WILDFIRE MITIGATION PLAN

Effective: October 30, 2024

Version: 0

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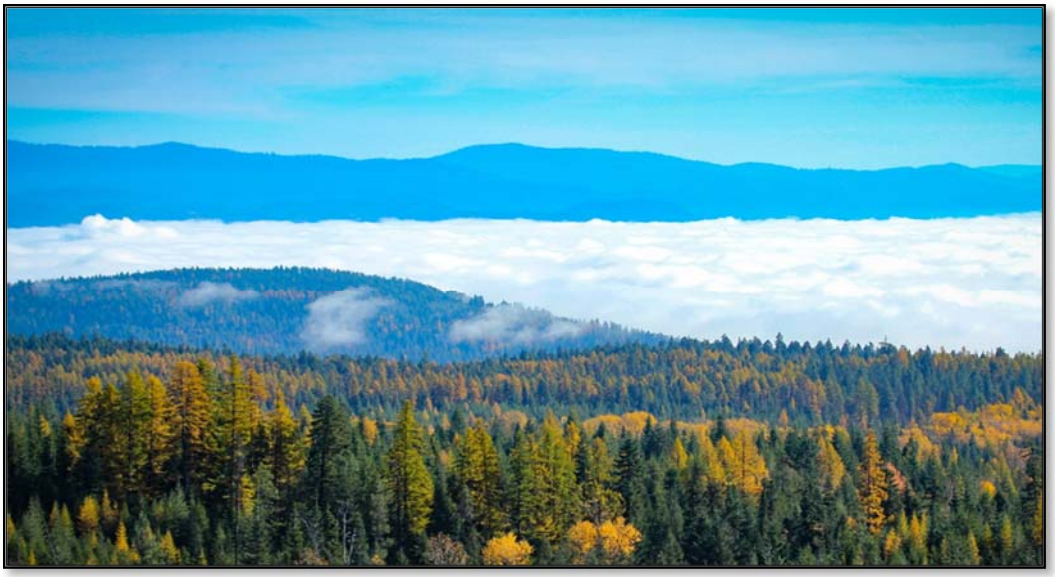

1 Executive Summary

Unusually large wildfires are on the rise in the Pacific Northwest. Although naturally occurring wildfire is necessary for healthy forests and ecosystems, Washington State has seen an increase in acres burned as well as a lengthening of the fire seasons. 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 four from 2041 to 2070 compared to 1971 to 2000 data[1]. As a result of this growing risk, 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). In April 2024, the Department of Natural Resources (DNR) published the template and list of recommended elements for electric utility Wildfire Mitigation Plans (WMP). This plan shall adhere to these guidelines and will be revised every three years, or as needed, going forward.

Public Utility District No. 1 of Pend Oreille County (POPUD, PUD, or the District) believes the proactive development of a thorough WMP prior to the approaching mandate is a prudent and responsible effort to prepare for increased wildfire conditions in Pend Oreille County. In an effort to create a comprehensive WMP, the PUD engaged an outside consultant to assist with the plan development and collaborated with local fire protection districts and emergency response agencies to review and provide input. For POPUD, 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, POPUD is committed to taking practical actions to reduce the likelihood of a utility-caused wildfire. This Wildfire Mitigation Plan lays out the steps we are taking to do so.

[1] Northwest Climate Adaptation Science Center

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Table 1. Plan Review and Revision Record

Date	Version	Author	Revision Description
Oct 2024	V0	BKI/POPUD	Original document adopted and submitted in 2024

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 POPUD'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, POPUD 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 POPUD 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 POPUD'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 WMP Information Can Be Found Online

The WMP will be made available on the PUD's website at the following web address: https://popud.org/top-links/safety-and-education/safety-plan.

2.3 Best Practices Cross-Reference Table

Table 2. Statutory Cross Reference Table

Standard or Best Practice Name and Description	Section & Page Number
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	Section 1, page i
WAC 296-45: Electric Power Generation, Transmission, and Distribution	Section 7.3.13, page 32
Avian Protection Construction Standards	Section 7.2.1, page 26
(ANSI) A300 Part 1: Tree, Shrub, and Other Woody Plant Maintenance.	Section 7.3.7, page 30

3 Utility Overview

Pend Oreille PUD is one of 28 not-for-profit, community-owned public utility districts in Washington State. POPUD was established in 1936 and began operations in 1948. The PUD is governed by three locally elected Commissioners. A General Manager and staff operate the utility within policies set by the Board of Commissioners.

The PUD has four operating systems: The electric system distributes electricity to the County, the production system produces power from the Box Canyon Hydroelectric Project. The water system consists of nine individual water distribution subdivisions, and the community network system provides wholesale broadband communication services. POPUD owns and operates its transmission and distribution system which are critical to maintaining electric service to its customers.

3.1 The Electric System

POPUD owns and operates an electric system that includes the Calispell Powerhouse generation, and transmission and distribution facilities serving approximately 10,000 meters throughout Pend Oreille County.

Power is purchased primarily from Seattle City Light and the Bonneville Power Administration (BPA) and is transmitted over the District's 115kV transmission line. The distribution system is comprised of overhead (OH) and underground (UG) circuits operating at 12.5kV and 25kV fed by seven substations.

The local power network is a part of a larger electrical grid serving the greater Pacific Northwest region. Major BPA transmission corridors with 115kV, and 230kV lines carry power into and through the service area. POPUD is also interconnected with neighboring utilities including Avista and Inland Power and Light.

Table 3. Utility Context Setting Information

General Utility Information	
Service Territory Size (sq miles)	1,425
Service Territory Make-up [ ]% Urban [ ]% Agriculture [ ]% Barren/Other [ ]% Conifer Forest [ ]% Conifer Woodland [ ]% Desert	[ ]% Hardwood Forest [ ]% Hardwood Woodland [ ]% Herbaceous [ ]% Shrub [ ]% Water [X] NA / Not tracked (see section 3.2)
Service Territory Wildland Urban Interface	[0.19]% Wildland Urban Interface [5.94]% Wildland Urban Intermix
Consumers Served	10,008 meters
Account Demographic *[provide as % of total customers served]*	[90.2]% Residential [0.3]% Agricultural [9.5]% Commercial/Industrial [] NA / Not tracked
Utility Equipment Make-up *Calculated using GIS data*	Overhead Distribution: 643.3 miles Overhead Transmission: 70.56 miles Underground Distribution: 419.5 miles Underground Transmission: 0 miles Substations: 7
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: [ ] No: [X]
Has the utility previously implemented a PSPS in response to elevated wildfire risk?	Yes: [ ] No: [X]

3.2 The Service Area

Operating out of offices located in Newport WA, Box Canyon Dam and Ione, WA, the District serves the towns of Cusick, Ione, Metaline, Metaline Falls, the city of Newport, and several unincorporated communities throughout the County as well as the Kalispel Tribe (Figure 1). The service area is divided into three districts, each being represented at the PUD by an elected commissioner.

The 1,425-square mile service area is located in the extreme northeast corner of the state and is bordered by the state of Idaho to the east, Spokane County to the south, Stevens County to the west, and Central Kootenay Regional District, BC to the north. The Pend Oreille River runs south to north through the County.

The Pend Oreille County area has a humid continental climate with continental and maritime air masses being the main weather influences. The major ecoregions include Granitic Selkirk Mountains, Inland Maritime Foothills and Valleys, Okanogan-Colville Xeric Valleys and foothills, Spokane Valley Outwash Plains, and Western Selkirk maritime Forest[2].

The summers are warm, dry, and sunny with occasional light rainfall. Fire season generally runs from mid-June to the end of September. With average daily high temperatures above 77°F, the hottest and driest day of the year is August 2nd with an average high temperature of 85°F[3]. Over the course of the year, the temperature typically varies from 21°F to 89°F and is rarely below 6°F or above 98°F, though extremes can range from subzero to over 100°F. Drought and wildfire are not uncommon. Annual precipitation ranges from 25 to 35 inches in the river valley with snowfall from 50 to 60 inches from October to April.

The service area is heavily vegetated with approximately 61% of the District occupied by federal and state managed lands[4], including approximately 825 square miles comprised of the Colville National Forest and the Idaho Panhandle National Forest.

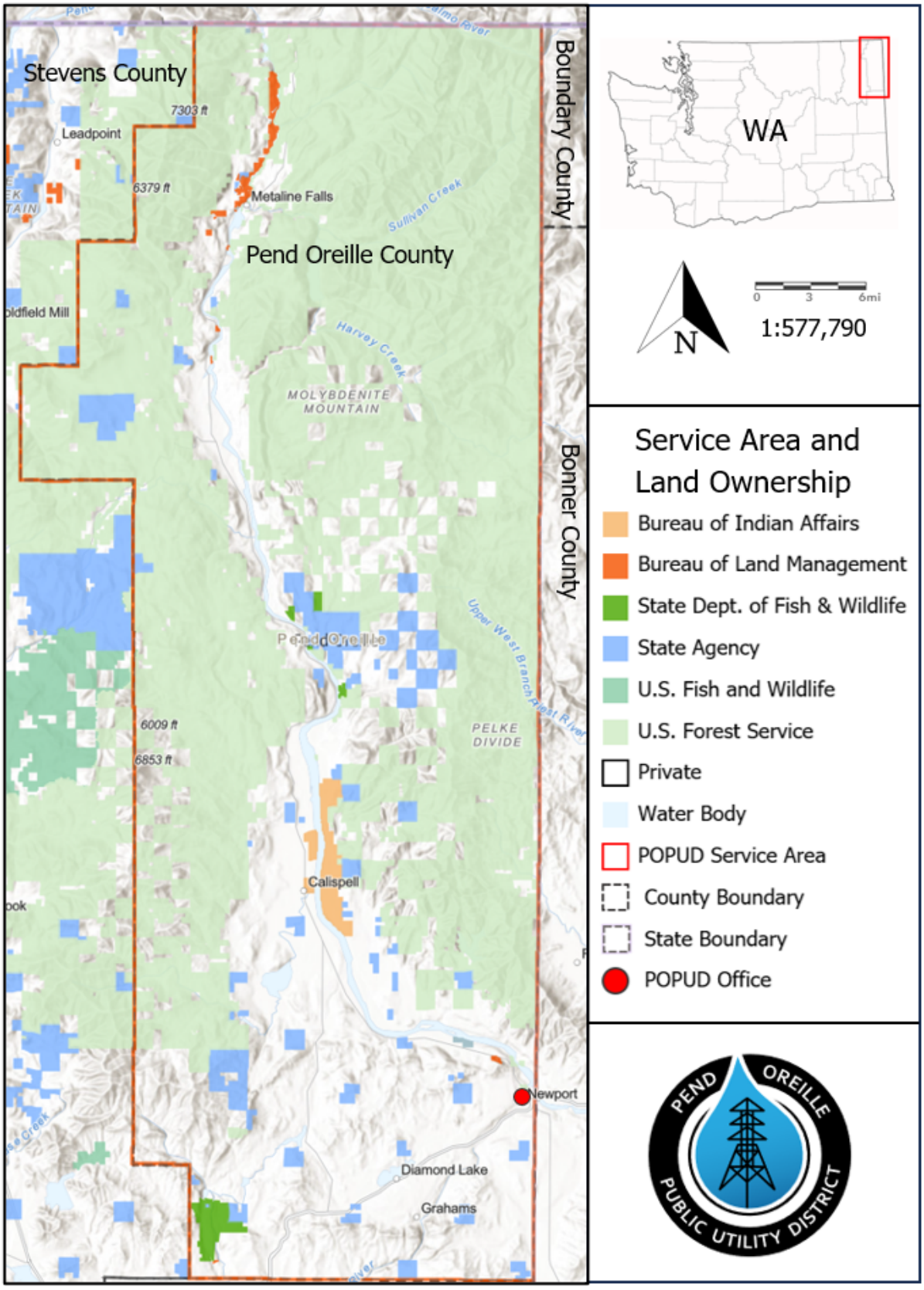
Topography is primarily mountainous uplands with moderate slopes, broad valleys, medium to high gradient streams and rivers. The Pend Oreille River runs nearly the entire length of the County. Elevations range from ~2,000 feet in the river valley to ~7,300 feet on Abercrombie Mountain. The highest point of the distribution system is ~5,120 feet above sea level.

[2] https://www.plantmaps.com/interactive-washington-ecoregions-l4-map.php

[3] https://weatherspark.com/s/2028/1/Average-Summer-Weather-in-Newport-United-States#Figures-Temperature

4 Approximately 825 square miles of USFS: Colville National Forest and Idaho Panhandle National Forest

Figure 1. POPUD Service Area and Land Ownership



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 POPUD assets becoming the origin or contributing factor for wildfire.
2. Comply with current Washington State law, and National Electric Safety Code (NESC) regulations and guidelines.
3. Maintain a plan that prioritizes safety, situational awareness, mitigation methods, and recovery for reduced liability.
4. Develop a plan that aligns with utility best practice competencies and risk mitigation activities.
5. Improved documentation and processes.
6. Continue to assess and incorporate new industry best practices, technologies, and risk mitigation activities.

4.1 Minimizing Sources of Ignition

The intended 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:** POPUD'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 POPUD's systems becoming a source of ignition.
- **Inspection & Maintenance:** POPUD'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:** These practices are 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 POPUD'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 Resiliency of the Electric Grid

While approximately 30% of the system is underground construction, the remainder 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. The District has not historically lost poles due to wildfire as is common for utilities to the west. With no vast distances for utility crews to travel, POPUD can 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 local distribution system can be manually looped in some instances, but the system contains no micro-grids. Segments that cannot be re-energized by looping may experience longer outages or remain de-energized until the feeders can be repaired and/or manually switched.

5 Roles and Responsibilities

The Commission makes policy decisions relative to the PUD – they will be responsible for approving and adopting the Wildfire Mitigation Plan, while the GM, DO and DUS oversee its implementation and execution.

5.1 Utility Roles and Responsibilities

Staff responsibility for plan implementation, operations, and communications is described below:

- **The PUD Commission** makes policy decisions relative to the utility – they will be responsible for approving and adopting the WMP.
- The **General Manager (GM)** directs management staff responsible for operations, engineering, finance, and information technology.
- The **Director of Utility Services (DUS)** oversees the electric system's design.
- The **Director of Operations (DO)** is responsible for implementing the plan in general. Staff will be directed as to their roles and responsibilities.
- The **DO** and senior staff are responsible for monitoring and auditing the targets and performance metrics specified in the WMP to confirm that plan objectives are met.
- All emergency-related communications are reviewed by the **Director of Customer Services (DCS)** and **Public Information Officer (PIO)** before distribution.
- The **PIO** responds to the news media and general membership and determines when and how to notify outside agencies in cases of wildfire emergency events.
- The **DO**, or designated staff, communicates with first responders, health agencies, communication providers, and Offices of Emergency Management.
- The **DO** oversees the contracted and in-house VM operations and inspections.
- The **DCS** and **PIO** communicate with key accounts prior to planned outages.

5.2 Coordination with Local Utility and Infrastructure Providers

POPUD will coordinate with other local utilities and infrastructure providers in the event of a wildfire impacting PUD infrastructure and other utility services and operations.

5.3 Coordination with Local Tribal Entities

POPUD will coordinate with the Kalispel Tribal Public Safety Department (KTPS) in the event of a wildfire impacting PUD infrastructure on the reservation or adjacent lands. The KTPS has wildland fire response personnel and equipment, law enforcement and medical emergency response capabilities. During emergencies, the Tribe participates in the daily incident command meetings along with PUD and Pend Oreille Office of Emergency Management personnel.

5.4 Emergency Management/ Incident Response Organization

During active emergencies, POPUD coordinates and collaborates with local emergency response agencies as well as other relevant local, state and federal agencies, as a peer partner. A small-scale emergency requires less resources and coordination than a large-scale event. Therefore, a two-tiered approach to emergency management interaction is sensible.

During small-scale emergencies, POPUD dispatch will coordinate efforts primarily through Pend Oreille County Sheriff's Office dispatch, which will communicate directly with fire crews and other first responders. This indirect coordination ensures that fire officers and emergency personnel receive clear and consistent information about POPUD's plans and actions on the ground. Communication and recovery efforts will continue until first responders declare the emergency over.

When large scale emergencies require County Emergency Management to stand up their emergency operations center (EOC), it means that many diverse resources are needed. During such events, POPUD's DO will contact the local EOC and establish themself as the duty officer for coordination. The DO will work with emergency management staff to ensure POPUD is contributing the necessary resources to the areas needed. Depending on the circumstances, this coordination may be via phone, email, or in person. POPUD's primary coordination point is Pend Oreille County Office Department of Emergency Management (PODEM or DEM).

6 Wildfire Risks

To establish a baseline understanding of the risks and risk drivers involved, POPUD looked at all aspects of its exposure to fire related hazards. Although there are inherent risks in the operation of an electric utility, it is possible to put in place strategies and processes to better plan and manage them.

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

6.1.1 Equipment Failure

There are many reasons equipment failure can occur during its service life. Most equipment requires regular maintenance for optimal performance. Even though POPUD's qualified personnel perform regular 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.

6.1.2 Foreign Contact

As is the case for most electrical utilities, most overhead power lines on the POPUD system are installed with bare wire conductors on insulated structures. Protection equipment is utilized to isolate issues (faults), but there are time delays associated with circuit breakers, reclosers and fuses. These time delays are not fast enough in some cases to prevent all sparks prior to interruption.

6.1.3 Other Potential Risk Factors

Construction projects by non-POPUD crews are another possible cause of ignition. Construction equipment, vehicles, and non-utility personnel working near power lines can contact conductors, causing a faulted condition. Excavation work performed without locating underground utilities is another hazard.

Tools and vehicles can be sources of sparks or ignition as well. For example, driving a vehicle over dry grass can cause an ignition when vegetation contacts hot exhaust components.

6.2 Fire Risk Drivers Associated with Topographic and Climate Factors

POPUD 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. Four categories were identified as contributors for heightened wildfire risk and listed by priority of concern and impact:

- High Winds
- Fire Weather/Drought

- Vegetation Type/Fuels
- Tree Failure

Risk is high due to the system's proximity to large stands of vegetative fuels, its position within a prevalent fire zone marked by recent incidents (Figure 5) and an increasing trend in wildfire activity.

The Pend Oreille County region has a notable record of frequent and intense wildfires, attributed to a combination of climatic conditions, prolonged dry spells, and human interactions with the environment. The landscape in this region is heavily forested, and the dense and dry nature of this vegetation, along with topographical features that facilitate rapid fire spread, contributes to a heightened risk.

6.2.1 High Winds

High wind events and storms are common occurrences in the region. Conductors can sway under these conditions, and if extreme, phase-to-phase contact or cross-phasing can occur. When two or more energized conductors encounter each other, they will generally emit sparks or cause breakers to trip.

6.2.2 Fire Weather/Drought

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.

The U.S. Drought Monitor[5] depicts the location and intensity of drought conditions across the landscape. The system uses five categories: Abnormally Dry (D0), showing areas that may be going into or are coming out of drought, and four levels of drought (D1–D4) as listed in the legend below. Records going back to 2000 show drought conditions for the Pend Oreille County area range from "None" to "Exceptional Drought" (Figure 3). Figure 4 on the following page represents the historic occurrence of Red Flag Warnings (RFWs) issued by the Spokane NWS office for the region[6] between 2017 and 2023. Unlike drought, RFWs are regional alerts to short term weather conditions that are conducive to wildfire outbreak and spread.

[5] https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?fips_53051
[6] Fire Weather Zones WAZ686, WAZ700, WAZ701

Figure 2. Historic Drought Conditions

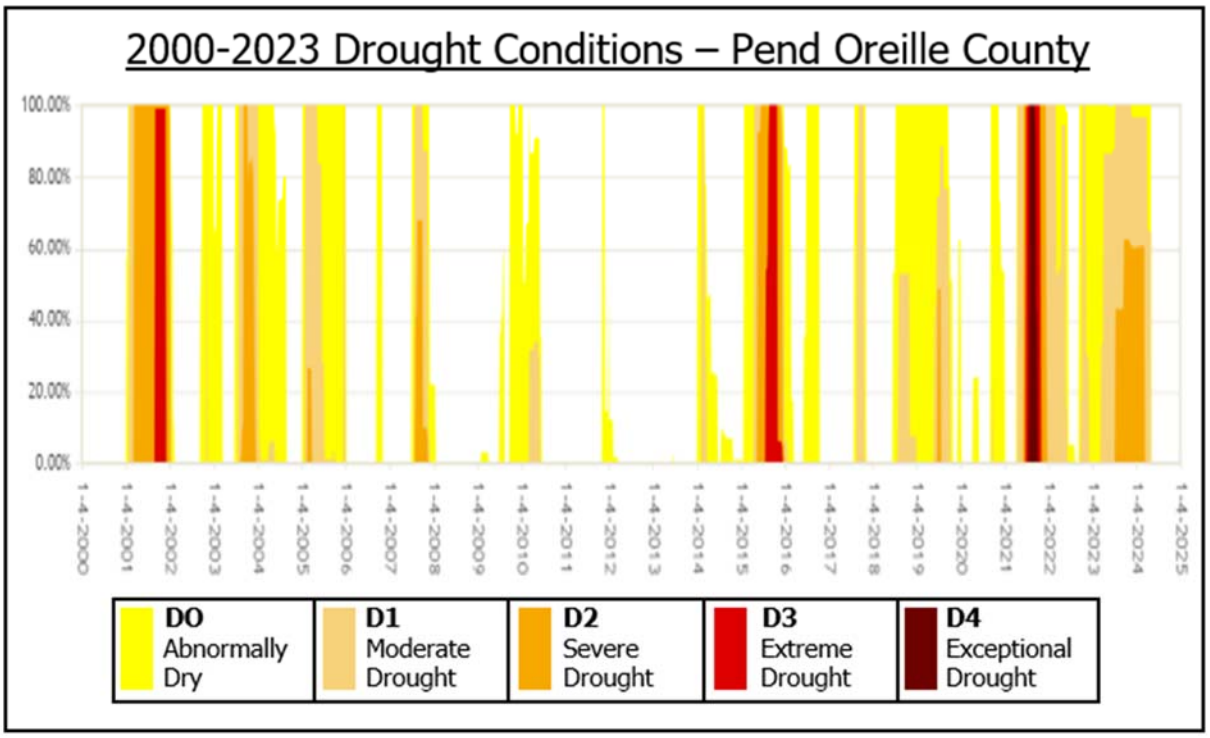
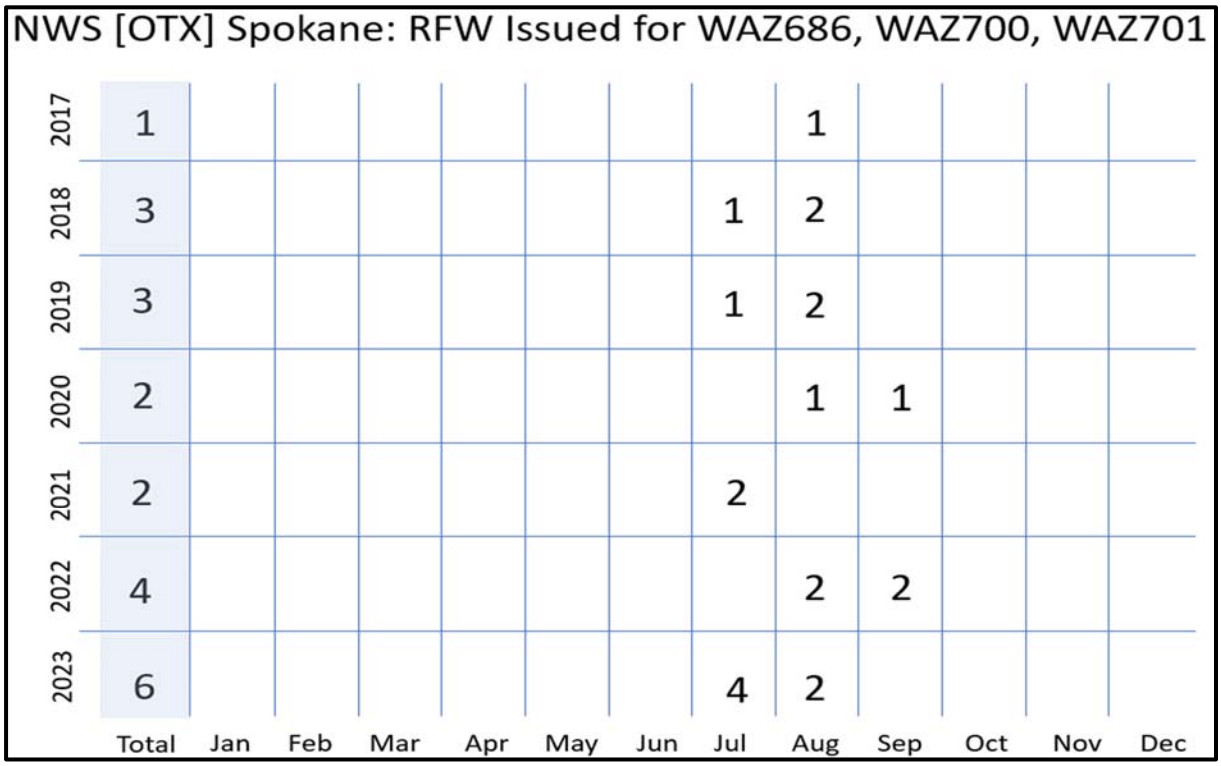


Figure 3. Red Flag Warning by Year/Month 2017-2023



6.2.3 Vegetation Type/Fuel Load

Vegetation (often referred to as fuels in a fire context), general climate, and specific fire weather patterns combine to comprise the fire environment. Most land in the County is made up of conifer forest types within the national forests. Breaks in the forested areas are usually associated with small wetlands, pastures, ranches, and dryland farming particularly in the south County. The native riparian vegetation of the river valley has been converted for the most part to agricultural uses.

A large percentage of power lines are located in densely forested lands containing a wide range of vegetation patterns and types; the predominant forest type in the hills and lower mountains is ponderosa pine, lodgepole pine, Douglas-fir, white-fir, larch, and other deciduous trees, transitioning to mixed, grand fir, western red cedar, and western larch forests at mid elevation, with subalpine fir, and spruce found at the upper elevations. These fuel types create a burning environment very conducive to large and intense wildfires. Drought conditions, beetles and other factors in recent years have stressed the area creating potential hazard trees.

Residential development within the wildland urban interface (WUI) are at increased risk for wildfire as these communities are primarily located within ponderosa pine and Douglas-fir forest types where grass, pine needle and brush surface litter create highly ignitable fuel conditions. Nine Pend Oreille County communities are listed in the "National Register Community at Risk" as "Urban Wildland Interface Communities within the vicinity of Federal Lands that are at high risk from wildfires[7]."

6.2.4 Tree Failure

Most line down events are attributed to trees or branches falling into power lines. In fact, trees and limbs account for a significant portion of the outages for the District. Since many portions of POPUD's distribution system are in wooded or heavily treed areas, any tree, either live or dead, is considered a potential threat to the electric system if it is within striking distance of the power lines. Electric utilities that investigate the actual causes of outages often find that the failure of hazardous branches and trees is a significant component of the tree-related outage category[8].

6.3 Enterprise-wide Safety Risks

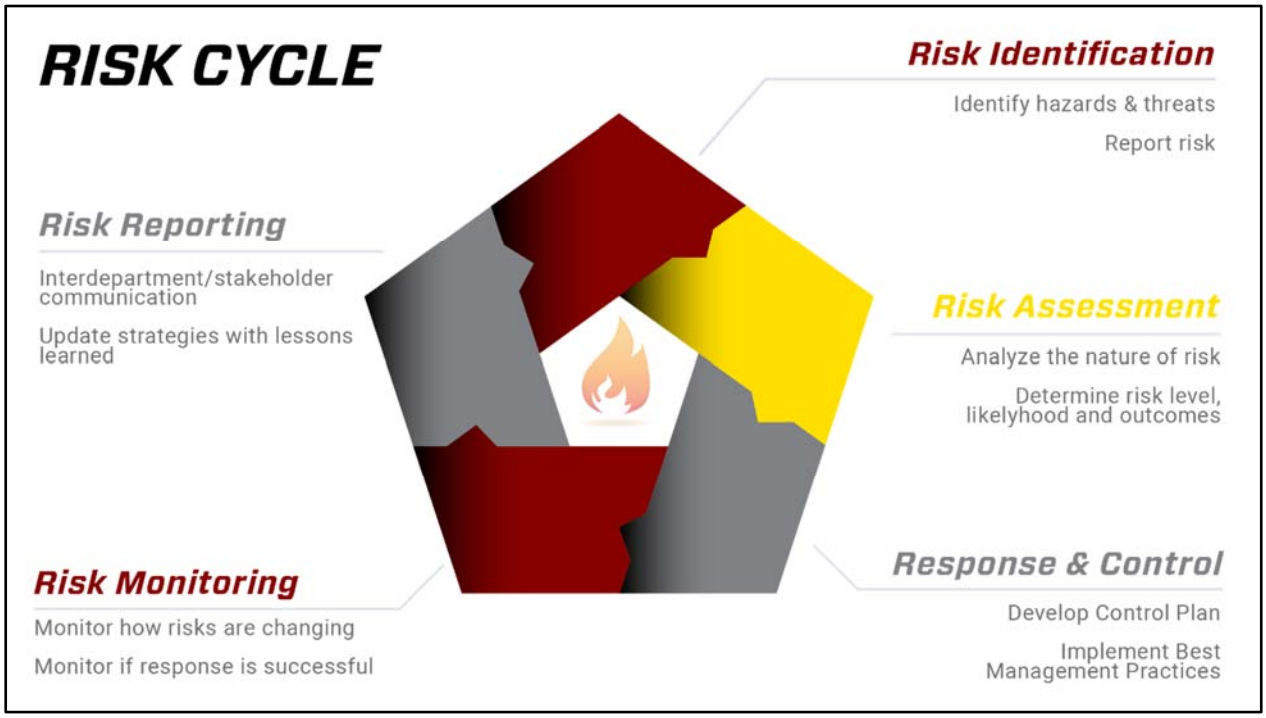
Enterprise Risk Management is a tool to assist in anticipating and managing risks, as well as considering how multiple risks can present even greater challenges. The overall goal is to determine the residual risk level after all mitigation factors have been applied to the initial inherent risk.

Enterprise Risk Management (ERM) is not a periodic "Risk Assessment" but an ongoing and forward-looking management discipline that allows POPUD to analyze risk on a routine basis and adapt to changing conditions. Figure 4 displays the 5 steps of the ERM process. The key or critical risks affect the entire community and are interrelated, and thus, are managed holistically and with a structured approach.

[7] Federal Register, Vol. 66, Number 160, 8/17/2001
[8] NRECA Vegetation Management Manual

The Risk Assessment process began with the General Manager, key staff, and stakeholders working together to collect information on potential and perceived risks. In 2024 POPUD staff participated in, and reviewed, the County's five-year Hazard Mitigation Plan update.

Figure 4. POPUD Enterprise Risk Management Process



6.4 Key Risk Consequences

The aforementioned risks have many possible consequences should one or more become a contributing factor for an ignition. The list below outlines some of the worst-case scenarios, the prevention of which is the impetus for the development of this WMP:

- Personal injuries or fatalities to the public, employees, and contractors
- Damage to public and/or private property
- Damage and loss of POPUD's infrastructures and assets
- Impacts on reliability and operations
- Damage claims and litigation costs, as well as fines from governing bodies
- Damage to POPUD's reputation and loss of public confidence
- Negative public opinion of the power industry in general
- Environmental impacts

6.5 Fire Threat Assessment

As part of the risk analysis process, POPUD examined its asset locations in relation to topographic features, communities, wildfire history and land ownership data to identify risks unique to its service area. This chapter will provide an overview of the service area properties and associated risks which are factored into the wildfire mitigation strategy. See section 3.2 for a description of the service area.

6.5.1 Wildfire History and Outlook

Washington has a long history of both small and very large wildfires, some reaching over 100,000 acres. In 1910, a wind-driven fire burned much of the south county (which was then Stevens County) before jumping the Pend Oreille River. Historic records show at least four people died in the county. This fire was part of the "Big Burn" that summer that torched some 3 million acres of forest throughout the Northwest, During the 1920s and 1930s, several massive, drought-induced wildfires burned throughout north Pend Oreille County, burning hundreds of thousands of acres of the Colville National Forest. More recently, the County endured the Oregon Fire (10,817 acres, 2023) and the Tower Fire (Kaniksu Complex 24,194 acres, 2015).

According to the DNR's fire cause database, human causes far outnumber natural sources of wildfire[9], with approximately 52% determined to have been negligently or intentionally started.

Based on National Weather Service (NWS) Fire Weather Watch (FWW) and RFW issuance data from 2000-2023, fire season in the region runs from June through the end of September.

Annual large wildfire frequency in United States Forest Service (USFS), National Park Service and Bureau of Indian Affairs (BIA) forests is significantly correlated with spring and summer temperature; the largest fire years coincide with warm spring and summer temperatures, and below-average winter

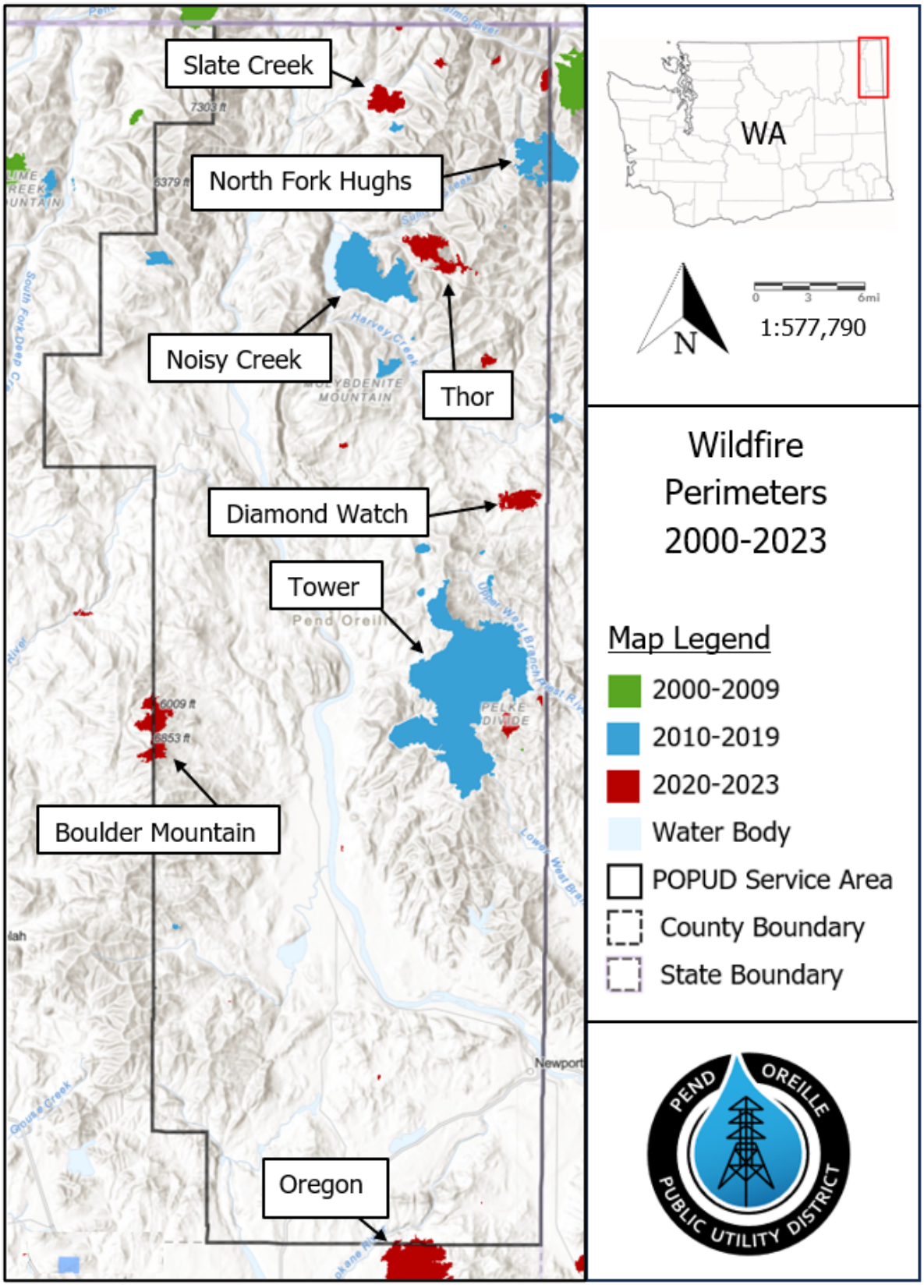
[9] https://www.dnr.wa.gov/Investigations

precipitation or early spring snowmelt. Snow melting earlier in the spring leads to soils and forests that are drier and stay dry longer. This leads to wildfires that can burn hotter and spread faster[10].

Projections estimate that the annual area burned will quadruple in Washington's forests by the 2040s[11]. Climatic conditions conducive to very large fires—those over 12,355 acres—are also expected to triple in the interior western US by mid-century[12]. Meanwhile, fire seasons are getting longer. The USFS reported that in 2015, fire seasons were averaging 78 days longer than in 1970. By mid-century, the wildland fire season could last approximately 35 days longer, beginning about two weeks earlier and lasting about three weeks longer compared to 1971-2000 data.

[10] https://ecology.wa.gov/air-climate/responding-to-climate-change/wildfire-risks
[11] https://www.dnr.wa.gov/publications/rp_wildfire_strategic_plan.pdf?lmvb8d
[12] Projection for 2040-2069, compared to 1971-2000 (Barbero, et al. 2015)

Figure 5. Historic Wildfire Perimeters 2000-2023



6.5.2 Wildland Urban Interface

The USFS defines the wildland urban interface (WUI) as a place where humans and their development meet or intermix with wildland fuel and is composed of both interface and intermix communities. The distinction between the two is based on the characteristics and distribution of houses and wildland vegetation across the landscape.

Interface WUI

Interface is defined as those areas where human development meets areas that are covered with more than 50% wildlands. To be considered an "interface" land area, development or structures must be bordered by wildlands on at least one side.

Intermix WUI

Intermix refers to areas where housing and wildland vegetation intermingle. To be considered intermix, a development or structure must be surrounded on two (2) or more sides by wildlands. Intermix is often found between the Interface and the wildlands. However, as can be seen in Pend Oreille County, Intermix can also be found in undeveloped/low-density pockets of urban areas.

Wildlands

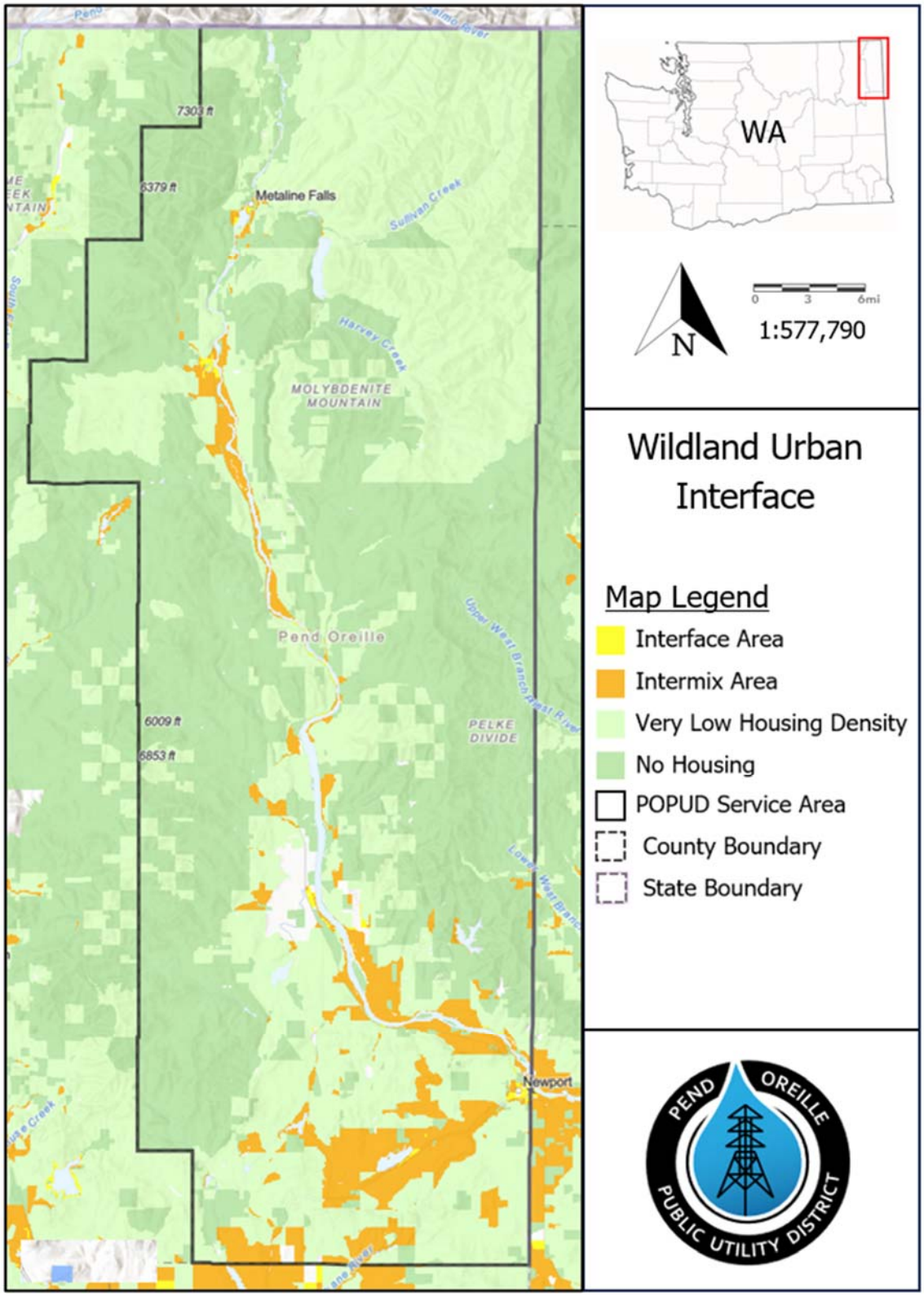
For the purposes of this map, "wildlands" are defined as any area without any structures or human development that also have more than 50% burnable vegetated cover including grasslands and sagebrush-steppe. However, most wildlands could eventually become intermix, interface, or even urban areas. For example, a new single-family home in the woods could make wildlands into intermix, while a new housing development, strip mall, or other series of structures could turn a section of wildlands into interface.

According to the USDA Forest Service, the area considered WUI has expanded 30% in Washington from 1990 to 2020 with the number of homes increasing by 50%[13]. There are now approximately one million homes in Washington located in the WUI[14] with 77% of housing units located in the WUI in Pend Oreille County (Figure 6).

[13] https://www.nrs.fs.fed.us/data/wui/state_summary/

[14] https://www.dnr.wa.gov/publications/rp_wildfire_strategic_plan.pdf?lmvb8d

Figure 6. Wildland Urban Interface



6.5.3 Wildfire Threat Assessment Mapping

The Wildfire Hazard Potential (WHP) map (Figure 7) 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. The 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.

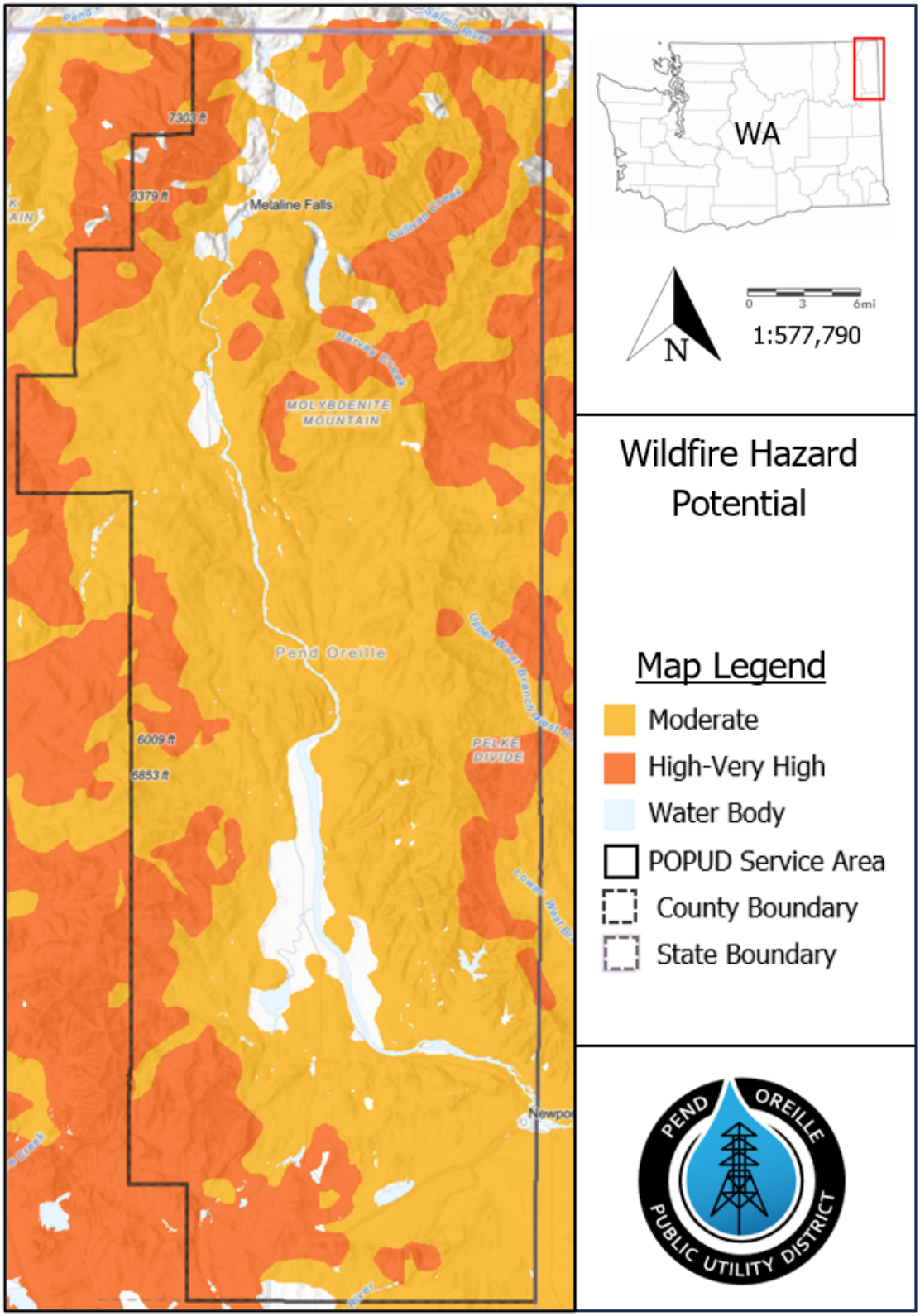
Areas mapped with higher WHP values represent fuels with a higher probability of experiencing torching, crowning, and other extreme fire behavior under conducive weather conditions. An essential aspect of the WHP method is the use of "resistance to control weights" at the end of the mapping process. 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.

A smoothing process was applied to the raw data and the Very Low and Low tiers removed from the map. The High and Very High tiers were also combined to form the High-Risk tier. The POPUD transmission and distribution system was then overlaid, and line miles calculated for each risk tier. Table 4 illustrates the breakdown of the POPUD system in relation to the risk tiers throughout the service area.

Figure 7. Wildfire Hazard Potential



6.5.4 Assets Within Wildfire Threat Index Tiers

Table 4 provides a high-level overview of POPUD's various transmission and distribution (T&D) assets relative to the Wildfire Hazard Potential tiers shown in the WHP map above (Figure 7). It should be noted that this information represents miles of ROW, not miles of conductor.

Table 4. Overview of T&D Assets within WHP Tiers

Assets	Total	Low		Moderate		High	
	Line-miles	Line-miles	%	Line-miles	%	Line-miles	%
115 kV OH Transmission	70.6	22.1	31.3%	48	68%	0.51	0.7%
7.2 kV–25 kV OH Distribution	643.3	119.4	18.6%	465.4	72.3%	58.5	9.1%
7.2 kV–25 kV UG Distribution	419.5	56.8	13.5%	316.5	75.4%	46.2	11%
Substations	7	3	37.5%	4	62.5%	0	0%

7 Wildfire Preventative Strategies

This WMP integrates and interfaces with POPUD'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 5 summarizes POPUD's five mitigation components with associated programs and activities that support the PUD's ongoing commitment to wildfire reduction and mitigation. Not all construction standards, such as underground lines, are employed solely for wildfire mitigation, or installed in all areas of the service territory.

Table 5. Mitigation Programs and Activities

DESIGN AND CONSTRUCTION
Underground distribution lines in select areas
Advanced electronic relays and reclosers
Covered jumpers and animal guards on new construction
Avian protection program and construction standards
Substation perimeter fencing for security and protection
Supervisory Control and Data Acquisition (SCADA)
INSPECTION AND MAINTENANCE
Infrared inspections of electrical substation equipment
Transmission line annual ground patrols
Wood pole testing and treatment
Vegetation right-of-way inspection and maintenance
Enhanced T&D vegetation right-of-way maintenance (Mowing)
Hazard Tree identification and removal
Cycle trimming of all T&D lines
Mid-cycle vegetation trimming (cycle busters)
Quarterly substation inspections

Table 5. Mitigation Programs and Activities (continued)

OPERATIONAL PRACTICES
Fire-safe settings on select field-deployed protection equipment
Fire suppression equipment on worksite during fire season
24/7 Manned Dispatch Center
Tailboard meetings prior to field work
Geographical Information System Mapping
Special work procedures for high Industrial Fire Precaution Levels
Community outreach/wildfire safety awareness
Ignition tracking
SITUATIONAL AWARENESS
Weather Monitoring in the service area
Tracking of active regional wildfires
Monitoring Industrial Fire Protection Levels
RESPONSE AND RECOVERY
Provide liaison to County Emergency Operations Center (EOC) during fire event
Coordination with local Department of Emergency Management (DEM)
Line patrols prior to re-energization

7.1 Weather Monitoring

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.

POPUD's System Operators use various resources to monitor evolving fire weather and climatological conditions that may lead to fire events. Based on available information, including real-time field observations, and ongoing wildfire reporting, POPUD appropriately schedules work crews, adjusts equipment settings, and prepares for fire conditions as needed.

- **The National Weather Service (NWS):** The NWS provides on-line predictive fire weather forecasting tools in the form of a current fire-weather outlook, 2-day, and a 3-8 day outlook. (https://www.spc.noaa.gov/products/fire_wx/)
- **Industrial Fire Level Precaution Levels (IFPL):** Fire season requirements become effective when fire season is declared in each Washington DNR Protection District. (https://www.dnr.wa.gov/ifpl)

7.1.1 Fire Precautionary Period

Historically, the fire season in POPUD's service area occurs between June and the end of September, with mid-August most vulnerable to extreme fire conditions. For this WMP and POPUD's wildfire related operations, the Fire Precautionary Period (FPP) is June 15th to September 30th of any year. During the Fire Precautionary Period, POPUD and contracted crews shall:

- Abide by the requirements of this WMP,
- Be responsible for reporting any fires set directly as a result of their operations,
- Take corrective action when observing or having been notified that fire protection measures have not been properly installed or maintained,
- Avoid smoking during fire season, except in a barren area or in an area cleared to mineral soil at least three feet in diameter.

7.1.2 Industrial Fire Precaution Levels

Each summer, when qualifying conditions of fire hazard exist, the State Forester will declare fire season to be in effect. The Industrial Fire Precaution Level (IFPL) system is intended to help prevent wildfires by regulating industrial and recreational activities on Washington Department of Natural Resources (DNR), Forest Service or BLM forestlands.

IFPL restrictions[15] are issued at one of four levels that begin with Level One at the start of the "closed fire season" and progress through Level Four as conditions warrant. Because conditions vary across the state, each protection district will declare fire season separately. The declaration of fire season affects forestry and other commercial operations as well as the activities of the general public. Fire season

[15] https://app.leg.wa.gov/wac/default.aspx?cite=332-24-301

remains in effect until terminated by an additional declaration or the State Forester declares that conditions of fire hazard no longer exist.

POPUD crews and contractors abide by all state IFPL restrictions and have the required hand tools and fire suppression equipment at the worksite. During fire season, POPUD monitors the status of these precaution levels and issues instructions to its crews and contractors accordingly. The IFPL levels also inform the decision making on recloser settings in high vegetation areas.

7.1.3 Firewatch Services

The purpose of the Firewatch is to stay after the day's work is over and report any fire starts to the proper authorities. The Firewatch is required to be on duty after the last power-driven equipment used by the operator has been shut down for the day. The Firewatch must be on duty for a minimum of one hour, although during periods of high fire danger, DNR recommends the fire watch be on the operation site longer than the mandated one hour. A fire watch must do the following:

- Visually observe all parts of the operation area on which industrial activity has been in progress.
- Be physically capable of fighting a fire and experienced in operating firefighting equipment.
- Have on-site communication (radio, or cellular) to summon help in the event a fire breaks out. Transportation is also required in case radio or phone communication doesn't work.
- Have transportation available in case radio or phone communication doesn't work.

7.2 Design and Construction Standards

7.2.1 Avian Protection Construction Standards

Since 2012, POPUD has employed design and construction standards to protect raptors, migratory birds, and other wildlife. The measures contained in POPUD's Avian Protection Plan have been shown to reduce the collision and electrocution risks and the number of birds injured. Consequently, avian protection strategies also reduce the potential for fire ignitions while helping to prevent power outages. Avian interactions are considered in the design and installation of new facilities, as well as the operation and maintenance of existing structures. Construction standards include but are not limited to:

- 10' cross arms to achieve 60" of phase separation
- Covered wire for jumpers and stingers
- Caps on surge arresters, energized bushings, and terminators
- Bushing covers on transformers, capacitors, reclosers, and regulators
- Bird flight diverters
- Replaced double crossarms with single fiberglass crossarms to limit osprey nesting where needed
- Elevated nesting platforms
- Perch deterrents

The construction specifications listed above are used where a need has been identified, and not necessarily at every structure. These safety measures have reduced the potential for fire ignitions while also assuring compliance with the Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (BGEPA), and the Endangered Species Act (ESA).

7.2.2 Underground Conductor

The benefits of OH bare wire conductor is that it is much lighter and easier to work with compared to insulated wire. It is also easier to troubleshoot following an outage event and restore to service quite readily compared to underground construction making it a much more cost-effective method of delivering energy compared to insulated/covered wire or underground.

The downside to bare wire is its susceptibility to contact from foreign objects such as wildlife, vegetation, and third-party equipment. The undergrounding of distribution lines eliminates the impacts of ice loading, improves reliability in high wind events and functions as an effective mitigation of wildlife related outages. POPUD has approximately 421 miles of UG distribution line on its network. Some remote, rural stretches of line have been selectively converted from OH to UG where issues with vegetation are exceptional.

While there are many benefits, UG lines do not prevent all outages and can have their own unique maintenance problems. In some areas underground lines may not be a reasonable or cost-effective solution due to distances, accessibility, terrain, or geological conditions.

7.2.3 Circuit Recloser Upgrade

A recloser is an automatic, high-voltage electric overcurrent protective device. Like a circuit breaker in a household electric panel, these devices shut off electric power when trouble occurs, such as a short circuit. Reclosers will close back multiple times to detect if the problem still exists. If the problem was temporary, the recloser automatically resets and restores power[16]. Electronic Vacuum reclosers provide fast, low energy interruption with long contact life, are oftentimes programmable, and do not require the high maintenance demands associated with traditional recloser devices which contain oil and utilize electromechanical mechanisms.

POPUD is in the process of replacing oil-filled hydraulic reclosers with electronic units that provide advanced line protection. These modern units reclosers can be remotely operated via SCADA, which will allow Operations to initiate fire-safe protection schemes remotely in response to fast-changing weather conditions.

7.2.4 System Monitoring - SCADA

POPUD has select retrofit substation breakers with supervisory control and data acquisition (SCADA) functionality to monitor circuit conditions providing early notification and faster response to system abnormalities. Connecting electronic reclosers to the operations center via SCADA will also allow the

[16] https://www.eaton.com/content/dam/eaton/products/medium-voltage-power-distribution-control-systems/reclosers/recloser-definition-information-td280027en.pdf

operators to make settings adjustments without rolling trucks thus improving response time and safety. The transmission system is completely controlled via the SCADA network.

7.3 Fuel and Vegetation Management

7.3.1 Current Strategy Overview

POPUD maintains approximately 714 miles of OH right-of-way (ROW) to minimize interruptions of services to our customers. This includes not only the maintenance of the hardware, conductors, and poles, but also trees and other vegetation that threaten to fall or grow into the conductors. Trees that grow within or adjacent to powerline ROW are a common cause of outages and damage to facilities as well as a potential cause for wildfire. While POPUD is responsible for maintaining the ROW above and below our power lines, we strive to balance maintaining our natural surroundings with ensuring a reliable power supply by keeping power lines clear of vegetation. While we recognize and appreciate the beauty of trees, the three main benefits to tree trimming in ROW areas are Safety, Reliability, and Affordability.

When work is well planned and completed, the overall impact on the desirable vegetation on the ROW is 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 Vegetation management (VM), POPUD can focus more of its energy and resources on preparing for future weather events, improving the reliability of the grid, and controlling maintenance costs.

7.3.2 Annual Corridor Vegetation Inspection (ACVI)

Each year prior to the growing season, the DO, District journeymen tree trimmers, journeymen linemen, or certified arborist inspect 100% of the transmission, and ~33% of the distribution ROW for vegetation encroachment and wildfire risk. This inspection identifies any incompatible vegetation on or adjacent to the ROW or electrical facilities, and encroachments into the Minimum Vegetation Clearance Distance (MVCD) to the power lines. ACVI results will inform the Annual Work Plan (AWP) which sets annual VM goals and priorities to be completed in the following year. Vegetation clearance issues found by line crews during regular daily work are reported to the DO and are corrected via the Service Order process. These clearance issues are remediated according to the severity of the deficiency.

7.3.3 Annual Work Plan

The AWP follows utility forestry best practices for the continual maintenance and improvement of our electrical system, which includes VM and control within utility corridors and ROWs. The AWP, developed from ACVI findings, sets out the goals and expectations of the in-house Tree Crew for the following calendar year. Prioritized by the results of the ACVI, approximately 20% of the distribution corridors, and 100% of the transmission ROWs are treated each year to mitigate fire risk, trim or remove hazard trees and to perform as-needed mid-cycle trimming. The goal is to complete all scheduled corrections within the yearly maintenance cycle. This program is governed by the DO and is subject to direct supervision by the General Manager (GM).

Table 6. Vegetation Management Schedule

ASSET CLASSIFICATION	OPERATION TYPE	FREQUENCY
Transmission ROW	VM Inspection	Annual
	Maintenance	Annual
Overhead Distribution ROW	VM Inspection	Every 3 years
	Maintenance	Every 5 years
High Growth Rate Areas	Mid-cycle Trimming	As needed

7.3.4 Mechanical and Chemical Control Options

Vegetation clearance options may include chemical, manual, or mechanical techniques. The choice of control option(s) is based on effectiveness, environmental impact, site characteristics, worker and public safety concerns, and economics. POPUD chooses the mechanical technique supported by chemical application as the preferred methods of maintenance.

POPUD approved, environmentally safe herbicides, may be applied for ROW maintenance and for cut stump treatment to prevent re-sprouting of the stump. Great care shall be taken to use herbicides and related products to provide the most cost efficient and effective maintenance of the ROW as possible. No herbicide applications shall be made within 3 feet of the fence lines of active pastures outside the ROW.

7.3.5 Site Preservation

Care shall be taken to encourage the growth of natural ground covers where possible. Rivers, lakes, streams, natural drainage area, ponds, etc. shall not be disturbed. All local, state, and federal laws and regulations will be followed when performing work around fish spawning streams.

7.3.6 Mid-Cycle Trimming

The VM inspection process is driven by an ongoing assessment of vegetation growth throughout the system with special attention given to areas with increased potential for tree-caused damage to power lines and utility equipment. By continuous evaluation of our entire system, we focus tree trimming resources in certain high growth areas more frequently than our normal 5-year cycle.

7.3.7 Trimming Standards

Trees are trimmed or removed for safety, reliability, and compliance with National Electric Safety Code (NESC)[17] and RCW 64.12.035 requirements. POPUD's tree trimming crew are also governed by "Best Management Practices-Utility Pruning of Trees[18]" which is a companion publication to the (ANSI) A300 Part 1: Tree, Shrub, and Other Woody Plant Maintenance. This standard is intended as a guide for federal, state, municipal, and private authorities including property owners, property managers, and utilities.

Correct tree trimming should promote tree growth away from electrical conductors, provide longer periods of clearance, and reduce future work. Correct trimming techniques include, but are not limited to, directional pruning such as side, slope, and V-pruning. Crown reduction is carried out when less extreme options are not considered adequate for system safety.

7.3.8 Clearance Specifications

In-house tree crews clear and trim all trees that are within 10 feet of overhead power lines to help ensure the reliability of our electrical system. Some tree clearance is also determined by the growth rate of the species. When permitted, trees are removed when proper pruning to the required clearance results in a reduction of 50% or greater in live crown area.

Factors considered in determining the extent of pruning required include, but are not limited to:

- Tree species, growth rates and failure characteristics
- Branch size
- Line voltage class
- Right-of-way limitations
- Framing and spacing between phases
- Vegetation's location in relation to the conductors
- Location of tree in relationship to protective devices and critical customers
- Location of tree in regard to general public safety

[17] The National Electric Safety Code, Vegetation Management Section 2IS.A.I
[18] The International Society of Arboriculture

- Potential combined movement of vegetation and conductors during routine winds
- Sagging of conductors due to elevated temperatures or icing
- Ice and snow loading on branches
- Branches overhanging at a sharp angle

During tree work, trimmers aim to achieve the following clearance specifications at time of trim:

- **OH Transmission:** All overhanging branches are removed over transmission conductors from ground to sky. So long as they do not obstruct safe access, some low-growing shrubs are allowed to remain in the transmission corridor and provide a viable habitat for wildlife.
- **OH Distribution:** Minimum of 15 feet from ROW centerline.
- **Trees Under Conductors:** All trees directly below POPUD facilities shall have the crown reduced to 5 feet below the system neutral wire. For high neutral construction, crowns are reduced to achieve 8 feet of clearance below the neutral wire.
- **Overhanging Branches:** Removed to a height of 15 feet above all distribution conductors. All weak, diseased, and dead limbs above primary lines shall be removed. No overhanging limbs are permitted on transmission circuits.
- **Pole Clearing:** Vines growing on poles and wires shall be cut at ground level to a 3-foot circumference.
- **Fiber Communications Cable:** Crown reduced to a minimum of 1 foot below the fiber cable.
- **ROW Brush Removal:** Cleared to 15-25 feet from centerline where feasible, or as far as allowed by the landowner.

7.3.9 Minimum Clearance Guidelines

Crews performing tree work must consider the tree species, growing environment, re-growth rate, maintenance cycle length, etc. in order to determine the amount of clearance required at the time of pruning. During tree work, trimmers aim to achieve 10' of clearance from the conductor plus 5-year regrowth at time of trim. Five-year growth rates can be as low as 5 feet for Douglas fir, or as high as 4 feet per year for young western larch. Mid-cycle trimming is often necessary where ROW limitations do not allow for 5 years of growth to be trimmed.

7.3.10 Brush Mowing Plan

The brush mowing process is used to remove under-growth within the POPUD's ROWs. The brush and small trees are removed with a large tractor mounted shredder that cuts and mulches the undergrowth into small pieces and spreads them across the ROW. The result is a ROW that is resistant to fire and easy to navigate by repair crews. This work is prioritized in areas identified as having high fire risk where access to lines may be difficult.

7.3.11 Hazard Trees

Electric utilities that investigate the actual causes of outages often find that the failure of branches and trees is a significant component of the tree-related outage category[19]. A subset of Danger Trees[20], a Hazard Tree is defined as any tree or portion of a dead, rotten, or decayed tree that may fall into or onto the overhead lines, or trees leaning toward transmission and distribution facilities.

When permitted, trees that are determined by the District to be a potential threat to the continued operation of the OH electrical facilities shall be removed, leaving the stump as close to the ground as possible

POPUD makes it a priority to remove hazard trees as soon as they are identified. If removal is not feasible, the crown is reduced below the neutral wire.

7.3.12 Reducing Incompatible Vegetation

In addition to the regular patrols by POPUD field staff observing and reporting on incompatible uses and encroachments, POPUD makes efforts to educate public and private landowners about incompatible vegetation that can pose risks if planted under or near conductors. POPUD 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 POPUD website provides tree planting guidance on its website. The District also offers free tree assessments and secondary line drops upon request. Additionally, POPUD provides free safety trim services in preparation for customer tree pruning to ensure there is at least 10 feet of clearance away from the energized primary electric lines.

7.3.13 Safety Standards

All personnel performing vegetation management work on or near POPUD facilities or ROWs shall follow approved safety guidelines and procedures and comply with all applicable governmental safety and health regulations, and the safety and health provisions of their contracts.

POPUD follows WAC 296-45 for worker safety. Contract line clearance tree workers must meet the requirements of these standards as well as any other applicable federal, state, or local laws, codes, or regulations.

7.4 Asset Inspections and Response

7.4.1 Current Strategy Overview

Recognizing the hazards of equipment that operate high voltage lines, POPUD maintains formal time-based inspection and maintenance programs for distribution, and substation equipment which plays an

[19] NRECA Vegetation Management Manual

[20] As defined by ANSI 300 Part 7 standards

essential role in wildfire mitigation, reliability, and safety. POPUD currently patrols its system regularly and has increased the frequency in high-risk areas. The following sections outline the inspection practices for utility-owned assets. Table 7 provides a high-level overview of the inspection intervals.

7.4.2 Substation Inspections

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

The routine inspections occur quarterly to ensure safety and reliability. Additionally, each substation receives an annual detailed inspection, which involves a thorough look at the system to confirm that there are no structural or mechanical deficiencies, hazards, or tree trimming requirements. These inspections also include transformer oil testing, thermal infrared photography, yard cleaning, DC system resistance testing and maintenance planning.

Comprehensive substation inspection and testing occur every five years, where the substation is taken off-line, and all systems and major pieces of equipment are tested. The Box Canyon substation is inspected daily by the generation facility operators.

7.4.3 Pole and Equipment Inspection Program

To maintain the District's approximately 13,000 wood utility poles, an informal Pole Management Program was initiated with the goal to inspect approximately 10% of the distribution system poles per year. Wood pole inspections are performed by qualified contractors on a planned basis to determine whether the wood structures have degraded below National Electric Safety Code (NESC) design strength requirements with safety factors.

In addition to assessing the condition of the wood pole, inspectors look for and note evident deficiencies of installed equipment such as missing ground wires, guy wire damage, damaged cross-arms, fire damage, as well as vegetation clearance violations and missing or damaged wildlife protection.

Poles which fail inspection are prioritized based on level of structural defect and scheduled for replacement or corrective repair accordingly. Wood poles that pass the intrusive inspections are re-tested with a target interval of every 10 years.

Table 7. Inspection Program Summary

ASSET CLASSIFICATION	INSPECTION TYPE	FREQUENCY
OH Transmission	Wood Pole Test and Treat	Every 7-10 years
OH Distribution	Wood Pole Visual Inspection	Every 10 years
Regulators	Routine Inspection	Annual
Substations	Routine Inspection	Every 3 months*
	Oil and Infrared Testing	Every 12 months
	Detailed Inspection/Testing	Every 5 years

*Box Canyon substation is visually inspected daily

7.5 Reporting Fires

Immediately after the initial discovery of a fire, or as soon as feasible, POPUD or their contractors shall call District System Operations. When reporting a fire, POPUD staff or contractors are to provide the following information:

- Name
- Call back telephone number
- Location: Descriptive location (Reference Point), Intersection, GPS position etc.
- Known fire information: Including Acres, Rate of Spread, and Wind Conditions

7.6 Workforce Training

POPUD is developing 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.

7.7 Relay and Recloser Policy

7.7.1 Current Strategy Overview

In response to the increasing conditions conducive to wildfire, POPUD has developed Fire-Safe operating procedures for feeder breakers and field reclosers during IFPL Level 3.

The PUD electric system operates a combination of electronic and oil-filled reclosers; electronic recloser units are adjusted remotely through the SCADA system if equipped with communications, while the traditional, oil-filled units, and electronic reclosers not equipped with communications are manually adjusted. When the IFPL reaches Level 3, breakers and reclosers are put into Fire-Safe modes for the duration of the fire season, or until the first major rain event. The purpose of this practice is to align circuit protection schemes with existing fire threat conditions.

When weather forecasts or real-time weather station information indicates high fire threat conditions, POPUD operates select distribution lines with a more sensitive protection regime, such as trip-reclose-trip, where reclosers rely on instantaneous rather than time-delay tripping or non-reclose settings.

De-energized circuits must be patrolled prior to re-energizing to ensure no vegetation, downed conductor, or other clearance issues are impacting the lines. While these measures are intended to reduce the risk of ignition, the required daytime safety patrols may lead to prolonged customer outages.

7.7.2 Red Flag Warning Operational Protocols

RFWs are issued by the NWS when critical fire weather conditions are forecast or met and are intended to call attention to limited weather conditions of importance that may result in elevated wildfire risk. The type of weather patterns that can cause an RFW include low relative humidity, strong winds, dry fuels, the possibility of dry lightning strikes, or any combination of the above. An RFW can be issued during an on-going event, or if the fire-weather forecaster has a high degree of confidence that Red Flag criteria will occur within 24 or more hours.

When the System Operators receive notice that an RFW has been issued, the following protocols are implemented. Work in areas of elevated wildfire risk is performed only when the following conditions are met:

- For emergency work only and if not doing the work poses a higher risk for ignition,
- Activities are under the direct observation of the crew foreman or site lead,
- When the crew can maintain adequate communications,
- Local weather conditions, terrain, and surrounding vegetation would permit crews to extinguish a fire resulting from the work being performed,
- Crew has fire suppression equipment accessible in the immediate area of work that would facilitate an immediate response to an ignition, and
- Crews will be on alert for fires while working or passing through high-risk areas and immediately report fires or signs of fire to the operations center as soon as feasible.

7.8 De-energization/Public Safety Power Shutoff

A Public Safety Power Shutoff (PSPS) preemptively de-energizes power lines before high wind events combined with hot and dry weather conditions. While POPUD does not currently have a formal PSPS policy in place, the utility is actively evaluating the implementation of such a program to mitigate the risk of wildfire ignition.

POPUD is considering and analyzing the external risks and potential consequences of de-energization while striving to meet its main priority of protecting the communities and customers we serve. The risks and consequences of initiating a PSPS are significant and extremely complex.

These risks 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.
- Loss of power for fuel station pumping.

POPUD is studying and analyzing the risks and rewards of PSPS for possible use in the future. A broad customer and stakeholder engagement campaign will be necessary to better understand the risks and rewards before a decision regarding PSPS can be made.

8 Community Outreach and Public Awareness

8.1 Current Community Outreach and Public Awareness Program

Pend Oreille PUD provides regular communication to customers regarding power service and wildfire preparedness. The PUD uses SmartHub, its website, social media platforms, and local media to share information. During wildfire season, customers receive specific instructions on emergency preparedness, including monitoring weather conditions, preparing defensible space around property, assembling an outage kit, and having an evacuation plan.

In the event of an outage, Pend Oreille PUD directs customers to the outage map on its website, Facebook page and SmartHub app for real-time updates.

Defensible Space is often defined as an area around a home or outbuilding, where the flammable vegetation is modified and maintained to slow the rate and intensity of an advancing wildfire. In practice, this is an area with a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation. This area also provides room for firefighters to work to protect a structure from advancing wildfire as well as protect the forest from a structure fire.

POPUD encourages its customers to take proactive measures to safeguard their homes from wildfire danger and to prepare for emergency events. To help promote awareness of wildfire, and what homeowners can do to minimize risk, POPUD provides information on prevention and mitigation on its website and social media.

Customers will find links to information on the POPUD website regarding:

- Link to National Weather Service alerts
- Link to Pend Oreille County Emergency Notifications
- Home Emergency Planning
- Defensible Space Guidelines
- Trees Near Power Lines/Right Plant, Right Place

8.2 Public Agency and Customer Communications for Outages

POPUD communicates with its customers before planned outages and during un-planned outages. For scheduled maintenance outages the District provides as much notice as possible. Depending on how many customers will be affected by the outage, customers may receive advance notification via phone call, text message, email, postings on the PUD Facebook page and website, and in the local newspapers.

Key stakeholders and key accounts including health care facilities affected by a planned de-energization of the power lines are notified in all cases. POPUD calls the local communications companies (phone and internet providers) if they will be impacted by the outage. Similarly, County government officials and Pend Oreille County Department of Emergency Management (PODEM) are contacted prior to planned outages that would directly affect their operations.

During unplanned outages, information including the number of customers affected and geographical location are posted on the POPUD web-based outage map. Additional information, such as phone

numbers for reporting downed lines and outages, and safety information are also included on the District's website.

8.3 Jurisdictional Structure

POPUD has considered the jurisdictional structure of the service area when developing or implementing its strategic plan, including those related to wildfires. Figure 1 (page 6) illustrates the general land ownership, while the various stakeholders with land management responsibilities within the service area are listed below.

POPUD has assets in the following counties:

- Pend Oreille, WA
- Stevens, WA (approx. one mile of OH distribution)
- Spokane, WA (< one mile of OH distribution)
- Bonner, ID (< one mile of OH distribution)

State Lands:

- WA Dept. of Fish and Wildlife – Sherman Creek Wildlife Area and LeClerc Wildlife Area
- WA State Parks – Lake Newport State Park
- WA Department of Natural Resources Districts – Northeast Arcadia and Northeast North Columbia
- WA Department of Natural Resources – Uplands

Federal Lands:

- US Forest Service – Colville National Forest
- US Forest Service – Idaho Panhandle National Forest
- US Fish and Wildlife Service
- Bureau of Land Management

Tribal Lands:

- Kalispel Tribe of Indians

9 Restoration of Service

If an outside emergency management/emergency response agency requests a power shutdown, or an unplanned outage, POPUD staff will patrol the affected portions of the system before the system is re-energized. Suspect equipment or distribution lines that cannot immediately be patrolled will remain de-energized until visual confirmation of safe conditions can be established. 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.

After a large outage, transmission circuits are given priority over distribution lines during the restoration process. POPUD prioritizes outages at the higher-voltage level, which power substations serving large numbers of customers, schools, businesses, and hospitals first, then work is done to restore the largest feeders.

9.1 Restoration Process

POPUD work crews will take the following steps prior to restoring electrical service after an unplanned outage. These measures are intended to protect the workers, general public, and the reliability of the system.

- **Patrol: De**-energized lines are patrolled to ensure no hazards have affected the system during the outage. If an outage is due to wildfire or other natural disaster, as soon as it is deemed safe by fire officials**,** lines and equipment are inspected for obvious damage or foreign objects and to estimate equipment needed for repair and restoration. Lines located in remote and rugged terrain with limited access may require additional time for inspection. VM crews are called on to assist in clearing downed trees and limbs as needed.
- **Isolate: Isolate** the outage and restore power to areas not affected.
- **Repair:** After the initial assessment, POPUD supervisors, managers, and engineers meet to plan the needed work. Re-building will commence as soon as affected areas become safe. Repair plans prioritize substations and transmission facilities, then distribution circuits that serve the most critical infrastructure needs. While the goal is to reenergize all areas as soon as possible, emergency services, medical facilities, and utilities are given first consideration when resources are limited. Additional crews and equipment will be dispatched as necessary. Upon request the District will provide Pend Oreille County 911 with outage updates. During large-scale restoration events a POPUD representative may be on-site to provide a direct line of communication between PODEM and POPUD.
- **Restore: After** repairs are completed and the equipment is safe to operate, power is restored to homes and businesses as quickly as possible. Periodic customer and media updates of restoration status prior to full restoration will be made. After the initial power restoration, further demolition and rebuilding will likely take place.

10 Evaluating the Plan

10.1 Metrics and Assumptions for Measuring Plan Performance

POPUD has developed performance metrics intended to gauge the effectiveness of its various programs and strategies for mitigating power-related ignitions (Table 8, Appendix A). The 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. The metrics are also intended to assess the performance of different aspects of the plan. These metrics quantify the risk environment of POPUD's service territory and the mitigation policies.

Because this WMP is in the initial stage of implementation, relatively limited data is on hand. However, as results of the mitigation programs become evident and additional data is collected, POPUD will identify areas of its operations that will require a different approach, as well as develop additional methods to eliminate POPUD asset-sourced ignitions.

As the metrics are analyzed in the coming years, refinements will be made, and the selected metrics, as with other aspects of the plan, will likely evolve in future iterations of the WMP.

10.2 Programmatic Goals

POPUD outlines and schedules required work on an annual basis. The District strives to complete the work within the initially scheduled time frame, however, emergencies, unplanned staff turnover, 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 completed allowing for safe and reliable operation following industry safety standards.

10.3 Identifying and Addressing Areas of Continued Improvement in the Plan

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

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

10.4 Monitor and Audit the Effectiveness of Inspections

Monitoring the effectiveness of inspection practices will occur through ongoing tracking and review of findings resulting from internal processes. Concerns found during routine field work, equipment and line inspections will be used as a method to assess the effectiveness of inspection procedures.

POPUD is developing a program to regularly monitor inspection and corrective maintenance records and diagnostic test results. Results will be used to adjust maintenance plans and develop new programs.

Appendix A: Metrics

Table 8. Performance Metrics

External Metric	2024	2025	2026
Red Flag Warnings in service area			
Days in Fire-safe mode			
Distribution Performance Metrics	**2024**	**2025**	**2026**
Circuit Miles inspected			
Transmission Performance Metrics	**2024**	**2025**	**2026**
Circuit Miles inspected			
Vegetation Inspections	**2024**	**2025**	**2026**
Circuit Miles inspected			
Hazard Trees Removed			

Appendix B: Definitions

Best Management Practices (BMP): Innovative environmental protection practices applied to help ensure that projects or regular operations are conducted in an environmentally responsible or effective manner.

Burnable fuel: Refers to fuel models that are "ignitable" in the fire modeling. Burnable land cover includes grasses, herbs, shrubs, trees, leaf litter, dead-and-down branch wood, etc.

Circuit Breaker: Distribution circuit breaker providing protection for distribution feeder circuits. Located inside substation.

Commission: PUD-elected 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 POPUD distribution system includes 7kV-12.47kV 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 feet around a structure that is cleared of flammable brush or vegetation.

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 forecasters 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 is 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 BMLM or Forest Service. 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.

MVCD: Minimum Vegetation Clearance Distance is the calculated minimum distance stated in feet (meters) to prevent flash-over between conductors and vegetation, for various altitudes and operating voltages.

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.

Non-reclose: A recloser setting which prevents it from automatically reclosing after fault. When facilities are set to non-reclose, the lines must be manually patrolled downstream from the device during daylight hours to ensure they are clear before the line can be reenergized.

Pole Clearing: The process of establishing a firebreak clearance within an imaginary cylindrical space surrounding each pole or tower on which a switch, fuse, transformer, or lightning arrester is attached and surrounding each dead end or corner pole unless such pole or tower is exempt from minimum clearance requirements.

Public Utility District: Public Utility Districts are not-for-profit, locally regulated utilities that are created by a vote of the people. They were authorized in 1930 by a voter-approved initiative. Their charter under state law is to "conserve the water and power resources of the State of Washington for the benefit of the people thereof, and to supply public utility service, including water and electricity for all uses."

Raster: An array or regular grid of square cells used to store data.

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 multiple attempts 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)[21]: 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
- 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.

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

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

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

Substation: Part of the electrical generation, transmission and distribution system, substations transform voltage from high to low, or the reverse, or perform any 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.

Transmission System: The bulk delivery of electrical energy from a generating site to an electrical substation. At POPUD, for line maintenance purposes, the transmission system is comprised of 115kV lines.

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

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

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

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.

Appendix C: Acronym Glossary

ANSI	American National Standards Institute
AWP	Annual Work Plan
ACVI	Annual Corridor Vegetation Inspection
BIA	Bureau of Indian affairs
BLM	U.S. Bureau of Land Management
BMP	Best Management Practices
BPA	Bonneville Power Administration
DNR	Department of Natural Resources
DO	Director of Operations
DLI	Detailed Line Inspections
EOC	Emergency Operation Center
ERM	Enterprise Risk Management
GM	General Manager
HFTA	High Fire Threat Area
ICS	Incident Command System
IFPL	Industrial Fire Protection Level
kV	Kilovolt
MVCD	Minimum Vegetation Clearance Distance
NESC	National Electric Safety Code
NFDRS	National Fire Danger Rating System
OH	Overhead
PSPS	Public Safety Power Shutoff
QC	Quality Control
RFW	Red Flag Warning
ROW	Right of Way
SCADA	Supervisory Control and Data Acquisition
T&D	Transmission and Distribution
UG	Underground
USFS	United States Forest Service
VM	Vegetation Management
WA	Washington State
WHP	Wildfire Hazard Potential
WMP	Wildfire Mitigation Plan
WUI	Wildland Urban Interface