



Seattle City Light

WILDFIRE RISK REDUCTION STRATEGY

Summer 2023

Version: 2023.08.v01

Table of Contents

- Message From the General Manager/CEOi**

- 1. Overview1**

- 2. Background3**
 - 2.1. Introduction.....3
 - 2.2. Purpose3
 - 2.3. Seattle City Light Service Area and Assets4
 - 2.4. Structure of the City Light WRRS6
 - 2.5. Regulatory and Legislative Context7

- 3. Current State of Risk.....8**
 - 3.1. Pacific Northwest Wildfire Risk and Climate Change8
 - 3.2. Risk Profile of City Light Facilities9
 - 3.2.1. Skagit Hydroelectric Project, Including Communities of Newhalem and Diablo11
 - 3.2.2. Boundary Hydroelectric Project 11
 - 3.2.3. Cedar Falls and South Fork Tolt Hydroelectric Projects 12
 - 3.2.4. Transmission Infrastructure 12
 - 3.2.5. Distribution Infrastructure..... 13
 - 3.3. Operational Risks..... 13

- 4. Risk Assessment 15**
 - 4.1. Asset Inventory..... 15
 - 4.2. Assessing Asset Condition..... 15
 - 4.3. Understanding Asset Failures..... 16

- 5. Risk Mitigation 18**
 - 5.1. Grid Hardening Programs..... 18
 - 5.1.1. Transmission Line Reliability Program 18
 - 5.1.2. Transmission Line Capacity Program 18
 - 5.1.3. Transmission Wooden Pole Replacement 18
 - 5.1.4. Distribution Overhead Equipment Replacements 19
 - 5.1.5. Distribution Overhead Customer-Driven Capacity Addition..... 19
 - 5.1.6. Distribution Undergrounding Programs 19
 - 5.1.7. Distribution Automation 19
 - 5.1.8. Substation Circuit Breaker Replacement Program 19
 - 5.1.9. Substation Equipment Improvement Program..... 20
 - 5.1.10. Cedar Falls Hydroelectric Facility Project Hardening..... 20
 - 5.2. Vegetation Management 20
 - 5.2.1. Transmission Vegetation Management..... 20
 - 5.2.2. Transmission Line Vegetation Inspections 21
 - 5.2.3. Vegetation Clearance..... 21
 - 5.2.4. Danger Tree Removal 22
 - 5.2.5. Right-of-Way Maintenance 23
 - 5.2.6. Quality Assurance and Control 23

5.3.	Power Supply Diversification	23
6.	Emergency Management.....	24
6.1.	Situational Awareness	24
6.1.1.	Weather Forecasting	24
6.1.2.	Operational Coordination	24
6.2.	Operational Response	25
6.2.1.	Emergency Management Plans	26
7.	Stakeholder Cooperation and Community Engagement.....	28
7.1.	Engagement With Communities	28
7.2.	Engagement With Emergency Response Organizations and Municipalities.....	29
8.	Accountability and Governance Structure	30
9.	Action Plan	31

Acknowledgments

The Seattle City Light Wildfire Risk Reduction Strategy team would like to thank the following individuals who participated in project reviews:

Oregon State University

- Andy McEvoy

Seattle Public Utilities

- Ann Grodnik-Nagle
- Chris Hilton
- Julia Munger

University of Washington

- Brain Harvey
- Crystal Raymond

Western Electricity Coordinating Council

- Steve Ashbaker



Message From the General Manager/CEO

Our assets and infrastructure span diverse geographies and topography, exposing them to a range of wildfire risks. The risks are highest where our transmission lines cross through forests and at our remote generation sites: Boundary Dam in the northeast corner of the state, the Skagit Hydroelectric Project in the upper watershed of the Skagit River in the North Cascade Mountains, and the Cedar Falls and Tolt hydroelectric projects in eastern King County.



At City Light, maintaining a culture of preparedness is a priority. We work year-round to make sure our electric grid, transmission lines, system equipment and facilities are resilient to storms and natural disasters. The risk of fires being ignited by our own assets is low, but we recognize wildfire risk is increasing even in typically soggy areas of the state. That is why we've developed this Wildfire Risk Reduction Strategy to help us prevent, mitigate and quickly recover from the devastation wildfires can bring to the people and communities we serve.

We've learned from our experience with past forest fires around the Skagit project, which have brought out the best in our crews. In 2005, a hiker ignited a fire along Highway 20 between the utility-owned towns of Newhalem and Diablo, which burned into City Light's right-of-way beneath transmission towers. In 2015, the Goodell Creek fire, caused by lightning, burned thousands of acres near Newhalem.

This strategy underscores our commitment to environmental stewardship and highlights existing preventive measures, including vegetation management, a climate-change research and adaptation program designed to increase resilience to changing climate and its associated consequences such as wildfire, and a robust emergency-management program to prevent, respond to and recover from threats and hazards.

Our strategy, which will be updated regularly, is a first step to proactively assess and develop a comprehensive approach that analyzes our existing programs and ensures City Light is prepared to respond to the crisis and impact of wildfires. It also includes critical components such as coordinating with regional agencies and partners, satisfying state and federal mandates, and providing an effective road map for post-wildfire recovery.

Thank you to the City Light team leading this important effort, our partners for their support and expertise, and our customers and communities for your trust as we continue our commitment to protect our system, employees and community from the growing threat of wildfires.

Debra J. Smith



1. Overview

Seattle City Light developed this Wildfire Risk Reduction Strategy (WRRS) because wildfire presents an increasing risk, driven in part by climate change. Ensuring the safety of customers, communities, and employees, as well as maintaining the reliability of our services, are City Light's foremost concerns. City Light also recognizes the legislative momentum around mitigating wildfire risk and wishes to address the issue in a proactive manner.

City Light has actively managed wildfire risk for years, and the WRRS is an effort to formalize and advance our wildfire risk reduction efforts. The objectives of the WRRS are to understand City Light's current state of wildfire risk, review industry best practices for wildfire risk reduction, identify the wildfire risk reduction actions and possible gaps of existing City Light programs, and develop a portfolio of potential future actions to address gaps in wildfire risk. The WRRS addresses both the potential for City Light infrastructure to cause wildfires as well as the potential for City Light infrastructure and operations to be impacted by wildfires.

The approach taken in developing the WRRS included establishing a wildfire risk reduction framework to guide development of the strategy, reviewing and customizing the various elements of the framework based on applicability to City Light, articulating the current status of City Light programs relevant to the individual framework elements, identifying gaps, and summarizing potential future actions. Many dedicated employees and subject matter experts across the organization and electric utility industry contributed to the effort. Numerous wildfire plans as well as regulatory requirements for wildfire mitigation were reviewed and resulted in a framework that incorporates the key elements to reduce wildfire risk:

- Risk assessment
- Risk mitigation
- Emergency management
- Stakeholder engagement

What are the key elements of City Light's Wildfire Risk Reduction Strategy?

- **Risk assessment** to understand the risk of electric grid assets causing wildfires, as well as the risk of those assets being affected by wildfires.
- **Risk mitigation** to reduce wildfire risk, including actions such as grid hardening and vegetation management.
- **Emergency management** to monitor for high-risk weather conditions when fires are more likely to occur and to respond when those conditions arise.
- **Stakeholder engagement** with the communities that may be affected by wildfire or City Light's response to wildfires, and coordination with emergency response organizations and municipalities to respond to events.
- **Governance and accountability** to designate responsibility for execution of the WRRS and provide oversight to improve the strategy as it is executed.

- Governance and accountability

City Light's WRRS includes all five elements, and the specific capabilities included in the strategy are based on their applicability to City Light's system, processes and circumstances. The WRRS also includes an action plan that outlines specific actions City Light will take across the five areas of the framework to advance the strategy.



Seattle City Light transmission lines overlooking downtown Seattle.

2. Background

2.1. Introduction

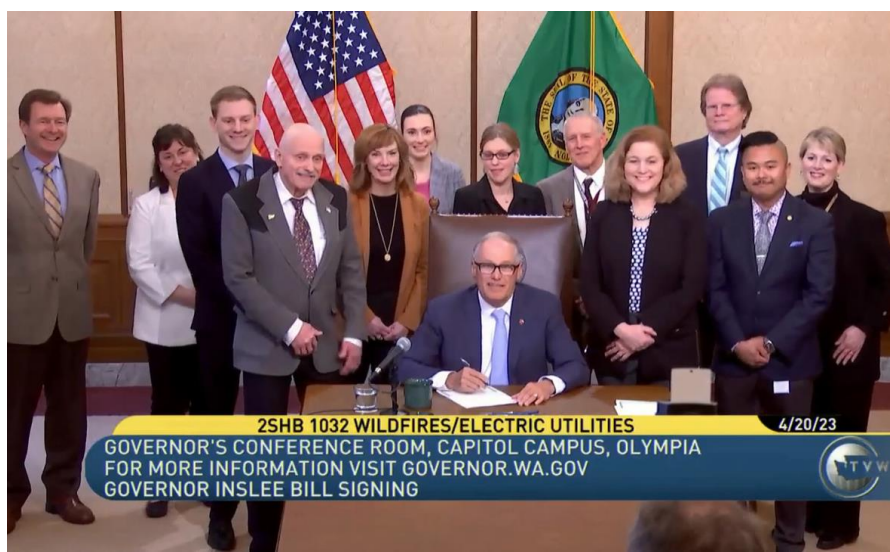
City Light strives to provide affordable, reliable, environmentally responsible energy while prioritizing the safety of our customers, communities and employees. Although wildfire risk has historically been relatively low in western Washington, climate change and the growing human population, resulting in expanding wildland-urban interface, are increasing the threat of wildfire to City Light's electricity generation and delivery, communities, and employees. All of City Light's hydroelectric projects and their associated transmission lines are in rural, forested areas with greater exposure to wildfires compared to urban areas with fewer trees and faster firefighting response. In 2015, a lightning strike ignited the Goodell Creek fire, which caused the evacuation of City Light's company towns and a temporary shutoff of transmission lines from the Skagit Hydroelectric Project. The Goodell Creek fire event is an example of the risk wildfire poses to City Light's facilities that demonstrated the need to establish a utility-wide wildfire prevention and response practice, which led to the creation of the WRRS.

2.2. Purpose

The WRRS is motivated by City Light's values, which include a commitment to public and employee safety, placing customers first, maintaining visible and active involvement in the communities we serve and operate in, and striving for excellence in our operational, financial, and environmental stewardship. With wildfire season increasing in duration and wildfires becoming more severe and frequent, City Light's WRRS serves as a living document for advancing wildfire risk assessment, risk mitigation and response. The insights gained in developing the WRRS also helped guide new legislation recently

Why does City Light need a Wildfire Risk Reduction Strategy?

- Wildfire presents an increasing threat to City Light's hydroelectric projects and their transmission lines.
- City Light's Climate Change Vulnerability Assessment and Adaptation Plan identified the increasing risk of wildfire as one of the 13 impact pathways through which the utility will experience climate-related risks to its mission.
- The safety of the public and City Light employees is one of City Light's core values.



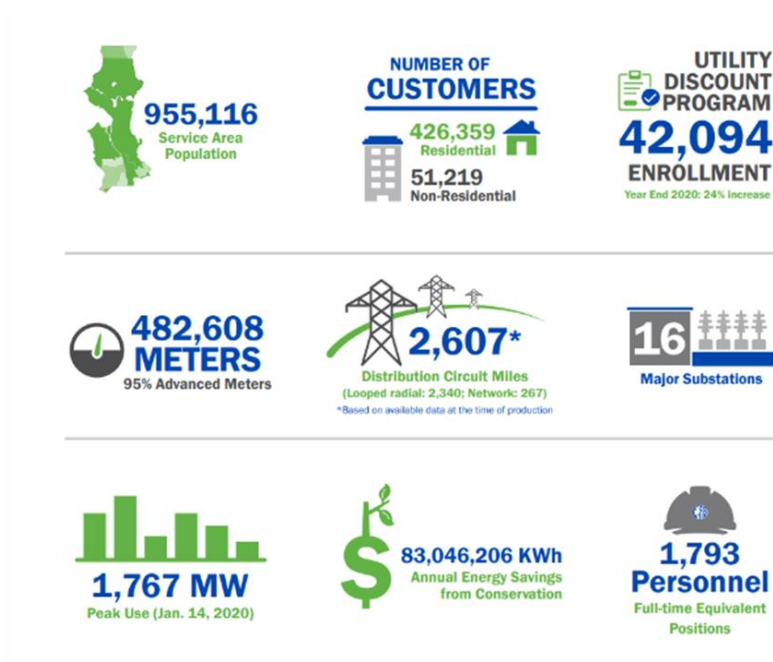
WA Governor Inslee signing Bill 25HB 1032.

passed in Washington (e.g., 2SHB 1032).¹ The Washington state 2023 budget also included \$189,000 for state agencies to review and consult with utilities on their wildfire mitigation plans. The WRRS is intended to meet requirements in this new legislation and prepare City Light for responding to future relevant legislation. Continued development and implementation of the WRRS will improve the reliability of electricity generation and delivery to customers, safeguard the welfare of employees and adjacent communities, and improve the resilience of City Light infrastructure.

2.3. Seattle City Light Service Area and Assets

City Light is a municipal, not-for-profit electric utility, owned by the residents of Seattle and run by the city’s elected officials. The utility has a state-of-the-art systems operation center for coordinating all activities for reliably serving electricity to Seattle and eight adjacent jurisdictions: Burien, Renton, Tukwila, SeaTac, Normandy Park, Shoreline, Lake Forest Park, and parts of unincorporated King County in White Center and Bryn Mawr-Skyway. To support meeting the electricity demand of all the customers in our service territory, City Light owns, maintains, and operates generation hydroelectrical facilities consisting of six hydroelectric plants located on the Pend Oreille, Skagit, Cedar and Tolt rivers with a combined maximum capacity of almost 2,100 megawatts. City Light’s generation resources ties into 668 miles of high-voltage transmission lines, of which 645 miles are overhead and 23 miles are underground.

Figure 1. High Level Overview of City Light²



¹ <https://app.leg.wa.gov/billsummary?billnumber=1032&year=2023>

² Information as of Dec. 31, 2022.

Figure 2. SCL Generation Facilities, Transmission Lines and Substations

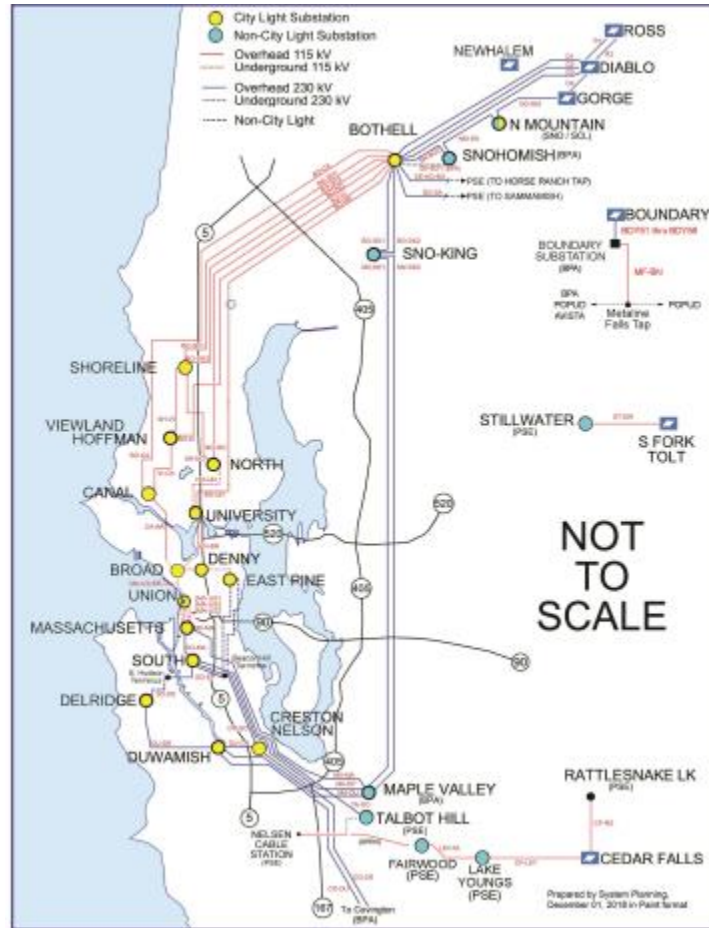
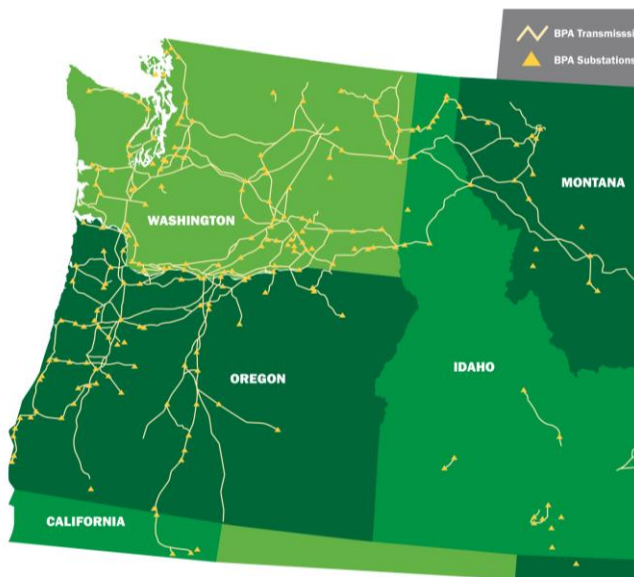


Figure 3. Bonneville Power Administration Transmission Lines and Substations



It should be noted that Bonneville Power Administration owns and operates a high-voltage transmission system across the Pacific Northwest, including transmission lines that run through the Seattle area. Bonneville Power Administration and City Light transmission systems are interconnected at several points and work together to provide reliable electricity to customers in Seattle. **Error! Reference source not found.** shows Bonneville Power

Administration transmission lines and substations.

2.4. Structure of the City Light WRRS

City Light developed the structure of the WRRS after reviewing industry best practices for wildfire risk reduction, including the California CPUC Wildfire Maturity Model.³ City Light’s WRRS is structured around five key elements, as shown in Figure :

1. **Risk assessment:** understanding the risk of electric grid assets (such as transmission lines) causing wildfires, as well as the risk of those assets and operations being affected by wildfires. Risk assessment includes understanding the inventory of operating assets, their condition and risk of failure.
2. **Risk mitigation:** actions that reduce wildfire risk, such as grid hardening and vegetation management, education, training, and providing the right equipment and gear.
3. **Emergency management:** actions to track mitigation actions and statuses, monitor for high-risk wildfire weather conditions, manage incidents effectively, restore services, and incorporate lessons and evolving industry best practices.
4. **Stakeholder engagement:** outreach to communities that may be affected by wildfire or City Light’s response to wildfires, as well as coordination with emergency response organizations, municipalities, Tribes, interconnected utility agencies, and regional and national regulators to most effectively respond to events.
5. **Governance and accountability:** oversight via a steering committee and advisory council, designating the leadership and organizations responsible for execution of the WRRS, identifying metrics to monitor and measure progress of the strategy, and incorporating lessons learned to improve the strategy as it is executed. The WRRS also includes an action plan that outlines specific actions for each of the five elements above — risk assessment, risk mitigation,

Figure 4. City Light WRRS Structure



³ Title: "2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model" Source: Energy Safety California URL: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53289&shareable=true>

emergency management, stakeholder engagement, and accountability and governance — that City Light will prioritize and incorporate to advance the WRRS.

2.5. Regulatory and Legislative Context

The Washington State Legislature has passed House Bill 1032, which is focused on providing wildfire mitigation plans to the Department of Commerce and the Department of Natural Resources. The plans will need to include elements that relate to utility activities such as vegetation management; infrastructure maintenance, repair, and inspection; modifications or upgrades to system facilities or construction of new facilities; operational procedures; and preventative programs, including adoption of new technologies.

The bill goes into effect July 23, 2023, and it will require electric utilities to provide their most recent wildfire mitigation plans to the Department of Natural Resources by Oct. 31, 2024. In addition, every three years thereafter, each utility will also need to review and revise its mitigation plan as appropriate.

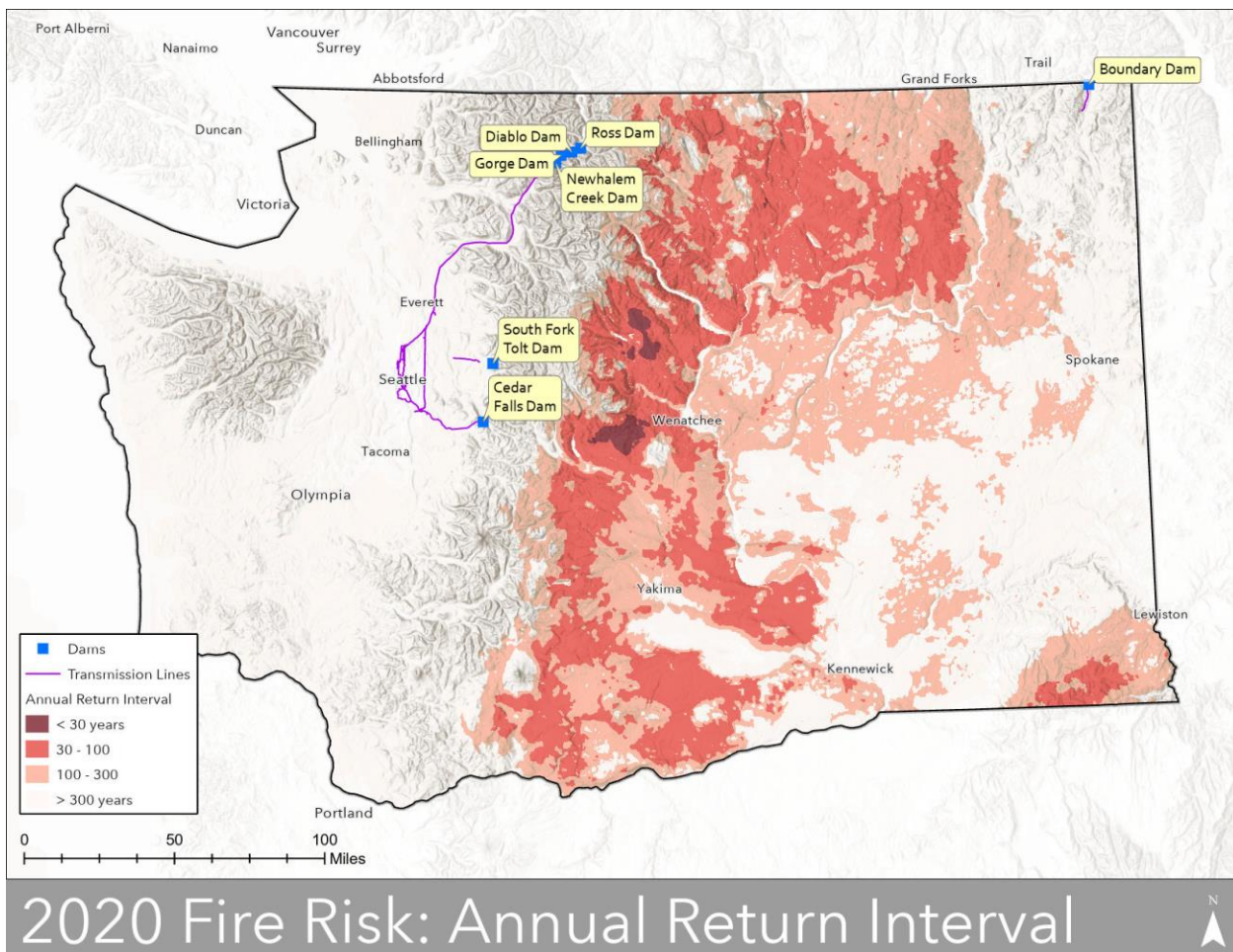
Similarly, other states in the Pacific Northwest have required utilities to plan for and address risks posed by wildfire. For example, in Oregon, Senate Bill 762, which passed in 2021, established standards for utility wildfire mitigation plans and the information these plans should contain. The bill required the following details in utility wildfire mitigation plans: identification of high-risk areas within the service territory, actions taken to minimize risks, and protocols to implement public safety power shutoffs. Utilities were also instructed to describe how they determine taking one course of risk reduction over the other. The Oregon Public Utilities Commission approved the wildfire mitigation plans for PacifiCorp, Portland General Electric, and Idaho Power in April 2022. Other utilities not regulated by the Public Utilities Commission, such as cooperatives and municipalities, filed their plans with the commission in July 2022.

3. Current State of Risk

3.1. Pacific Northwest Wildfire Risk and Climate Change

City Light’s generation and transmission infrastructure is in forested areas owned mostly by private companies and state and federal natural resource agencies. Relative to drier regions in eastern Washington, wildfires have been infrequent in the maritime climate of western Washington, where most of City Light’s transmission and generation infrastructure is located. However, on the west side of the Cascade Mountains, dense forest vegetation and summer drought can create conditions that are conducive to wildfires spreading once started during strong east-wind events. Figure shows the historical annual wildfire return interval in Washington state, developed by the USDA Forest Service, as well as the locations of City Light generation and transmission facilities. Most areas where City Light’s facilities and service territory are located have a historical annual wildfire return interval of greater than 300 years. However, these return intervals are at a single location and wildfires can occur more frequently somewhere on the landscape. Additionally, increased human population and changing climate are shifting the historical probability of wildfire.

Figure 5. Historical Wildfire Return Interval and City Light Facilities



City Light recognizes the impact that climate change has on wildfire risk within our service area and the Pacific Northwest region. City Light's Climate Change Vulnerability Assessment and Adaptation Plan⁴ identifies the increasing risk of wildfire as one of the 13 impact pathways through which the utility will experience climate-related impacts to our mission. More recently, University of Washington's Climate Impacts Group completed an assessment of extreme weather and found indications of potential increases in lightning as well as the number of days with low humidity and easterly winds in mountainous areas near City Light's hydroelectric projects in the future.⁵ Climate models project a doubling in the annual number of high fire danger days near City Light's Skagit and Boundary Hydroelectric projects by mid-century compared to current levels.⁶

Wildfires in the Pacific Northwest region are projected to increase in frequency and size based on the following major variables related to climate change:

1. Higher temperatures and lower snowpack will cause snow to melt earlier in spring, lengthening the fire season at higher elevations.
2. Higher temperatures and reduced precipitation in summer will dry soils, woody debris and vegetation, creating vegetation conditions that enable wildfires to spread.
3. Greater tree mortality caused by drought and insects will likely increase the amount of dead vegetation available as fuel to support the spread and severity of wildfires as well as the susceptibility to partial or whole tree failure near power lines.
4. Higher summer temperatures throughout the western United States could increase fire hazards across the region limiting fire suppression capacity.

3.2. Risk Profile of City Light Facilities

Wildfires in Washington typically occur in forested, mountainous terrain, which is illustrated over the span of several decades in Figure 6. Because City Light hydroelectric projects are also located in such places, these fires present a risk to those projects and their associated transmission lines more so than to transmission and distribution lines located in more urban areas further west. Eight wildfires larger than 100 acres have occurred within five miles of City Light infrastructure since 1986, according to records from the National Interagency Fire Center (NIFC) and the United States Department of Agriculture using United States Forest Service.⁷

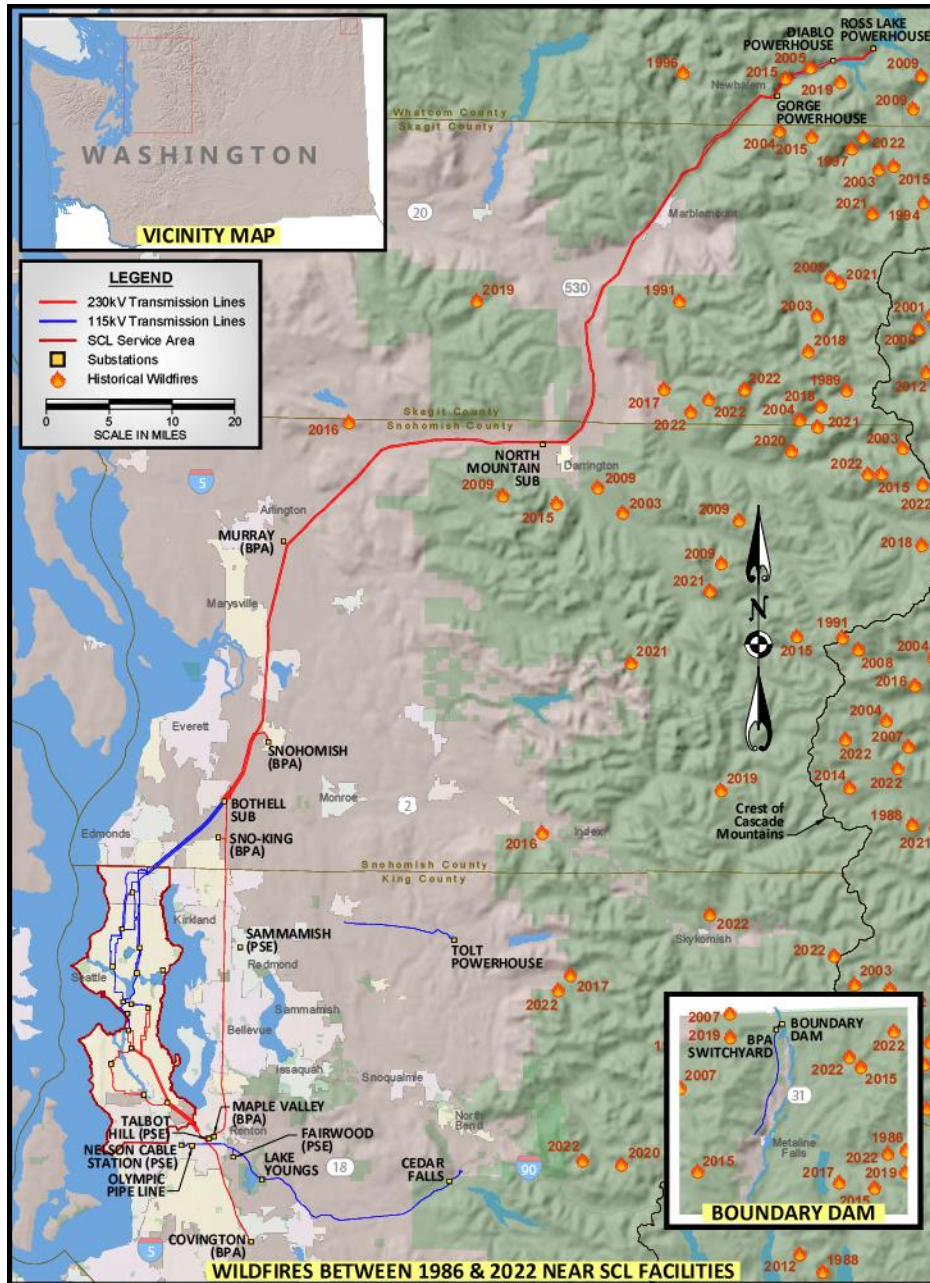
⁴ <https://www.seattle.gov/documents/Departments/CityLight/ClimateChangeAdaptationPlan.pdf>

⁵ <https://cig.uw.edu/projects/extreme-weather-and-seattle-city-light-operations/>

⁶ High fire danger day is a day when 100-hour fuel moisture levels are less than the historical 20th percentile - <https://cig.uw.edu/resources/analysis-tools/climate-mapping-for-a-resilient-washington/>

⁷ Data gathered from <https://data-nifc.opendata.arcgis.com/> and https://data.fs.usda.gov/geodata/edw/datasets.php?xmlKeyword=S_USA.FinalFirePerimeter

Figure 6. Wildfire Mapping Between 1986 and 2022 Near City Light Facilities



3.2.1. Skagit Hydroelectric Project, Including Communities of Newhalem and Diablo

Located within the Ross Lake National Recreation Area, the Skagit Hydroelectric Project is surrounded by the forested wilderness of North Cascades National Park. Both the recreation area and park are part of the North Cascades National Park Complex, managed by the U.S. National Park Service. The towns of Diablo and Newhalem, as well as portions of the hydroelectric facilities, are mapped as a wildland-urban interface by the Washington State Department of Natural Resources⁸ and represent areas most at risk with increasing wildfire hazard. The wildland-urban interface is a transition zone between structures and other development and undeveloped land or vegetative fuels.⁹

The forests surrounding the Skagit Hydroelectric Project and extending north to Hozomeen along the east side of Ross Lake have historically had a moderate fire return interval of 50 to 100 years,¹⁰ whereas the maritime forests west of Ross Lake have had a fire return interval of 80 to 1,000+ years, according to LANDFIRE.¹¹ Washington State Highway 20 through the Ross Lake National Recreation Area is a popular corridor for summer recreation, increasing the potential for human-caused ignitions. This area also experiences frequent lightning ignitions that have sparked several wildfires in recent history, including the Goodell Creek fire that started with a lightning strike north of Newhalem in August 2015.

The Goodell Creek fire required City Light to evacuate nonessential personnel from Diablo and Newhalem and de-energize transmission lines for several days. The cost to the utility was \$2.2 million in damages, response and labor, as well as an additional \$900,000 for power purchases and lost generation. The low snowpack, early snowmelt and abnormally warm temperatures in the spring and summer of 2015 likely contributed to the spread of the fire, a weather pattern that is consistent with projected changes in climate for the Skagit area.

3.2.2. Boundary Hydroelectric Project

Located in northeastern Washington near the U.S.-Canada border, the Boundary Hydroelectric Project is surrounded by U.S. National Forest Service land and forested lands across the border. According to LANDFIRE, the surrounding forests burn with a shorter fire return interval (i.e., 20 to 80 years) compared with forests in northwestern Washington.¹² The hot, dry summers in this region are conducive to the start and spread of wildfires. Additionally, lightning is more frequent in this area than west of the Cascade Mountains. These forests have adapted to be fire resilient, but a legacy of forest management and fire exclusion by humans in this region has contributed to greater fire hazard, causing fires to burn with higher severity and over larger areas when they occur.

⁸ Wildland Urban Interface mapped for the state of Washington, available on Washington Geospatial Open Data Portal at: https://geo.wa.gov/maps/786aaa1dbbd748e6ae04bc43c8f127fe_0/explore?location=48.714522%2C-121.186626%2C11.86.

⁹ <https://www.usfa.fema.gov/wui/what-is-the-wui.html>

¹⁰ Hamlet, A.F. [et al.]. 2010, Final Project Report for the Columbia Basin Climate Change Scenarios Project, <http://warm.atmos.washington.edu/2860/report/>.

¹¹ LANDFIRE, Landscape Fire and Resource Management Planning Tools, is a shared program between the wildland fire management programs of the U.S. Department of Agriculture Forest Service and U.S. Department of the Interior, providing landscape scale geospatial products such as fire return interval for the entire United States. <https://landfire.gov/index.php>.

¹² <https://landfire.gov/>

3.2.3. Cedar Falls and South Fork Tolt Hydroelectric Projects

The Cedar Falls and South Fork Tolt projects are in wet, maritime forests with long historic fire return intervals (i.e., over 250 years), but large wildfires have occurred in these forests in the past. For example, in 2022 the Lock Katrine and Bolt Creek wildfires were burning in watersheds south and north of the Tolt River watershed, respectively. Wildfires typically burn under extreme weather conditions with warm, dry easterly winds and during periods of extended drought; thus, fires are large when they do occur. The Cedar Falls Hydroelectric Project is in the Cedar River Watershed, which is owned and managed by Seattle Public Utilities (SPU). The South Fork Tolt Hydroelectric Project in the Tolt River Watershed is managed for forest production by private, federal and tribal entities. These municipal watersheds are heavily monitored for wildfire by SPU because of the potential detrimental impacts of wildfire on drinking-water quality. SPU maintains an active and highly trained wildfire suppression crew and monitors conditions throughout the summer. SPU owns and manages 8,400 acres primarily to safeguard drinking water quality. As a result, public access to these watersheds is limited to minimize water contamination risks and prevent human-induced wildfires. Lightning is less common in this region compared with eastern Washington. Thus, the potential for wildfires to start near these projects is lower and the likelihood of suppressing them quickly is greater compared with the wilderness areas surrounding the Skagit and Boundary projects.

3.2.4. Transmission Infrastructure

The location of City Light's transmission lines from the Skagit and Boundary hydroelectric projects increases their wildfire risk because they pass through rural, forested land owned by private companies and state and federal natural resource agencies. These lands have abundant vegetation, rugged topography and limited access, making fire protection more challenging compared with urban or agricultural areas. Transmission rights-of-way across the system are managed to promote vegetation of varying heights to create a more natural landscape, consistent with industry best practices. However, this increases the volume of combustible vegetation under the lines.

Furthermore, the rights-of-way for transmission lines are, in some places, relatively narrow, limiting the area adjacent to the lines in which City Light can actively manage vegetation. This limits City Light's ability to control the amount of vegetation that can support fire spread, either through ignition from transmission lines or from surrounding ownerships.

The materials used in the construction of transmission towers are an important factor affecting risk. The 230 kV transmission lines from the Skagit and Boundary projects are primarily on steel structures, decreasing sensitivity to wildfire compared to wooden poles. The 115 kV transmission lines from the Cedar Falls and South Fork Tolt projects contain more wooden poles and are at higher risk of damage from fire.

Fire-related outages of the local distribution system at the hydroelectric projects can have consequences for reliability locally if power is not available to support the facilities. For example, at the Skagit Hydroelectric Project, 26 kV transmission and 7 kV distribution lines on wooden poles provide station service to Ross and Ross Lake Resort and power to the Gorge Dam.

Since City Light's transmission system is connected inside of the Bonneville Power Administration's transmission system, in addition to them being the regional transmission path operator, the potential that

Bonneville Power Administration will need to initiate public safety power shutoffs to prevent wildfires presents a risk of reduced energy supply to the city of Seattle.

3.2.5. Distribution Infrastructure

City Light's distribution system is within our service areas in Seattle and several surrounding cities, with over 50% above ground. The service area is primarily urban; though, there are stretches of urban forest and greenbelts that contain contiguous sections of trees and other vegetation. These areas have the potential for vegetation to contact electrical equipment and spark a fire. However, the cities' fire departments can rapidly respond within minutes to reported fires. Consequently, fires would likely be contained, small and cause only limited local outages due to the interconnected system and prompt response by utility personnel.

3.3. Operational Risks

Wildfires produce significant amounts of smoke, which can reduce visibility, as well as fine particles that can be harmful when inhaled.

Smoke reduces visibility, which can impact operations in several ways. It can make driving hazardous and result in road closures, especially on highways or roads near active fire zones. Such road closures may impact the ability of City Light operations crews to perform normal maintenance as well as respond to electric outages or emergency situations such as de-energizing electric service to a building on fire or a wire down on a vehicle. Smoke may also disrupt transportation systems which can impact the ability of City Light employees to travel to work.

Fine smoke particles can also present health hazards to those employees with respiratory issues such as asthma, bronchitis, etc., with such hazards compounding the impact on City Light operations. Smoke may also impact other City operations and make coordinating with other City agencies more difficult, potentially lengthening response times to outages and emergency situations.



Wildfire smoke from the Goodell Creek fire near Newhalem.

4. Risk Assessment

This section describes the processes City Light uses to assess wildfire risk posed by our assets as well as the risks wildfire poses to those assets. Effective risk assessment includes asset management, understanding asset performance and failure rates, and assessing the condition of assets via inspection and testing.

4.1. Asset Inventory

Having an accurate inventory of electric system assets, their operating history and condition is critical to understanding the wildfire risk posed by those assets. City Light has two primary systems that support asset management: the Work and Asset Management System and a geographic information system.

The Work and Asset Management System captures and houses information on all of City Light's physical assets and is used to assist in decision-making. The database tracks asset-specific information such as:

- Date of installation, i.e., asset age.
- Nameplate data, including make, model and serial numbers.
- Asset-specific information, e.g., unique asset numbers, locations and recent condition assessment scores.
- Work-order activities, including repair history, preventive maintenance cycles and inspection criteria for all applicable electrical assets.

Information concerning City Light's linear assets, such as conductors and duct banks, is housed in the geographic information system. The system shows the overall connectivity of City Light's electrical system and our assets in location-based settings.

As City Light's inspection programs stand, there is no formal quality-assurance/quality-control trigger to determine the quality of maintenance work performed. City Light requires contractors to develop an approved quality-assurance/quality-control process to ensure accurate information and quality data are delivered and entered in the Work and Asset Management System.

4.2. Assessing Asset Condition

City Light assesses the condition of our assets through inspection and testing. Periodic asset inspections are used for transmission lines, structures and their associated components. These assets have documented assessment criteria and a standardized asset health-scoring system. City Light determines asset-inspection intervals by considering factors such as:

- Age and condition.
- Average useful life span.
- Regulatory requirements.
- Environmental factors.
- Consequences of failure.

For the City Light transmission system, the primary inspection method is to perform visual inspections from the ground or from the air (using helicopters with high-definition cameras). Inspections aim to confirm the structural integrity of the tower, tower base and groundline installation by looking for the following risk factors:

- Potential metal loss.
- Vegetation encroachment at the footings.
- Excessive corrosion, bent or damaged members, and broken or loose hardware.
- Inadequate cathodic protection.¹³
- Mechanical damage to components.

City Light continues to evaluate the optimal inspection cycle for our steel-lattice transmission structures and overhead transmission conductors. Both asset classes are estimated to be able to provide reliable service for 80 to 90 years, and condition assessments done in the last five years indicate that these assets are in good condition.

City Light performs testing to evaluate the condition of our assets. This testing includes technologies such as:

- Partial discharge detection, which detects radio frequency emissions from defective electrical components.
- Infrared monitoring, which is used to find hot spots in electrical connections that may signal a higher risk of failure.
- Resistograph™ pole drilling, which uses an electronically controlled drill and computer analysis that measures the density of wood and can identify weakened poles.
- Light Detection and Ranging scanning, performed periodically by helicopter, to measure the distances of the transmission conductors from the ground and surrounding vegetation to ensure the utility is maintaining all required clearances.
- Drone inspections, currently in the initial stages of development.

For distribution infrastructure, City Light runs an active and ongoing wooden pole inspection and replacement program. Every one of the approximately 92,000 wooden poles are inspected every 10 years. Out of this, City Light replaces 1,500-2,000 wooden poles each year through this program.

City Light conducts periodic visual inspections on distribution infrastructure. If an issue is identified, City Light conducts further inspections, repairs and/or replacements as required.

4.3. Understanding Asset Failures

To better understand ignition risk and mitigate wildfire, City Light tracks data on component failure rates and electric-system reliability performance. Failures of overhead components, whether in-service failures or components in danger of imminent failure, present a risk of wildfire ignition from potential arcing or

¹³ A technique used to control the corrosion of metal surfaces using electric currents.

wires falling to the ground. City Light tracks transmission and distribution component failures and reliability performance via several systems, including:

- Dispatcher Logging System
- Outage Management System
- Energy Management System
- Advanced Grid Analytics System

Analyzing reclosing activities on overhead lines can help inform City Light's understanding of wildfire risk. For instance, auto-reclosing, relay-protection schemes and using system operator-initiated reclosing on transmission and distribution circuits enhances stability margins and increases system reliability. These reclosing activities provide insight into the interaction between electric lines and vegetation. Lines with a higher number of reclosing incidents interact with vegetation to a greater degree, with each interaction presenting some level of ignition risk. Animals and objects such as Mylar balloons can also trigger reclosing incidents. Reclosing operations are tracked in the Energy Management System and Outage Management System.



The Diablo switchyard in the North Cascades with Elephant Butte in the background.

5. Risk Mitigation

City Light's risk mitigation strategy includes grid hardening, vegetation management and actions to mitigate the impact of losing supply sources not controlled by City Light.

Grid hardening includes activities that help reduce the risk of wildfire by replacing defective assets with new assets, increasing operating flexibility by changing the grid structure with switches, and performing routine or preventive maintenance activities that identify and correct deficiencies before they present undue risk.

Vegetation management includes inspecting rights-of-way to identify encroaching vegetation, trimming/removing incompatible vegetation, and promoting compatible vegetation to reduce the risk of becoming a fuel source for wildfires or of wildfires damaging transmission lines.

Risk mitigation also includes actions that can reduce the impact of the loss of supply from sources not owned by City Light. For example, this could include outages of generation units or transmission lines that deliver energy to City Light.

5.1. Grid Hardening Programs

City Light has a portfolio of programs to replace assets and install new ones to improve safety, increase reliability and reduce the risk of wildfire. City Light's Capital Improvement Program provides funding for repairing, upgrading and expanding infrastructure to reduce the risk of infrastructure causing wildfires.

5.1.1. Transmission Line Reliability Program

This ongoing program repairs or replaces the worst 1% of City Light's transmission structures and conductors each year. It also sets engineering, construction and other goals for improving and maintaining the reliability of the overhead and underground transmission systems.

5.1.2. Transmission Line Capacity Program

This ongoing program upgrades transmission lines, builds new lines, relocates lines and provides for other system needs, including enhancing City Light's transmission capacity. As part of these upgrades, older and poorer-performing components are replaced, reducing wildfire risk.

5.1.3. Transmission Wooden Pole Replacement

Some of the City Light 115 kV transmission system is supported by wooden poles. City Light has been strategically replacing wooden poles with composite poles, which are more fire resistant, in ecologically sensitive areas, reducing potential damage from externally caused wildfires. As of spring 2023, 24 poles have been replaced with composite poles, and an additional 36 poles are scheduled to be replaced by the summer of 2023.

5.1.4. Distribution Overhead Equipment Replacements

This ongoing project replaces older equipment in City Light's distribution system that is nearing the end of its usable life, is overloaded or no longer has an available supply of spare parts. These items include poles, cross arms, transformers and open-wire secondaries. Such replacements reduce the risk of component failure that can cause wildfire ignitions.

Covered overhead conductors present a lower ignition risk than bare conductors. City Light's distribution system consists of approximately 1,730 miles of overhead conductors; virtually all those circuit miles are bare conductor. The Overhead Equipment Replacement Program includes the replacement of bare overhead distribution conductors with covered conductors.

5.1.5. Distribution Overhead Customer-Driven Capacity Addition

The replacement of substandard or deteriorated assets under this program reduces the risk of component failure and consequently the risk of wildfire. Work includes replacing old line segments, building new line segments, relocating lines for construction clearances and replacing rotten or damaged poles in the distribution system. This ongoing program reduces wildfire risk by replacing older, obsolete 4 kV electrical equipment with new, efficient, more reliable 26 kV distribution equipment. This program also increases capacity to deliver power to City Light customers, rebuilds and maintains the backbone of City Light's system, saves energy by reducing transformer and line losses, improves quality and reliability of service to customers, and releases unit substation properties for better neighborhood uses.

5.1.6. Distribution Undergrounding Programs

Converting overhead wire-distribution infrastructure to underground significantly reduces the risk of wildfire. City Light has several undergrounding programs that move overhead infrastructure underground during other City transportation and utilities projects. This program also addresses modifications to the distribution system, including replacement or modifications of old lines, poles and underground facilities as necessary.

5.1.7. Distribution Automation

Distribution automation systems help reduce wildfire risk by improving situational awareness and control over distribution feeders, which can support the implementation of public safety power shutoffs (PSPS) and help minimize the scope and duration of those events. This ongoing program automates radial distribution feeders, which includes installing equipment to provide remote control of switches on power lines and gather real-time data on the conditions of distribution power lines. The installation of strategically placed switches allows automatic outage restoration, shifting blocks of load to maximize system efficiency, and reconfiguration of the grid to reduce customer impact of PSPS.

5.1.8. Substation Circuit Breaker Replacement Program

Circuit breakers interrupt the flow of electric current when the system senses problems. They are also used to turn off power for maintenance and can support PSPS, where utilities de-energize lines during high-risk

weather to reduce the threat of lines causing wildfires. The Substation Breaker Replacement Program funds the review of City Light's inventory of approximately 400 transmission and distribution voltage circuit breakers and determines which have the greatest wear, gas or oil leaks, maintenance cost, service stress, and fault interrupting history. City Light replaces circuit breakers with the highest failure risk.

5.1.9. Substation Equipment Improvement Program

Properly operating equipment in City Light substations is critical to reducing the risk of wildfire and responding to wildfires that do occur. The Substation Equipment Improvement Program adds, replaces and upgrades substation equipment, including remote control and monitoring equipment at the System Operations Center. The upgrades improve response times to correct problems or respond to outages. Additionally, better remote control of substation equipment facilitates the implementation of PSPS, reducing wildfire risk as well as the scope and duration of PSPS events.

5.1.10. Cedar Falls Hydroelectric Facility Project Hardening

The Cedar Falls facility includes a dam, penstocks, a powerhouse, substation and associated outbuildings. The penstocks transport raw drinking water, water for the hydroelectric powerhouse and water for fire suppression. This facility is a critical community lifeline that supplies clean drinking water to approximately one million people in the Seattle area.

City Light has applied for funding to protect the Cedar Falls Hydroelectric Project under the Federal Emergency Management Agency Hazard Mitigation Grant Program. The scope of the project includes developing a hazardous fuels management strategy and creating a defensible space of approximately 100 feet surrounding the hydroelectric project's infrastructure to protect the facility from wildfire hazards. The defensible space buffer will extend the entirety of two 7,500-foot-long (1.42-mile-long), 78-inch-diameter steel penstocks from their source at Masonry Dam to the powerhouse located at Cedar Falls.

5.2. Vegetation Management

Vegetation management includes inspecting rights-of-way to identify encroaching vegetation, trimming/removing incompatible vegetation, and promoting compatible vegetation to reduce the risk of causing wildfires or of wildfires damaging transmission lines.

5.2.1. Transmission Vegetation Management

Trees can cause damage to electrical lines, with the risk of triggering ignitions and wildfire. City Light's Transmission Vegetation Management Program is designed as a management framework that, through routine inspection, maintenance and documentation, can reduce the risk of wildfire, increase the reliability of electric service, and improve safety for surrounding communities.

The City Light Transmission Vegetation Management Program includes the following management components:

- Annual right-of-way patrols and inspections.
- Routine, cyclical vegetation management to achieve required clearances.
- Routine, cyclical right-of-way maintenance.
- Danger tree removal.
- Quality assurance.

The City Light vegetation management strategy uses the Integrated Vegetation Management approach, an industry best practice, which employs a variety of manual, chemical, biological and cultural techniques to promote desirable, stable, low-growing plant communities that will resist invasion by tall-growing tree species.

5.2.2. Transmission Line Vegetation Inspections

City Light transmission right-of-way crews work the transmission corridors daily. Transmission line crew chiefs monitor vegetation growth, clearances between vegetation and the line, access roads, culverts, bridges, right-of-way uses, land use/easement encroachments, and vandalism in their daily work to identify areas and prioritize types of vegetation needing control.

City Light's 230 kV transmission system is patrolled once every calendar year, typically in the October to December time frame, to capture the following:

- Assess the condition of the transmission right-of-way.
- Identify potential encroachments, including new construction that could conflict with the safe operation of the transmission system.
- Identify changes in vegetation and tree conditions along the right-of-way.
- Identify potential damage to transmission access and roadways.

In addition to the annual patrols on the 230 kV system, the City Light transmission right-of-way vegetation management organization conducts a four-year work cycle plan that includes maintenance such as clearing vegetation, maintaining right-of-way infrastructure, and addressing encroachments or ensuring proper access or egress. The return intervals for the segments vary, with most maintained on a two-year interval and some segments inspected and maintained annually. These schedules ensure the entire system is maintained over the course of the four-year cycle.

5.2.3. Vegetation Clearance

The City Light Transmission Vegetation Management Program complies with the requirements in the North American Electric Reliability Corporation reliability standards, including FAC-003,¹⁴ which addresses all transmission circuits rated at 200 kV or higher. City Light also uses guidelines from the National Electric Safety Code, Rule 218, and considers the annual growth rates of vegetation. Any issues or concerns found during the inspection process are documented with a Transmission Planned Action Item form, which outlines transmission work that will be prioritized and distributed to the appropriate crews.

¹⁴ <https://www.nerc.com/pa/Stand/Reliability%20Standards/FAC-003-4.pdf>

Using Integrated Vegetation Management, City Light or contractor crews:

- Selectively remove and control tall-growing species with as little impact as possible to native and other low-growing species. City Light Power Line Clearance and Landscapes trims trees according to City Light’s minimum standing vegetation clearances. This work includes removing deciduous trees in a way that prevents resprouting.
- Develop new plant communities through seeding and planting with compatible species.
- Seed or fertilize existing or disturbed areas with compatible species.

The following table summarizes the clearance methods at various City Light facilities.

City Light Facility	Description	Clearance Objectives
Distribution Power Lines	Primary Voltage	10 ft. for slow-growing species 14 ft. for fast-growing species 15 ft. overhang clearance
	Service Lines and System Neutral Lines	3 ft. for slow-growing species 5 ft. for fast-growing species City Light prunes vegetation away from Service Lines for the first 10 ft. from where they connect to utility poles
Transmission Power Lines	115,000 Volt	Based on line-engineering, species, trim-cycle, and right-of-way width
	240,000 Volt	Based on line-engineering, species, trim-cycle, and right-of-way width
Infrastructure	Underground Vaults	Vaults must be accessible for maintenance work
	Power Meters	Meters must be accessible
	Transformer	10 ft. clearance for all tree species
	Utility Poles	3 ft.

5.2.4. Danger Tree Removal

Diseased or dying trees, commonly called “danger trees” or “hazard trees,” outside the right-of-way falling into transmission lines are one of the largest causes of electrical power outages to City Light’s transmission lines. In assessing danger trees for removal, crews consider the growth rate and overall health of the tree, the stability of the ground surrounding the tree, the location and proximity to the power lines and the criticality of the power line.

City Light has begun to explore remote sensing technologies, including Light Detection and Ranging scanning and satellite imagery, with the capacity to help evaluate tree health, height and strike potential at a right-of-way scale.

Since trimming danger trees often requires consultation and permission from the owners of the adjacent property, City Light continues to build and foster relationships with owners to improve the safety and reliability of the transmission system.

5.2.5. Right-of-Way Maintenance

Crews also perform maintenance in the right-of-way, including mechanical clearing and applying herbicides. Mechanical clearing is used on a limited basis on City Light rights-of-way in areas with high tree density and accessible terrain. Herbicides are primarily used to help control deciduous tree stump resprouting and invasive and noxious weeds. Spot application of approved herbicides is the only airborne application method used for herbicides on rights-of-way; injection and hand-painting methods are employed as well.

5.2.6. Quality Assurance and Control

The City Light Transmission Vegetation Management Program includes a quality assurance and control component. After vegetation management work is completed, a field inspection is conducted by City Light crew chiefs and/or right-of-way leads, who verify each other's work for added quality control measure. Copies of the verification forms are retained digitally by the Vegetation Management team and submitted to City Light's Compliance Unit team for review, regulatory compliance and record retention.

5.3. Power Supply Diversification

City Light also reduces the potential impact of wildfires on electricity supply by diversifying our portfolio of power resources to include utility-owned generation, power contracts with other suppliers and geographic diversity. Geographic diversity increases resilience to natural hazards, such as wildfires, that affect resources in a specific location. Overall risk to reliability of the system in one location can be mitigated by resources in other locations.



Crew conducting inspection/vegetation clearance around power lines.

6. Emergency Management

Emergency management involves actions to monitor for high-risk weather conditions when fires are more likely to occur and to respond when those conditions arise. The City Light emergency management component of the WRRS includes situational awareness and operational response to events.

Situational awareness comprises actions to understand the current state and trajectory of the risk of City Light assets causing wildfire as well as those assets being impacted by externally caused wildfires. It also includes awareness of the potential that transmission lines owned by Bonneville Power Administration may be impacted by wildfires.

Operational response includes the plans and actions that City Light — in coordination with other City agencies, the state and other entities — would take to prepare for, operate through and recover from a wildfire impacting City Light operations.

6.1. Situational Awareness

The two main elements supporting City Light’s situational awareness for the WRRS are weather forecasting and operational coordination with other entities.

6.1.1. Weather Forecasting

The City Light Resource Planning, Forecasting and Analysis team and the Power Operations and Marketing team monitor meteorological and environmental forecasts from various sources to support operations. These include:

- Weather data and forecasts from public and contracted services that include both local and regional information, particularly forecasted wind events.
- Current snow-water equivalent data from the Natural Resources Conservation Service for each of their hydro basins.
- Soil moisture and drought conditions information.

City Light does not currently contract services with any entities designated for wildfire detection but does monitor publicly available wildfire maps during wildfire season, such as the [AirNow Fire and Smoke Map](#).

6.1.2. Operational Coordination

City Light maintains ongoing communications and coordination with adjacent utilities, municipalities, local, state, and federal agencies, and other organizations regarding a wide range of planning and operational subjects that include real-time wildfire risk. Such coordination is critical to help reduce wildfire risk since wildfires don’t respect municipal or company boundaries.

The electricity for City Light customers is supplied by transmission lines — some of which are owned by City Light and others that are owned by Bonneville Power Administration — that may need to be de-energized for the following reasons:

- To avoid arcing or flashover from the lines to the ground through smoke when wildfires and smoke are in the vicinity.
- To ensure the safety of firefighters and firefighting activities such as helicopters dropping water on fire near lines.

Because of the networked nature of the transmission grid, such de-energizations may not necessarily result in customer outages. City Light system-operations personnel have direct communications with Bonneville Power Administration system-operations personnel, and this existing communications channel would be integral in the event of such a de-energization. The decision to de-energize City Light transmission would be made by field personnel performing inspections or during coordination through an incident command structure. It is also possible that protective relaying might trip lines out of service during an event, depending on the proximity of the fire to the transmission lines.

As City Light develops the WRRS, the work of exploring the creation of a formal public safety power shutoffs (PSPS) program should consider the following best practices:

- Monitoring forecasts on the potential for high-risk weather to affect our service area.
- Developing well-defined protocols for initiating PSPS with explicit procedures and thresholds above which PSPS are activated as a measure of last resort.
- Proactively communicating the potential for PSPS to customers who may be affected, with particular focus on customers with life support equipment and other vulnerable populations.
- Providing timely communication updates via a variety of channels, including Microsoft Teams channels, Webex, email, and voice and radio communication.
- Working with the community and various stakeholders to minimize the impact of PSPS events.
- Developing well-defined protocols for reenergization.

Another important aspect of operations concerns the risk of wildfires caused by utility and contract personnel while performing work. City Light has specific training and communications protocol for our employees and contract crews regarding work practices to reduce the risk of causing ignitions, including effective techniques for suppressing any ignitions, if they do occur. City Light staff follow the Industrial Fire Precaution Levels when planning and performing their work to minimize fire ignition and spread.¹⁵

6.2. Operational Response

Operational response encompasses managing transmission operations to mitigate wildfire risks and addressing externally triggered wildfires with the City of Seattle's Comprehensive Emergency

¹⁵ <https://www.dnr.wa.gov/ifpl>

Management Plan and All-Hazards Mitigation Plan as well as City Light's Continuity of Operations Plan and All Hazard Response and Restoration Plan.

In addition, to ensure a unified, interoperable approach to resource sharing, coordination, incident management and information dissemination, City Light employs the Incident Command System under the National Response Framework as established by the Federal Emergency Management Agency.

6.2.1. Emergency Management Plans

The City of Seattle's Comprehensive Emergency Management Plan¹⁶ is an all-hazards plan describing how the City of Seattle's emergency management system is organized and managed in order to prepare for, prevent, mitigate, respond to and recover from any emergency that could adversely affect the health and safety of Seattle's employees, residents, visitors and environment. Through a series of documents, the Comprehensive Emergency Management Plan describes how City departments coordinate emergency management-related actions, resources and activities with county, regional, state, federal, private sector and nongovernmental organizations.

Annex III of the Comprehensive Emergency Management Plan, City of Seattle All-Hazards Mitigation Plan, is the guiding document for the City's hazard mitigation program with the goal of understanding hazards from which the city is at risk and identifying a comprehensive strategy for minimizing potential losses and maximizing opportunities to increase the community's resiliency.

The All-Hazards Mitigation Plan requires that all City departments, including City Light, maintain a Continuity of Operations Plan, which is discussed below.

Annex IV of the Comprehensive Emergency Management Plan, Response & Emergency Support Function, provides the foundation for Emergency Support Functions, the various Support Operations Plans (Alert & Warning, Evacuation, and Military), and the Incident Operations Plans. This plan describes how the City will respond to save lives, protect property and stabilize an incident. It describes how coordination is managed among the many departments and organizations, including City Light, that may be involved in response to achieve unity of effort.

City Light's Continuity of Operations Plan provides a clearly defined and structured approach to restorations following an incident that results in an outage event. This plan ensures that restoration efforts are performed in an effective and coordinated manner, enhancing City Light's ability to restore electrical systems and essential services to our customers. The plan has four missions:

- Protection of physical infrastructure and cyber security.
- Mitigation, to identify vulnerabilities and reduce them.
- Response, which maintains a strong capability to address emergencies.
- Recovery, which gets City Light and our customers back to normal.

The City Light All-Hazard Response and Restoration Plan is a guide for decision-making actions involving damage assessment, identification of restoration tasks, development of metrics and activation levels during

¹⁶https://www.seattle.gov/documents/Departments/Emergency/PlansOEM/2021%20EMAP%20Updated%20Plans/2021-10-26_CEMPIIntroduction.signed2.pdf

restoration efforts. The plan is distributed to all City Light staff who have restoration responsibilities. To ensure effective coordination during restoration efforts, the plan is shared as necessary with local emergency response and management agencies, designated emergency coordination officers, emergency management directors, emergency management planners and other affected parties. The plan:

- Describes the basic strategy and tactics for responding to outage events and demobilizing after completion of restoration efforts.
- Defines storm and earthquake activation modes, trigger points and expected actions of various operating centers.
- Outlines the basic restoration response organization.
- Outlines the roles and responsibilities for City Light personnel to respond to emergencies in a coordinated effort to restore power to customers.
- Identifies restoration event and response levels.
- Provides notification and mobilization procedures for City Light response personnel.
- Establishes overall restoration procedures and policies.

City Light activates the Continuity of Operations Plan and the All-Hazard Response and Restoration Plan and takes necessary actions, in coordination with Citywide disaster plans, in the following situations:

- Widespread or significant interruption of electrical service to City Light customers or failure of generation, transmission or distribution facilities that impact overall public safety and cause property damage that requires emergency response on the part of City Light or other City departments.
- Emergencies or disaster situations caused by storms or earthquakes where City Light assistance is needed by other City departments or outside agencies.

7. Stakeholder Cooperation and Community Engagement

The Stakeholder Engagement component of City Light's WRRS entails engaging the communities we serve, emergency response organizations, and other utilities and agencies to identify lessons learned and best practices for reducing wildfire risk and responding to wildfires that do occur.

7.1. Engagement With Communities

In engaging with communities, City Light incorporates or plans to incorporate the following:

- Publishing brochures designed to inform and educate the public, for example, "Living and Working Near High Voltage Power Lines" and "Native Plants for Power Lines."
- Collaborating with the Washington State Nursery and Landscape Association to issue certificates through The Urban Landscape Tree Certificate program to property owners who support tree removal on City Light's transmission right-of-way.
- Ensuring information is appropriate and accessible for all audiences, including language access and tailored, targeted outreach, via the City Light Communications Division.
- Providing a dedicated Outreach & Engagement Advisor who is focused on developing a utility-wide framework for inclusive outreach, engagement, and relationship-building with the extensive network of community-based organizations in our service area.
- Ensuring visibility into enrolled-customer locations and needs during unplanned outages via City Light's Life Support Equipment Assistance Program.
- Collaborating proactively prior to implementation of a Public Safety Power Shutoff (PSPS) program, emphasizing transparent communication, timely updates, and tailored outreach strategies to ensure resident preparedness and safety.

For the communities of Newhalem and Diablo, where City Light's generation facilities are located, partnerships with the Skagit and Whatcom conservation districts led to completing wildfire hazard risk assessments in 2013 and 2014 that resulted in the following:

- City Light developed action plans to reduce the likelihood and consequences of wildfire for infrastructure damage and employee safety.
- The towns were recognized as Firewise USA® communities in 2013 and 2014, which raises the awareness of wildfire hazard and increases coordination among City Light and the local, state and federal agencies responsible for wildfire response.
- City Light identified at-risk infrastructure and actions that can be taken to reduce future wildfire risk:
 - Removing vegetation and woody debris near buildings to increase defensible space.
 - Removing invasive and flammable vegetation around infrastructure.
 - Enhancing evacuation procedures.

- Increasing capacity to manage wildfire risk by hiring a full-time fire brigade chief to support coordination with fire and emergency agencies in preparation/response/recovery activities as a utility liaison, support and conduct risk assessments, and address other wildfire-related safety concerns.

7.2. Engagement With Emergency Response Organizations and Municipalities

City Light maintains ongoing communications and coordination with adjacent utilities, municipalities, local, state, and federal agencies, and other organizations regarding a wide range of planning and operational subjects impacting City Light's WRRS:

- The City Light wildfire mitigation plan for the Skagit Hydroelectric Project was developed through the collaboration of local emergency-management experts, community members, climate-adaptation specialists and City Light employees.
- City Light, along with other public- and investor-owned utilities and rural electric cooperatives, has been collaborating with the Washington Department of Natural Resources on approaches to wildland fire-risk assessment, prevention and mitigation. City Light participated in the Utility Wildland Fire Task Force in 2019, which addressed fire investigation protocols and removal regulations for "danger trees" within utility rights-of-way. City Light continues to work with utilities and agencies on the Utility Wildland Fire Prevention Advisory Committee to develop solutions for fire prevention and risk mitigation.
- City Light participated in the Washington State Urban and Community Forestry Council and Washington State Department of Natural Resources' Electric Utility Wildfire Prevention Advisory Committee.
- City Light supported King County's development of a wildfire risk reduction strategy, its first-ever strategic framework for cross-jurisdictional and cross-organizational work on wildfire risk reduction.
- Where City Light transmission lines cross U.S. Forest Service (USFS)-administered lands, City Light manages the land and vegetation through either a Federal Energy Regulatory Commission (FERC) license if lines are on land within the FERC project limits or a special-use permit with the USFS. The license and permit detail how the utility operates on USFS-administered lands. The special-use permit also includes operating plans that describe treatment of vegetation within the right-of-way to prevent vegetation grow-in and maintain North American Electric Reliability Corporation compliance.
- City Light has served as the Executive Committee Chair of the CEATI¹⁷ Vegetation Management Task Force for the last several years, which focuses on the advancement of technologies to support utility vegetation management, including wildfire detection, mitigation, planning and response.

¹⁷The Centre for Energy Advancement through Technological Innovation

8. Accountability and Governance Structure

City Light has conducted benchmarking on the current practices for accountability and governance for wildfire mitigation plans. As City Light advances the governance structure for the WRRS, we will consider industry best practices, such as incorporating:

- A steering committee, chaired by an officer, which oversees the governance of wildfire risk, with representation from a diverse set of groups across the company, such as electric operations, emergency management, regulatory and others.
- A core group with responsibility for oversight, governance and execution of the wildfire mitigation plan, along with officer-level oversight.
- Specific program owners with accountability for execution of the individual initiatives and components of the WRRS.
- An advisory council that includes a group of diverse, well-connected, trusted community leaders to provide feedback recommendations and support to senior management, including periodic meetings attended by company officers where updates to the WRRS are presented for discussion, suggestions and recommendations by the community.
- Periodic review and updates that align with City Light objectives and legislation.

9. Action Plan

Table 1 outlines a sampling of action plans to advance the WRRS over the next several years. More details on actions are provided in an appendix that will evolve over time as actions are implemented and new ones are identified during implementation of the WRRS.

TABLE 1. CITY LIGHT WRRS ACTION PLAN	
Area	Action Description
Risk Assessment	Evaluate wildfire risks at asset level for Skagit, Boundary, Cedar Falls and South Fork Tolt generation facilities as well as transmission lines.
Risk Assessment	Advance City Light's understanding of the wildfire risk reduction value of investment programs and incorporate findings into decision and optimization processes.
Risk Assessment	Expand and centralize data repositories on reliability performance, customer interruptions, asset inventory and condition, vegetation management, weather data and fire events.
Risk Assessment	Evaluate current inspection/assessment cycles for infrastructure with lens of fire risk reduction.
Risk Assessment	Explore technology options to inspect infrastructure in remote areas.
Risk Assessment	Develop a report on overhead transmission and distribution line reclosing operations to help inform the risk assessment component of the WRRS.
Risk Mitigation	Incorporate wildfire risk-reduction potential into new technology evaluations.
Risk Mitigation	Seek federal funding to mitigate wildfire risk to critical energy and water infrastructure.
Risk Mitigation	Continue to diversify portfolio of power resources with respect to location of power generation.
Risk Mitigation	Develop a formal quality-assurance and quality-control program to verify the quality of repairs performed.
Risk Mitigation	Evaluate Vegetation Management Program to identify opportunities to better reduce wildfire risk, including formulating agreements with landowners on danger tree management.
Emergency Management	Explore developing a formalized public safety power shutoff, including procedures for high-risk weather conditions.
Emergency Management	Create formal agreements with Skagit County fire chiefs, National Parks Service and the Washington State Department of Transportation for clarity on wildfire response events.
Emergency Management	Increase the deployment of remote sensors and cameras in City Light transmission corridors.

TABLE 1. CITY LIGHT WRRS ACTION PLAN (CONT.)

Area	Action Description
Emergency Management	Integrate WRRS with the City of Seattle's Comprehensive Emergency Management Plan, Seattle Disaster Readiness and Response Plan, and other plans.
Emergency Management	Contract services from entities designated for wildfire detection outside current use of publicly available wildfire maps during wildfire season (https://fire.airnow.gov/).
Stakeholder Engagement	Identify and map disadvantaged communities in service and remote areas; integrate wildfire hazard risk assessments with Skagit, Whatcom and Pend Oreille conservation districts for rural communities (Newhalem, Diablo, Metaline Falls).
Stakeholder Engagement	Evaluate relationship with landowners adjacent to hydroelectric projects and transmission lines, and engage in conversations and collaborations with adjacent landowners on wildfire prevention methods and wildfire response.
Accountability and Governance	Develop a formal governance structure following industry best practices.