CASCADE LOCKS

2022 WILDFIRE MITIGATION PLAN

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1 Introduction

The Pacific Northwest (PNW) experiences some of the most devastating and catastrophic wildfires in the country. Unusually large wildfires are on the rise in the PNW, with an increase in fires in west-side conifer forests including previously rare fire events in the coastal temperate 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]. The City of Cascade Locks (CL or City) was directly impacted by wildfire when the 2017 Eagle Creek fire burned along the entire length of its Colombia River Gorge service area forcing mandatory community evacuations.

As a result of this increased wildfire danger Oregon Gov. Kate Brown signed an executive order (EO) creating the Governors' Council on Wildfire Response[3]. The EO recommends that the Oregon legislature develop legislation requiring utilities to prepare risk-based wildfire standards and procedures including criteria for initiating preemptive power outages. As of the writing of this plan, legislation regarding utility Wildfire Mitigation Plans (WMPs) remains in committee but is expected to be signed into law once passed[4].

For CL, which aims to protect public safety and preserve the reliable delivery of electricity, wildfire mitigation is without question a top priority. While an electric utility can never fully eliminate the risk of fire, CL is committed to taking all practical actions available to it to prevent 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
[3] Executive Order 19-01, January 30, 2019
[4] Senate Bill 762

1.1 Purpose of the Wildfire Mitigation Plan

Reducing the risk of utility-caused wildfire plays an essential role in CL'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 wildfire.

Going forward, CL 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 CL Wildfire Mitigation Plan (WMP or Plan) takes an active approach to reducing fire-related risks to its community while allowing for retooling and improvement over time. The Plan describes CL'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.

The plan takes an active and comprehensive approach tailored for CL's service territory with the ultimate objective to minimize CL's assets as the origin or contributing factor in a wildfire. While CL's City Council Members review and approve the Plan as needed, its implementation primarily resides with the City Administrator (CA).

1.2 Objectives of the WMP

The main objectives of this WMP are to:

1. Implement an actionable plan to increase reliability and safety while minimizing the likelihood of CL assets becoming the origin or contributing factor for wildfire.
2. Maintain a plan that prioritizes safety, situational awareness, preventive 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.
5. Develop safety related protocols that align with requirements found in Oregon Administrative Rules (OAR) and Oregon Public Utility Commission (OPUC) regulations.

1.3 CL Profile and History

CL is one of 11 municipally-owned electric utilities in Oregon State. As the first community served by Bonneville Dam, CL has operated its electric system for 83 years. Since its inception in 1938, City Electric strives to uphold a commitment to service excellence while delivering safe, affordable, and reliable electricity to its customers. These tenets are further enhanced with innovative energy solutions and a deep-rooted involvement in the community it serves. The system provides power to approximately 700 residential meters, 126 commercial and industrial meters and street lighting customers.

2 Service Area and Electric System

2.1 The Service Area

Operating out of offices located in Cascade Locks, City Electric serves the City of Cascade Locks, as well as the unincorporated communities of Dodson and Warrendale in Hood River and Multnomah Counties (Figure 1) and provides service to approximately 1,800 community members. The local economy is concentrated in tourism-focused industries (accommodation and food service) and also manufacturing.

The approximately 25-mile long, 10-square mile service area is bound by the Columbia River to the north and the steep cliffs of the Columbia Gorge and Mount Hood National Forest to the South. The service area runs from approximately 4 miles east of the city of Cascade Locks and continues west along U.S. Route 30 to the Bridal Veil Falls scenic area. Much of the service area is quite narrow, with the widest point at .65 miles.

The Cascade Locks area has a warm-summer Mediterranean climate[5] and receives an average of 76.3 inches of precipitation per year. The "Rain Shadow" created by the Cascade Range of mountains runs almost directly through the Cascade Locks. This means that the service area receives more rain than the City of Hood River, and other locations to the east. The summer fire season runs generally from June to mid-September with average daily high temperatures above 75°F. On average, the hottest and driest day of the year is August 4th with an average high of 84°F[6].

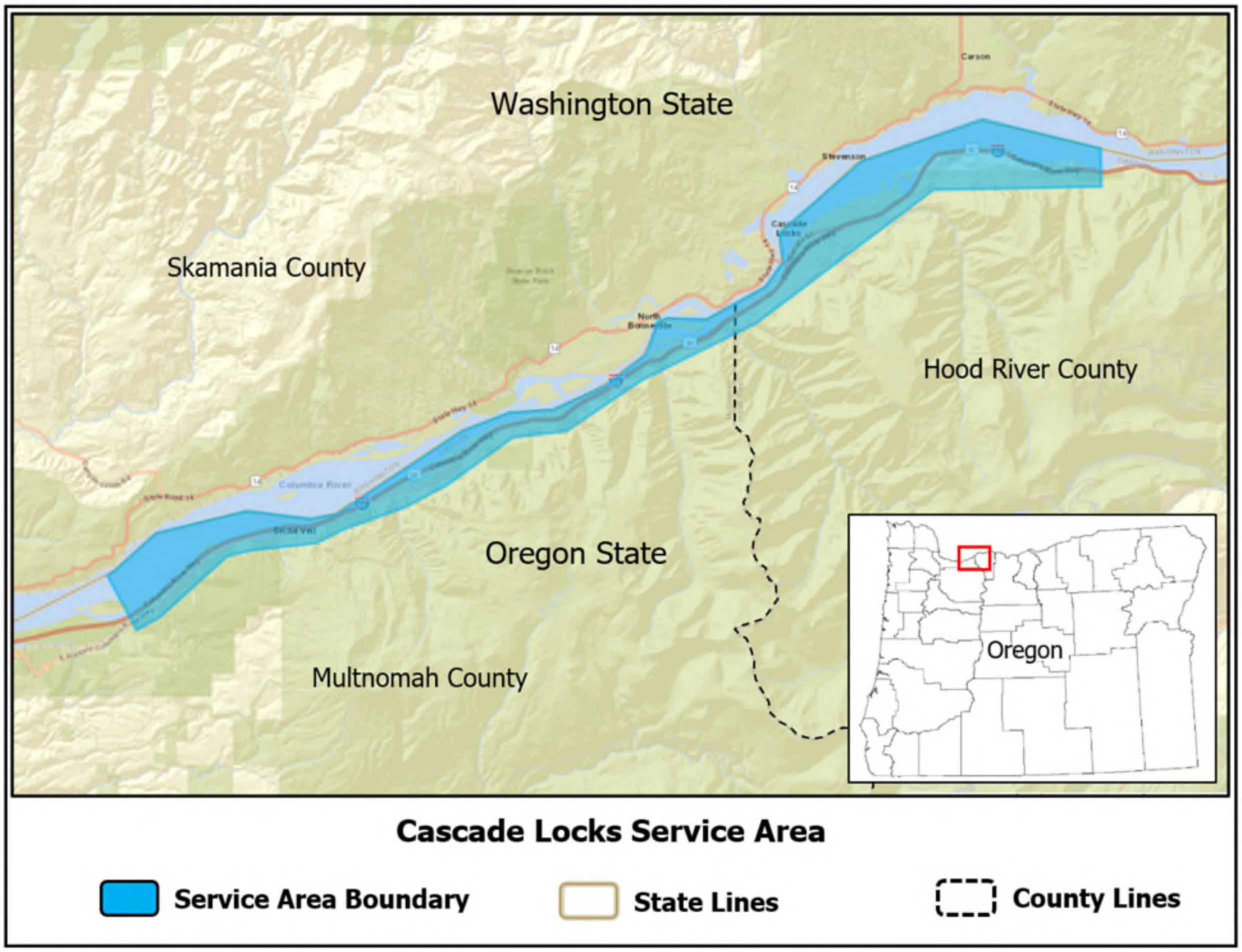
The average hourly wind speed in Cascade Locks experiences mild seasonal variation over the course of the year. The windier part of the year lasts for 4.2 months, from November 3 to March 10, with average wind speeds of more than 4.6 miles per hour. The windiest day of the year is December 29, with an average hourly wind speed of 5.5 miles per hour.

Vegetation in the service area comprised mainly of conifer forest (60%), with the remainder made up of grassland (3%), riparian (2%), and non-vegetated or developed lands (33%). Recent wildfire incidents have left many dead trees in portions of the service area which may pose risks to the distribution system in the future as they deteriorate and become unstable.

[5] Köppen climate classification

[6] https://weatherspark.com/y/1226/Average-Weather-in-Cascade-Locks-Oregon-United-States-Year-Round

Figure 1. Cascade Locks Service Area



2.2 The Electric System

CL owns and operates an electric system that includes transmission and distribution facilities and provides power to customers by way of one bulk substation, overhead transmission lines, and overhead and underground distribution line assets. The utility has its headquarters office, operations center, and equipment storage facility in Cascade Locks, OR.

The local power network is a part of a larger electrical grid serving the Northern Oregon and greater Pacific Northwest region. CL buys its wholesale power from the Bonneville Power Administration (BPA), of which approximately 83% comes from large hydroelectric generation facilities along the Columbia River and takes delivery at its Pyramid substation.

The OH (T&D) system is comprised primarily of wood pole structures with bare wire conductors, although some areas have been converted to tree wire (insulated conductor) for reliability and fire mitigation benefits. Approximately 4 miles of the distribution system is underground (UG), with all new residential and commercial connections built as underground installations.

Major BPA transmission corridors with 115kV, and 500kV lines carry power into and through the service area.

Table 1 provides a high-level overview of CL's T&D assets.

Table 1. Asset Overview

ASSET CCLASSIFICATION	ASSET DESCRIPTION
Transmission	Approximately 390 feet of 115kV transmission line*, structures, and switches.
Distribution	Approximately 50 miles of 13.8kV overhead (OH) and 4 miles of 13.8kV underground (UG) conductor, cabling, transformers, voltage regulators, capacitors, switches, and line protective devices.
Substation	Major equipment such as power transformers, voltage regulators, capacitors, protective devices, relays, open-air structures, switchgear, and control house in 1 substation facility.

* Owned and maintained by Bonneville Power Administration

3 Overview of CL's Fire Mitigation Strategies

3.1 Strategy and Program Overview

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

- **Design & Construction:** CL's design and construction consist of system, equipment, infrastructure design, and technical upgrades. These practices aim to improve system hardening to prevent contact between infrastructure and fuel sources to minimize the risk of CL's systems becoming a source of ignition.
- **Inspection & Maintenance:** CL's inspection and maintenance strategies consist of diagnostic activities as well as various methods of maintaining and ensuring all equipment and infrastructure is in excellent 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 CL'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.

3.2 Mitigation Strategies and Programs

This WMP integrates and interfaces with CL'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 new, best management practices as they are identified, developed, and deemed feasible for use on CL's electrical infrastructure.

Table 1 summarizes CL's five mitigation components with associated programs and activities that support CL's ongoing commitment to wildfire prevention and mitigation.

Table 2. Mitigation Programs/Activities

DESIGN AND CONSTRUCTION
Underground distribution lines
Tree wire (covered conductor)
Animal guards on select electrical equipment
Avian protection construction standards
INSPECTION AND MAINTENANCE
Wood pole inspection and treatment program
Vegetation right-of-way maintenance
Distribution system line patrols and detailed inspection
Enhanced line patrols during fire season
Increased removal rate of undesirable trees on right-of-ways
Vegetation management program
Mid-cycle vegetation trimming
Inspection of distribution system high risk areas before fire season

Table 2. (continued)

OPERATIONAL PRACTICES
Alternate recloser practices during fire weather
Work procedures and training for persons working in locations with elevated fire risk conditions
Community outreach/wildfire safety awareness
Fire suppression equipment on worksite during fire season
Special work procedures for high Industrial Fire Precaution Levels
SITUATIONAL AWARENESS
Monitoring active fires in the Pacific Northwest
Service area weather conditions monitoring
Industrial Fire Protection Level monitoring
RESPONSE AND RECOVERY
Pre-emptive de-energization protocols
Provide liaison to county offices of emergency management during fire event
Coordination with local Department of Emergency Management
Line patrols prior to re-energization
Emergency Operations Plan

4 Risk Analysis and Risk Drivers

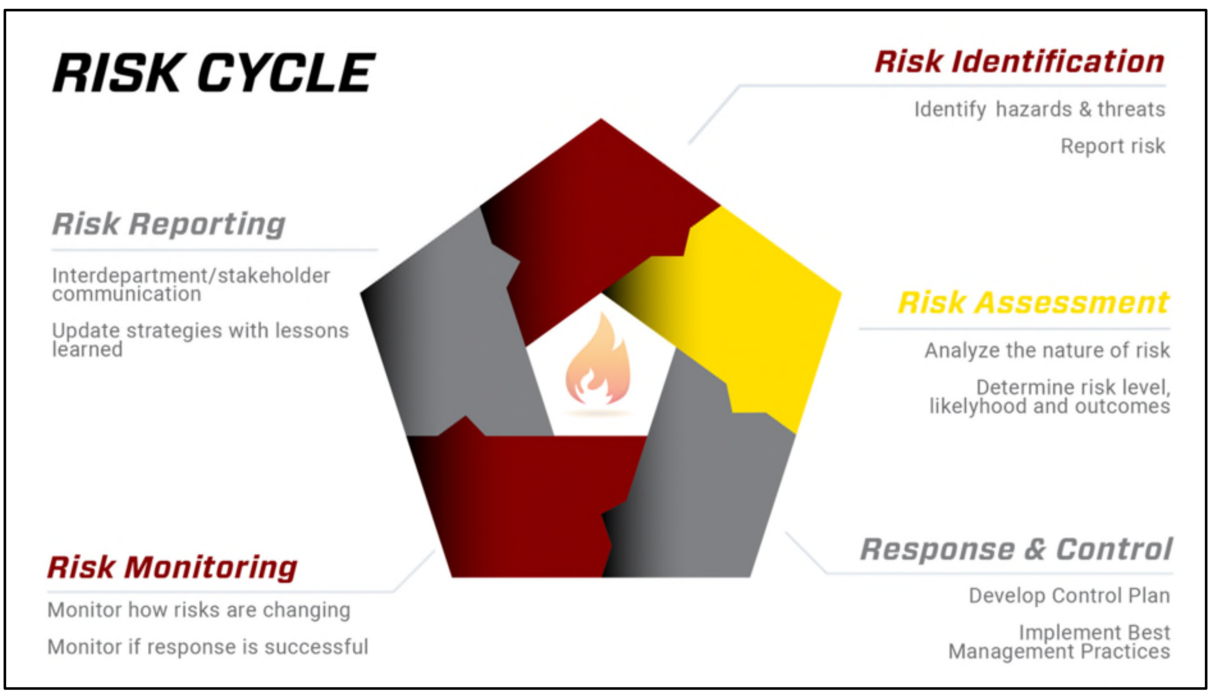
CL examined its exposure to fire-related hazards to establish a baseline understanding of the risks and risk drivers involved in electrical distribution operations. Although inherent risks exist in operating an electric utility, there are strategies and processes to better plan and manage them. After identifying key risk factors, CL incorporated best available utility practices where necessary, to bolster existing mitigation strategies and programs. This combination of existing and soon-to-be-implemented practices has been incorporated in the plan to mitigate the identified risk factors for the utility.

4.1 Enterprise Risk Management

The Enterprise Risk Management process is not a periodic "Risk Assessment" but an ongoing and forward-looking management discipline enabling CL to analyze risks continually and adapt to changing conditions. The key or critical risks affect the entire community and are interrelated, therefore, they are managed holistically with a structured approach. Figure 2 illustrates the risk management process.

The Risk Assessment process began with the City Administrator, 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, mitigations, controls, and CL policies and procedures.

Figure 2. CL Enterprise Risk Management Process



4.2 Climate Change

The Fourth National Climate Assessment, published in 2018, states that 2015 temperatures were 3.4°F above normal (as compared to the 1970-1999 average) with winter temperatures 6.2°F above normal. The warm 2015 winter temperatures are illustrative of conditions that may be considered "normal" by mid or late century. The lack of snowpack in 2015 in concert with extreme spring and summer precipitation deficits led to the most severe wildfire season in the Northwest's recorded history with more than 1.6 million acres burned across Oregon and Washington[7].

Climate change can affect forests by altering the frequency, intensity, duration, and timing of fire, drought, introduced species, insect and pathogen outbreaks, windstorms, ice storms, or landslides (Dale et al. 2001). Potential climate change effects on this ecosystem would likely include a shift to plant species more common on hotter, drier sites. The average annual temperature is projected to continue to increase in the Pacific Northwest along with the increasing number and severity of wildfires and insect outbreaks[8]. Rising temperatures are likely to increase bark beetle survival, but climate-induced changes to other insects and forest pathogens are more varied and less certain. Increased temperatures will have positive or negative effects on individual trees and forest-wide processes, depending on local site and stand conditions, but impacts from increased extreme heat will be negative.

4.3 Fire Risk Drivers

CL 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.

The conditions listed below were identified for having the potential for causing powerline sparks and ignitions:

- Equipment / Facility Failure
- Foreign Contact
- Vehicle Impact
- Expulsion Fuses
- Aging Infrastructure
- High winds
- Tree Failure/Hazard trees
- Red Flag Warning Conditions
- Vegetation Type / Fuel Load

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[7] NCEI, 2018: Climate at a Glance. Regional Time Series: Northwest Climate Region, Average Temperature, January–December 2015

[8] (McKenzie et al. 2004, 2008, Westerling et al. 2006, Mote et al. 2014, Shafer el al. 2014)

4.4 Key Risk Impacts

The aforementioned risks have many possible consequences should any be a contributing factor for an ignition. The list below outlines some of the worst-case impact 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 CL owned infrastructures and assets
- Impacts to reliability and operations
- Damage claims and litigation costs, as well as fines from governing bodies
- Damage to CL's reputation and loss of public confidence

4.5 Wildfire History and Outlook

Generally speaking, fire season in north-central Oregon lasts from April through the end of October, but research indicates that this is changing. In the PNW the annual probability of very large fires is projected to increase by a factor of 4 in 2041-2070 compared to 1971-2000[9], and fire seasons from 2003 through 2012 averaged more than 84 days longer than in 1973 to 1982[10]. The largest fires 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[11].

Previous significant fires in the vicinity include the Eagle Creek fire, which burned nearly 50,000 acres in 2017, and the 500 acre Herman Creek fire of 2003. All fire starts in and around the service area have been human caused, meaning they are not attributable to lightning. Trees severely damaged, but not immediately killed from wildfire usually die within 2 years[12]. These "hazard trees" will eventually fall and may pose ongoing risks to the powerlines. There are a significant number of dead trees upslope from the distribution lines presenting an indirect threat to the distribution lines and poles.

4.5.1 Fire Threat Assessment Mapping

The Wildfire Hazard Potential[13] (WHP) map used in this plan is a raster geospatial dataset produced by the USDA Forest Service, Fire Modeling Institute that can help to inform evaluations of wildfire risk or prioritization of fuels management needs across very large landscapes. The specific objective of the WHP map is to depict the relative potential for

[9] Northwest Climate Adaptation Science Center
[10] Westerling, A.L. 2016 Increasing Western US Forest Wildfire Activity; https://royalsocietypublishing.org/doi/10.1098/rstb.2015.0178
[11] RMJOC 2018; Gergel et al 2017
[12] Managing Forests After Fire, Pacific Northwest Research Station, Issue 15, 2007
[13] https://www.fs.usda.gov/rds/archive/Catalog/RDS-2015-0046-2

wildfire that would be difficult for suppression resources to contain. The 2018 version was built upon spatial datasets of wildfire likelihood and intensity generated for the conterminous U.S. in 2016 with the Large Fire Simulator (FSim), as well as spatial fuels and vegetation data from LANDFIRE 2012 and point locations of past fire occurrence (ca. 1992 - 2013). Areas mapped with higher WHP values represent fuels with a higher probability of experiencing torching, crowning, and other forms of extreme fire behavior under conducive weather conditions, based primarily on landscape conditions at the end of 2012. A WHP map for the State of Oregon is provided on the following page to give context to the detailed map below.

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 information on current or forecasted weather or fuel moisture conditions. It is instead intended for long-term strategic planning and as a fuels management tool.

Figure 3. Cascade Locks Wildfire Hazard Potential Map

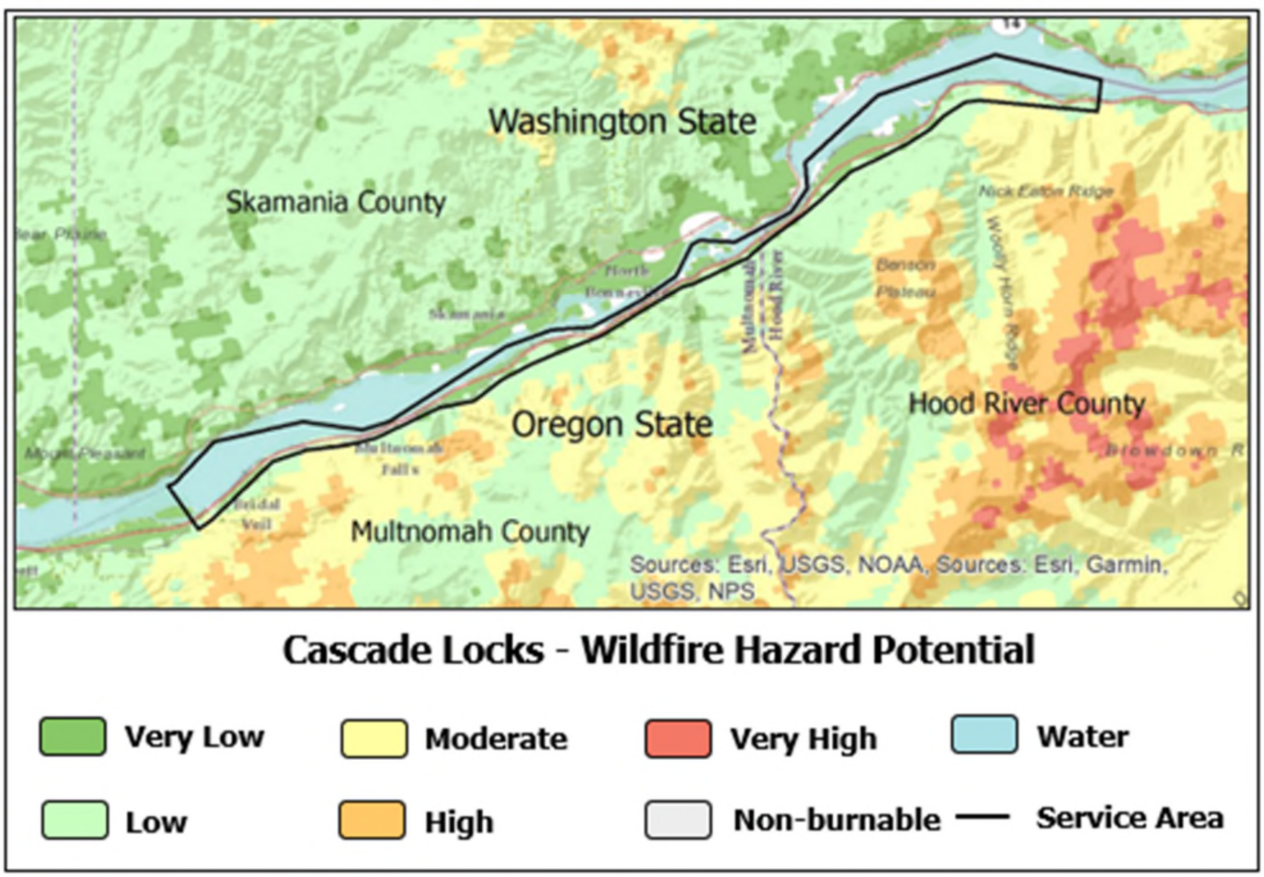
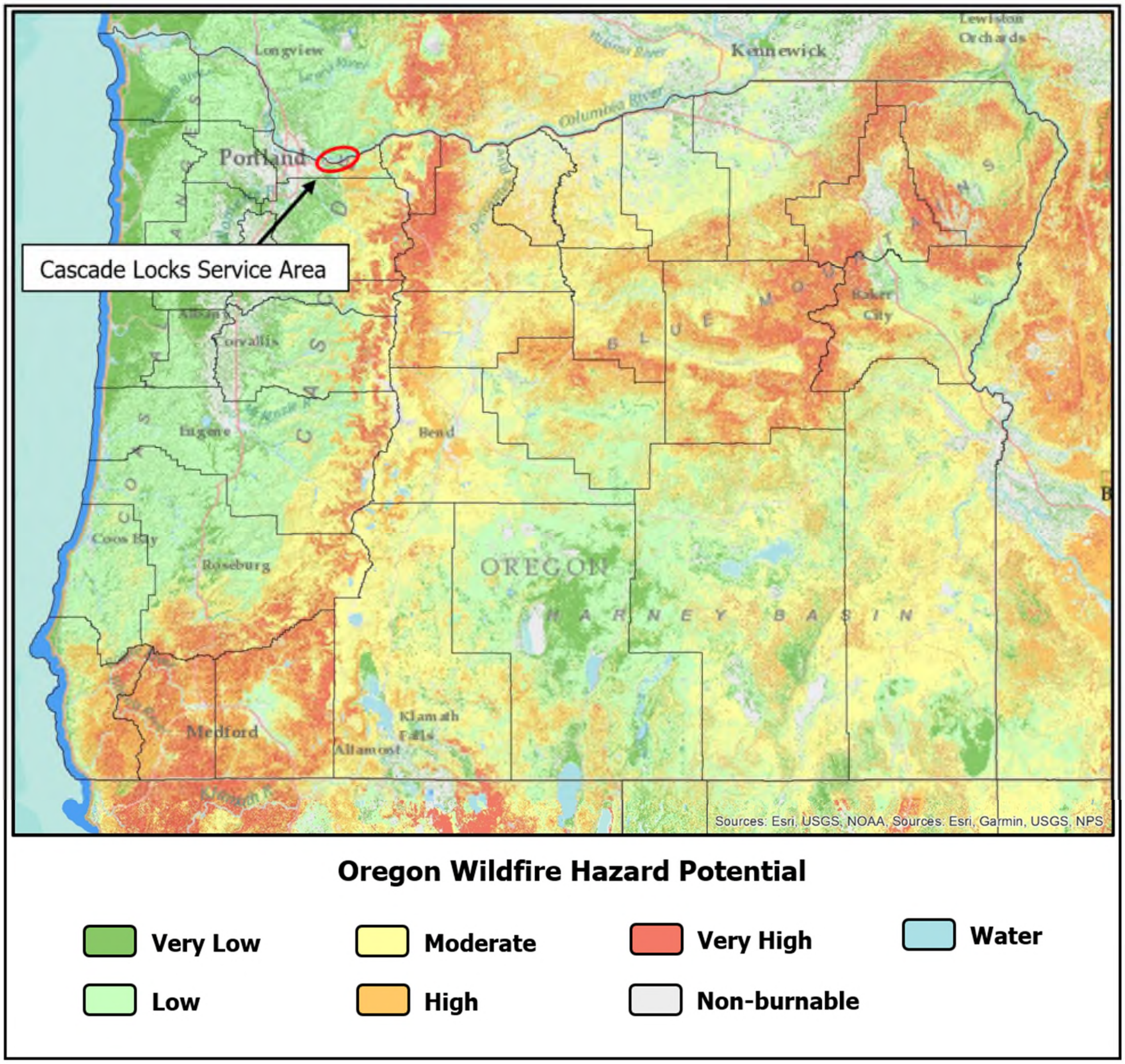


Figure 4. Oregon State WHP Map



5 Wildfire Prevention Strategy and Programs

5.1 Transmission & Distribution Operational Practices

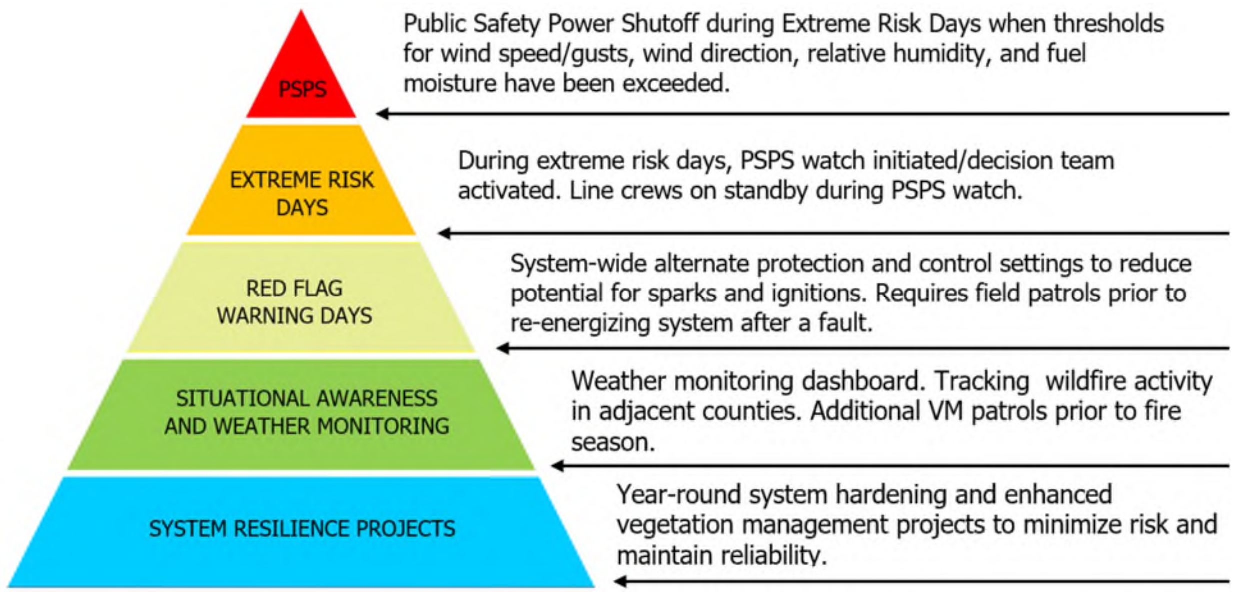
This chapter outlines CL's existing fire mitigation efforts and identifies new processes and pilot programs CL may employ moving forward. Some of these programs are multi-year and programmatic, while others are situational and based on environmental conditions such as Red Flag Warnings or other high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

CL continues to explore new technologies and approaches to determine their ability to reduce the probability of an ignition and improve system reliability. CL updates its practices as new information emerges and then adopts improved strategies.

5.1.1 Wildfire Readiness Framework

CL's enterprise-wide approach to wildfire readiness is comprised of the conditional levels depicted in figure 4 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 5. Wildfire Readiness Framework



5.1.2 Situational Awareness and Assessment Tools

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.

CL 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, on-line weather reporting, asset maintenance reports, ongoing wildfire reporting and other resources. Based on available information, CL appropriately schedules work crews, adjusts equipment settings, and prepares for imminent fire conditions as needed.

5.1.3 De-energization of Powerlines

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, CL examines the impacts on fire response, water supply, public safety, and emergency communications.

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

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

The risks and potential consequences of initiating a PSPS are significant and extremely complex. Based on the above considerations, CL reserves the option of implementing a PSPS when conditions dictate. While CL 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, CL 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, but the final determination is made by the Cascade Locks Electric Department.

5.1.4 Recloser Operational Practices

When high fire risk conditions exist in the service area, such as during Red Flag Warnings or a Fire Weather Watch, CL may disable automatic reclosers throughout the system as a preventative measure. The system does not currently have SCADA capabilities, therefore, to set protection equipment to non-reclose mode, operators must make the adjustment at the recloser.

CL will continue to use, analyze, and modify this practice as necessary and will fold this practice into its existing outage communications 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 automatic reclosing, or manual testing.

5.2 Infrastructure Inspections and Maintenance

Recognizing the hazards of equipment that operate high voltage lines, CL has initiated formal time-based and risk-based inspection and maintenance programs for distribution, transmission, and substation equipment which plays an essential role in wildfire prevention. CL currently patrols its system regularly and is increasing the frequency of inspections in high-risk areas. The following sections outline the inspection practices for the utility.

5.2.1 Definition of Inspection Levels

1. **Safety Patrol Inspection:** A simple visual inspection of applicable utility equipment and structures designed to identify obvious structural problems and hazards. Patrol inspections may occur in the course of other company business.
2. **Detailed Inspection:** Individual pieces of equipment and structures receive a careful visual examination, and using routine diagnostic testing as appropriate, and if practical and useful information can be gathered, opened and the condition of each rated and recorded.
3. **Intrusive Pole Inspection:** Involving the movement of soil, boring holes in the wood pole above and below the ground line, checking for decay, and installing a fumigant as needed.

5.2.2 Safety Patrol Inspection

CL has a system patrol process complying with OAR 860-024-0011 requirements, including biennial patrol inspections of T&D system infrastructure. Theses inspections also provide ground-level evaluation of right-of-ways (ROW)s, access roads, vegetation-to-conductor clearances, and hazard tree identification. The information accumulated informs planning and scheduling of future maintenance to avoid major faults and ignition potential.

Routine safety patrol inspections of overhead electric supply lines and accessible facilities are performed by service vehicle and foot patrol. Inspectors look for visible signs of defects, structural damage, broken hardware, abnormally sagging lines, vegetation clearance issues, and wildlife contacts. Any anomalies found are addressed based on the severity of the defect.

Routine patrol inspections are conducted on a two-year cycle on all overhead transmission and distribution lines. In the "High Risk" WHP areas, safety patrol inspections occur annually before fire season. The maximum interval between safety patrols is two years, with a recommended rate of 50% of lines and facilities per year.

5.2.3 Detailed Inspection

Detailed Line Inspections (DLI) of the distribution lines fall within a 10-year cycle which ensures safety and reliability based on standards found in Oregon Administrative Rules (OAR) 860-024-0011. System equipment found in need of maintenance or repair is categorized depending on the severity of the condition.

DLIs consist of foot and vehicle patrols to examine wood poles, conductors, and equipment. Visual aids assist with evaluating and detecting potential damage to above-ground components. Any anomalies found are addressed based on the severity of the defect.

5.2.4 Wood Pole Intrusive Inspection

To maintain the District's wood poles, a formal Wood Pole Assessment Plan was initiated with the goal to inspect 12% of the system each year. Wood pole decay will progress at generally predictable rates, and its advance 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.

CL 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.

5.2.5 Instructions to Inspectors

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

Inspection data (overhead & underground) will be prioritized and issued as follows per OAR 860-024-0012 safety standards:

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

- **Priority # 2** – Non-emergency repair condition: Except as otherwise provided by this rule, the operator must correct violations of Commission Safety Rules no later than two years after discovery. These are conditions requiring maintenance, which can be scheduled to maintain the system's integrity. Priority #2 repairs will be prioritized by urgency and scheduled to have appropriate repairs to correct the condition within one year where practicable.
- **Priority # 3** – Non-emergency repair condition: An operator may elect to defer correction of violations of the Commission Safety Rules that pose little or no foreseeable risk of danger to life or property until the next major work activity. These are conditions that do not present a situation which could jeopardize the system's safety, line workers, or the general public. Priority #3 repairs are completed within the time interval recommended.

5.2.6 Substation Inspections

The maintenance plan provides for regular inspections of CL's substation. 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 conducted monthly.

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.

5.3 Vegetation Management

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. CL maintains over 50 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, CL has developed a comprehensive vegetation management schedule intended to minimize the hazards of vegetation on the system.

CL'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, 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, CL 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.

5.3.1 VM Trimming Schedule

Through its regularly scheduled tree-trimming program, CL 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, CL employs in-house tree trimming crews for year-round vegetation management work on a 3-year pruning cycle. Areas with fast-growing species are trimmed mid-cycle as needed to maintain safe vegetation clearance from the power lines and associated equipment.

CL line crews also address vegetation concerns in response to service calls or field observations by line crews. 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 a VM contractor for priority trimming.

5.3.2 Vegetation to Conductor Clearance

Interfering tree limbs and falling trees or branches are the No. 1 cause of power outages. Since conductors move horizontally and vertically based on dynamics such as operating temperature, wind, and loading, clearance is evaluated from all possible conductor positions. Clearance also accounts for vegetation that would grow into, bend into, swing into, or fall into a clearance distance if not removed. Effort will be made to eliminate all trees, tree parts, and growth points beneath the wires and any weak, diseased, and dead limbs above the wires which may fall or blow into the wires.

The goal at the time of trimming is to achieve 10 feet of clearance from the conductor on each side and as high above the lines as is possible with the equipment available.

CL realizes that it is not always possible to achieve these specifications due to existing vegetation, which is why the utility works together with its customers to achieve as close to the ideal trim as possible. Pad-mount transformers are also cleared of vegetation so that no obstructions would impede CL crews in the operation, maintenance, installation, removal, or repair of the equipment.

5.3.3 Controlling Incompatible Vegetation

In addition to the regular patrols by CL field staff observing and reporting on incompatible uses and encroachments, CL makes efforts to educate public and private landowners about incompatible vegetation that can pose risks if planted under or near conductors. To help achieve this public awareness, CL website provides guidance on "Correct Tree / Correct Place". Customer input, combined with regularly scheduled ROW maintenance, helps to ensure that our power system is as reliable as possible.

For property owners wishing to prune trees near service lines, CL will provide a courtesy disconnect so that this work can be done safely.

5.4 Fire Mitigation Construction

CL is taking steps to harden the electrical system with several upgrades and design changes. These designs stem from many decades of engineering experience and the adoption of emerging technologies. CL's design practices continue to advance with the addition of newer safety and reliability-related technologies. This advancement recognizes the importance of understanding and adapting to the challenges brought on by the use of public land, development in the WUI, and climate change.

5.4.1 Avian Protection

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.

CL has implemented design and construction standards to protect raptor and migratory birds throughout the service area. These measures have 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).

Future projects include steps to enhance avian populations and habitat by developing nesting platforms on unused poles.

5.4.2 Underground Conductor

Approximately 8% of CL's distribution system is underground. The undergrounding of overhead distribution lines provides several benefits for utility operations and functions as an effective tool in CL'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 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

CL has approximately 4 miles of 13.8kV 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 do take longer and cost significantly more to construct, maintain, and repair. The majority of the service taps are underground line.

5.4.3 Tree Wire

Tree wire, or covered open 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. CL has installed tree wire in some areas to improve service reliability and to reduce the risk of ignitions due to vegetation contact.