2024 WILDFIRE MITIGATION PLAN

DATE: OCTOBER 8, 2024
PROJECT: CW21-001
REVISION: V2

BROWN & KYSAR, INC.

THIS PAGE INTENTIONALLY LEFT BLANK

1 Executive Summary

Unusually large wildfires are on the rise in the Pacific Northwest, with an increase in fires in west-side conifer forests including a 170-day event in the Queets Rainforest on the Olympic Peninsula[1]. In the western U.S. region encompassing the Pacific Northwest, the annual probability of very large fires is projected to increase by a factor of 4 in 2041-2070 compared to 1971-2000[2]. As a result of this increased wildfire risk, Washington State legislation was enacted requiring utilities to put practices in place aimed at reducing the risk of wildland fire, damage, and losses resulting from those fires through the development of Wildfire Mitigation Plans (HB-1032). By April 1, 2024, the department will make public a recommended format and list of elements for electric utility Wildfire Mitigation Plans (WMP). The legislation in general will direct utilities to develop operational policies and practices to mitigate, prepare for and respond to wildfires using accepted best practices.

Cowlitz Public Utility District (CPUD) believes the proactive development of a thorough WMP prior to the approaching mandate is a prudent and responsible effort to prepare for increased wildfire occurrence in Cowlitz County. For CPUD, which aims to protect public safety and preserve the reliable delivery of electricity, wildfire mitigation is a top priority. While an electric utility can never fully eliminate the risk of fire, CPUD is committed to taking practical actions to reduce the devastation that a wildfire could bring to the people and communities we serve. This Wildfire Mitigation Plan lays out the steps we are taking to do so.

1 https://outdoor-society.com/as-seen-from-space-the-2015-paradise-fire-in-olympic-national-park/
2 Northwest Climate Adaptation Science Center

WILDFIRE MITIGATION PLAN DISCLAIMER

The information provided in this report was developed by Cowlitz County PUD No. 1 (CPUD) staff and is intended for CPUD's internal planning purposes only. CPUD does not warrant the accuracy, reliability, or timeliness of any information in this report, and assumes no liability for any errors, omissions, or inaccuracies in the information provided. CPUD shall not be held liable for losses caused by using this information. Portions of the data may not reflect current conditions. Any person or entity who relies on any information obtained from this report, does so at their own risk. This report is presented solely for internal use AS-IS by CPUD staff. CPUD make no representations or guarantees expressed or implied regarding the accuracy or completeness of the report.

Table of Contents

Table 1. Plan Review and Revision Record

Date	Version	Author	Revision Description
11/23/21	V1	BKI	Original document adopted in 2021
	V2	BKI	Report and maps updated in 2024. Format modified to new DNR template.

Table of Tables

Table of Figures

THIS PAGE INTENTIONALLY LEFT BLANK

2 Wildfire Mitigation Plan Overview

2.1 Purpose of the Wildfire Mitigation Plan

Reducing the risk of utility-caused wildfire plays an essential role in CPUD's operational practices. Its existing policies, programs, and procedures are intended to directly or indirectly manage or reduce the risk of its utility infrastructure becoming the origin of a catastrophic wildfire.

Going forward, CPUD will implement additional programs to adapt to evolving fire-related conditions, incorporate emerging technological advances, and improve operational practices to mitigate the potential for ignitions and more effectively respond to increasing wildfire risk conditions.

The CPUD Wildfire Mitigation Plan (WMP or Plan) takes an active approach to reduce fire-related risks for its customers while allowing for retooling and improvement over time. The Plan describes CPUD's ongoing vegetation management (VM), asset inspection and maintenance, de-energization, communication plans, and restoration of service processes. Additionally, the WMP outlines roles and responsibilities for its implementation, performance metrics, deficiency identification, and the audit process.

2.2 Description of Where the WMP Can Be Found Online

The CPUD's WMP can be found on the utility's website under the "Outages and Safety" tab on the site's navigation ribbon, or by entering "Wildfire" into the web page search window. The specific web address is https://www.cowlitzpud.org/wp-content/uploads/Wildfire-Mitigation-Plan.pdf

2.3 Best Practices Cross-reference Table

Table 2. Best Practices Cross Reference Table

Standard or Best Practice Name and Description	Document, page number, or citation
HB 1032 - By October 31, 2024, and every three years thereafter, each Investor-owner and Consumer-owned Utility must review, if appropriate revise, and adopt its wildfire mitigation plan	

3 Utility Overview

Table 3. Context Setting Information

General Utility Information	Cowlitz County Public Utility District
Service Territory Size (sq miles)	1,166
Service Territory Make-up [ ]% Urban [ ]% Agriculture [ ]% Barren/Other [ ]% Conifer Forest [ ]% Conifer Woodland [ ]% Desert	[ ]% Hardwood Forest [ ]% Hardwood Woodland [ ]% Herbaceous [ ]% Shrub [ ]% Water [X] NA / Not tracked
Service Territory Wildland Urban Interface 0% High Density Intermix 0.17% High Density Interface 0.94% Med Density Intermix 1.46% Med Density Interface	13.61% Low Density Intermix 1.54% Low Density Interface 33.77% Very Low Density Vegetated 48.51% Uninhabited Vegetated
Consumers Served	53,500
Account Demographic *[provide as % of total customers served]*	[ ]% Residential [ ]% Agricultural [ ]% Commercial/Industrial [X] NA / Not tracked
Utility Equipment Make-up (circuit miles) *Calculated using GIS data*	Overhead Distribution:609 Overhead Transmission: 124 Underground Distribution:1,321 Underground Transmission:0 Substations: 35
Have customers have ever been notified of a potential loss of service due to a forecasted utility de-energization event?	Yes: [ ] No: [X]
Has the utility developed protocols to pre-emptively shut off electricity in response to elevated wildfire risks?	Yes: [X] No: [ ]
Has the utility previously implemented a PSPS in response to elevated wildfire risk?	Yes: [ ] No: [X]

3.1 Utility Description and Context Setting

CPUD is one of 27 not-for-profit, community-owned electric utilities in Washington State. Founded in 1936, CPUD serves approximately 53,500 residential, commercial, industrial, and street lighting customers. Power is provided to CPUD customers by way of bulk substations, overhead transmission lines, and overhead and underground distribution line assets. The District also owns a hydroelectric power generation facility located within the county. The utility has its headquarters office, operations center, and equipment storage facility in Longview, WA.

CPUD strives to uphold a commitment to service excellence while delivering safe, affordable, and reliable electricity to its customers. These principal focuses are further enhanced with innovative energy solutions and a deep-rooted involvement in the communities it serves.

As a Public Utility District, CPUD is governed by a three-member popularly elected Board of Commissioners that determines policy and appoints the GM who is responsible for CPUD's overall management and operations. CPUD owns and operates its transmission and distribution system which are critical to maintaining electric service to its customers.

While CPUD's Commissioners review and approve the Plan as needed, its implementation primarily resides with the Director of Operations, and it is the General Manager (GM) who is ultimately responsible.

3.2 The Service Area

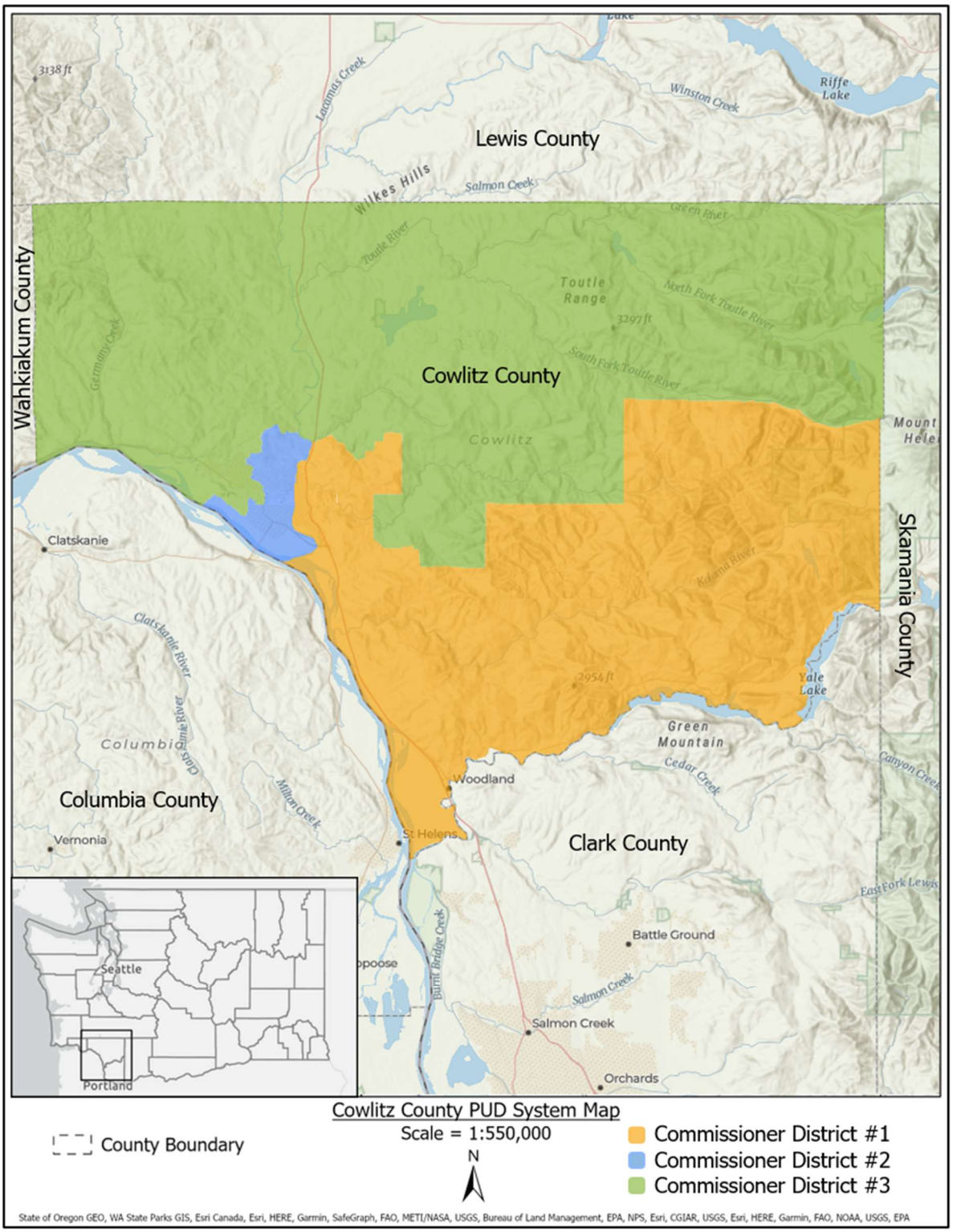
Operating out of offices located in Longview, WA, the District serves the cities of Castle Rock, Kalama, Kelso, Longview, and Woodland, as well as 31 unincorporated communities throughout Cowlitz County (Figure 1).

The 1,166-square mile service area is located along the Columbia River and is bordered by Wahkiakum, Lewis, Skamania, Clark, and Columbia Counties. The service area is divided into three districts, each being represented at the PUD by an elected commissioner.

The Cowlitz County area has a Northern Pacific coastal climate and a summer fire season running generally from mid-June to mid-September with average daily high temperatures above 73°F. The hottest and driest day of the year is August 3rd with an average high temperature of 80°F[3]. The windier part of the year lasts for 4.6 months, from October 29 to March 17, with average wind speeds of more than 4.3 miles per hour. The windiest day of the year is December 3, with an average hourly wind speed of 5.0 miles per hour.

[3] Southwest Washington Regional Airport Data 1980-2016

Figure 1. CPUD Service Area



3.3 The Electric System

CPUD owns and operates an electric system that includes generation, transmission and distribution facilities and provides power to customers throughout Cowlitz County.

The local power network is a part of a larger electrical grid serving the Southwest Washington and greater Pacific Northwest region. CPUD buys over 90% of its wholesale power from the Bonneville Power Administration (BPA), of which approximately 83% comes from large hydroelectric generation facilities along the Columbia River. The balance of CPUD's power comes from its own Swift No. 2 Hydroelectric Project on the Lewis River, located in southeast Cowlitz County near Cougar, Washington.

The overhead transmission and distribution (OH T&D) system is comprised primarily of wood pole structures with bare wire conductors, although several areas have been converted to tree wire (insulated conductor) for reliability and fire mitigation benefits. Approximately one-third of the distribution system is made up of OH assets.

CPUD has done extensive work replacing direct-buried, bare concentric UG conductors throughout the system with conductor housed within conduit. All new residential connections are underground installations.

Other electric power providers own and maintain major transmission facilities in Cowlitz County. Major BPA transmission corridors with 115kV, 230kV, and 500kV lines carry power into and through the service area.

4 Objectives of the Wildfire Mitigation Plan

The main objectives of this WMP are to:

1. Implement an actionable plan to increase reliability and safety while reducing the likelihood of CPUD assets becoming the origin or contributing factor for wildfire.
2. Maintain a plan that prioritizes safety, situational awareness, mitigation methods, and recovery.
3. Develop a plan that aligns with utility best practice competencies and risk mitigation activities.
4. Continue to assess and incorporate new industry best practices, technologies, and risk mitigation activities.

4.1 Minimizing Sources of Ignition

The proposed wildfire mitigation strategies can be categorized into five main mechanisms that align with the PUD's best practices. Together, the five components create a comprehensive wildfire preparedness and response plan with a principal focus on stringent construction standards, fire reduction through system design, proactive operations and maintenance programs, and specialized operating procedures and staff training.

- **Design & Construction:** CPUD's design and construction consist of system, equipment, infrastructure design, and technical upgrades. These practices aim to improve system hardening to reduce contact between infrastructure and burnable fuel sources to minimize the risk of CPUD's systems becoming a source of ignition.
- **Inspection & Maintenance:** CPUD's inspection and maintenance strategies consist of diagnostic activities as well as various methods of maintaining and ensuring all equipment and infrastructure is in functional working condition.
- **Operational Practices:** Comprised of proactive day-to-day actions taken to mitigate wildfire risks and to ensure preparedness in high-risk situations, such as dry and windy climatological conditions.
- **Situational & Conditional Awareness:** This component consists of methods to improve system visualization and awareness of environmental conditions. The practices in this category aim to provide tools to improve the other components of the Plan.
- **Response & Recovery:** These strategies consist of CPUD's procedures and protocols for response to wildfire, the process for restoring power after a major outage, and the methods for efficient communications with emergency responders.

4.2 Mitigation Strategies and Programs

This WMP integrates and interfaces with CPUD's existing operations plans, asset management, and engineering principles, which are themselves subject to change. Future iterations of the WMP will reflect any changes to these strategies and will incorporate best management practices as they are developed and adopted.

Table 4 summarizes CPUD's five mitigation components with associated programs and activities that support CPUD's ongoing commitment to wildfire reduction and mitigation.

Table 4. Mitigation Programs and Activities

DESIGN AND CONSTRUCTION
Underground distribution lines
Tree wire (overhead covered conductor)
Advanced electronic relaying and reclosers
Covered jumpers and animal guards
Avian protection program and construction standards
Non-expulsion fuses in select areas (pilot program 2022)
INSPECTION AND MAINTENANCE
Infrared inspections of electrical equipment
Transmission line ground patrols
Wood pole testing and treatment
Vegetation right-of-way inspection and maintenance
Distribution and transmission system line patrols and inspections
UAV-assisted inspection program (Pilot program 2022)
Additional line patrols during fire season
Hazard identification and mapping
Mid-cycle vegetation trimming (cycle busters)
LiDAR inspection of distribution system and vegetation (pilot program 2024)
Aerial-saw tree trimming (pilot program 2021)

OPERATIONAL PRACTICES
Alternate reclosing or relay setting practices during observed or forecasted fire weather
Supervisory Control and Data Acquisition (SCADA)
24/7 Manned Dispatch Center
Work procedures for persons working in locations with elevated fire risk conditions
Fire suppression equipment on worksite during fire season
Geographical Information System Mapping
Community outreach/wildfire safety awareness
Special work procedures for high Industrial Fire Precaution Levels
SITUATIONAL AWARENESS
CPUD-owned weather stations at substations (pilot program 2023)
Monitoring active fires in the Pacific Northwest
Service area weather conditions monitoring
RESPONSE AND RECOVERY
Pre-emptive de-energization protocols
Provide liaison to county offices of emergency services during fire event
Coordination with local Department of Emergency Management
Line patrols prior to re-energization
Crisis Communication Plan

4.3 Resiliency of the Electric Grid

While the majority of the system is underground construction, approximately 30% of the utility's assets are overhead, well-maintained wood pole construction; much of this is located across heavily treed landscape which is of course susceptible to wildfire. Historically, CPUD has not been impacted by naturally-occurring wildfire. The poles are not generally vulnerable to grass and range fires as there is no dryland farms and pastures in the service area.

The electric grid is relatively small, with the operations center centrally located. With no vast distances for utility crews to travel, CPUD are able to quickly complete outage recovery work. Post fire restoration and recovery time frames would be dependent on the magnitude of the wildfire and the response agency's ability to contain and extinguish any fires. The forested areas, without active forest management, tend to grow thick with heavy underbrush making navigation difficult, however, most of the T&D lines are along road ROWs.

Most of the local distribution grid is a radial, rather than looped system with no micro-grids, therefore segments at that experience wildfire-related outages at circuit extremities would remain de-energized until the feeders can be repaired.

5 Roles and Responsibilities

5.1 Utility Roles and Responsibilities

The Board of Commissioners make policy decisions for CPUD – they will be responsible for approving the Wildfire Mitigation Plan.

- All communications are reviewed by the General Manager before distribution, and by any other staff members contributing information to the communication.
- The Director of Operations is responsible for monitoring and auditing the targets specified in the WMP to confirm that the objectives of the WMP are met, as well as the implementation of the plan in general. Staff will be directed as to their roles and responsibilities.
- The Director of Operations and Safety Manager or Superintendent determine when and how to notify outside agencies in cases of wildfire emergency events.
- The Engineering Key Account Manager or Operations Superintendent communicates with key accounts.
- The Communications and Public Relations Manager responds to the news media and general membership.
- The Safety Manager or Superintendent communicates with public agencies, first responders, health agencies, and communication providers.
- The GM directs management staff responsible for operations, customer service, information technology, and finance.
- The Operations Superintendent is responsible for oversight of the contracted VM operations.
- The Operations Superintendent is responsible for implementing the WMP and related system improvement efforts.
- The Engineering Business Unit is responsible for oversight of the electric system's design.
- The Risk Manager is responsible for coordination and communication with the District's various insurance companies.

5.2 Coordination with Local Utility and Infrastructure Providers

Depending on the severity of emergency, coordination with other local utility and infrastructure providers will generally be coordinated through Cowlitz Department of Emergency Management (DEM). In minor cases, the coordination can be done through CPUD's dispatch center directly with the affected utility or provider. CPUD's dispatch center has all relevant contact information for each separate utility or provider.

5.3 Coordination with Local Tribal Entities

There are currently no local tribes located in the District's service territory. The Cowlitz Tribe is located just to the South of Cowlitz County in Clark County and are wholly served by Clark County PUD.

5.4 Emergency Management/ Incident Response Organization

CPUD understands the importance of proactive planning and coordinating closely with local governments, agencies, and key accounts including critical infrastructure, emergency first responders, utility districts, confederated tribes, customers, and business groups.

In response to active emergencies, CPUD coordinates and collaborates with the DEM and relevant state agencies as a peer partner. During such emergencies, CPUD may provide a utility representative to the county and/or city DEM to ensure effective communication and coordination.

CPUD's primary coordination point is Cowlitz County DEM. CPUD's Operations Safety Manager or Superintendent contacts the local DEM and establishes themselves as the duty officer for coordination. The Safety Superintendent acts as the communications officer during an emergency and is responsible for responding to public agencies, first responders, health agencies, and communications providers.

6 Wildfire Risks

CPUD staff evaluated its own, as well as other utilities' fire causes in the region and applied its own field experience to determine the key potential risk drivers.

6.1 Risk Drivers Associated with Design, Construction, Operation, and Maintenance

Two risk factors associated with design, construction, operations, and maintenance were identified during the risk analysis process.

6.1.1 Foreign Contact

As is the case for most electrical utilities, overhead powerlines have traditionally been installed using bare wire conductor on insulated structures. The benefits of this type of conductor are that it is much lighter and easier to work with, as well as a much more cost-effective method of delivering energy compared to insulated/covered wire. The downside to bare wire is its susceptibility to contact from foreign objects such as wildlife, vegetation and third-party equipment. Protection equipment is utilized to isolate faults, but there are time delays associated with circuit breakers, reclosers and fuses. These time delays are not fast enough, in many cases, to prevent all sparks prior to tripping. Ejected molten metal, sparks or burnt foreign objects can potentially ignite any fuels in the vicinity of the fault.

6.1.2 Equipment Failure

There are a many reasons equipment can fail during its service life. Most equipment requires regular maintenance for optimal performance. Even though CPUD's qualified personnel perform regularly scheduled inspection and maintenance on system equipment, internal defects that are not visible or predictable can be the cause of destructive equipment failure resulting in ejection of sparks and/or molten metal. The failure of components such as hot line clamps, connectors and insulators can result in wire failure and wire to ground contact. Transformers and capacitor banks can have internal shorts potentially resulting in the ejection of materials which could be a fire source.

6.2 Risk Drivers Associated with Topographic and Climatological Factors

Three interrelated risk factors associated with environment and topography were identified for having the potential for causing powerline sparks and ignitions. Fire weather is mitigated through enhanced situational awareness and response procedures. Vegetation type and tree failure risks are mitigated through year-round trimming on a three-year cycle along with tree-related information for customers on the PUD website.

- Fire Weather
- Vegetation Type
- Tree Failure

6.3 Enterprise-wide Safety Risks

The Enterprise Risk Management process is not a periodic "Risk Assessment" but an ongoing and forward-looking management discipline enabling CPUD to analyze risks continually and adapt to changing conditions. The key or critical risks affect the entire community and are interrelated. Therefore, they are managed holistically with a structured approach.

The Risk Assessment process began with the Director of Operations, key staff, and stakeholders working together to collect information on all potential and perceived risks. Relevant local plans were reviewed for additional data. Also analyzed were the risks, risk drivers, key impacts, mitigation steps, controls, and CPUD policies and procedures.

6.4 Wildfire History and Outlook

Generally, fire season in Southwest Washington lasts from April through the end of October, but research indicates that this is changing. Fire seasons from 2003 through 2012 averaged more than 84 days longer than in 1973 to 1982[4] in the Western U.S. region. The largest fire years coincide with warm spring and summer temperatures, and early spring snowmelt. Annual large wildfire frequency in USFS, National Park Service, and Bureau of Indian Affairs (BIA) forests is significantly correlated with spring and summer temperature. Projected warmer and drier summers and declining snowpack and correlated decreases in summer soil moisture will increase the risk of wildfires, particularly in forested areas where fuels are abundant[5].

While most large fires in Southwest Washington have occurred east of the Cascades, the Big Hollow fire of 2020 burned ~25,000 acres and came within a few miles of CPUD's generation facilities at Swift Reservoir. Previous fires in Cowlitz County (1975-present) have been under 200 acres in size. Compared with the east side, western Washington currently sees a lower occurrence of large fires due to lower average peak temperatures, and higher precipitation. However, vegetative fuel levels in the area are very high and the potential for very large fires exists. In general, more frequent burning is associated with less intense or severe wildfires. Conversely, infrequent burning generally leads to higher severity fires that consume much of the aboveground live and dead vegetation—the principal fuels in a wildfire[6].

[4] Westerling, A.L. 2016 Increasing Western US Forest Wildfire Activity; https://royalsocietypublishing.org/doi/10.1098/rstb.2015.0178
[5] RMJOC 2018; Gergel et al 2017
[6] The National Cohesive Wildland Fire Management Strategy

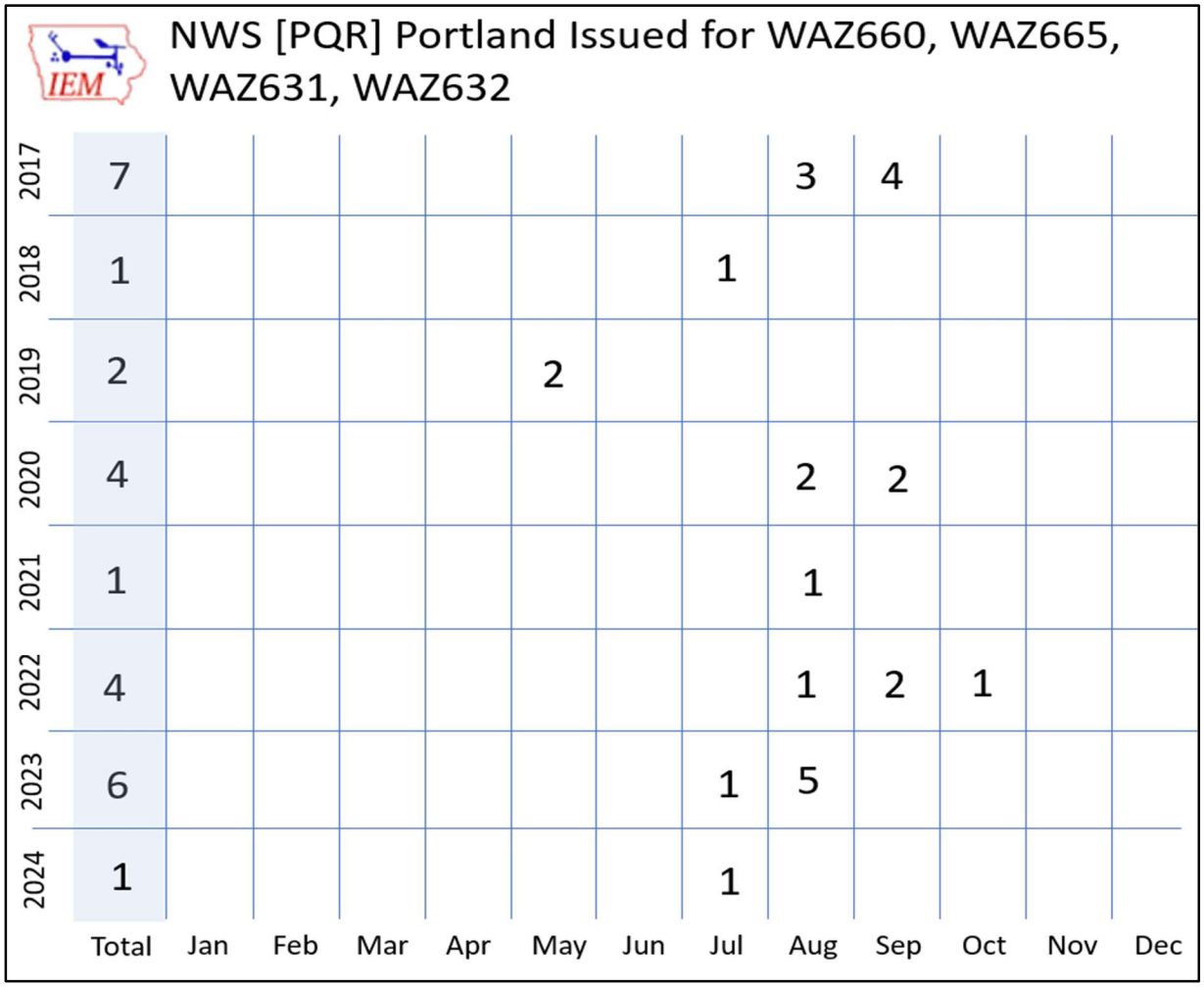
6.4.1 Fire Weather

The service area can experience hot and dry weather during late summer and early fall. Drought, combined with warming temperatures, can result in decreased snowpack and streamflow, increased evaporative demand, dry soils, and tree deaths, which results in increased potential for wildfires. These conditions create increased potential for extreme wildfires that spread rapidly, burn with more severity, and are costly to suppress.

Figure 2 represent the historic occurrence of Red Flag Warnings (RFWs) issued by the Portland NWS office for the region between 2017 and August of 2024. Unlike drought, RFWs are regional alerts to short term weather conditions that are conducive to wildfire outbreak and spread.

In 2024, the NWS revised the Fire Weather Zones (FWZ) boundaries in Washington with some zones being divided into smaller areas to provide more granularity. The CPUD service area now falls within the new WAZ631, WAZ632 and WAZ634 FWZs. It should be noted that archived RFW data will continue to refer to the previous zone numbers.

Figure 2. Red Flag Warnings by Year/Month 2017-2024



6.4.2 Fire Threat Assessment Mapping

The Wildfire Hazard Potential (WHP) map (Figure 3) used in this plan is a raster geospatial dataset produced by the USDA Forest Service, Fire Modeling Institute (FMI). It is intended to inform evaluations of wildfire risk or prioritization of fuels management needs across large landscapes. The specific objective of the WHP map is to depict the relative potential for wildfire that would be difficult for suppression resources to contain.

The WHP-2023 dataset was built upon:

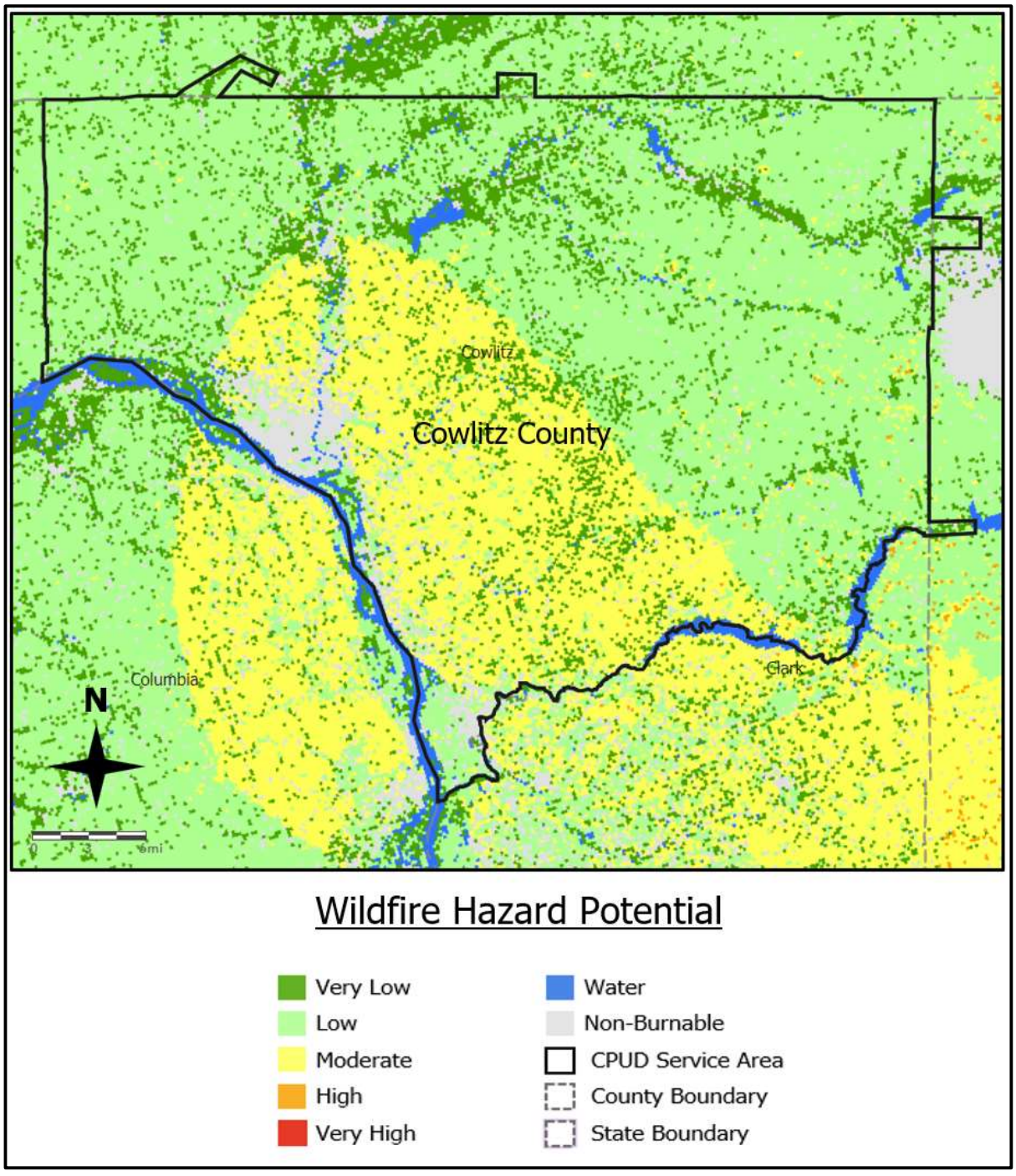
- Spatial vegetation and wildland fuels data from *LANDFIRE 2020* (version 1.4.0). The *LANDFIRE* Fire Behavior Fuel Models layer is a primary input to the FSim Burn Probability (BP) and Fire Intensity Level (FIL) datasets and forms the foundation for WHP.
- Spatial datasets of wildfire likelihood and intensity were generated for the conterminous U.S. with the *Large Fire Simulator* (FSim). FSim simulates the growth and behavior of hundreds of thousands of fire events for risk analysis across large land areas using geospatial data on historical fire occurrence, weather, terrain, and fuel conditions. Effects of large-fire suppression on fire duration and size are also simulated. This research aims to develop a practical method of quantifying geospatial wildfire impacts, including annual probabilities of burning and fireline intensity distributions at any point on the landscape.
- Point locations of past fire occurrence from 1992 through 2020

Areas mapped with higher WHP values represent fuels with a higher probability of experiencing torching, crowning, and other extreme fire behavior under conducive weather conditions. An essential aspect of the WHP method is the use of "resistance to control weights" at the end of the mapping process. This serves to reduce the WHP index in areas with light fuels, such as grass and shrubs. This helps to inform where forest fuel reduction treatments might be most needed.

On its own, WHP is not an explicit map of wildfire threat or risk, but when paired with spatial data depicting highly valued resources and assets such as communities, structures, or powerlines, it can approximate relative wildfire risk to those resources and assets. WHP is not a forecast or wildfire outlook for any particular season as it does not include any information on current or forecasted weather or fuel moisture conditions.

The WHP map can be used to prioritize vegetation management activities, determining the location for focused recloser operational protocols, and future sectionalizing studies and associated remedial actions.

Figure 3. Cowlitz County Wildfire Hazard Potential



7 Wildfire Preventative Strategies

This chapter outlines CPUD's existing fire mitigation efforts and identifies new processes and new programs CPUD may employ moving forward. Some of these programs are multi-year and programmatic, while others are situational and based on environmental conditions such as Red Flag Warnings or other high fire risk conditions. CPUD's community outreach efforts are also discussed.

CPUD continues to explore new technologies and approaches to determine their ability to reduce the probability of an ignition and improve system reliability. It is currently initiating several pilot programs, such as Unmanned Aerial Vehicle (UAV) inspection methods, enhanced fire weather tracking, and the incorporation of LiDAR imaging technology into the asset inspection program. CPUD will also be performing a pilot project in 2025 for Early Fault Detection (EFD). CPUD updates its practices as new information emerges and then adopts improved strategies. Table 4 depicts the activities intended to address key wildfire risk factors.

7.1 Weather Monitoring

7.1.1 Current Strategy Overview

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

CPUD uses all situational awareness resources at its disposal to monitor evolving fire weather, fuel, and other climatological conditions that may lead to fire events. It evaluates information such as real-time field observations, GIS data, asset maintenance reports, ongoing wildfire reporting and other resources. Based on available information, CPUD appropriately schedules work crews, adjusts equipment settings, and prepares for imminent fire conditions as needed.

In 2023 CPUD began subscribing to the Daily Situational Awareness Tool (DSAT). This service provides daily extreme weather and fire danger data via an online mapping portal with 6-day ahead forecast of operating conditions. The online weather monitoring portal features real-time observations related to key wildfire factors (wind speed, wind direction, temperature, humidity, etc.) from a network of weathers stations at CPUD substations and throughout the service area.

7.1.2 CPUD-Owned Weather Stations

As part of its proactive approach to improve CPUD's situational awareness capabilities, CPUD installed (9) weather stations throughout its service territory, mostly in existing substations. These weather station observations would allow the Operations Department to analyze fire weather elements at critical locations in real-time. Since the service area is quite expansive, having the ability to collect precise weather information will allow the utility to focus its attention and resources on the areas showing the most immediate risk. Most weather stations measure the following parameters:

- Air temperature
- Relative humidity
- Wind speed
- Wind direction
- Precipitation
- Barometric pressure

Weather data of the above is trended internally on graphs over an approximately 3-day period to help make informed decisions on weather changes in each location.

7.1.3 Planned Updates

CPUD is planning a pilot project for 2025 to contract with a 3rd party weather forecast software vendor to overlay predicted and real-time weather conditions with CPUD's electrical infrastructure. The goal is to obtain a more granular, geolocated view of the current wildfire risk throughout Cowlitz County. This will increase CPUD's situational awareness during high fire conditions.

7.2 Design and Construction Standards

7.2.1 Current Strategy Overview

CPUD's design practices continue to advance with the addition of newer safety and reliability-related technologies. These designs stem from many decades of engineering experience and the adoption of emerging technologies.

7.2.1 Avian Protection Program

Birds tend to interact with overhead electrical assets by perching or nesting on utility poles or other electrical equipment such as substation transformers and switches. These contacts can lead to avian electrocutions and collisions, with the potential for outages and wildfire ignitions.

Since 2016, CPUD has implemented design and construction standards to protect raptor and migratory birds throughout the service area. These measures, outlined in its Avian Protection Plan (APP), have substantially reduced the electrocution risk to raptors and the number of injured wildlife. Concurrently, these measures have reduced the potential for fire ignitions while also improving compliance with the Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (BGEPA), and the Endangered Species Act (ESA).

In addition to taking steps to reduce mortality risk to avian species, the District has taken steps to enhance avian populations and habitat by developing nesting and perching platforms. One such site is equipped with a live Osprey-Cam which is viewable on the CPUD website.

7.2.2 Underground Conductor

Approximately two-thirds of CPUD's distribution system is underground. The undergrounding of overhead distribution lines provides several benefits for utility operations and functions as an effective tool in CPUD's wildfire mitigation strategy. Not only does it improve the aesthetics of the service area, but it also alleviates several negative aspects of bare wire overhead conductor.

Underground distribution lines typically eliminate:

- The need for VM work in the ROW
- Damage from ice loading
- Risk of vegetation contact which can result in ignitions
- Galloping conditions due to high wind
- Electrocution risk to birds and wildlife
- Risk of tree caused outages

CPUD has approximately 1,321 miles of 7.2kV UG distribution line on its network and will prioritize future UG projects in heavily forested and high fire-risk areas. While there are many benefits to undergrounding distribution lines, these facilities have less capacity, and do take longer and cost significantly more to construct, maintain, and repair. Most of the service taps are underground line.

7.2.3 Tree Wire

Tree wire, or covered overhead wire, consists of the conductor and the extruded covering (conductor shield, low-density inner layer, and protective outer layer). Tree wire allows closer spacing of the conductors, resists abrasion from foreign contact, withstands temporary contact from tree branches and other ground points, is UV stable, and is tracking and abrasion-resistant. CPUD has installed tree wire in several heavily treed areas to improve service reliability and to reduce the risk of ignitions due to vegetation contact.

While there are many benefits to tree wire, this type of wire does take more time to construct, maintain, and repair.

7.2.1 Non-expulsion Fuses

Typical utility industry practice has been to install expulsion fuses on transformers and tap-lines as a means of protecting and isolating parts of the system that have experienced a faulted condition. Expulsion fuses utilize a tin or silver-link element in an arc-tube that expel gas and potentially molten metal to the atmosphere as a means of extinguishing an arc created by a faulted condition. The molten metal, however, can be a source of ignition for fire. In contrast, non-expulsion current-limiting fuses are a non-venting fuse encapsulated within a tube to contain the arc and gases, which minimizes the potential for molten metals to be expelled. CPUD has installed non-expulsion fuses in various areas that were identified as higher risk in the previous version of this WMP. These installations were completed in 2023.

7.3 Fuel and Vegetation Management

7.3.1 Current Strategy Overview

Trees that grow within or adjacent to powerline ROWs are a common cause of outages and damage to facilities, as well as a potential cause for wildfire. CPUD maintains over 733 miles of overhead T&D ROW to minimize interruptions of services and to provide a safe and reliable supply of electricity to its customers. This includes not only the maintenance of hardware, conductors, and poles but trees and other vegetation that threatens to fall onto or grow into the electrical conductors. To this end, CPUD has developed a vegetation management (VM) schedule intended to minimize the hazards of vegetation on the system.

CPUD's VM program utilizes a mix of tools to accomplish the goal of reliability and public safety on its electrical system. Methods include a combination of mechanical pruning, aerial-saw trimming, mowing, and tree removal.

When work is well planned and completed, the overall impact on the desirable vegetation on the ROW will be reduced, and the neighboring landowners, the motoring public, and the wildlife that uses the ROW for nesting and foraging will benefit. With a prescriptive and balanced approach to VM, CPUD can focus more of its energy and resources on quality pruning of trees along the powerline ROW, replacement of undesirable urban trees under the lines, and good customer service, while improving reliability and safety, and controlling maintenance costs

7.3.2 VM Trimming Schedule

Through its regularly scheduled tree-trimming program, CPUD redirects tree growth away from power lines to help limit damage and wildfire risk that may occur due to the extreme weather. To accomplish this, CPUD contracts full-time tree trimming crews for year-round vegetation management work on a 3-year pruning cycle. Areas with fast-growing species are typically trimmed mid-cycle as needed to maintain safe vegetation clearance from the power lines and associated equipment.

CPUD line crews also address vegetation concerns in response to service calls or field observations by employees or customers. Proactive maintenance during routine operations and prompt action during emergency events maintain system reliability, a safe work environment, and reduces fire danger. Any urgent VM issues that cannot be immediately handled by the line crews are referred to the VM contractor for priority trimming.

7.3.3 Vegetation to Conductor Clearance

Interfering tree limbs and falling trees or branches are the No. 1 cause of power outages in Cowlitz County. Since conductors move horizontally and vertically based on dynamics such as operating temperature, wind, and loading, clearance is evaluated from all possible conductor positions. Effort will be made to reduce trees, tree parts, and growth points beneath the wires and any dead or dying trees which may contact the wires.

The goal at the time of trimming is to achieve 10 feet of clearance from the conductor on distribution lines and 20 feet from transmission lines. Lines are also cleared 20 feet above and 10 feet below.

CPUD realizes that it is not always possible to achieve these specifications due to existing vegetation, which is why the District works together with its customers to achieve as close to the ideal trim as possible.

7.3.4 Controlling Incompatible Vegetation

In addition to the regular patrols by CPUD field staff observing and reporting on incompatible uses and encroachments, CPUD makes efforts to educate public and private landowners about incompatible vegetation that can pose risks if planted under or near conductors. CPUD believes that the customer plays an important part in our ability to address problems that may pose a threat to our power supply system. Customer input, combined with regularly scheduled ROW maintenance, helps to ensure that our power system is as reliable as possible.

To this end, the CPUD website provides guidance on "Correct Tree / Correct Place", as well as answers to frequently asked tree-trimming questions. An online form to submit "Trouble Tickets" as well as phone numbers for reporting hazardous trees are also provided on the CPUD website. For property owners wishing to prune trees near service lines, CPUD will provide a courtesy disconnect so that this work can be done safely as outlined in CPUD's Customer Service Policies.

7.3.5 Planned Updates

CPUD is starting a pilot project in 2024 to have a contract forester on staff to provide a professional opinion on existing vegetation that may need additional care for trimming or removal. This program will continue through 2025, where it will be reviewed for effectiveness. By providing this additional look throughout the Districts infrastructure, a reduction in risk should be accomplished.

In the next three years, CPUD may investigate the use of herbicides in various locations to help control or slow the re-growth of vegetation. This could possibly reduce the risk of vegetation caused outages or fuel for fires near electrical infrastructure.

7.4 Asset Inspections and Response

7.4.1 Current Strategy Overview

Recognizing the hazards of equipment that operate high voltage lines, CPUD maintains formal time-based and risk-based inspection and maintenance programs for distribution, transmission, and substation equipment which plays an essential role in wildfire reduction. CPUD currently patrols its system regularly. The following sections outline the inspection practices for the utility.

7.4.2 Transmission and Distribution Line Inspections

Line Inspections consist of UAV footage, foot patrols, and all-terrain vehicle patrols to examine CPUD poles, crossarms, conductors, and equipment. Visual aids assist with evaluating and detecting potential damage to above-ground components. Inspectors look for visible signs of defects, structural damage, broken hardware, abnormally sagging lines, and wildlife contacts. Any anomalies found are addressed based on the severity of the defect. The Distribution Line Inspection also provides ground-level evaluation of right-of-ways (ROW)s, access roads, and vegetation-to-conductor clearances. The information accumulated informs planning and scheduling of future maintenance to avoid major faults and ignition potential.

CPUD considers and prioritizes maintenance work by assessing the most urgent needs. The inspectors will document the overhead systems' condition, recording defects, deterioration, safety concerns, or any other factors requiring attention on the inspection records. The inspections focus on any hazards that could affect the system's integrity or the safety of line workers and the public.

7.4.1 Wood Pole Inspection, Test and Treatment

To maintain the District's wood poles, a formal Wood Pole Assessment Plan has been in place for many years, with the goal to inspect approximately 10% of the system each year. Wood pole decay will progress at generally predictable rates, and can be readily diagnosed in the field, except for in the very early stages. Early detection and treatment is by far the most important and successful step in extending pole service life. Circuits are identified, mapped, and scheduled for inspection and testing using the latest industry standards and practices.

An outside contractor inspects and tests all wood poles on an 8-year cycle exceeding the interval recommended in RUS Bulletin 1730B-121. Inspections are intended to determine whether the poles have degraded below National Electric Safety Code (NESC) design strength requirements with safety factors.

7.4.2 Substation Inspections

The maintenance plan provides for regular inspections of CPUD substations. Qualified personnel will use prudent care while performing inspections following all required safety rules to protect themselves, other workers, the general public, and the reliability of the system. These inspections are typically conducted once every 3 months.

A substation inspection involves a thorough look at the system to confirm that there are no structural or mechanical deficiencies, hazards, or tree trimming requirements. Individual pieces of equipment and or structures receive careful visual examination and routine diagnostic tests as appropriate.

7.4.1 Unmanned Arial System LiDAR/Infrared Inspections

Due to the cross-county alignment of many of CPUD's T&D lines, Unmanned Aerial Vehicles (UAVs) are being integrated into the CPUD's asset inspection program to improve the speed and quality of the asset inspection program.

Unmanned aerial vehicle (UAV) technology has advanced considerably in recent years and has proven to be a useful mechanism for gathering information and supporting operations in our industry. The Cowlitz PUD UAS (Unmanned Ariel System) Program is designed to safely support and improve efficiency of a variety of inspection, reconnaissance or mapping operations within the district. Operations might include inspecting hard-to-access equipment, capturing images or video with a birds-eye perspective, or three-dimensional modeling of sites or assets.

In 2023 the District designated personnel from various departments who are trained and licensed to safely pilot our UAVs. Hardware and equipment such as drones and cameras or sensors are utilized for gathering remotely sensed information, while software aids in flight missions as well as processing data to produce 2D and 3D products.

Customers near planned operations will be notified via robocall of upcoming flights in the area, and planned flights throughout the district can be viewed on the PUD's website.

7.4.1 GIS Mapping

An electrical utility uses a network of physical facilities to provide electric power and energy to customers connected to those facilities throughout a geographical area. Each component of the distribution system (i.e., asset) and each meter have an approximate physical location and associated data. To plan, construct, maintain, and operate the distribution network it is beneficial to create, manage and utilize this geospatial data. To streamline the inspection and maintenance process, CPUD has integrated handheld computer tablets and GIS mapping applications into its operations.

The tablet interface allows field workers to capture and return field data that integrates into GIS mapping software. Inspectors, linemen, or VM crews can document equipment-condition or vegetation-clearance issues using the handheld mobile devices.

7.4.1 Industrial Fire Precaution Levels

When conditions of fire hazard exist each summer, Washington Department of Natural Resources, United States Forest Service, or the Bureau of Land Management declare fire season to be in effect. Title 36 of CFR 261.50(a) gives each Forest Supervisor the authority to issue orders which close or restrict use of the area over which he/she has jurisdiction. As conditions warrant, the forester will issue an Industrial Fire Precaution Level[7] (IFPL) at one of four levels. The declaration of fire season affects utility and other commercial operations and as well as recreational activities by the public. Fire season remains in effect until terminated by each

[7] https://fortress.wa.gov/dnr/protection/ifpl/

Agency or by reducing the IFPL until conditions for fire hazard no longer exist. While CPUD does not operate within state or federally protected lands, there are portions of the distribution system that are adjacent to public lands. To maintain safety during maintenance and VM work, the Operations Department monitor IFPL levels daily (during fire season) and direct staff and VM crews to take the necessary precautions and deploy available fire suppression equipment to job sites.

7.4.2 Planned Updates

CPUD will be performing a pilot project in 2025 on new Early Fault Detection (EFD) technology on a limited scale. If the project is proven successful, there are plans to expand implementation in other areas of the county to reduce the risk of utility-related ignitions by sensing equipment issues prior to it failing. Implementation of this technology in additional areas will take place over the next few years after successful product testing.

7.5 Workforce Training

CPUD has developed rules and complementary training programs for its workforce to reduce the likelihood of an ignition. Field staff will be:

- Trained on the applicable content of the WMP
- Trained in proper use and storage of fire extinguishers and fire suppression equipment
- Required to conduct tailgate meetings to discuss the potential(s) for ignition, environmental conditions (current and forecasted weather that coincides with the duration of work for the day)
- Required to identify the closest fire extinguisher and other fire abatement tools
- Required to report all ignition events to management for follow-up
- Encouraged to identify deficiencies in the WMP and bring such information to management

The OS or designee will conduct annual training of all District personnel involved in or having responsibilities associated with the VM program including the latest program objectives, applicable CPUD line limits, inspections and forms, trimming, reporting, record keeping and follow-up.

7.5.1 Planned Updates

7.6 Relay and Recloser Practices

7.6.1 Current Strategy Overview

When high fire risk conditions exist in the service area, such as during Red Flag Warnings or a Fire Weather Watch, CPUD disables automatic reclosing throughout the system as a reduction measure. To set protection equipment to non-reclose mode, the District utilizes its SCADA[8] system to make the adjustment remotely. This allows Operations to react to quickly changing

[8] SCADA=Supervisory control and data acquisition

weather conditions and to restore the settings when conditions are safe without deploying line crews.

CPUD will continue to use, analyze, and modify this practice as necessary and will fold this practice into its existing Outage Communication Plans to ensure they are considered. This practice increases the risk for power to be interrupted for longer than usual, but significantly decreases the risk of fire posed by auto reclosing, or manual testing.

7.6.2 Planned Updates

CPUD may embark on a pilot project in 2025 for High-Impedance-Fault detection (HIF) relay settings. It has been estimated that existing technology and relay timing settings may not be a suitable fire mitigation strategy due to their limitations in detecting these types of faults in a timely fashion.

7.7 De-energization / Public Safety Power Shutoff

7.7.1 Current Strategy Overview

A Public Safety Power Shutoff (PSPS) preemptively de-energizes power lines during high wind events combined with hot and dry weather conditions. When considering de-energization, CPUD examines the impacts on fire response, water supply, public safety, and emergency communications.

CPUD considers the external risks and potential consequences of de-energization while striving to meet its main priority of protecting the communities and customers we serve. They include:

- Potential loss of water supply to fight wildfires due to loss of production wells and pumping facilities.
- Negative impacts to emergency response and public safety due to disruptions to the internet and mobile phone service during periods of extended power outages.
- Loss of key community infrastructure and operational efficiency that occurs during power outages.
- Medical emergencies for members of the community requiring powered medical equipment or refrigerated medication. Additionally, the lack of air conditioning can negatively impact medically vulnerable populations.
- Negative impacts on medical facilities, fire, police, and schools.
- Traffic congestion resulting from the public evacuation in de-energized areas can lengthen response times for emergency responders.
- Negative economic impacts from local businesses forced to close during an outage.
- The inability to open garage doors or motorized gates during a wildfire event.

The risks and potential consequences of initiating a PSPS are significant and extremely complex. Based on the above considerations, CPUD reserves the option of implementing a PSPS when conditions dictate. While CPUD believes the risks of implementing a PSPS far outweigh the

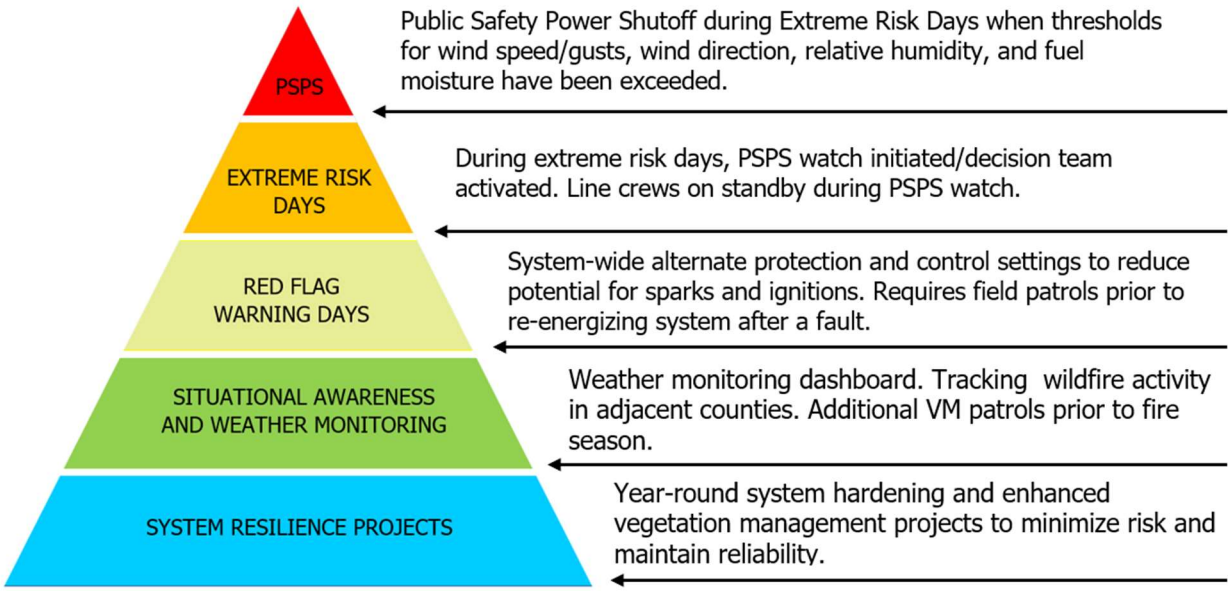
chances of its electric overhead distribution system igniting a catastrophic wildfire, the PSPS provides a last resort tool and another mitigation option.

On a case-by-case basis, CPUD has historically and will continue to consider de-energizing a portion of its system in response to a known public safety issue or response to a request from an emergency management/response agency. Any de-energizing of the lines is performed in coordination with key local partner agencies (mainly Cowlitz County DEM), but the final determination is made by the District.

7.7.1 Wildfire Readiness Framework

CPUD's enterprise-wide approach to wildfire readiness is comprised of the conditional levels depicted in figure 3 below. These readiness protocols are intended to harden the system overall, create situational awareness within and outside the service area, implement conservative protection and control settings during critical fire weather conditions, deploy additional resources when needed, activate the PSPS Decision Team, and finally, in a worst-case scenario, preemptive de-energization of portions of the system.

Figure 4. Wildfire Readiness Framework



7.7.2 Planned Updates

CPUD is planning a pilot project for 2025 to contract with a 3rd party weather forecast software vendor to overlay predicted and real-time weather conditions with CPUD's electrical infrastructure. The goal is to obtain a more granular, geolocated view of the current wildfire risk throughout Cowlitz County. This will increase CPUD's situational awareness during high fire conditions.

8 Community Outreach and Public Awareness

8.1 Current Community Outreach and Public Awareness Program

Fuel reduction projects and vegetation treatments have been identified as an effective means of mitigating wildfire hazards. Each year, wildland fires consume hundreds of homes in the Wildland-Urban Interface, but studies show that as many as 80% of the homes lost to wildland fire could have been saved if their owners had only followed a few simple fire-safe practices. Projects of this type include fuel breaks, thinning, pruning, landscape modifications, etc. Homeowners and local government bear much of the responsibility for improving the defensibility of homes in the WUI but may lack knowledge and information regarding what needs to be done and how to do it.

CPUD encourages its customers to take proactive measures to safeguard their homes from wildfire danger and to prepare for emergency events. To help create an awareness of fire safety, CPUD provides information on prevention and mitigation on its website, including the District's Wildfire Mitigation Plan.

At Cowlitzpud.org, CPUD provides information and guidance on:

- Defensible Space/Home Ignition Zone
- Outage preparation
- What to do during an outage
- Ready, Set, Go/Red Flag Warning
- Vegetation concerns reporting
- Tree trimming requests
- Right Tree/Right Place
- Vegetation management policy

8.1.1 Defensible Space

Fuel reduction projects and vegetation treatments have been identified as an effective means of mitigating wildfire hazards. Each year, wildland fires consume hundreds of homes in the Wildland-Urban Interface, but studies show that as many as 80% of the homes lost to wildland fire could have been saved if their owners had only followed a few simple fire-safe practices. Projects of this type include fuel breaks, thinning, pruning, landscape modifications, etc. Homeowners and local government bear much of the responsibility for improving the defensibility of homes in the WUI but may lack knowledge and information regarding what needs to be done and how to do it.

CPUD encourages its customers to take proactive measures to safeguard their homes from wildfire danger and to prepare for emergency events. To help create an awareness of fire safety, CPUD provides information on reduction and mitigation on its website.

8.2 Planned Updates

CPUD hosted its first PSPS town hall with customers in June 2024. Going forward, CPUD will take lessons learned from this and continue to provide a town hall to its customers each year prior to the start of wildfire season. Other local emergency and first responder agencies will be invited to participate in these yearly town halls.

9 Restoration of Service

If an outside emergency management/emergency response agency requests a power shutdown, or if CPUD elects to de-energize segments of its system due to extreme weather, CPUD staff will patrol the affected portions of the system before the system can be re-energized. Suspect equipment or distribution lines that cannot immediately be patrolled will remain de-energized until CPUD staff can do so. Poles and structures damaged in a wildfire must be assessed and rebuilt as needed prior to re-energization. Periodic customer and media updates of restoration status prior to full restoration will be made.

9.1 Service Restoration Process

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

- **Patrol:** Crews patrol every de-energized line to ensure no hazards have affected the system during the outage. If an outage is due to wildfire or other natural disasters, as soon as it is deemed safe by the appropriate officials, crews inspect lines and equipment for damage, foreign contacts and estimate equipment needed for repair and restoration. Lines located in remote and rugged terrain with limited access may require additional time for inspection.
- **Isolate:** Isolate the outage and restore power to areas not affected.
- **Repair:** After the initial assessment, CPUD staff meet to plan the needed work. Rebuilding commences as soon as the affected areas become safe. Repair plans prioritize substations and transmission facilities, then distribution circuits serving the most critical infrastructure needs. While the goal to re-energize all areas is as soon as possible, emergency services, medical facilities, and utilities receive first consideration when resources are limited. Additional crew and equipment are dispatched as necessary.
- **Restore:** Periodic customer and media updates of restoration status before full restoration are posted on CPUD's website. After repairs are made, power is restored to homes and businesses as quickly as possible. Customers, local news, and other agencies receive notification of restored electric service.

10 Evaluating the Plan

In addition to a robust mitigation strategy, CPUD has developed performance metrics to monitor its efforts over time. The goal of these metrics is to provide a data-driven evaluation of plan performance to help determine the effectiveness of various programs and to identify areas for improvement.

10.1 Metrics and Assumptions for Measuring Plan Performance

CPUD is developing performance metrics intended to gauge the effectiveness of CPUD's various programs and strategies for mitigating wildfire ignitions. Tracking of these metrics will help identify circuits most susceptible to unexpected outages, time-of-year risks, and the adequacy of the VM and asset inspection schedules. CPUD will reassess its operations and identify areas for improvement as more data becomes available and refine the WMP as needed. The selected metrics, as with other aspects of the Plan, will likely evolve in future iterations of the WMP.

10.2 Identifying and Addressing Areas of Continued Improvement

The Director of Operations is responsible for ensuring the WMP meets all the applicable State of Washington guidelines. Staff responsible for assigned mitigation areas must vet current procedures and recommend changes or enhancements to build upon the Plan's strategies. Due to unforeseen circumstances, regulatory changes, emerging technologies, or other rationales, deficiencies within the WMP may be identified and reported to the General Manager.

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

10.3 Monitoring the Performance of Inspections

CPUD's compliance with RCW, WAC[9], NERC, and NESC regulations and guidelines ensures that facilities are inspected and repaired in accordance with industry standards. Any issues found impacting safety and reliability are addressed as outlined in those regulations. In addition to the maintenance program, CPUD continuously evaluates its facilities while performing other activities such as outage patrols, new business planning, replacements, and related fieldwork.

Monitoring the effectiveness of inspection practices will occur through ongoing tracking and annual review of findings resulting from internal processes. Concerns found during routine

[9] WAC 296-45-045

fieldwork, equipment, and line inspections will be used as a method to assess the effectiveness of inspection procedures.

The review process is a joint effort by the Operations and Engineering Departments, where reviews of inspection records, identification of deficiencies, and corrective actions are determined. Related strategies to mitigate wildfire risk are identified and proposed within the Plan's next iteration. Aggregating this data guides future decision-making on the direction of the wildfire mitigation strategy with the intention that incidents will occur less frequently.

10.4 Transmission and Distribution System Inspection QC Process

The Director of Operations manages the T&D line and substation assets and develops comprehensive inspection and maintenance programs following industry best practices. These programs ensure the safe operation of the T&D line and substation facilities. The Director of Operations or designated managers regularly monitor inspection and corrective maintenance records and diagnostic test results to adjust maintenance plans and develop new programs.

Key imperatives are to:

- Reduce the risk of power-related wildfire.
- Meet federal and state regulatory requirements.
- Achieve reliability performance within mandated limits and optimize capital and O&M investments.

CPUD's Operations Department is responsible for performing the inspections and corrective maintenance. If deficiencies are found, work orders are created by the Operations Department or Engineering Department. The priority for corrective maintenance is to remove safety hazards immediately and repair minor deficiencies according to the type of defect and the severity of the risk level associated with the location of the asset. Work orders are monitored throughout the year to ensure timely completion.

10.4.1 Programmatic Metrics

CPUD outlines and schedules required work on an annual basis. Any incomplete work behind schedule is flagged for review or field verification. CPUD aims to complete the majority of the work within the initially scheduled time frame, however, emergencies or other unforeseen contingencies can occur, requiring material and labor resources to be otherwise assigned. When this happens, the delayed work receives prioritization for future time frames and is completed allowing for safe and reliable operation following industry safety standards.

10.5 Vegetation Management QC Process

Quality control efforts monitor program effectiveness, overall tree work performance, and determine the adequacy of the VM work schedule. The quality control results will go under review, and deficient work will be reissued to the contractor for corrective action.

It is a short-term goal of the PUD to utilize GIS mapping technology to track and monitor VM work as well as the quality assurance inspections, including the use of LiDAR both before and after trimming has been completed and also using input from the contract forester on staff.

10.6 Monitoring and Auditing of the WMP

The Director of Operations monitors the WMP's implementation and the specified objectives. The Director of Operations, or their designee, updates leadership with recommendations or proposed actions to enhance the Plan's objectives and strategies over time.

Table 5. Board Review Record

Version No.	Date of Board Approval	Date of Submittal to UWFPAC
V1	11/23/21	N/A
V2	10/08/24	10/17/24

Appendix A: Metrics

Metrics to be tracked to gauge the plan's effectiveness will be as follows:

External Risk Metrics:

- Red Flag Warning days will be tracked for each year and reported on annually.

Inspection Metrics:

- Overhead Pole Inspections
  - Number of poles inspected
  - Summary of inspection findings
- Groundline Pole Inspections
  - Number of poles inspected
  - Summary of inspection findings

Outage Metrics:

- The number of fires originating from utility infrastructure will be tracked each year and reported annually.

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix B: Definitions

Bonneville Power Administration: The Bonneville Power Administration (BPA) is an American federal agency based in the Pacific Northwest created in 1937 to market electric power from the Bonneville Dam and to construct transmission facilities. BPA is the marketing agent for power from all 31 of the federally owned hydroelectric projects in the Pacific Northwest. The BPA is one of four regional Federal power marketing agencies within the U.S. Department of Energy (DOE).

Circuit Breaker: An electrical switch designed to protect an electrical circuit from damage caused by overcurrent/overload or short circuit. The basic function is to interrupt current flow after protective relays detect a fault.

Commission: Publicly elected three-member board of commissioners.

Danger Tree: A danger tree is any tree, on or off the right of way, that can contact electric power lines. A danger tree may be completely healthy and intact, or it may be sick or dead. Even a healthy tree could sustain damage in a severe storm and impact nearby power lines, thus the potential for "danger."

Distribution System: The final stage in the delivery of electric power carrying electricity from the transmission system to individual consumers. The Skamania PUD distribution system includes 7.2Kv lines not tied to generation facilities.

Defensible Space: An area around a structure, either natural or manmade, where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildfire and the structure. In practice, it is defined as an area a minimum of 30 to 100 feet around a structure that is cleared of flammable brush or vegetation.

Drop Crotch Tree Trimming: A form of thinning used to reduce the size of large trees, involves the removal of a main branch (or leader) by cutting it back to a large, lateral branch.

Electric Utilities Wildland Fire Prevention Task Force: The tasks assigned to the Task Force by the legislature are to advise the department on the following issues:

a) Developing, for consideration by the department and individual electric utilities, a model agreement for managing danger trees and other vegetation that pose a risk of wildland fire and associated utility liability due to the proximity to electrical transmission wires and other utility equipment;

b) Assist the department with the distribution of the model danger tree management agreement developed in (a) to utilities for their consideration for execution with the department;

c) Developing communication protocols and educational exchanges between the department and electric utilities for identifying and addressing issues relating to utility infrastructure to reduce the risks of wildland fires;

d) Developing protocols, including thresholds, for implementing the relevant provisions of RCW 76.04.015 when the department's investigation involves electric utility infrastructure or potential electric utility liability;

e) Creating rosters of certified wildland fire investigation firms or persons and third-party qualified utility operations personnel who may be called upon by the parties as appropriate; and

f) Other issues brought forward by Task Force members.

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

Fire Risk: "Risk" is the potential damage a fire can do, to the area under existing conditions, including any modifications such as defensible space, irrigation and sprinklers and ignition resistant building construction which can reduce fire risk. Risk considers the susceptibility of what is being protected.

Fire Season: 1) Period(s) of the year during which wildfires are likely to occur, spread, and affect resource values sufficiently to warrant organized fire management activities. 2) A legally enacted time during which burning activities are regulated by state or local authority.

Fire Weather Watch: A term used by fire weather forecaster to notify using agencies, usually 24 to 72 hours ahead of the event, that current and developing meteorological conditions may evolve into dangerous fire weather.

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

Hazard Tree: A specific type of danger tree that poses a greater likelihood of causing damage to electric power lines or equipment. In this case, the tree is structurally unsound and positioned in such a way that it could fall onto conductors.

Industrial Fire Precaution Level (***IFPL):*** Activated when needed during the summer fire season, IFPL are an activity closure system to reduce wildfire risk. By law (WAC 332-24-301), it applies to woods workers and other industrial forest users on 13 million acres of unimproved private, federal, and state forestlands protected by the WADNR, BLM or USFS. Levels range from Level-1 to Level-4.

Landscape: Refers generally to the area of interest in a project or study and could refer to modeled or on-the-ground conditions.

National Fire Danger Rating System (NFDRS): A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels. It combines the effects of existing and expected states of selected fire danger factors into one or more qualitative or numeric indices that reflect an area's fire protection needs.

Raster: An array or regular grid of square cells used to store data. Raster data is made up as a matrix of pixels, also referred to as cells in much the same way as you might find when working within a spreadsheet. They are often square and regularly spaced on a field divided into a grid of squares with each square representing a value which can be discrete (e.g. soil type) or continuous (e.g. elevation).

Recloser: Recloser is a device that is used in over-head distribution systems to interrupt the circuit to clear faults. Automatic reclosers have electronic control senses and vacuum interrupters that automatically reclose to restore service if a fault is temporary. There are several attempts that may be made to clear and reenergize the circuit and if the fault still exists the recloser locks out. Reclosers are made in single-phase and three-phase versions and use oil or vacuum interrupters.

Red Flag Warning (RFW)[10]: A term used by fire- weather forecasters to call attention to limited weather conditions of importance that may result in extreme burning conditions. It is issued when it is an on-going event, or the fire weather forecaster has a high degree of confidence that Red Flag criteria will occur within 24 hours of issuance. Red Flag criteria occurs whenever a geographical area has been in a dry spell for a week or two, or for a shorter period, if before spring green-up or after fall color, and the National Fire Danger Rating System (NFDRS) is high to extreme and the following forecast weather parameters are forecasted to be met:

- A sustained wind average 15 mph or greater;
- Relative humidity less than or equal to 25 percent and, and;
- A temperature of greater than 75 degrees F

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

Remote Automatic Weather Station (RAWS): an apparatus that automatically acquires, processes, and stores local weather data for later transmission to the GOES Satellite, from which that data is retransmitted to an earth-receiving station for use in the national Fire Danger Rating System.

Right-of-Way (ROW): The corridor of land under (and adjacent to) a transmission or distribution line.

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

Risk: A measure of the probability and severity of adverse effects that result from exposure to a hazard.

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

Summer Fire Rules (DNR): Washington's "summer fire rules" are in effect April 15 through October 15. These rules apply to the 13 million acres of private and state forestlands protected from wildfire by the Washington Department of Natural Resources.

These regulations affect loggers, firewood cutters, land clearers, road builders, heavy equipment operators, off-road motorcyclists, and others. During fire season, people using motorized equipment in the woods must have approved spark arresters and follow fire safety precautions. In addition, those working in the woods must have fire prevention and extinguishing equipment in good working order at the job site and workers trained in proper use.

The rules are intended to prevent forest fires and to extinguish small fires before they spread to the forested lands. These rules restrict cigarette smoking in forested areas to roads, gravels pits, or other clearings and prohibit lighting fireworks on forestland.

Transmission System: The bulk delivery of electrical energy from a generating site to an electrical substation. While Skamania PUD does not currently own any transmission system assets, BPA does operate several transmission lines in the county.

UAV: An unmanned aerial vehicle is a powered, aerial vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, can fly autonomously or be piloted remotely.

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

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

Wildfire: Also called wildland fire, an unplanned, uncontrolled fire in a forest, grassland, brushland or land sown to crops.

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

Wildlands: Forests, shrub lands, grasslands, and other vegetation communities that have not been significantly modified by agriculture or human development*. A more specific meaning for fire managers, used by the National Wildfire Coordinating Group (which coordinates programs of participating wildfire management agencies nationwide), refers to an area in which development is essentially non-existent (except for roads, railroads, power lines, and similar transportation facilities); structures, if any, are widely scattered.

Wildland Urban Interface (WUI): Line, area, or zone where structures and other human development meet or intermingle with vegetative fuels in wildlands.

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix C: Acronym Glossary

ANSI	American National Standards Institute
BIA	Bureau of Indian affairs
BLM	U.S. Bureau of Land Management
BMP	Best management practices
BOF	Board of Forestry
BPA	Bonneville Power Administration
CPUD	Cowlitz County Public Utility District
CWPP	Community Wildfire Protection Plan
DOE	Director of Operations and Engineering
DLI	Detailed Line Inspections
EOC	Emergency Operation Center
EM	Emergency Manager
ERM	Enterprise Risk Management
FEMA	Federal Emergency Management Agency
GM	General Manager
HFTA	High Fire Threat Area
IFPL	Industrial Fire Protection Level
KV	Kilovolt
KWH	Kilowatt Hours
LDE	Line Down Event
MW	Mega Watts
MVCD	Minimum Vegetation Clearance Distance
NESC	National Electric Safety Code
NFDRS	National Fire Danger Rating System
NF	National Forest
OEM	Office of Emergency Management
OS	Operations Superintendent
OH	Overhead
PNRA	Pacific Northwest Region Wildfire Risk Assessment

PSPS	Public Safety Power Shutoff
QA	Quality Assurance
QC	Quality Control
RAWS	Remote Automated Weather Station
RFW	Red Flag Warning
ROW	Right of Way
RUS	Rural Utilities Service
SCADA	Supervisory Control and Data Acquisition
SEMS	Standardized Emergency Management System
T&D	Transmission and Distribution
UAV	Unmanned Aerial Vehicle
UG	Underground
USFS	United States Forest Service
UWFPAC	Utility Wildland Fire Prevention Advisory Committee
VM	Vegetation Management
WADNR	Washington Department of Natural Resources
WA	Washington State
WDFW	Washington Department of Fish and Wildlife
WHP	Wildfire hazard Potential
WMP	Wildfire Mitigation Plan
WUI	Wildland Urban Interface