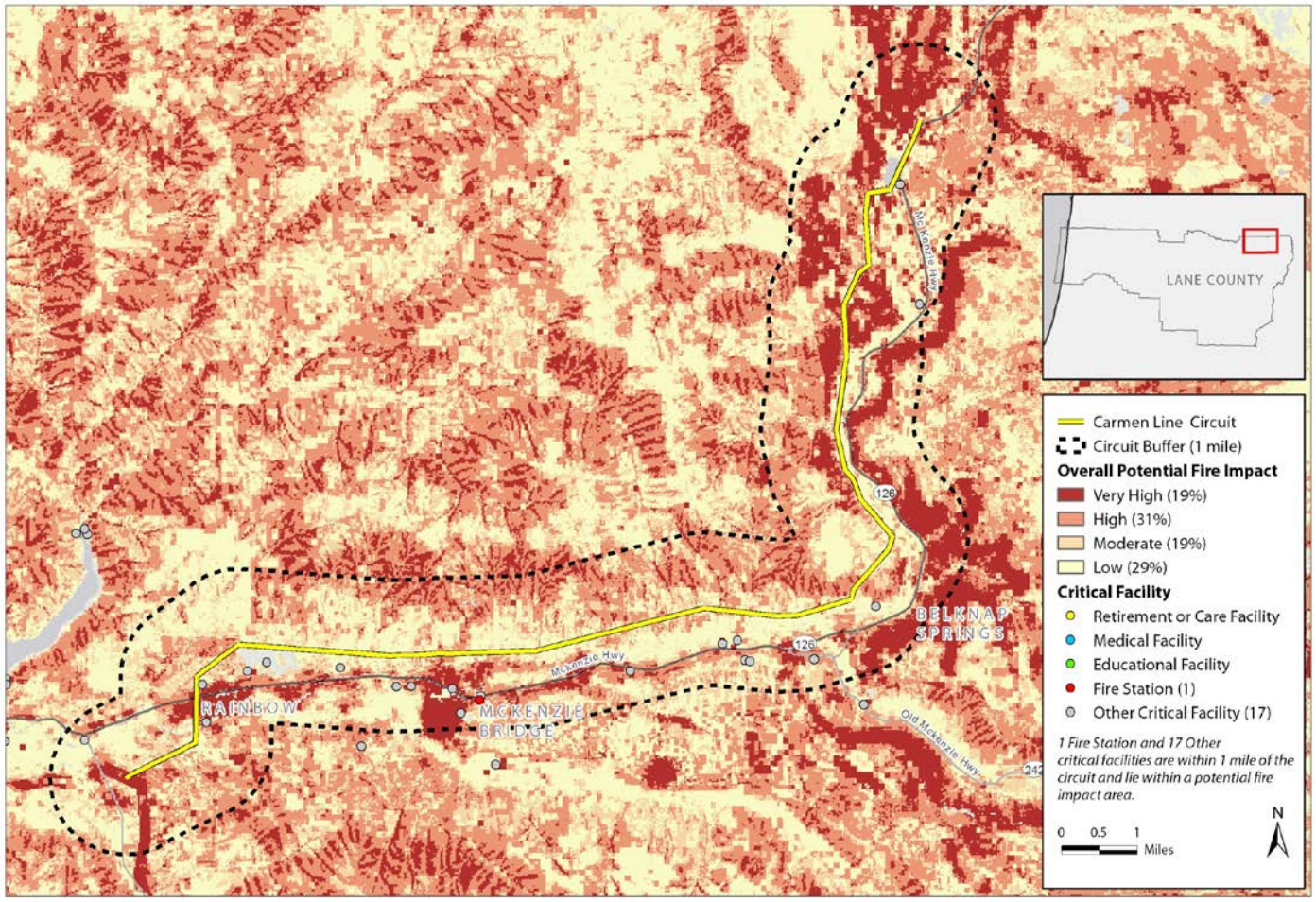
3.1.7 Walterville 2224



Circuit: Walterville 2224, Critical Facilities and Overall Potential Fire Impact

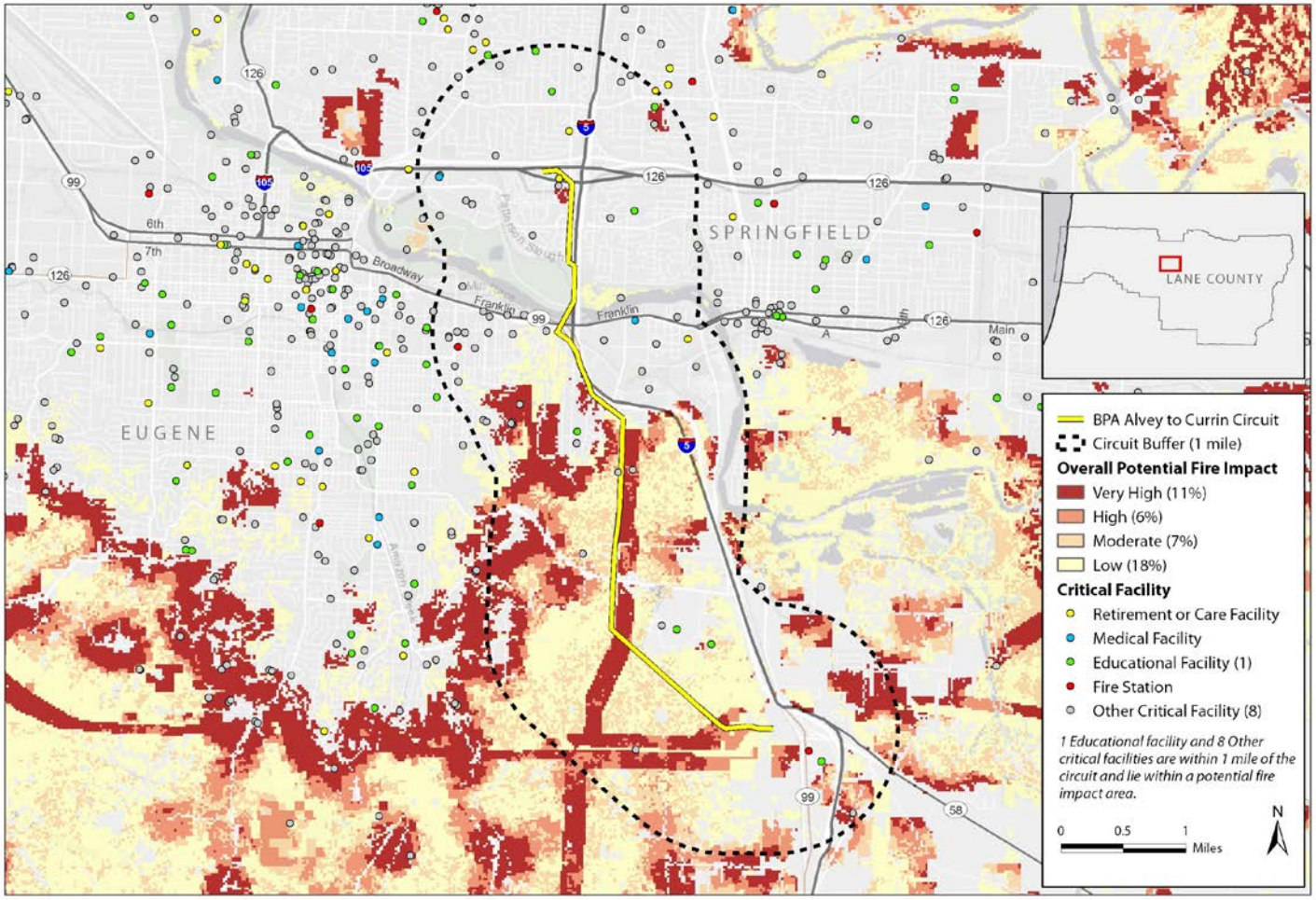
3.2 Transmission Circuits

3.2.1 115KV Carmen Line Tap



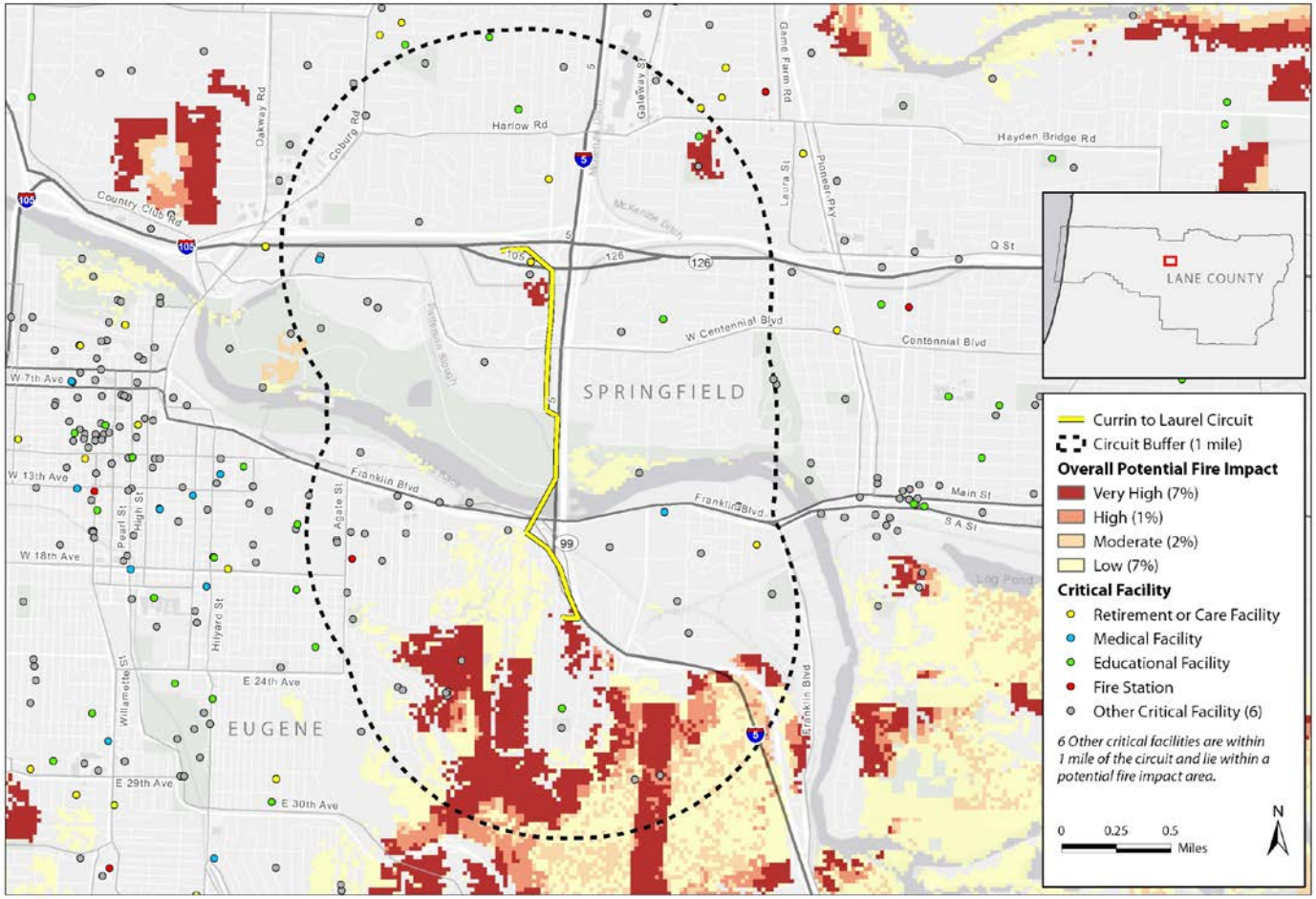
Circuit: Carmen Line, Critical Facilities and Overall Potential Fire Impact

3.2.2 115KV Currin to BPA Line



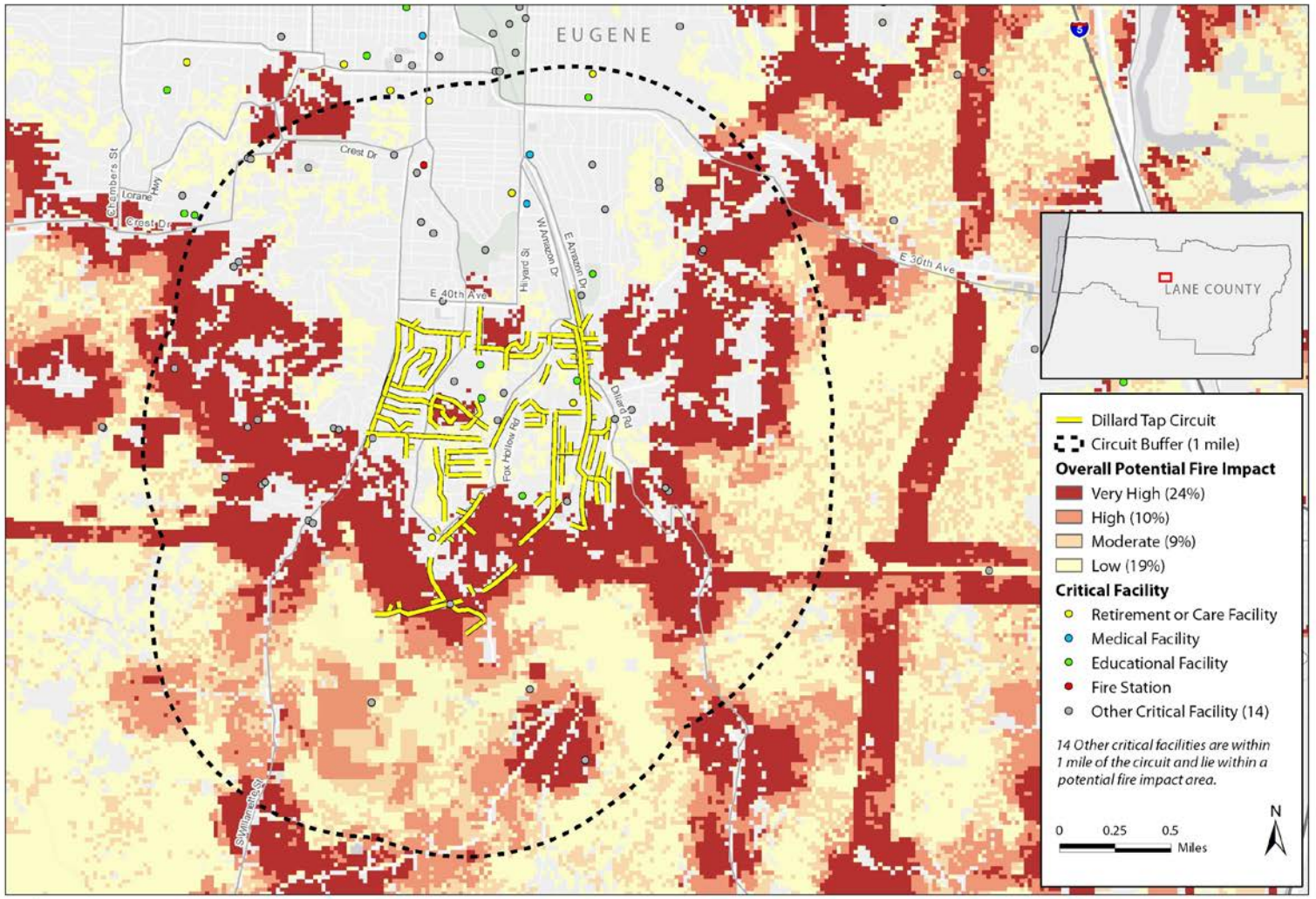
Circuit: BPA Alvey to Currin, Critical Facilities, and Overall Potential Fire Impact

3.2.3 115KV Currin to Laurel Line



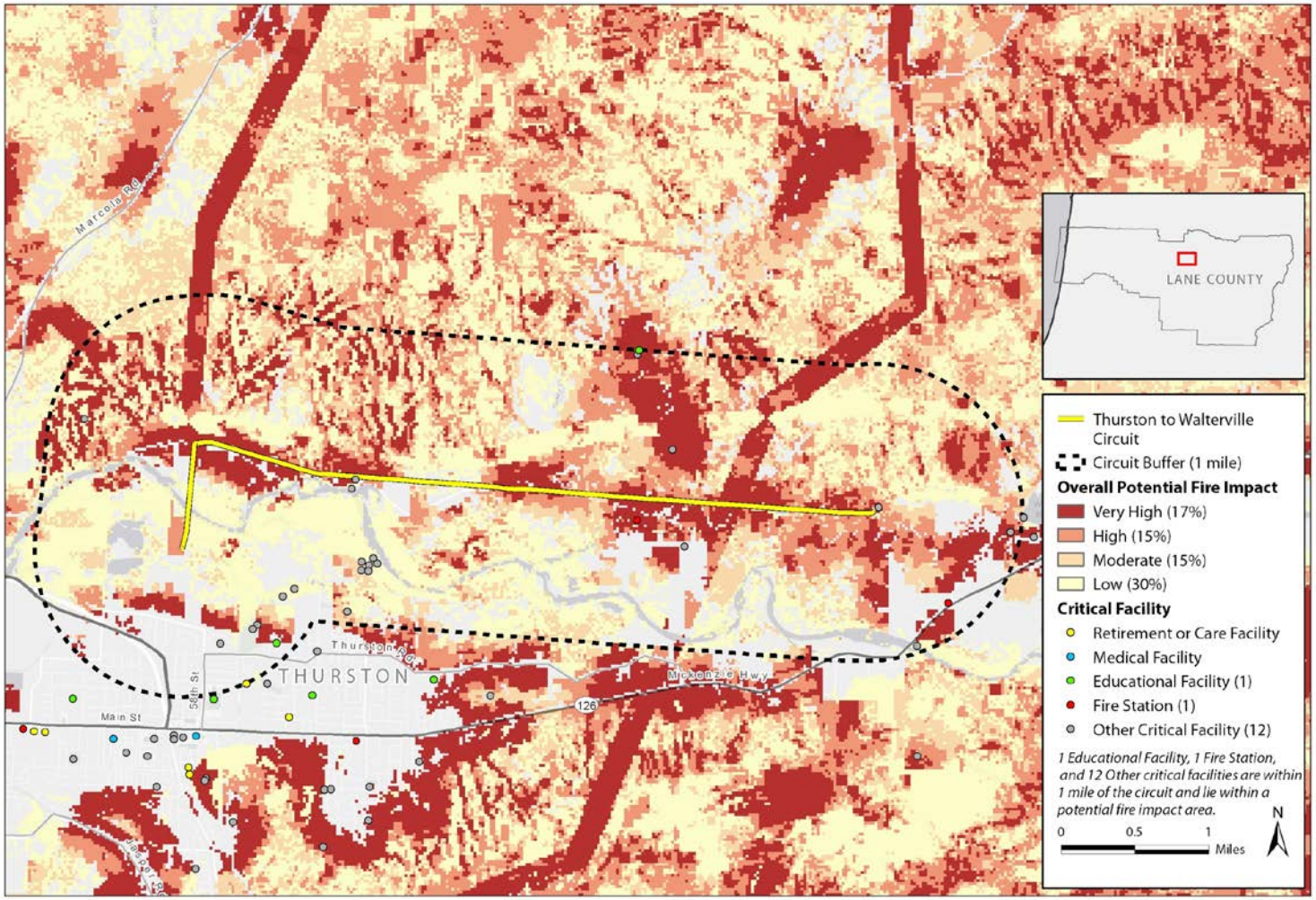
Circuit: Currin to Laurel, Critical Facilities and Overall Potential Fire Impact

3.2.4 115KV Dillard Tap



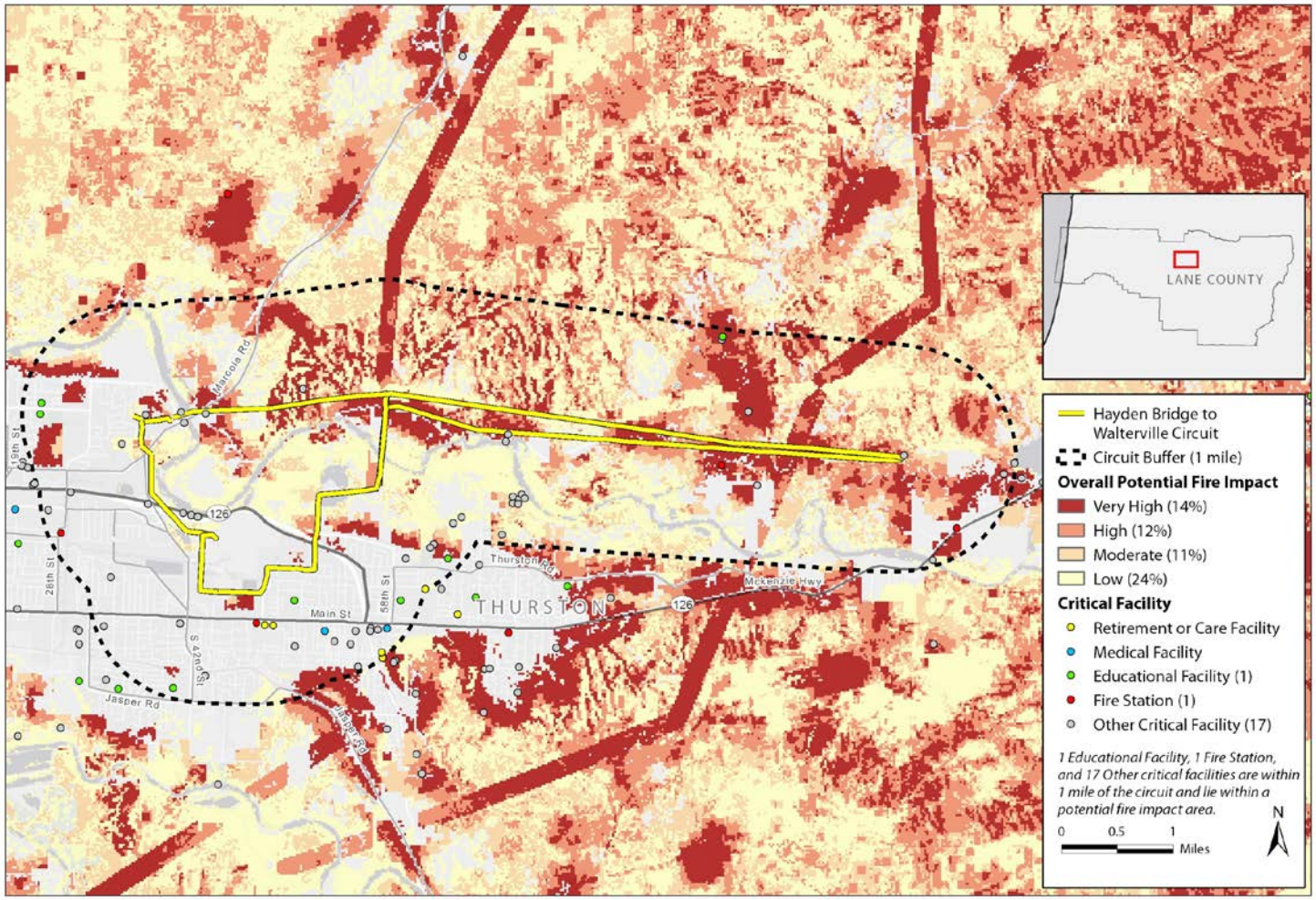
Circuit: Dillard Tap, Critical Facilities and Overall Potential Fire Impact

3.2.5 69KV Thurston to Walterville Line



Circuit: Thurston to Walterville, Critical Facilities and Overall Potential Fire Impact

3.2.6 69KV Walterville to Hayden Bridge Line



Circuit: Hayden Bridge to Walterville, Critical Facilities and Overall Potential Fire Impact

icf.com

twitter.com/ICF
linkedin.com/company/icf-international
facebook.com/ThisIsICF
#thisisicf

About ICF

ICF (NASDAQ:ICFI) is a global consulting and digital services company with over 7,000 full- and part-time employees, but we are not your typical consultants. At ICF, business analysts and policy specialists work together with digital strategists, data scientists and creatives. We combine unmatched industry expertise with cutting-edge engagement capabilities to help organizations solve their most complex challenges. Since 1969, public and private sector clients have worked with ICF to navigate change and shape the future. Learn more at icf.com.

Eugene Water & Electric Board

Rely on us.

Right of Way Vegetation Management Program: Procedures, Clearances, and Technical Specifications

Document Owner:	Vegetation Management Supervisor
Authoring Department:	Electric Division, Vegetation Management
Resides with:	Electric Division Administrative Assistant
Document Number:	**DR.100.PRG.01-04**
Revision Number:	04
Approved/Revision Date:	
On-Line Location:	R:\Share\Elec Doc Mgmt.
File Name:	DR.100.PRG.01-04 Right of Way Vegetation Management Program

Approval	Signature	Date
Document Owner	Shane Tennison Shane Tennison	6/2/22
Electric Operations Manager	Tyler Nice Tyler Nice	6/2/22

DOCUMENT CHANGE LOG

A history of changes made to this document is shown below. The current document supersedes all previous procedure versions, understandings, agreements, and written or oral guidelines. Documents are effective the date they are approved and until superseded or determined obsolete.

Date	Rev	Change Description	Entry First Initial, Last Name	Check A Column	
				Major Change	Minor Change
02/2010	00	Procedure written.	R. Dyer	X	
03/25/2010	00	Put program document in Electric Division document management format.	T. Richardson		X
09/19/2010	01	Changed authorizing department	R. Dyer		X
09/19/2010	01	Changed wording on Page 10, Section 21	R. Dyer		X
05/31/2011	02	Revised clearances in Table 1 and 3, Page 6 and 7	R. Dyer		X
12/31/2018	03	Updated maintenance cycles and added sections for streetlights, private work, wood chips and hazard trees sections.	J. Nuttall	X	
05/26/2022	04	Added annual inspections	S. Tennison		X

Table of Contents

LIST OF TABLES

LIST OF FIGURES

Summary

The purpose of this document is to provide clear direction by EWEB to contractors engaged in utility line clearance activity on the EWEB electrical system.

Trees that grow on or adjacent to power line rights-of-ways are a common cause of outages, damage to facilities, fires, injury, or damage to public and private property. EWEB has an obligation to maintain those electrical facilities to minimize interruptions of service and to provide a safe and continual supply of electricity to our customers. This includes not only the maintenance of hardware, conductors and poles, but trees and other vegetation that encroaches or threatens to fall onto or grow into our electrical conductors.

Beyond this obligation, EWEB is required by the Oregon Public Utilities Commission Safety Rules which means the National Electric Safety Code as supplemented by the rules in the Oregon Administrative Rules (OAR), Chapter 860-024. This rule requires utilities to keep trees from damaging ungrounded electric supply conductors and has specific limits of separation that should be maintained between electrical conductors and trees.

For primary distribution voltages, vegetation must be kept at least 3 ft. from conductors and 5 ft. for climbable trees. For 115 kV transmission lines, the regulations state that the utility must maintain at least 7.5 ft. between trees and vegetation and the conductors. Further, the rule states that some intrusion is allowable for small branches into this minimum clearance zone, as long as the vegetation does not come closer than 6 inches to the conductor. OPUC has defined this as applying to trees that are on circuits that are toward the end of the scheduled cycle pruning.

Performance of vegetation management work is further addressed by the following industry standards:

- American National Standard ANSI Z133.1 (2000) – the *Safety Requirements*
- American National Standard ANSI A300 – Part 1 (2008) – *Pruning, approved 2017.* (Part 7 - 2006) *Integrated Vegetation Management for Electric Utility Rights-of-ways*
- OSHA 1910.269 - *Regulations (Standards – 29 CFR)*

CLEARANCE GUIDELINES

The following are guidelines for use in determining proper clearances for utility line clearance on the EWEB system.

1. **Industry Standards and Training** – Each tree is unique in its structure, form, growth rate, and position with respect to the electrical conductors. Therefore, these clearance specifications can only be used as a guideline to the electric utility and their arborists. Training of the arborists on tree species, understanding tree vigor and tree growth rates must accompany training on these clearance guidelines. Best management practice (BMP) guides have been developed by the International Society of Arboriculture for utility tree pruning[1] and Integrated Vegetation Management[2], and were published as companion publications to the ANSI A300 that is listed above. New and experienced arborists must study and achieve an understanding of the clearance guidelines and BMP's for utility vegetation management.

2. **Clearance Specifications** - The distribution clearance guidelines are designed to prevent tree-conductor conflict on the EWEB system on a 4-year vegetation management cycle. They are designed to serve only as **a guideline** to achieve adequate clearances for a 4 year cycle, unless otherwise indicated by EWEB. When achieving these guidelines, utility tree crews and contract crews must consider the impact of tree sway in storms and line sag during periods of high energy usage. The following table describes which trees to include when pruning. Trees that fall within the pruning thresholds shall be pruned to the listed clearances. Those that fall outside the thresholds shall be left until the following cycle.

Table 1: Specification Clearances by Growth Rate- Primary Distribution

Primary Distribution	**Non-climbable Trees**		**Climbable Trees**	
Slow Growing Trees (1 foot per year or less)	**Threshold:**	**Specification Clearance**	**Threshold:**	**Specification Clearance**
Side Clearance	4 feet	8 feet	6 feet	8 feet
Under Clearance	8 feet	10 feet	8 feet	10 feet
Medium Growing Trees (1-3 feet per year)				
Side Clearance	8 feet	10 feet	8 feet	10 feet
Under Clearance	10 feet	12 feet	10 feet	12 feet
Fast Growing Trees (great than 3-5 feet per year)				
Side Clearance	10 feet	12 feet	10 feet	12 feet
Under Clearance	12 feet	14 feet	12 feet	14 feet
Extra Fast Growing Trees (great than 5 feet per year)				
Side Clearance	10 feet	12 feet	12 feet	14 feet
Under Clearance	12 feet	14 feet	14 feet	*16 feet

*this clearance should be obtained if the tree cannot be made non-climbable (see item 6 below) or removed.

[1] Kempter, Geoff. 2004. Best Management Practices: Utility Pruning of Trees. International Society of Arboriculture. Champaign, IL.
[2] Miller, Randall H. 2007. *Best Management Practices: Integrated Vegetation Management.* International Society of Arboriculture. Champaign, IL.

Table 2: Specification Clearances by Growth Rate- Urban Transmission

Slow Growing Trees (1 foot per year or less)	**Threshold:**	**Specification Clearance**
Side Clearance	11 feet	14 feet
Under Clearance	12 feet	15 feet
Medium Growing Trees (1-3 feet per year)		
Side Clearance	13 feet	16 feet
Under Clearance	14 feet	17 feet
Fast Growing Trees (great than 3 feet per year)		
Side Clearance	15 feet	18 feet
Under Clearance	17 feet	20 feet

3. **Tree Growth Rates** - Tree clearance is determined by the growth rate of the species, with minimum distances for all sizes of trees.

   a. Slow growing trees grow an average of less than 1 ft. per year.
   b. Moderately fast growing trees grow 1 ft. to 3 ft. per year.
   c. Fast growing trees average 3-5 ft. of growth per year.
   d. Extra fast growing trees average over 5 ft. of growth per year.

   Note: Irrigated trees may exceed these guidelines and should be classified individually or treated as fast growing trees. Table 1 below, provides a classification of tree species growth rates on the EWEB system.

Table 3: Tree growth rates* for trees on the EWEB system.

Slow <1 ft./Year	**Moderate 1-3 ft./Year**		**Fast 3-5 ft./Year**	**Extra Fast >5 ft./Year**
Alaska-Yellow Cedar	Apple	London Plane	Birch spp.	Ailanthus
Colorado Blue Spruce	Ash spp.	Mimosa	Black Walnut	Bigleaf Maple
Giant Sequoia	Blue Atlas Cedar	Northern Red Oak	Boxelder	Black Cottonwood
Incense Cedar	Callery Pear	Norway Maple	Catalpa spp.	Black Locust
Juniperus spp.	Cherry spp.	Pacific Madrone	Empress (Paulownia)	Lombardy Poplar
Lodgepole pine	Dawn Redwood	Ponderosa Pine	Flowering Plum	Silver Maple
Magnolia spp.	Deodar Cedar	Quaking Aspen	Leyland Cypress	Silver Poplar
Mt. Hemlock	Douglas-fir	Raywood Ash	Oregon Ash	
Noble Fir	English Walnut	Red Alder	Pin Oak	
Oregon White Oak	Filbert	Sitka Spruce	Red Maple	
Pt. Orford Cedar	Grand Fir	Sweetgum	Siberian elm	
Scotch Pine	Honeylocust	Tuliptree	Willow spp.	
Shore Pine	Horsechestnut	Western Hemlock		
Western Red Cedar	Littleleaf Linden	Western White Pine		

**Individual tree growth rates may vary due to soils, site, vigor, and presence of irrigation systems.*

4. **Mid-cycle Clearing** – Some species of trees grow too fast to prune to a point where they will be clear for an entire cycle. If for whatever reason, these trees cannot be removed, they must be maintained to stay clear of the lines until the next scheduled cycle. This is accomplished by pruning them half way between regularly scheduled cycles. An inspection of all circuits will be performed at this half way point to identify cycle-busters so that they can be pruned. No other pruning will be performed on these circuits such as pruning for guy wires and neutrals and clearing poles.

5. **Annual Inspections and Patrols –** Consistent with OAR 860-024-0016 and OAR 860-024-0018, EWEB will perform annual inspections of circuits with known cycle-buster vegetation and prune as necessary to maintain clearance. Annual patrol and vegetation maintenance of circuits identified as High Risk Fire Zones in EWEB's adopted Wildfire Mitigation Plan will be prioritized.

6. **Trees and Brush Defined** - A tree is defined as a woody plant with a stem diameter of 4 inches and larger measured at DBH (4.5 feet above the ground line). Trees smaller than 4 inches DBH are considered to be brush. Brush is normally measured in units for inventory purposes. A 'unit' of brush is a patch of brush 10' x 10'. It may include one stem or stems may fully stock the 10' x 10' area.

7. **Readily Climbable Trees** - Trees with tree houses, swings, or lower branches that make them readily climbable should be removed or have their branches pruned to a height of 8 ft. above the ground line to prevent climbing. This is required by Oregon Administrative Rules (OAR), Chapter 860-024-0016.

8. **Low Vigor Trees** - These are trees that are mature, over mature, or damaged and may be growing at a very slow rate. In some cases, pruning the terminal branches of these trees may stimulate growth that otherwise may not reach the clearance zone for many years. In these cases, it is appropriate to skip pruning, leaving the clearance slightly less that required in the clearance guidelines. Dead trees or very low vigor/diseased/declining trees below the conductors and that do not threaten EWEB facilities are the responsibility of the landowner.

9. **Tree Removal** - The priority for removal is:

    a. Hazard trees,
    b. Fast growing trees under the conductors that will grow into the 3 ft. separation prior to the next maintenance cycle in 4 years (cycle-busters),
    c. Fast growing trees beside the conductors, and
    d. Other tall growing tree species under the conductors that meet the removal standard when weighed against the pruning cost. Removal should be pursued on small diameter trees 12" DBH or less for these species. For larger diameters, EWEB tree program staff will determine the size of removals as opposed to pruning recommended for each cycle.

10. **Trees Beside Conductors** - Minimum clearances are specified for slow, moderate, and fast-growing tree species. These range from 8-12 ft. for distribution, and 14-18 ft. for roadside/urban transmission with underbuild. Brush should be removed 3 ft. beyond the

maximum side clearances. That is 17 ft. for distribution and 21 ft. for transmission conductors. All hazard trees should be removed from both sides of the conductors. For defined width transmission rights-of-ways, the minimum side clearance is 30 ft. between the conductor and the rooted tree stem. The goal is to minimize the need to side prune trees on defined width (cross-country) corridors.

10. **Overhanging Branches** - Branches should be removed for a height of 15' over all distribution conductors. All overhanging branches should be removed over all transmission. The lower whorl of overhanging branches may require tipping to lighten the end weight. This pruning should be done to lateral branches and should not remove more than 50% of the live foliage from the branch, or the branch should be removed.

11. **Hazard Trees/Facility Protect** – Defined as *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.* Trees on opposite side of the road of the conductors **also** need to be evaluated to identify potential hazard trees. Removal of hazardous trees is seen as a partnership between EWEB and the landowner or agent. Typically, the role of EWEB is to mitigate the hazard to EWEB facilities. Responsibility of the cleanup will be at the discretion of the EWEB forester.

    a. Crews dispatched for storm work will not be responsible for clean-up on any brush or wood.

12. **Exceptions for Major Woody Stems** – There are large conifer trees and possibly some deciduous trees that are situated very close to the conductors. They have been side pruned to the stem and overhang has been pruned to 15 feet. In many cases the bark has thickened on these trees and little or no lateral branch or epicormic regrowth is occurring. Little benefit to reliability may be gained by removal of these types of trees. The following are the guidelines for Major Woody Stems:

    a. A 19" plus DBH tree that is sound and healthy can occur up to 4 ft. of the conductor. There also may be a few healthy trees that are closer than 4 ft. that could be left. Note these trees and notify EWEB tree program staff to approve this variance from the clearance guidelines.
    b. A 13" to 19" DBH tree that is sound and healthy can occur up to 6 ft. from the conductor. There may be a few healthy trees that are closer than 6 ft. that could be left. Note these trees and notify the EWEB system arborist to approve this variance from the clearance guidelines.

13. **Other Clearance Exceptions** – Any other exceptions to the clearance guidelines must be approved by the EWEB Tree Program Staff.

14. **Young Tree Training** – Young trees of a tall-growing species that have been inappropriately planted under the power lines, but that cannot be removed and replaced should be pruned early (when terminal bud is nearing phone lines) to direct the top growth around the power lines. A

few cuts (or less) should be all that is necessary to start redirecting this growth. Future directional pruning will be much easier and less damaging, and will appear to deform the tree less.

15. **Pole Clearing** – A 3 ft. diameter area around EWEB poles shall be cleared of vegetation that would prevent the pole from being safely accessed and climbed.

16. **Open Wire Secondary Conductors** - Trees near open wire secondary should be pruned to provide a minimum of 3 feet of clearance.

17. **Insulated Secondary Wire Clearances** - Service wires or other secondary wires should be pruned to eliminate strain or abrasion only. They shall not be pruned to eliminate future issues or for contact with the wire.

18. **EWEB Street Lights & Light Service Wires** - Pruning for EWEB light service wires should be done to eliminate strain, abrasion, and hazard limbs. Pruning for EWEB light service wires shall not be done to eliminate future issues, or for non-abrasive contact with the wire. Pruning should be done to prevent mechanical damage to EWEB lights. Pruning to provide illumination shall be the responsibility of the customer or property owner.

19. **EWEB Fiber-optic lines** – Shall be pruned to a minimum clearance of 2’ on regularly scheduled cycle maintenance.

20. **Neutral Conductors and Other Facilities** - Large branches threatening conductors or trees laying on or applying pressure to guy wires, poles, or other EWEB facilities should be pruned or removed. Neutral conductors shall be pruned to a minimum clearance of 2’ on regularly scheduled cycle maintenance. Neutral conductors in the primary position shall be pruned to primary clearances.

    Vines should be removed and treated with an approved herbicide. Unless directed by EWEB, no pruning should be done for:

    a. Cable television,
    b. Telephone cable,
    c. Fiber-optic lines (except EWEB owned fiber optic lines),
    d. Private electrical facilities, or
    e. To improve the illumination of streetlights.

21. **“Tag”/Ticket Work –** Work that is not on circuits that are scheduled for regular cycle maintenance should be avoided as much as possible. Attempts should be made to have customers wait for requested tree work to be accomplished on the next scheduled cycle unless a hazard exists. Other exceptions to off-cycle work are:

    a. Work that needs to be completed in association with EWEB capital work
    b. Trees that are hazardous

c. Pruning associated with private tree work; providing 10’ of clearance from high voltage to allow private tree work to be completed safely and that cannot be postponed until the next scheduled cycle

22. **Clearance for Private Tree Pruning** - Clearance for private contractors and landowners preforming tree pruning or removal will be given when requested, based on OROSHA minimum approach distances for energized conductors. Minimum approach distances for unqualified persons are provided in section 437-002-0306 of the Oregon Administrative Rules (OAR). Clearances will be provided so that no part of the tree, rigging, or any person(s) may breach minimum approach distances during private tree work. Clean up shall be the responsibility of the landowner or contractor. Signed authorization should be obtained by the forester/arborist prior to providing clearance for trees that will be removed privately. Contractors that plan to use equipment within 20 feet of any EWEB transmission wire or facility must meet with a EWEB Electric Operations Crew Leader prior to beginning any work.

23. **Stump Treating** - All deciduous stumps shall be treated with an approved herbicide according to the herbicide label, Integrated Pest Management practices, local, state and federal regulations, EWEB guidelines, and best management practices. The EWEB herbicide guidelines are provided in document DR 400 PRC 03-00 Herbicide Implementing Procedure.

24. **Wood Chips -** EWEB Vegetation Management Staff and contractors should make every effort to provide chipped material from pruning operations to EWEB customers when feasible. Customers in the immediate area of the work site are preferred, inefficiently distant deliveries should be avoided. Chip loads containing noxious/invasive/poisonous vegetation should be disposed of at the recycling center.

25. **Customer Relations** – At no time during interpretation or implementation of these guidelines should customer service be compromised. The general public and the tree owners have more than a casual interest in the appearance of trees located upon the rights-of-way. Therefore, it is important that EWEB and its contractors conduct themselves in a professional manner at all times, and that all work performed be in accordance with these guidelines and industry standards. Proper cuts and professional work to provide adequate clearances and to protect tree health can be supported in the face of customer concerns.

26. **Customer Notification** – It is common knowledge across the U.S. that utility customers receive more face-to-face contacts from the vegetation management department than any other aspect of utility operations. It is very important that the notifiers, tree crews, and their supervisors present a professional appearance, friendly attitude, and be well-trained in modern utility arboriculture. Trees shall not be pruned without prior notification. 3 business days should elapse prior to pruning if the customer is notified with a door hanger.

27. **Tree Crew Customer Courtesy Knock** – At the time of work, the contract tree crew shall knock on the door of the tree owner just prior to work. This is simply a courtesy to the customer, and should not be a rehash of the notification process or a renegotiation of the previous agreements between the notifier and customer for pruning or removal. If a customer reneges on permitted removals, pull off of the property and inform the EWEB system arborist.

The notifier should return to the property to discuss the necessary work. Often the person at the door is not the owner or agent that entered into the tree removal agreement for the tree work. If there is nobody home, proceed with the work as prescribed by the notifier.

28. **Customer Concerns** – The notifier shall make every effort to defuse customer concerns in the field. If they are unable to answer all of customer's questions, or abate their concerns, then the notifier shall turn in the information to EWEB tree program staff. If the concern arises at time of pruning, the tree crew shall notify the general foreman. The general foreman shall make every effort to defuse the customer's concerns. If they are unable to answer all of customer's questions, or abate their concerns, then the general foreman shall turn in the information to EWEB tree program staff. It may be necessary to interrupt work on that customer's property until their concerns are addressed.

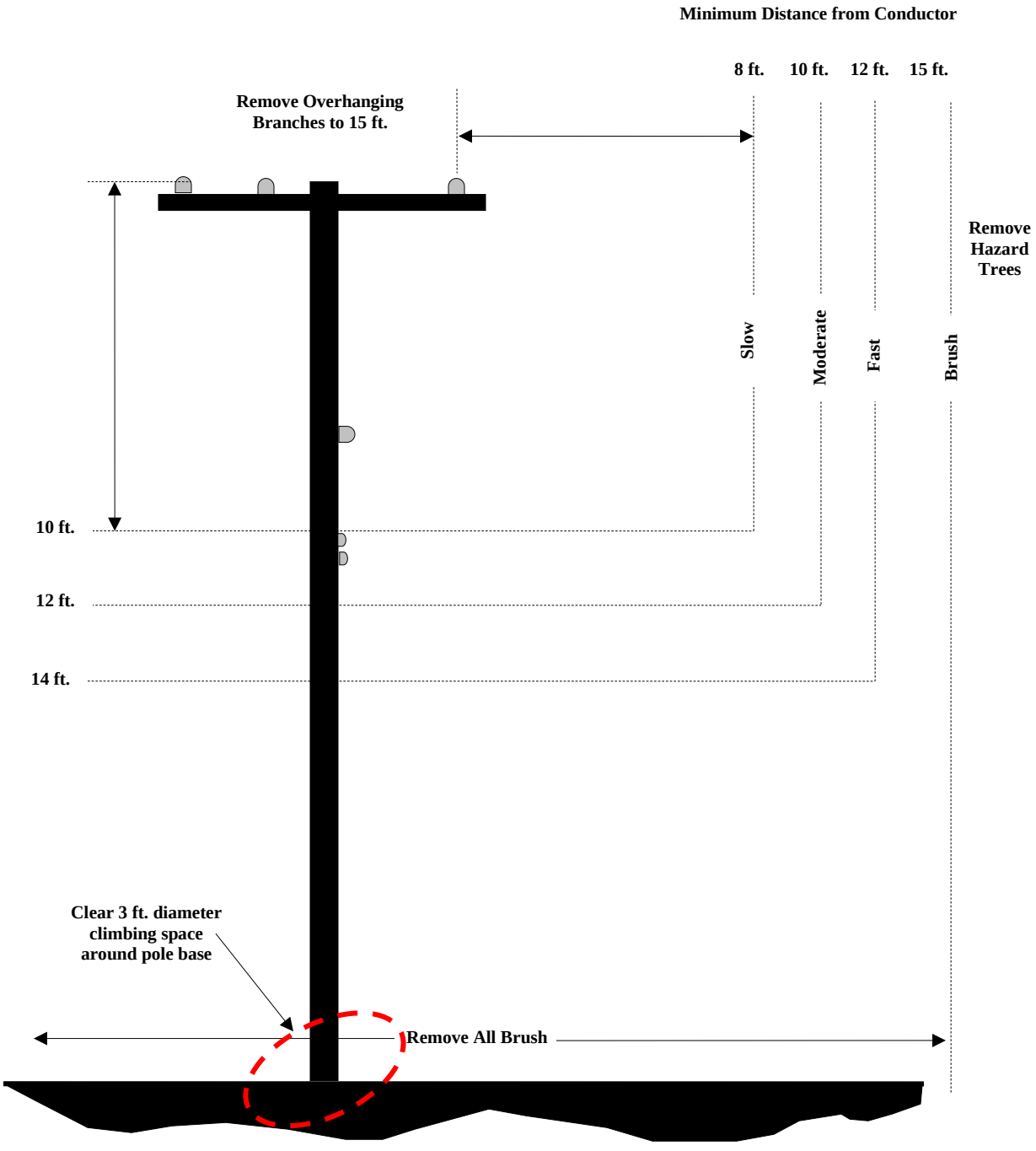
29. **Cutting Big Wood** – Sometimes pruning to EWEB specifications will require cutting beyond cuts that have been made on the tree in the past. The notifier shall notify EWEB tree program staff if making these deeper cuts has the potential to be a concern to customers or the public.

30. **Tree Replacement Vouchers** – These vouchers are to be used by the notifiers as a tool to achieve removal and replacement of fast growing trees under the power lines. They should not be offered initially, but should be kept as a tool to help achieve necessary removals. Occasionally these vouchers could be used with a concerned customer if all did not go as expected.

31. **Customer Surveys** – Customer surveys are another tool to help gauge customer perception of the notifications, tree work, and overall vegetation program success. Surveys should be conducted on a quarterly basis, with surveys randomly distributed to a sample of property owners with recent tree work.

32. **Local Regulations** – Local regulations, ordinances, or other agreements with cities and towns should be carefully observed.

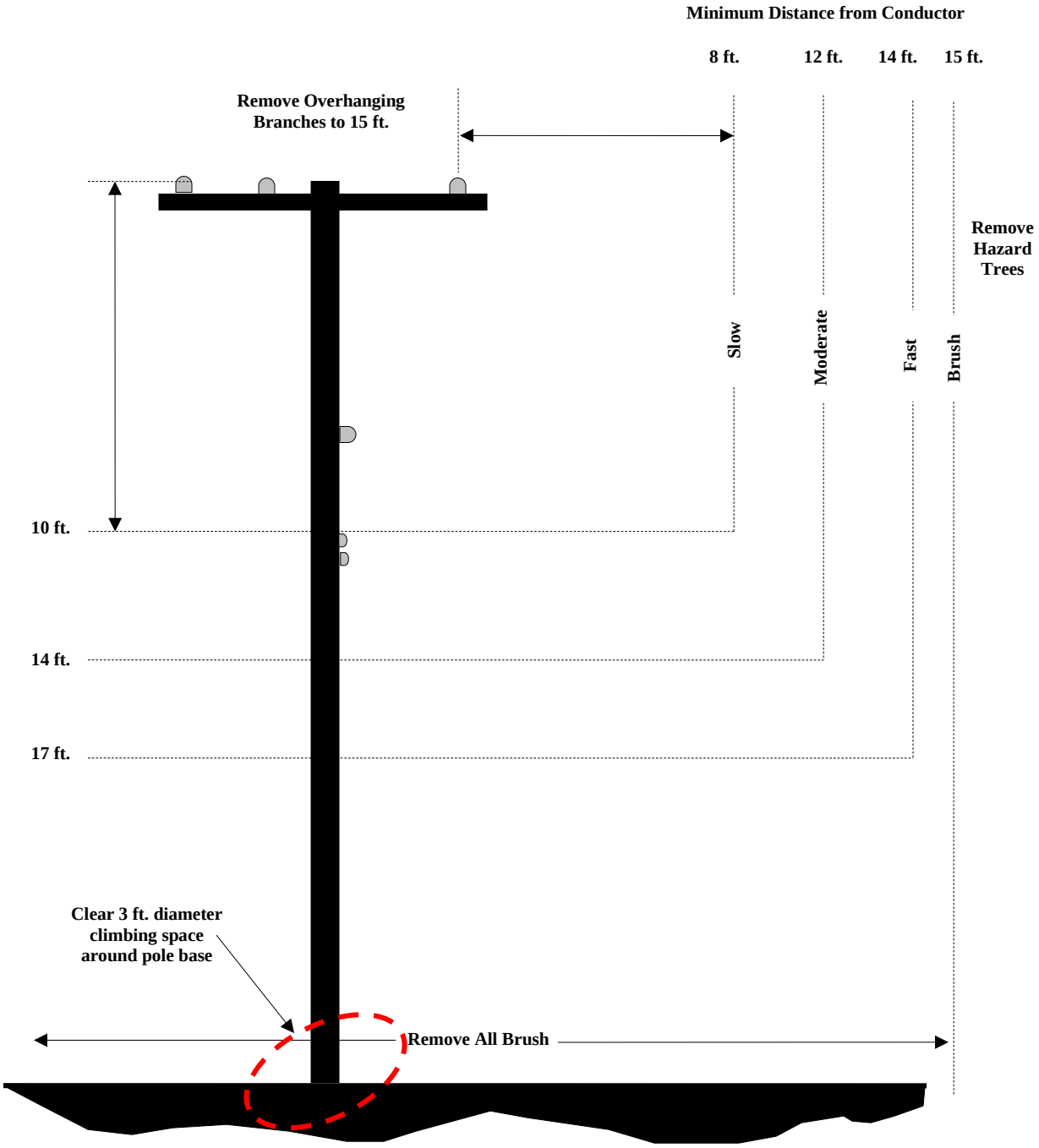
Figure 1. EWEB Distribution Clearance Guidelines- Non-climbable trees



1. Remove slow growing tree species to 10 ft. from conductor.

2. Remove moderately fast growing tree species to 13 ft. from conductor.
3. Remove fast growing tree species to 17 ft. from conductor.
4. Remove all brush under and beside the line to a distance of 15 ft. on rural or cross-country lines.

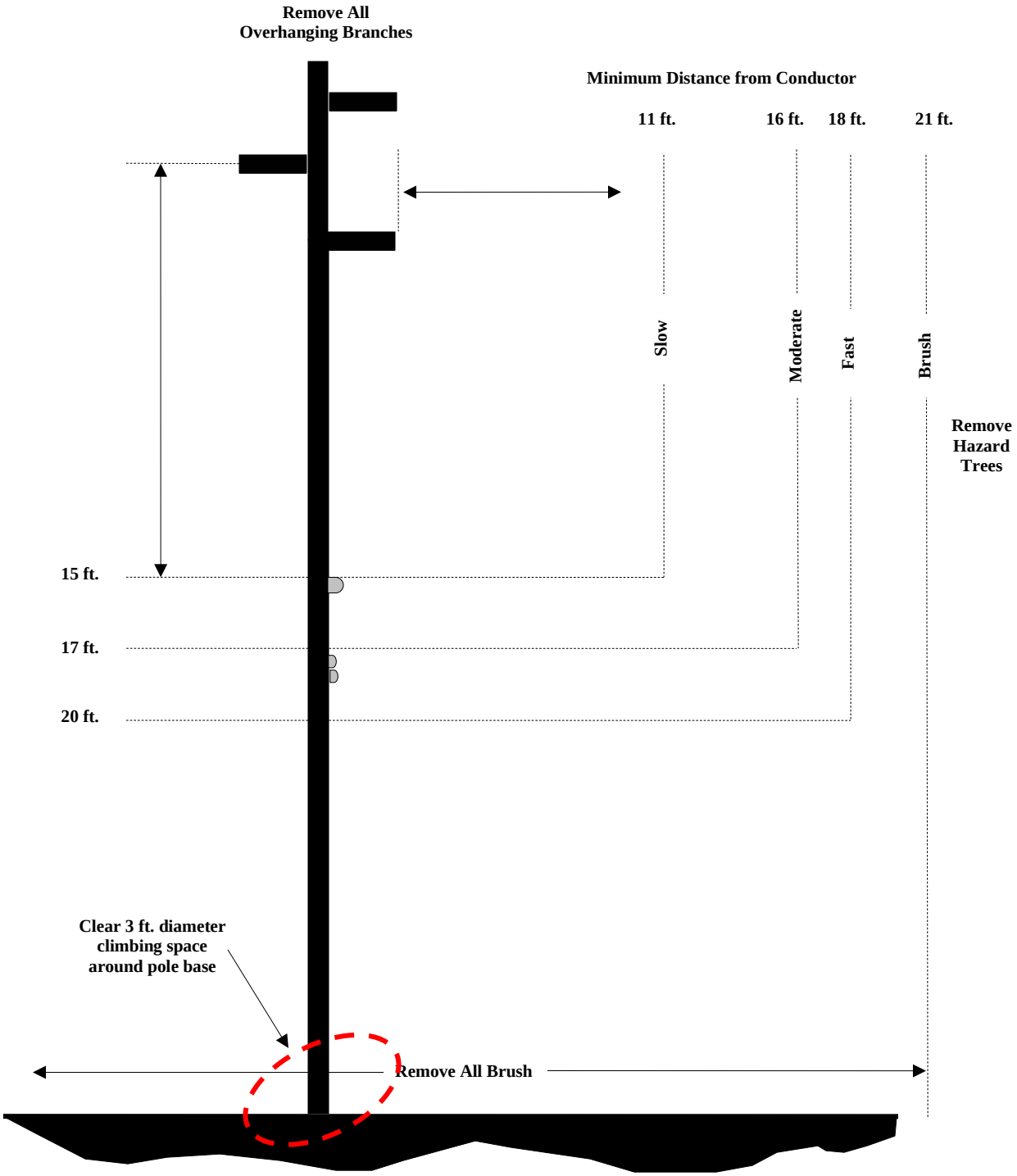
Figure 2. EWEB Distribution Clearance Guidelines- Climbable trees



1. Remove slow growing tree species to 10 ft. from conductor.

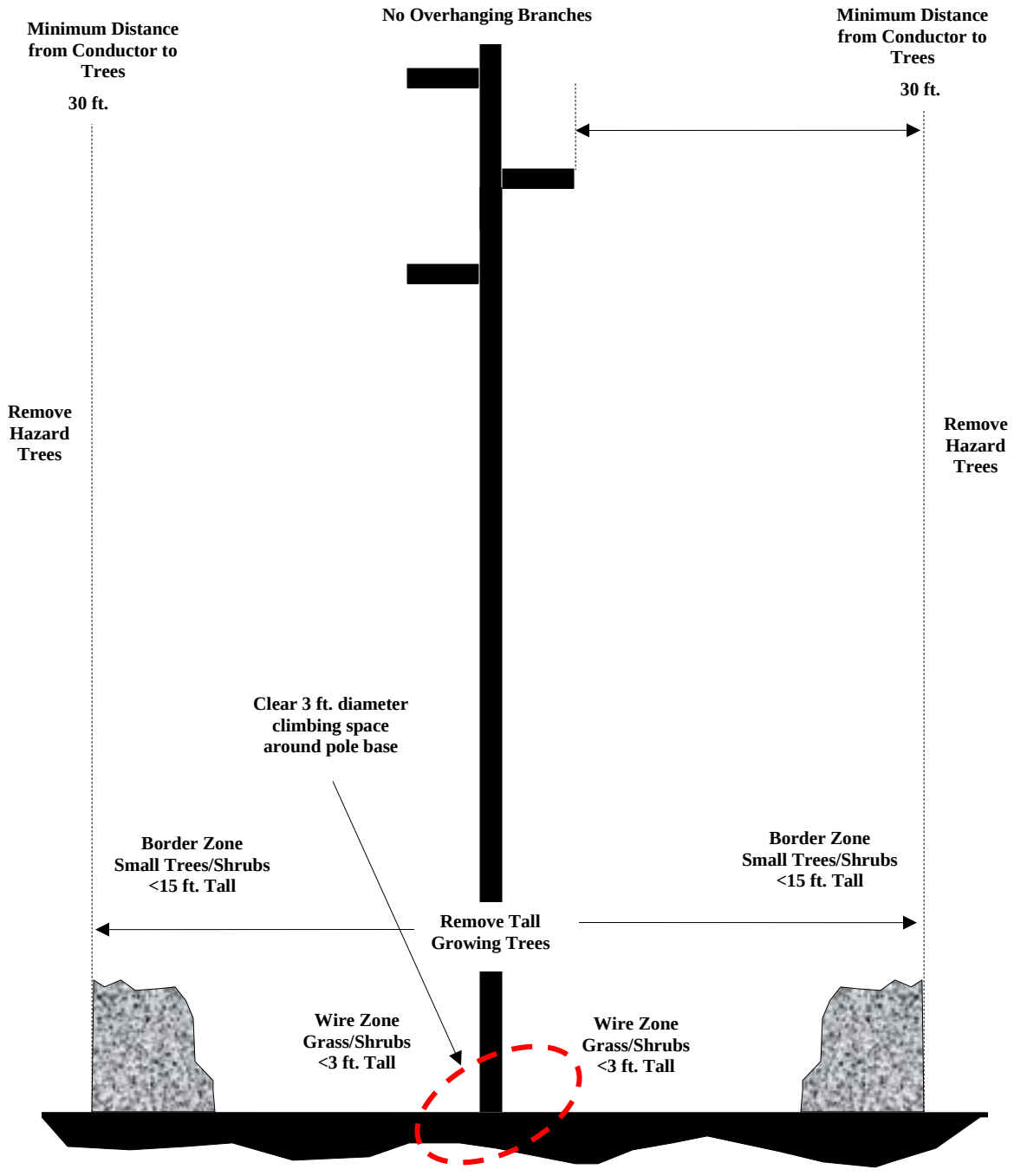
2. Remove moderately fast growing tree species to 13 ft. from conductor.
3. Remove fast growing tree species to 17 ft. from conductor.
4. Remove all brush under and beside the line to a distance of 15 ft. on rural or cross-country lines.

Figure 3. EWEB Urban Transmission Clearance Guidelines



1. Remove slow growing tree species to 9 ft. from transmission conductor.
2. Remove moderately fast growing tree species to 13 ft. from transmission conductor.
3. Remove fast growing tree species to 15 ft. from transmission conductor.
4. Remove all brush under and beside the line to a distance of 18 ft. from trn conductor.

Figure 4. EWEB Transmission – Defined Width Rights-of-Way Clearance Guidelines



TECHNICAL GUIDELINES

1. Modern Utility Arboriculture

Tree Pruning shall be governed by principles of modern arboriculture. Performance of vegetation management work on EWEB's system is addressed by the following industry standards:

- American National Standard ANSI Z133.1 (2000) – the *Safety Requirements*
- American National Standard ANSI A300 – Part 1 (2001) – *Pruning*
- Utility Pruning of Trees: Special companion publication to the ANSI A300 Part 1(2004)
- American National Standard (Part 7 - 2006) *Integrated Vegetation Management for Electric Utility Rights-of-ways*
- *Pruning Trees near Electric Utility Lines* (Shigo-1990).

Best management practices (BMP) guides have been developed by the International Society of Arboriculture for utility tree pruning[3] and Integrated Vegetation Management[4], and were published as companion publications to the ANSI A300 that is listed above.

2. Proper Cuts

Proper utility tree pruning techniques include:

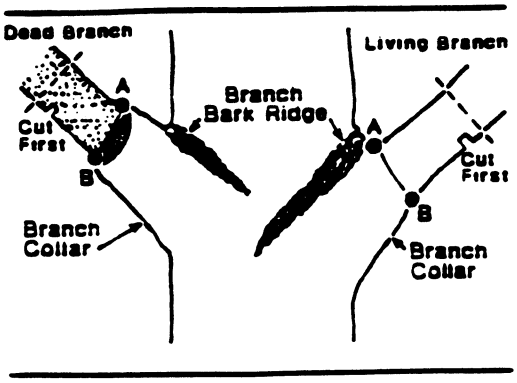
- Making cuts at the branch bark collar, and
- Directional pruning to lateral branches.

Proper pruning for utility line clearance should direct tree growth away from electrical conductors, provide for longer periods of clearance, and reduce future work on that tree.

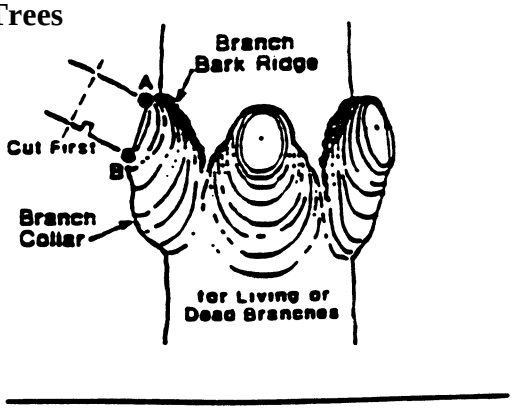
The collar cut is the cutting of a branch just beyond the point of intersection with the trunk of the tree or another branch, at the branch collar. The lateral branch used to prune back to should be at least 1/3 the size of the parent branch.

[3] Kempter, Geoff. 2004. Best Management Practices: Utility Pruning of Trees. International Society of Arboriculture. Champaign, IL.
[4] Miller, Randall H. 2007. *Best Management Practices: Integrated Vegetation Management.* International Society of Arboriculture. Champaign, IL.

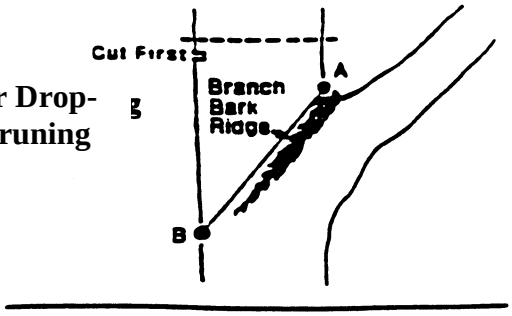
Deciduous Trees



Conifer Trees



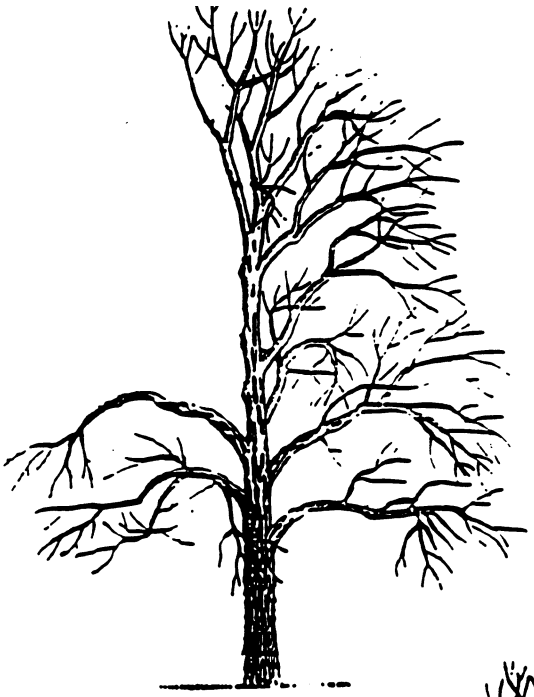
Lateral or Drop-Crotch Pruning



Tree pruning shall be performed using the collar cut method, making cuts at the branch bark collar or ridge. Properly made cuts will help the tree form callus tissue that will roll over and seal the pruning wound. Topping and flush cuts are unacceptable and shall not be utilized. Ripping or peeling of the bark below the cut branch is not acceptable. Tipping and heading should be avoided.

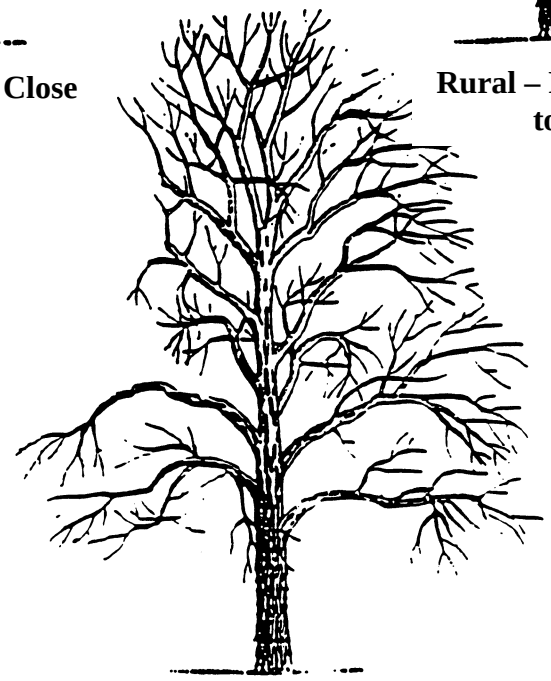
3. Directional (Natural) Pruning

When trees are under or nearly under the conductors this directional pruning is called natural or drop-crotch pruning. Directional pruning is a technique that forces future tree growth to a desired direction. When pruning trees under facilities, the branches growing upward should be cut back to branches growing away from the conductors. This is called 'pruning to laterals'. Drop crotch or natural pruning often leaves a 'V' appearance in the top of the tree. It is also sometimes also called 'through pruning'.



Landscape Tree – Too Close to Conductor

Rural – Forest – Too Close to Conductor



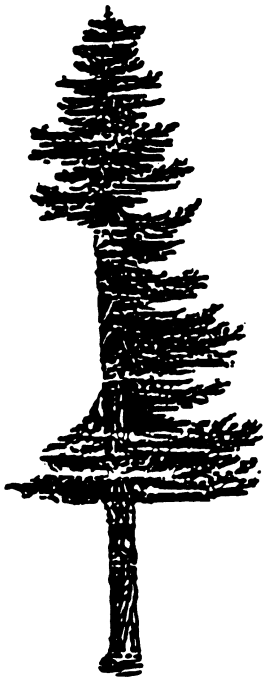
Tree Set Back from Conductors

As few as possible cuts should be made to achieve this clearance. This involves making fewer cuts and on larger branches. This will increase clearances while reducing the number of pieces to dispose of. When pruning trees to the side of facilities, the branches growing outward should be cut back to branches growing vertical, parallel to the lines, or in a downward direction. This technique will promote future tree growth away from facilities, thereby reducing future work. Rounding over or topping trees for aesthetics is not allowed or desirable since it simply promotes more buds to break and more sprout growth in the tree. **Every effort should be made to protect as many existing terminal buds in the tree being pruned as possible.**

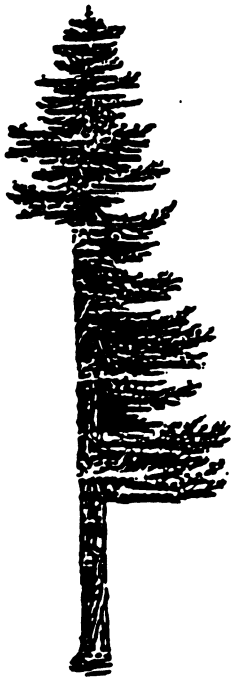
Some small (pencil size or smaller) limbs or suckers should be left when pruning back to bare wood. This can discourage rapid epicormic sprouting and also protect trees from sun scald.

4. Side Pruning

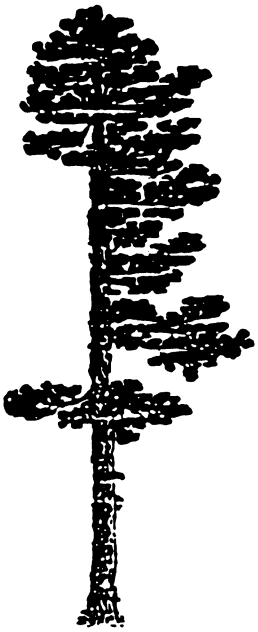
Often trees must be pruned back to the main stem to achieve acceptable clearances. In all cases branches should be pruned to the branch bark collar with proper cuts.



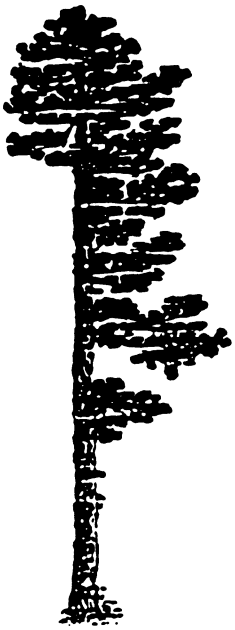
Landscape Tree



Rural Non-Landscape Tree



Landscape Tree



Rural Non-Landscape Tree

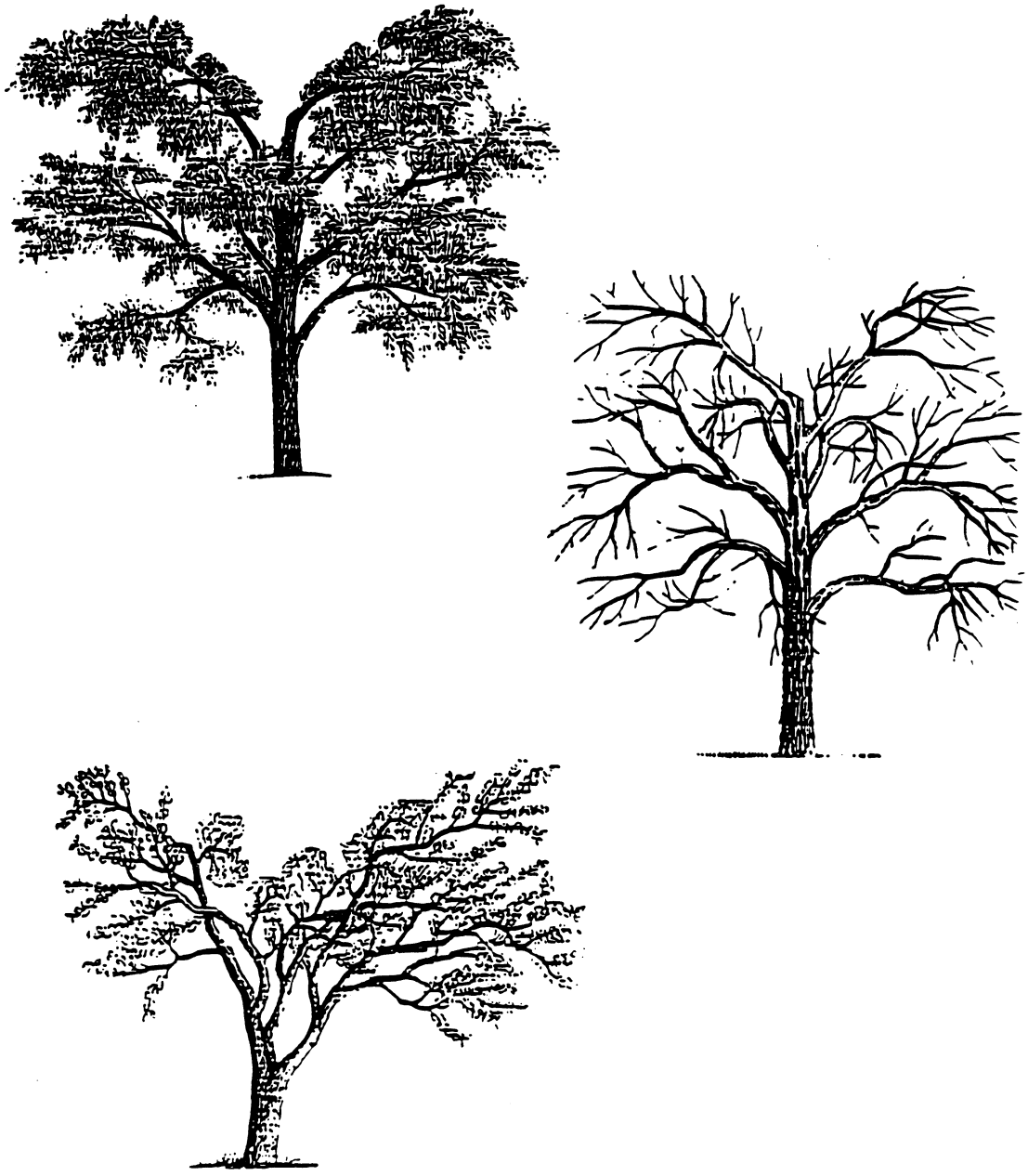
4.1. Tipping ("Green Pruning") Conifers

Tipping of conifer branches is the removal of only the ends of a conifer branch. This should be avoided in general. However, some tree owners may request that their trees are not pruned back to the stem. In these cases, and with western red cedar, conifer branches may be tipped, but do not remove more than 50% of the live foliage on a branch. This will help to insure that the branches live and do not become unsightly. If adequate clearances cannot be achieved while meeting this minimum foliage requirement, then the branch must be removed to the stem.

In rural settings, remove all side branches below the conductor – in residential settings, the lower branches can be left on, though clearances around the conductors must be to minimum clearance guidelines. Anything less must be approved by EWEB tree program staff.

5. Crown Reduction

When conifers under the power lines cannot be removed, the crown reduction pruning should be utilized. Clearance is determined utilizing Table 1 based on the anticipated growth rate of the tree. The main stem cut should be made just above a whorl of branches. Any upright live branches should be pruned back to the parent branches to achieve the necessary clearance.



In some cases crown reduction pruning is applied to deciduous trees as well, instead of natural or drop crotch pruning. In all cases, cuts are made to proper lateral branches to achieve necessary clearances.

The difference between topping and performing crown reduction pruning on a conifer tree is the placement of the cut. Topping cuts are made indiscriminately (internodally) leaving stubs on branches or the main stem. Proper crown reduction cuts are made to appropriate lateral branches or the main stem.

Heading cuts are similar to topping cuts, but the terminology generally refers to cuts on smaller trees or large shrubs. Generally heading cuts are considered to be the same as topping cuts and are not acceptable unless pruning a species such as English Laurel or Hawthorne.

6. Tree Removal

Tree removal is an important element of EWEB's vegetation management program. Tree removal eliminates cyclebuster trees, hazard trees, and other tall growing trees under the power lines, improving access to facilities, and reducing future work. Tree removals that fit guidelines will be pursued wherever feasible.

6.1. Tree Removal Candidates:

The following is a prioritization scheme for determining which trees should be removed from EWEB's distribution and transmission system rights-of-ways. This is a meant to be a guideline only. Decisions should be made on an individual tree basis and should consider cost, access, difficulty of removal, flagging, and customer issues. The following is a listing of good removals, listed in order of priority/risk:

6.1.1. Hazard trees. All dead, dying, diseased, or structurally defective trees that are reasonably expected to fail within the next 4 years. The tree or parts of the tree will fall toward and reach the power line, guy wire, or other electrical facilities. Trees that are expected to fall away from the lines, or cannot reach the lines are not hazardous to EWEB facilities. Hazard trees can be mitigated by topping the tree to a height where it no longer threatens EWEB facilities or by removing the tree, whichever is most cost effective. Situations that arise when trees may become a hazard after pruning should be discussed with the customer and EWEB tree program staff.

6.1.2. Climbable trees under or within 10' to the side of the lines that cannot be made safe by pruning.

6.1.3. Trees with tree houses from which the tree houses cannot be removed; or the structure of the tree will permit entry into close proximity of the power lines; or reconstruction of the tree house will likely occur.

6.1.4. Trees under or within 12' of the lines that have been disfigured by repeated pruning, and are aesthetically unattractive, but still vigorous.

6.1.5. Trees that cannot be side pruned for 4 years of clearance.

6.1.6. Cyclebuster trees under the wires that allow less than 4 years of clearance by pruning. These species are likely to include:

- Lombardy poplar
- Black cottonwood

- Black locust
- All walnut species
- Boxelder
- Catalpa
- Tree of heaven
- Silver maple
- Siberian elm
- Silver Poplar

6.1.1. Other species: look at vigor, past growth, and presence of irrigation.
6.1.2. Small trees under the wires that are less than 12" DBH – especially in rural areas or on rural rights-of-ways. In town look at the tree, species, and ability to prune to look good.
6.1.3. All seedlings and saplings of any tall growing tree species within 15' of the conductors.
6.1.4. Trees that can be removed that are within the size defined by EWEB tree program staff for the given cycle.
6.1.5. Other trees that common sense and knowledge of utilities dictates removal.

Be more aggressive in seeking necessary removals on higher priority lines such as:

- Transmission – higher voltages are higher priority.
- Distribution – 3 phase lines are higher priority than single phase.
- Lines feeding hospitals, medical office complexes, life-support systems, or sensitive industry such as micro-chip producers.
- Higher customer load lines are higher priority than lines with lower numbers of customers.

6.2. Tree Removal Conditions:

6.2.1. Generally, the time to remove a tree should be limited to five times the time it would take to trim the tree. Exceptions would be hazard trees or cycle-buster trees.
6.2.2. Rule of Thumb - If greater than 1/3 of a tree or 50% of branches foliage must be removed to achieve clearance then the entire tree (or branch) should be removed.
6.2.3. Tree removals should be limited to 15 feet on either side of primary conductors and within rights of way. Exceptions would be hazard trees and brush, and defined width transmission corridors.
6.2.4. Stumps shall be cut as close to the ground as practical in urban areas. Cut flat; do not leave pongee sticks (angled cuts on brush).
6.2.5. Tree removal requires signed permission from the property owner. Right of way easements or permits may have already granted permission for tree removal, in which case notification to the property owner is required.
6.2.6. Trees will not be removed for secondary lines. Customers that need trees removed that are targeting secondaries should be referred to EWEB to schedule a disconnect.

7. Climbing Hooks

Climbing hooks injure thin barked trees and should only be used on removals, or where the tree cannot be reached by a lift or climbed safely without hooks.

8. Brush Disposal

Tree crews should be creative in disposing of branches from line clearance operations. In residential or maintained areas, tree branches resulting from crew activities should be chipped and removed from the site.

Proper planning shall be utilized when taking chips to dumping facilities. A facility shall be selected that will take the shortest amount of time to travel to and discard the chips. Mid-day trips to the facility shall be avoided. If one is necessary it should be performed by one person, not the entire crew is possible.

Occasionally customers will call and ask for chips. This should be accommodated as much as possible provided that the site is either near the work site, near the crew shop location or near the route between. No partial loads shall be provided so the customer must be able to take the full load.

Tree branches should not be left overnight unless the crew has notified the property owner. Large tree branches and logs greater than four inches in diameter should be cut into manageable lengths and left for the property owner. Work sites will be left in a safe and orderly condition. This means that wood from the trees and branches are piled at the base of the tree or stump, smaller branches are properly disposed of, and yards, sidewalks, street, and driveways are raked or cleaned to the same or better condition than before work was started. No wood is to be cut in firewood lengths or stumps ground unless directed by EWEB tree program staff.

In rural or unmaintained areas, tree branches, other brush, and logs resulting from crew activities should be disposed of on the site. If brush is chipped, it should be blown on site in a manner that does not create chip piles deeper than 6 inches or block water drainage. Any brush not chipped should be lopped and scattered in lengths not to exceed three feet. Brush that is lopped and scattered should be in contact with the ground, but no deeper than twelve inches. If the property owner requests the brush and logs be piled, it should not be highly visible to the public, create access limitations to the right of way, or create fire hazards. Burning of brush is not allowed. Work sites will be left in a safe and orderly condition.

Operational Protocols for 2022 Wildfire Season

1. **Wildfire Season:**

- Operations Supervisors will monitor and adhere to IFPL restrictions 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
- 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 conference call to evaluate staffing/resource needs and begin additional weather monitoring and enhanced situational awareness for field crews during the watch event.
   - If RFW 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 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
     - Monitor weather forecasts and other relevant fire potential information
     - 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.

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 decides to activate a PSPS:

- PIO will initiate PSPS communication protocols for customers, inter-agency stakeholders and employees, including location (s) and expected duration of event.

- ICS will continue to monitor weather forecasts and maintain close communication with public safety officials to determine when conditions warrant re-energizing circuits.
- Schedule and conduct a ‘hotwash’ to debrief the PSPS event to continuously improve response protocols and practices.

EWEB Communication Plan

Project or Initiative

Wildfire Mitigation Strategic Communications Plan

Summary

Due to the increased frequency and magnitude of wildfires in recent years, the Oregon Public Utilities Commission is expected to require wildfire mitigation plans (WMP) be completed and filed by mid-2022. EWEB will be required to complete a plan and have it adopted by the EWEB board, then filed with the PUC. EWEB has several programs in place for wildfire mitigation, and management plans to build on those to meet PUC requirement. Finally, while most wildfires are started by lightning strikes or caused by human actions, utilities such as EWEB have a role to play in risk reductions.

EWEB has select areas of the territory with high fire risk where there is increased vegetation density or remoteness. This includes the upriver territory and select feeders in the southern territory of the Eugene urban area. EWEB will take a programmatic approach to a WMP which will include the following elements:

- **Operational Response** – Trigger criteria and actions to be taken upon alert of a Red Flag event which result in changes to normal system controls and protection (not de-energization), and internal response and communication protocols around outage response and restoration.
- **Public Power Safety Shutoffs (PSPS)** – evaluate efficacy of this approach for EWEB territory. If deemed appropriate, will include specific trigger criteria and actions to be taken which result in de-energization of equipment and systems proactively ahead of a Red Flag or triggered during a Red Flag event
- **Mitigation Program** – enhancement measures through monitoring, vegetation management, capital improvements or design standards changes to mitigate damage to equipment in the event of a fire and reduce risk of ignition from the power system.
- **Communication Plan** – internal and external communications around the above tactics, changes and protocols as well as internal and external education around the WMP.
- **Interagency Coordination** – partnering with area agencies which are involved in the planning, response or recovery of wildfire related events.

Communication goals

- Build customer trust and confidence.
- Demonstrate to customers the efforts EWEB has taken and will take to mitigate the risk of wildfire ignition from the power system when a Red Flag warning is issued.
- Create a sense of shared responsibility when it comes to preventing wildfires.
- Work with county, city and state agencies to share messaging developed for this plan.
- As criteria is established and PSPS program is developed, help customers prepare for a PSPS with as much notice as possible and help them understand why such an action is necessary.

Strategies

- Enhance EWEB's reputation as a "safety first" utility that puts the safety of the community and staff first in every instance. This can be emphasized by leveraging the wildfire mitigation communications plan with other safety-related activities, event and/or metrics.
- Partner with local, state and federal organizations to help educate customers about how to reduce wildfire risk at, near and around their homes in partnership with other community groups such as Team Up 4 Fire Safety and other urban/wildland interface fire prevention organizations.
- Educate customers about the dangerous combination of high winds, warm temperatures, low humidity and wind-related wildfires and about also about potential outages and to urge them to be aware of conditions and sign up and be proactive in receiving Red Flag alerts.
- Emphasize that EWEB works with other agencies, including the U.S. Forest Service, Oregon Department of Forestry, Lane County Emergency Management, Eugene Springfield Fire and others to review the combination of factors in deciding if power should be shut off.
- Socialize, through all available channels, the safety and PSPS messages in advance of fire season **once the program is finalized, approved and launched.**
- Give customers appropriate notice in advance of forecast conditions that may result in Operational Changes or PSPS (**once program is approved**) and direct them to the source of the information (NOAA, Lane County Emergency Management, LCSO, etc.)
- Recognize and empathize that shutting off power for safety reasons can present challenges for customers, especially those who live in rural areas and rely on electric pumps for wells, rely on power for communication, and give customers tools and information to mitigate those challenges (e.g. Pledge to Prepare).
- Highlight the programs EWEB created before and after the Holiday Farm Fire to help impacted residents (including the Generator Loan Program).
- Ensure staff, board and partner agencies have the information to respond to customer inquiries
- Educate customers how they can prepare for extended outages or more frequent interruptions as these events may be experienced more often. (Something similar to pledge to prepare).

Audiences

- All EWEB customers
- The larger community, including areas of the Upper McKenzie River Valley where EWEB has facilities
- EWEB Board and staff
- Partner agencies, including City of Eugene, Lane County and Oregon Department of Forestry

Key messages

Vegetation Management

- To help prevent tree-related outages and mitigate wildfire risk, EWEB proactively prunes trees and trims vegetation to help keep our equipment clear.

- Even as the protection systems do their job, arcs and sparks can happen before the electricity is removed which can quickly ignite grass and other vegetation, particularly in very dry conditions, and the fire can spread rapidly in high winds or gusts. EWEB cannot control all the fuels, except in the areas it owns and controls.

- Tree branches can cause faults in multiple ways. A tree falling across a line can tear the line down. If a limb falls on the line, it can produce an electrical arc. The arc itself has the possibility of sparking a fire if

the conditions for fuel, wind and temperature exist, and if the branch remains in contact with the line, it may eventually break the line.

- Crews trim around 300 “line” miles of vegetation annually to minimize falling trees and branches for ongoing reliability maintenance, with an additional 250 “line” miles inspected and pruned specifically for fire protection in high-risk areas.

- Our vegetation management program is consistently recognized by state officials as a model for other utilities to follow.

Grid Operational Changes for Wildfire Mitigation

- When there is a high risk of wildfire, we modify the protection settings on power lines in certain areas and make safety-related operational changes to select substations.

- As each weather situation is unique, we work closely with other agencies such as Lane County Emergency Management, U.S. Forest Service, and Oregon Department of Forestry, and carefully review a combination of factors that dictate when to implement additional protective measures, including:

    - NOAA Red Flag Warning
    - High Wind Forecast
    - Wind-Related Outages
    - Low Humidity Levels
    - Dry Material on the Ground
    - Situational Awareness

- High winds are especially problematic in that they create more vegetation contacts with our electric wires, increasing spark potential, and those gusting winds can cause fires to spread faster than they can be contained.

- While most wildfires are started by lightning strikes or caused by human actions, utilities have a role to play in risk reduction.

- To decrease the risk that EWEB powerlines become a potential ignition point, we change the protective settings on our equipment during Red Flag Warning within our service territory. These enhanced protective steps are concentrated in areas at a higher risk of wildfire, including:

    - All lower McKenzie Valley circuits from Hayden Bridge/Camp Creek up to Leaburg.
    - South of S. 34th Ave. and east of Willamette St. to the intersection of Old Dillard Road and E. 43rd Ave.
    - South of Potter St. at the intersection of Amazon Dr., and north of E. 43rd Ave. going east to Spring Blvd.

- These protective measures include modifying high-voltage electric switches and relays. Just like a circuit breaker in your home, the switch senses when trouble occurs - such as a tree branch falling on the line - and shuts off the power.

- EWEB takes these steps during Red Flag Warning events for the safety of our customers, community and staff.

- Unlike some utilities in California utilities that enact "Public Safety Power Shutoffs" (PSPS) during high wind, low humidity weather events, we do not plan (in 2021) to proactively de-energize power lines when officials declare a Red Flag Warning within our service area.

- However, turning up the sensitivity of the system to reduce the potential of sparking a fire increases the chances of power outages.

- If a powerline in this area does shut off when the protective measures are in place, crews will visually patrol the line to make sure equipment is safe to operate and work with our public safety partners to ensure there is no active fire in the vicinity before re-energizing the line. While these are prudent and safety-focused steps, we have alerted customers that in the event of an outage, restoration could take longer because we must first visually inspect the lines.

- As EWEB becomes more wildfire aware, we are also engaging our customers in this effort. We've started a wildfire awareness social media campaign, and have a brochure ready to share with customers to accompany information on our website. A new map will soon be available on-line to show customers areas of our system that are at higher wildfire risk, to be refined as we learn more information over time.

- Because emergency preparedness is a shared responsibility, we encourage our customers and our staff to be ready year-round and have an emergency plan (and supplies) in place and ensure we are all ready for a prolonged power or water disruption – whether caused by snow, ice, wind or wildfire.

- EWEB frequently de-energizes power lines at the request of public safety agencies, such as the fire department, police or Lane County Emergency management. When a vehicle strikes a power pole, for example, police and/or fire often request that we re-energize a line to allow for extraction and public safety.

- During periods of high wildfire danger, EWEB would de-energize lines if asked to do by other agencies to ensure public safety.

- Safety remains our No. 1 priority, and EWEB reserves the right to de-energize power lines for safety reasons.

Public Safety Power Shutoff (Not approved for sharing publicly)

- A Public Safety Power Shutoff is a practice used to preemptively shut off power in certain high risk fire areas to reduce fire risk during extreme and potentially dangerous weather conditions. EWEB is currently evaluating the use of PSPS for the EWEB electric system. If deemed appropriate, EWEB will develop the PSPS program and that would launch after board adoption.

- We realize the proactive approach of preemptively shutting off power can present challenges, especially for those who live in rural areas and rely on electricity for pumps for wells, internet and communications. However, customer, community and staff safety is our No. 1 priority.

- If applied wisely, the relative inconvenience of a PSPS is a fair price to pay to avoid a wildfire that could result in the loss of life and property and any actions EWEB may take in the future using PSPSs will be in coordination with local agencies and as adopted by the board and PUC.

- If your power has been shut off, we will restore power as soon as the conditions permit, and crews have inspected the system to confirm it is safe to re-energize power lines.

What can customers do?

- Just as EWEB manages vegetation to keep trees away from power lines, it is important for everyone in our community to create a line of defense around their property by clearing dead trees and brush away, particularly if you live in the south hills and other heavily forested areas of our community. Contact Eugene Wildfire Preparedness Coalition for more information and guidance.

- When selecting a new tree to plant, follow the Right Tree, Right Place approach. By picking the proper species and planting procedure, you can increase public safety, reduce power outages, reduce the need for routine pruning, and promote healthy trees.

- Everyone should also have a plan for how you and your family will stay safe from wildfire. Find more information at https://www.ready.gov/wildfires.

- Outage preparation – pledge to prepare; water storage, flashlights, food, backup power, etc. family emergency plan go to www.eweb.org/emergencyprep for more information.

Tactics

Website – post information about vegetation management program, what PSPSs are, PSPS criteria (once finalized and adopted) and wildfire prevention and mitigation measures in the Newsroom and Electric Safety page.

Enhance the eweb.org page dedicated to wildfire safety and mitigation.

Visual media – Photos and videos of vegetation management and grid-hardening activities.

Email – send information about EWEB wildfire mitigation programs applicable listservs.

Bill message/insert – Wildfire mitigation brochure insert to go out in October 2021 (email) and June 2022.

Earned media – use earned media to promote EWEB's proactive vegetation management program as well as the need to institute operational changes during Red Flag Warnings.

Social media – post regular educational materials about EWEB's proactive vegetation management program as well as the need to institute PSPS under certain conditions and the shared responsibility of wildfire prevention.

EWEB's new customer service portal – Once the new portal is operational in May 2021, we hope to be able to use that as a tool to communicate with customers, including providing notice of responses ahead of Red Flag warnings and during the events.

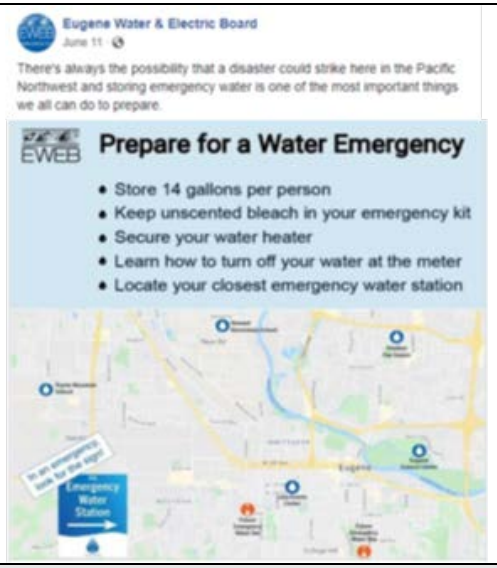
Collateral – prepare a PowerPoint slide deck, talking points, and digital/print assets that can be used by staff, shared in various forums and incorporated into communications and events.

Events/Sponsorship – Attend and participate in community events that focus on wildfire safety. Perhaps become a sponsor or partial sponsor of such an event.

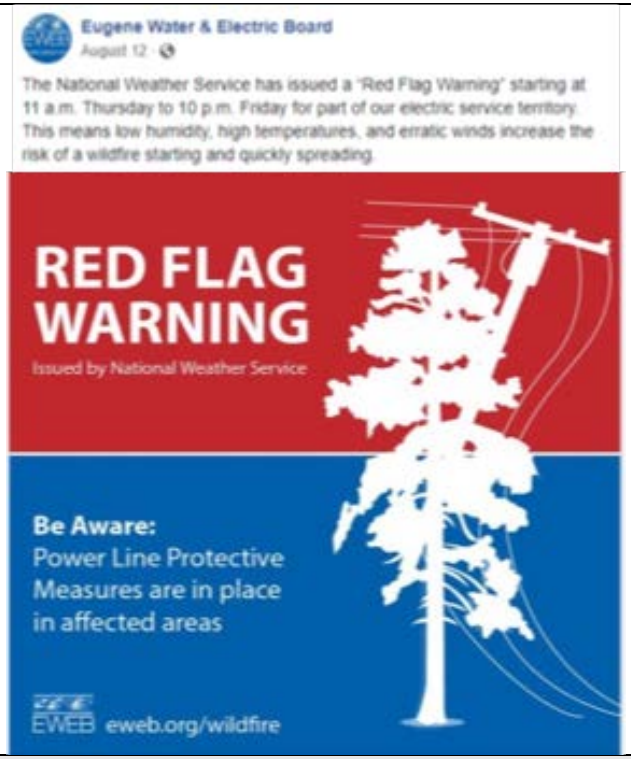
Timing	
May - July	Start educating customers about the steps EWEB takes to prevent our equipment from sparking a fire. This will help socialize the messages and strategies listed above.
August - October	Continue community education about wildfire mitigation and begin more frequent messaging that wildfire season is here. Build awareness that this is the time of year where EWEB is most likely have to de-energize lines for safety reasons.
October - November	Re-emphasize EWEB wildfire mitigation efforts customers, commissioners and staff.
Identified Risks & Mitigation Efforts	
Risk	Mitigation Effort
Impacts to PSPS-impacted customers	Proactively promote wildfire mitigation efforts so customers understand why EWEB implements a PSPS.
Criticism re: PSPS implemented, customers impacted by voluntary outage.	• Emphasize re: Customer and staff safety is our No. 1 priority. • The relative inconvenience of a PSPS is a fair price to pay to avoid a wildfire that could result in the loss of life and property.
EWEB's reputation if customers or the community see us as responsible for starting a fire.	• Create and implement a formal Wildfire Mitigation Action Plan. • Implement the Wildfire Mitigation Communications Plan.
Concerns re: potential for future wildfires in forested areas of EWEB's service territory.	• Acknowledge that climate crisis has increased dangers to EWEB's service area--including wildfire, algal blooms and drought--stemming from hotter, dryer summers. • Emphasize that degraded watersheds become more and more vulnerable to megafires, making McKenzie watershed restoration an urgent form of climate change remediation.

2021Wildfire Social Media Metrics

Appendix E

<table>
<tr>
<td> 
</td>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>Facebook reach: 955
Engagements: 33
Instagram reach: N/A</td>
<td>Facebook reach: 936
Engagements: 23
Instagram reach: N/A</td>
<td>Facebook reach: 1236
Engagements: 33
Instagram reach: 431</td>
</tr>
<tr>
<td> 
</td>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>Facebook reach: 2101
Engagements: 142
Instagram reach: N/A</td>
<td>Facebook reach: 634
Engagements: 6
Instagram reach: N/A</td>
<td>Facebook reach: 864
Engagements: 9
Instagram reach: N/A</td>
</tr>
</table>

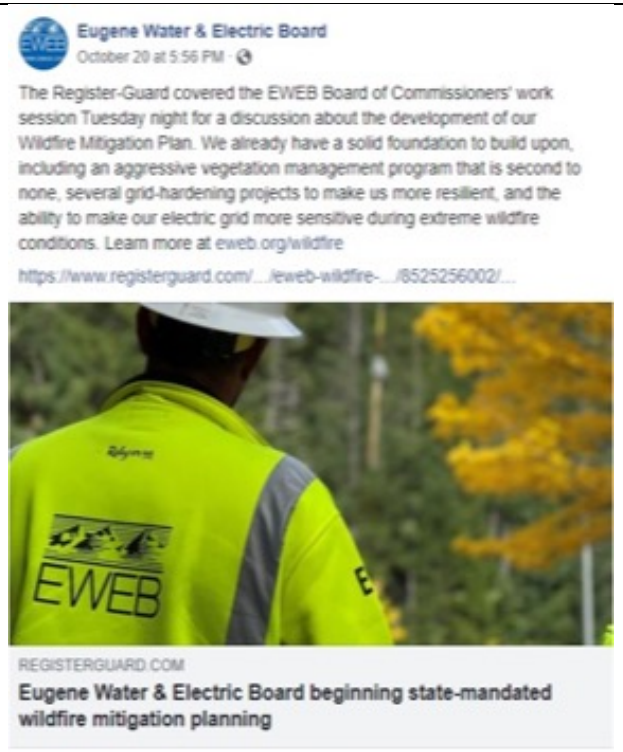
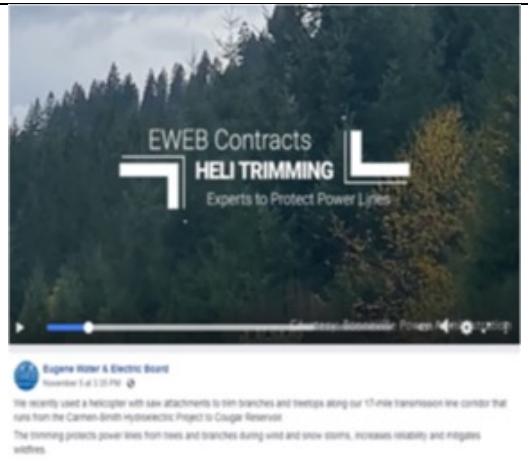
		
Facebook reach: 807 Engagements: 18 Instagram reach: N/A	Facebook reach: 1897 Engagements: 195 Instagram reach: 153	Facebook reach: 1388 Engagements: 84 Instagram reach: N/A

		
Facebook reach: 1514 Engagements: 51 Instagram reach: 121	Facebook reach: 1358 Engagements: 43 Instagram reach: 171	Facebook reach: 8539 Engagements: 953 Instagram reach: 240

Eugene Water & Electric Board August 28 The National Weather Service has issued a "Red Flag Warning" starting at 1 p.m. Saturday to 8 p.m. this evening for all of our service territory. The warning includes Lane and Linn counties. This means low relative humidity and erratic, gusting winds increase the risk of a wildfire starting and quickly spreading.  	Eugene Water & Electric Board August 31 When the National Weather Service issued a Red Flag Warning for our area this past Saturday, we changed the protective settings on electric equipment in the McKenzie Valley and in the south Eugene hills to reduce wildfire risk. While the red flag warning is now over, preparedness is a year-round effort. As part of your personal emergency preparation plans, you should "Know Your Zone" and where to go if a crisis that requires evacuation occurs. Eugene Springfield Fire has put together an interactive map so you can type in your address and learn your zone number. #WildfireAware #Oregon #WildfirePrevention #ItOnlyTakesaSpark https://eugene-pwe.maps.arcgis.com/.../webappviewer.../index.html... More info: eweb.org/wildfire  	Eugene Water & Electric Board September 3 These cooler temperatures at night are great! But, keep in mind we are still seeing elevated fire danger across the state. Do your part as we head into the Labor Day weekend to avoid sparking a wildfire. Follow all burn bans and restrictions put in place.   Oregon Office of State Fire Marshal August 27 This weekend is calling for warmer temperatures. Across the state of Oregon, the landscape remains very dry. Please take the necessary precautions we've been talking about all summer to avoid sparking a fire. #WildfireAware #Oregon #WildfirePrevention #ItOnlyTakesASpark
Facebook reach: 18,676 Engagements: 2142 Instagram reach: N/A	Facebook reach: 950 Engagements: 29 Instagram reach: N/A	Facebook reach: 1090 Engagements: 10 Instagram reach: N/A

		
Facebook reach: 704 Engagements: 4 Instagram reach: N/A	Facebook reach: 366 Engagements: 4 Instagram reach: N/A	Facebook reach: 544 Engagements: 2 Instagram reach: N/A

		
Facebook reach: 690 Engagements: 4 Instagram reach: 111	Facebook reach: 1604 Engagements: 80 Instagram reach: N/A	Facebook reach: 721 Engagements: 6 Instagram reach: N/A

		
Facebook reach: 786 Engagements: 23 Instagram reach: 111	Facebook reach: 722 Engagements: 9 Instagram reach: N/A	Facebook reach: 645 Engagements: 5 Instagram reach: N/A

Glossary

Term	Definition
Asset (utility)	Electric lines, equipment, or supporting hardware.
Circuit (distribution)	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.
Circuit (transmission)	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.
Conductor	The wire that transmits power in either a Transmission or Distribution circuit.
Critical facilities and infrastructure	Those facilities and infrastructure that provide essential public services and/or that require additional assistance and advance planning for community safety, including: • Fire/Police/Emergency Services • Hospitals/Critical Care Facilities • Energy Systems • Water and Wastewater Systems • Communications • Transportation
Fault	An abnormal condition on an electrical circuit that interrupts the flow of electrical current.
Feeder	See distribution circuit.
Fire behavior modeling	A software program which simulates wildfire spread in an area based on defined variables.
Grid hardening	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.
High Fire Risk Zone	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.
Ignition Event	A utility equipment arc or spark that becomes a self-sustaining fire.
Impact/consequence of ignitions	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.
Match drop simulation	Wildfire modeling tool that takes a selected ignition location and simulates propagation and consequence/impact based on different variables like vegetation type.

Protective settings mode	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.
Public Safety Power Shutoff	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.
Recloser	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.
Red Flag Warning (RFW)	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.
Span	The space between adjacent supporting poles or structures on a circuit consisting of electric lines and equipment. "Span level" refers to asset-scale granularity.
Vegetation management	Trimming and clearance of trees, branches, and other vegetation that poses the risk of contact with electric equipment.
Wildfire risk	The potential for the occurrence of a wildfire event typically expressed in terms of ignition probability and wildfire impact/consequence.
Wildland Urban Interface (WUI)	An area or zone where natural, forested areas and development meet.