
# 2020 WILDFIRE MITIGATION PLAN

PUBLIC SERVICE COMPANY OF COLORADO

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# 1. Executive Summary

Public Service Company of Colorado ("Public Service" or the "Company") is committed to delivering electricity to our customers that is first and foremost safe, but also reliable and cost-effective. It is with this focus on safety that the Company is implementing measures to reduce the risk of fire ignitions caused by the operation of our equipment, in order to minimize the potentially devasting impacts caused by wildfires.

To be clear, the Company has always worked to reduce the risks presented by wildfires. However, recent increases in the occurrence of severe weather events has impacted both the frequency and intensity of wildfires in Colorado, along with much of the western United States. This, in turn, has changed the risk profile that wildfires present to utilities and the communities we serve, which has driven increased focus on efforts and investments that can mitigate wildfire risk.

Following the devastating California wildfires in 2017 and 2018, several of which were attributed to electric utility equipment, a number of utilities outside of California (including Public Service) have undertaken additional efforts to evaluate how the risk of fires could impact their own customers, communities, and utility operations. In early 2018, the Company began engineering and risk analysis to determine overall wildfire risk and develop an initial plan to mitigate those risks. As part of this holistic evaluation, the Company determined additional actions could further promote public safety and systematically mitigate the risk of ignition from electrical infrastructure. Those three categories include:

In 2019, the Company formally assembled a Wildfire Mitigation Team to explore and implement the various options Public Service could undertake to minimize the risks of its facilities being the source of ignitions that could cause wildfires. The Company's updated, comprehensive Wildfire Mitigation Plan ("WMP" or "Plan") is built around this emphasis on public safety, environmental stewardship, and stakeholder engagement, reflecting our commitment and desire to continually minimize all safety risks inherent in the operation of an electric system. To these ends, the Company's WMP provides for detailed inspections and remediations, vegetation management, infrastructure hardening, and operational protocols, as well as robust risk analysis and stakeholder and community outreach processes.

Public Service filed its first Plan with the Colorado Public Utilities Commission ("Commission") in 2019 as part of its 2019 Phase I Electric Rate Case ("2019 Rate Case").[1] An Unopposed Partial Settlement Agreement

[1] Commission Proceeding No. 19AL-0268E.

("Wildfire Settlement Agreement") was executed in November 2019 to resolve parties' concerns related to the WMP, which the Commission approved without modification by Decision No. C20-0096.

The Company completed the following WMP activities in 2019:

- Inspected 2,900 miles of transmission line via ground and aerial patrol (100 percent of circuits in the Wildfire Risk Zone ("WRZ");
- Inspected 2,900 miles of transmission line and equipment infrared;
- Analyzed four transmission circuits with 511 transmission structures for extreme wind loading conditions;
- Corrected 72 transmission defects;
- Inspected 2,851 transmission wood poles intrusively;
- Inspected 66,681 distribution wood poles intrusively;
- Replaced 2,305 distribution wood poles due to groundline inspection failures;
- Upgraded multiple fuses and lightening arrestors;
- Completed system protection study, and initiated engineering for 85 additional reclosers;
- Removed or mitigated hazard trees from an additional 20 circuits;
- Collected light detection and ranging ("LiDAR") data via helicopter for 20 distribution segments and began wind loading analysis;
- Completed infrared inspections on 430 miles of distribution feeders;
- Completed focused program for enhanced above groundline ("AGL") inspections on 792 distribution poles; and
- Engaged with 14 counties and 3 community organizations as part of its community outreach effort.

This updated Plan builds on the 2019 Plan and activities and is explicitly designed to continue the Company's proactive approach to keeping customers safe, enhancing system reliability and resiliency, and addressing the concerns of stakeholders and parties to the Wildfire Settlement Agreement – based on the core principles of Engagement, Acceleration, and Technology. We have completed, and will continue to complete, many inspections, studies and modeling, and evaluated those results to determine additional actions including replacements and additional inspection programs.

This updated Plan details the range of activities that Public Service is taking or plans to take in order to mitigate the threat of electric facility ignited wildfires, including its various programs, activities, and procedures. Among other things, this updated Plan builds upon the same foundational elements included in the 2019 Plan, providing more rigorous analysis and detail, and incorporating data and lessons learned over the course of 2019. This updated Plan includes several new or enhanced initiatives since the 2019 Plan, including AGL inspections, covered conductor replacement programs, and major line rebuild programs.

In developing this Plan, the Company conducted extensive asset-based risk modeling to identify the highest risk assets on its system. Using our own data and state data available through the Colorado Wildfire Risk Assessment Portal developed by the Colorado State Forest Service, we have developed the WRZ, which is a targeted area where we will focus our efforts. This includes 2,100 miles of overhead distribution feeder (out of 9,500 miles total on the system) and 2,900 miles of transmission lines (of nearly 5,000 total). While virtually all of our WMP efforts will occur within the WRZ, due to the nature of the system and our geography, there will inherently be some activities that occur outside the WRZ.

Public Service is committed to building on the meaningful progress we have made to date on wildfire mitigation, as well as the continual development, evolution, and improvement of our WMP over time. Along these lines, this Plan is not a static document and will inherently evolve as we complete studies and inspections, implement new technologies, and as best utility practices evolve in the coming years.

# 2. Introduction

Public Service is one of the four energy subsidiaries that make up Xcel Energy Inc. ("Xcel Energy"). As the largest investor-owned utility in Colorado, the Company serves approximately 510,000 electric customers, 400,000 gas customers, and 1.1 million electric and gas combined customers in its 8,200 square mile service area. Headquartered in Denver, Colorado, Public Service is engaged in the generation, transmission, sale, and distribution of electricity for commercial and residential customers. The entire Public Service electric transmission network is located within the State of Colorado and consists of over 4,983 miles of transmission lines and 9,500 miles of overhead distribution lines. The Company's electric system is summer-peaking, with a 2019 peak customer demand of 6,881 MW.

Xcel Energy is committed to protecting the environment as it transitions to cleaner sources of energy and continues to lead the clean energy transition in the U.S. as the first major U.S. power company aiming to provide 100 percent carbon-free electricity by 2050, and by cutting greenhouse gas emissions. As part of our commitment to protecting our customers, local communities, and the environment, the Company is making strategic investments and improvements to bolster the performance of the power grid, build resilience, and enhance our ability to protect and respond to the threat of wildfires.

Public Service's overarching goal is to provide safe, reliable, environmentally sustainable, and affordable electric service to its Colorado communities. To meet this goal, we strive to construct, maintain, and operate our electrical lines and equipment in a manner that minimizes the wildfire risk associated with our system. We are also continually evaluating new ways to mitigate this risk. While wildfires have long posed threats to utility systems, more recent events have served to re-focus the industry's attention on wildfire mitigation practices. Because of this, the practices, techniques, and technologies used to minimize the risk of utility equipment-caused wildfires are in a period of significant evolution and study, with Public Service committed to being a local and industry-leader in this area.

Public Service provides electricity to its customers *via* generation, transmission, substation and distribution assets. Table 2-1 below depicts a high-level description of the Company's transmission and distribution assets, and Table 2-2 provides an overview of Public Service's assets located within the WRZ.

*Table 2-1: Public Service Assets*

| Asset Classification | Asset Description |
|---|---|
| Transmission line assets | Assets include conductors, transmission structures and switches operating at or above 69 kV (only 69 kV lines that are tied to generation are considered transmission). |
| Distribution line assets | Assets include overhead conductors, underground cabling transformers, voltage regulators, capacitors, switches, line protective devices and street lighting operating at less than 69 kV (all 69 kV lines not tied to generation are considered distribution). |
| Substation assets | Assets include major equipment such as power transformers, voltage regulators, capacitors, reactors, protective devices, relays, open-air structures, switchgear and control houses. |

*Table 2-2: Wildfire Risk Zone Assets*

| Asset | Total Circuit-miles | WRZ Circuit-miles | % of Total OH Miles in WRZ |
|---|---|---|---|
| Total Transmission | 4,983 | 2,904 | 58% |
| Total OH Distribution | 9,548 | 2,191 | 23% |
| Total OH Miles | 14,531 | 5,095 | 36% |

Public Service is committed to delivering affordable, reliable energy using advanced clean energy technologies. For the past 15 years, the Company has led the clean energy transition while ensuring reliability and enhancing affordability. Now, Xcel Energy plans to increase renewable energy and reduce carbon emissions to levels never imagined a decade ago. Xcel Energy is the first major U.S. power company with an aspiration to provide 100 percent carbon-free electricity by 2050. The Company recognizes that climate change is an important issue for policy makers, investors, and customers. It is a priority for us as well, and the reason we have set ambitious goals to reduce carbon dioxide emissions 80 percent from 2005 levels by 2030 and deliver 100 percent carbon-free electricity by 2050.

Public Service also recognizes how climate change has increased the risk, frequency, and severity of wildfires. Some studies indicate that climate change will continue to amplify the potential for wildfire activity. Also, the wildland-urban interface ("WUI"), which is the area where houses and wildland vegetation meet or intermingle, has continued to grow at a rapid pace, making it the fastest-growing land use type in the conterminous United States. WUI growth often results in more wildfire ignitions, putting more lives and houses at risk. Since safety is a core value of the Company, our Wildfire Mitigation Program is designed to help

protect lives, homes and property from the threat of wildfire, while simultaneously mitigating the threat of wildfire to communities, ecosystems, and environment where we operate.

# 3. Overview of the Wildfire Mitigation Plan

The primary objective of this WMP is to promote public safety through minimizing the risk of the Company's equipment being a potential source for a wildfire ignition. In developing this Plan, the Company determined three main categories of additional actions could further promote public safety and systematically mitigate the risk of ignition from electrical infrastructure. Those categories include:

**Engagement -** increased engagement with local, county, and state entities to facilitate more coordinated planning and mitigation efforts across organizations and ensure our customers, communities, and emergency response responders are aware and informed of the Company's operations, existing procedures, and WMP;

**Technology -** equipment upgrades and increased use of technology, including extreme wind loading conditions analyses and involving an increased collection of Light Detection and Ranging ("LIDAR") data, to enable the Company to systematically mitigate the risk of electrical infrastructure starting a wildfire, as well as the use of Unmanned Aerial Systems to provide detailed pole top inspections;

**Acceleration -** accelerating certain utility practices that mitigate wildfire risk, like routine pole inspections and replacements, for example, in areas designated as Public Service's WRZ based on data from the Colorado State Forest Service, from traditional timeframes to shorter cycles presented a prudent measure to undertake to promote public safety and environmental stewardship in light of increasing intensity and frequency of wildfires in the state and expanding WUI exposure.

While utilities have traditionally focused on reliability, the concept of resiliency has evolved from reliability with the goal of minimizing and shortening power outages during all types of weather. Wildfire mitigation takes this a step further, by focusing on proactive steps to minimize the risk of the system causing a problem that could ignite a wildfire, while following the three guideposts identified above.

In developing this Plan, the Company conducted extensive asset-based risk modeling to identify the highest risk assets on its system. Using our own data and state data available through the Colorado Wildfire Risk Assessment Portal ("CO-WRAP") developed by the Colorado State Forest Service, we have developed the WRZ, which is a targeted area where we will focus our efforts. This includes 2,100 miles of overhead distribution feeder (out of 9,500 miles total on the system) and 2,900 miles of transmission lines (of nearly 5,000 total). While virtually all of our WMP efforts will occur within the WRZ, due to the nature of the system and our geography, there will inherently be some activities that occur outside the WRZ. The CO-WRAP and WRZ are discussed in more detail in Section 4 below.

This Plan describes the Company's activities planned for 2020 to 2025 to minimize the risk of ignitions within its service territory. The primary actions contained in this Plan include:

- Accelerated and enhanced equipment and vegetation inspections and replacements, system protection and wind strength modeling programs, and asset data gathering;
- System protection enhancements;
- Expanded and incremental vegetation management;
- Repair and replacement activities of equipment identified through inspections, system protection and wind modeling programs;
- Metrics, Tracking, and Reporting;
- Community and stakeholder outreach; and
- Ongoing assessment of other activities for future consideration.

These efforts are designed to reduce the frequency of potential ignition events and reduce the chance of an ignition through updated protection practices. Table 3-1 below contains a summary of the programs and activities we are implementing through this Plan.

*Table 3-1: Wildfire Mitigation Programs and Activities*

| Inspection & Modeling | Distribution | Transmission | Current WMP | 2021-2025 |
|---|---|---|---|---|
| Groundline Intrusive Pole Assessment | X | X | X | |
| Above Groundline Inspection | X | | X | X |
| Annual Visual Inspection | | X | X | X |
| Annual Visual Inspection | X | | | X |
| Infrared Inspection | X | | X | X |
| Infrared Inspection | | X | | |
| Overhead Secondary Open Wire Quantification | X | | X | |
| Structure Wind Strength Review | | X | X | |
| Structural Wind Strength Review | X | | X | X |
| Risk Modeling Development | X | X | X | X |
| **Repair & Replacement** | **Distribution** | **Transmission** | **Current WMP** | **2021-2025** |
| Pole Repair/Replace | X | | X | X |
| Open Secondary Conductor Replacement | X | | X | X |
| Overhead Covered Conductor | X | | | X |
| Equipment upgrade (cutouts, arresters, etc.) | X | | X | X |
| High Priority Defect Correction | | X | X | X |
| Major Line Rebuilds | | X | X | X |
| Overhead Rebuilds | X | | X | X |
| Minor Equipment Replacement | X | | X | X |
| Small Conductor Replacement | X | | | X |
| **System Protection** | **Distribution** | **Transmission** | **Current WMP** | **2021-2025** |
| Advanced Distribution Management Enhanced System Protection | X | | X | X |
| Design/Construct Revised Protection Schemes | X | | X | X |
| Protection Study for Feeders | X | | X | |
| Recloser Communications Network | X | | X | X |
| Substation Relay Communications Upgrade | X | | X | X |
| Substation Relay Upgrade for Remote Non-Reclosing | X | | X | X |
| **Enhanced and Incremental Vegetation Management** | **Distribution** | **Transmission** | **Current WMP** | **2021-2025** |
| Mountain Hazard Tree Program | X | X | X | X |
| Defensible Space Around Poles | X | | X | X |
| Secondary Lines and Service Line Clearance | X | | X | X |
| ROW Vegetation Type Conversion | | X | X | X |
| **Metrics and Tracking** | **Distribution** | **Transmission** | **Current WMP** | **2021-2025** |
| Program and activity Targets | X | X | X | X |
| Progress and Outcome Metrics | X | X | X | X |
| **Operations** | **Distribution** | **Transmission** | **Current WMP** | **2021-2025** |
| RFW Day Procedures | X | X | X | X |
| Work Practice Procedures | X | X | X | X |
| **Community and Stakeholder Outreach** | **Distribution** | **Transmission** | **Current WMP** | **2021-2025** |
| Community Engagement Meetings | X | X | X | X |
| Stakeholder Engagement Meetings | X | X | X | X |

Risk is often defined as the product of the likelihood of an event and the possible consequence or impact. Given that a significant wildfire event—especially a utility-caused wildfire—has a very low likelihood, the Company's Wildfire Risk Model, explained later in this document, focuses on the most significant potential impacts (the "tail" events in the distribution of outcomes in the model's simulation). In that sense, the term "risk" is often used to refer to the possible consequence of a wildfire event (regardless of likelihood). For example: CO-WRAP uses the term "risk" to describe the potential wildfire consequence due to various attributes, such as availability of fuels and proximity to the WUI. One of the Company's first efforts in preparing a comprehensive WMP was working to objectively understand the wildfire risk within its service territory. The Company consulted with a fire scientist and engaged a utility wildfire consultant to assist it in developing and launching its Wildfire Mitigation Program. The Wildfire Mitigation Team ultimately chose the CO-WRAP, which is administered by the Colorado State Forest Service, to help determine which areas to focus on and identify the overhead asset locations that are in a WRZ. This work provided a score for each overhead asset location in Colorado. Locations that received a score of 3, 4, or 5 are considered in the WRZ, along with any asset location that is within 1,000 feet of an asset location with a score of 3, 4, or 5.

Situational awareness refers to the ability to monitor environmental conditions to make critical operational decisions more quickly and effectively. Utilities utilize a variety of situational awareness tools, such as meteorologists, weather stations, cameras, super computers, and fire science. For Public Service's wildfire mitigation initiative, the focus has been primarily on meteorology and weather monitoring. Company meteorologists monitor and compile relevant weather information such as Red Flag Warning days and High Fire Risk information gathered from various public sources, such as the National Weather Service. The information is gathered for the entire state of Colorado but is displayed to highlight the Company's service territory. The Company also uses Indji Watch, which is a tool that provides information on environmental threats like active fires that the Company monitors for proximity to Company assets. That information is used to adjust operations protocols and field crew work practices to ensure employee safety. In addition, the Company is evaluating the implementation of software that will allow System Operators to predict spread of any fire in or near portions of our service territory in real-time, as well as simulate fire starts at many of our equipment assets to determine fire spread consequences. The Company is exploring the use of publicly-available weather and fire information and will consider the use of other situational awareness tools in the future, such as weather stations and cameras.

While Public Service has always considered wildfire risk, in 2018, Public Service began taking a concerted look at the wildfire risks posed by operating its utility equipment and the associated consequences of the wildfire risk in its service territory. Also in 2018, the Company consulted with a fire scientist and engaged a utility wildfire consultant to assist it in developing and launching its Wildfire Mitigation Program and Plan. To

understand the risk of wildfires and subsequent potential consequences in Colorado, the team utilized the CO-WRAP as described previously.

System hardening involves all activities focused on preventing Company facilities from causing an ignition. The system hardening program incorporates activities to safeguard the electric system against wildfires irrespective of ignition source. The overall goal of the program is to ensure the electric transmission and distribution systems possess the structural integrity to withstand the environmental conditions, to sectionalize, and to prevent damaging interference of vegetation onto energized facilities. Multiple elements address aspects of system hardening, and the programs are synchronized to provide a comprehensive approach to an ignition resistant infrastructure. The Company categorizes its System Hardening program into the following areas:

- Inspections and modeling programs;
- Repair and replacement programs;
- System protection; and,
- Vegetation management.

Metrics are intended help track what has been done and how progress is made to reduce wildfire risk. They provide information to trace how the plan contributes to safety and other objectives. They should include both lagging indicators, to understand to past incidents and help prevent recurrence, and leading indicators, to understand near-misses and help avoid potential incidents. In its 2019 WMP, Public Service listed the following Tracking and Operations actions:

- Red Flag Warning notifications;
- Wildfire mitigation training;
- Operational modifications; and
- Downed conductor tracking.

Following the 2019 WMP, the Company has enhanced its metrics tracking to include the following:

- The communities or areas which experienced Red Flag Warnings, as well as the dates they occurred, in addition to the number of Red Flag Warnings in Colorado;
- The number of ignitions associated with electric overhead powerlines within the WRZ, in addition to the number of downed lines within the WRZ;
- The total number of wildfires in the Company's service territory; and,
- The total actual annual investment in the WMP.

Engaging with our communities and stakeholders is essential to building an understanding of wildfire risks and the efforts the Company is taking to mitigate utility-caused wildfires. We have proactively communicated with various stakeholders, educating them on the work being done for wildfire mitigation, answering questions about the Plan, and receiving feedback on what is important to them. Our Plan will continue to evolve as we evaluate new technologies, gain more industry and stakeholder input and support, and complete more inspections and studies to inform our programs. Our outreach efforts also include collaboration and benchmarking with the Electric Power Research Institute, Edison Electric Institute, National Labs, and neighboring utilities, to share lessons learned and best practices.

The Company continues to leverage lessons learned and share best practices with other utilities, particularly in Colorado and California, to drive continuous improvements in our WMP, balanced against risks and consequences. The utilities in the western U.S. have been advancing wildfire mitigation plans for several years, with San Diego Gas and Electric being the recognized leader in the industry. By regularly comparing Public Service's mitigation practices to other utilities allows the Company to continually improve its Plan, to minimize the growing risk of utility-caused wildfires. While observing and comparing against California provides insights into future potential maturity of a program, Colorado has not historically experienced the same frequency or consequences of wildfires that have occurred in California largely due to geographical and environmental differences between the two states. While Public Service's WMP compares favorably to ongoing California programs, no two utilities are the same in terms of the risks and variables they face. Public Service has therefore scaled its WMP to the threat and likely consequence of a utility-equipment-caused wildfire in Colorado.

In late 2019, Public Service began discussions with multiple Colorado electric providers to determine what wildfire mitigation programs they had in place or planned to implement. As a result, in January of 2020, the Company hosted the first Colorado Wildfire Mitigation Summit to provide an opportunity to share best practices and learnings. The following companies participated and shared plans: Holy Cross Energy, Tri-State Generation and Transmission, Black Hills Energy, United Power, Platte River Power Authority, Colorado Springs Utilities, the Western Area Power Administration, and Intermountain Rural Electric Association. Each provider, all being in various stages of program development and implementation, shared their plans and provided discussion and feedback on all plans. Public Service hosted a second meeting in April 2020 to share wildfire response plans and to get input on utilities' planned actions. As programs continue to develop, future discussions will be held to further collaborate and leverage the work being conducted.

# 4. Risk Analysis

The Company's wildfire risk analysis process assigns a composite wildfire risk score to each structure/asset obtained out of Public Service's Geographic Information System ("GIS"). The assets considered are: distribution (overhead conductor, poles, capacitors, overhead secondary, fuses, transformers, and breakers) and transmission (poles and conductor). Each structure/asset is ranked from 1 to 5, with 1 being the lowest and 5 being the highest wildfire potential consequence. For a 100-foot radius around each structure, six attributes from the CO-WRAP were assigned. The attributes are equally weighted, and thus the rating from the CO-WRAP is normalized to assign a risk score from 1 to 5. Below are the ratings for each attribute, converted to a risk score of 1 to 5 or 0 to 5:[2]

- Flame Length: 1-7 (Non-burnable to extreme)
- Fire Intensity: 1-5 (Lowest intensity to highest intensity)
- Rate of Spread: 1-7 (Non-burnable to extreme)
- Fire Extreme: 1-3 (Surface fire, passive canopy fire, active canopy fire)
- Suppression: 1-9 (Least difficult to most difficult)
- Wildland Urban Interface: 1-7 (Less than 1 house per 40 acres to more than 3 houses per acre)

The product of these attributes determines the composite Wildfire Risk Score. Additionally, CO-WRAP has a Wildfire Risk Theme labeled "Wildfire Risk." This is derived by combining the Wildfire Threat and Fire Effects assessment outputs. The Wildfire Threat output includes historical fire occurrences; these historical fires are from all possible ignition sources. Since the majority of wildfire ignitions are the result of human causes, such as campfires, the Wildfire Threat category is skewed in populated areas where there is a greater chance of these types of ignitions. Conversely, areas with electric utility assets where there were no historical instances of wildfires, yet with many attributes of high wildfire risk, are likely not adequately captured in CO-WRAP as high wildfire risk areas with the Wildfire Risk Theme. Where the CO-WRAP and Wildfire Risk scores are different, the Company selects and assigns the higher of the two scores to a given structure.

[2] Fire Intensity and Suppression may have a value of zero, thus zeroing out the composite Wildfire Risk Score if either of these attributes show no wildfire risk. Note that zeros in these fields are not missing values, but rather a value of no risk.

The following figures show examples of low, medium-high, and high wildfire risk scores:

Example – Low Risk Area

| ID | HEIGHT | CLASS | MATERIAL | STATUS | INSTALL_DA | TREATMENT_ | YEAR_MANUF | X | Y | City | zipcode |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 439758304 | 95 | H1 | Not Assigned | Existing | 3/21/2014 | Not Assigned | 2013 | -105.8915793 | 37.76508454 | Center | 81125 |

| CO WRAP - Characteristic | Score |
|---|---|
| FlameLength | 3.1 |
| Rate of Spread | 3.3 |
| Intensity | 4.3 |
| Type Extreme | 1.7 |
| Suppression | 1.3 |
| Wildland Urban | 0.6 |
| **WildFire Risk** | **53.3** |
| | **Low Risk** |


*Figure 4-1: Example of Low Risk Area*

Example – High Risk Area

| ID | HEIGHT | CLASS | MATERIAL | STATUS | TREATMENT_ | YEAR_MANUF | X | Y | City | zipcode |
|---|---|---|---|---|---|---|---|---|---|---|
| 451955138 | 60 | 2 | Wood | Existing | Pentachlorophenol | 1983 | -107.2675484 | 39.56517482 | Glenwood Springs | 81601 |

| CO WRAP - Characteristic | Score |
|---|---|
| FlameLength | 5.0 |
| Rate of Spread | 4.2 |
| Intensity | 4.3 |
| Type Extreme | 3.3 |
| Suppression | 2.5 |
| Wildland Urban | 0.6 |
| **WildFire Risk** | **409.9** |
| | **High** |


*Figure 4-2: Example of High Risk Area*

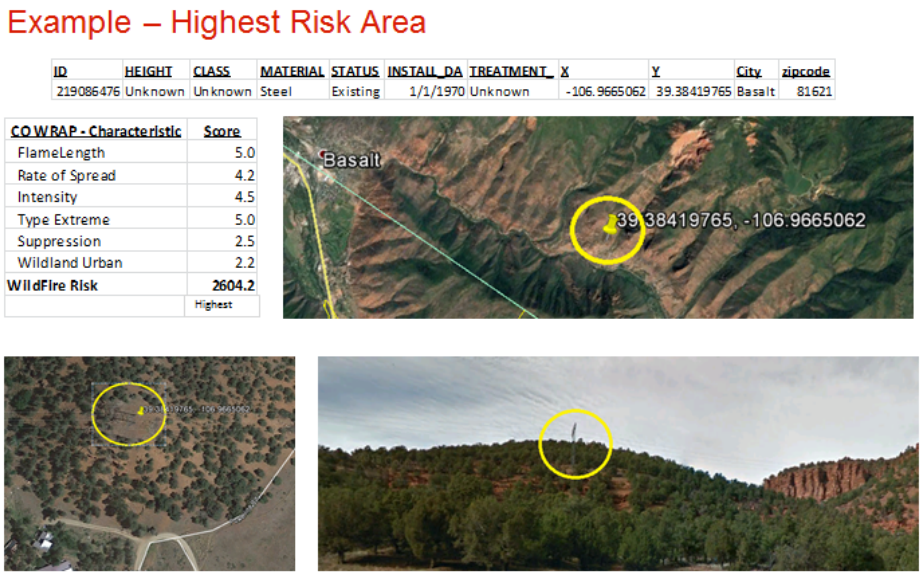



*Figure 4-3: Example of Highest Risk Area*

Ongoing updates to the assumptions are made and will be made to the Company's Wildfire Risk Model as data becomes available. This includes updates to wildfire distributions of acres burned by equipment failure and object contact type from California Public Utilities Commission wildfire data, including the most significant historical wildfires if applicable, adjusting the normalization for Colorado based of the most recent historical number of wildfires and number of acres burned.

To account for potential cascading events that could initiate in a lower risk area and impact assets that are in a higher consequence area, the Company adds a 1,000-foot buffer to capture the assets within a 1,000-foot radius of those assets within the wildfire risk score of 3, 4, or 5 (where the score is calculated using a 100-foot radius). This is the basis for the creation of the WRZ identified in the Company's Plan. The map below shows the WRZ and wildfire work practice area within the Company's service territory. The black dots indicate a 1,000-foot radius around each transmission structure and the red dots represent a 1,000 foot radius around each distribution structure.

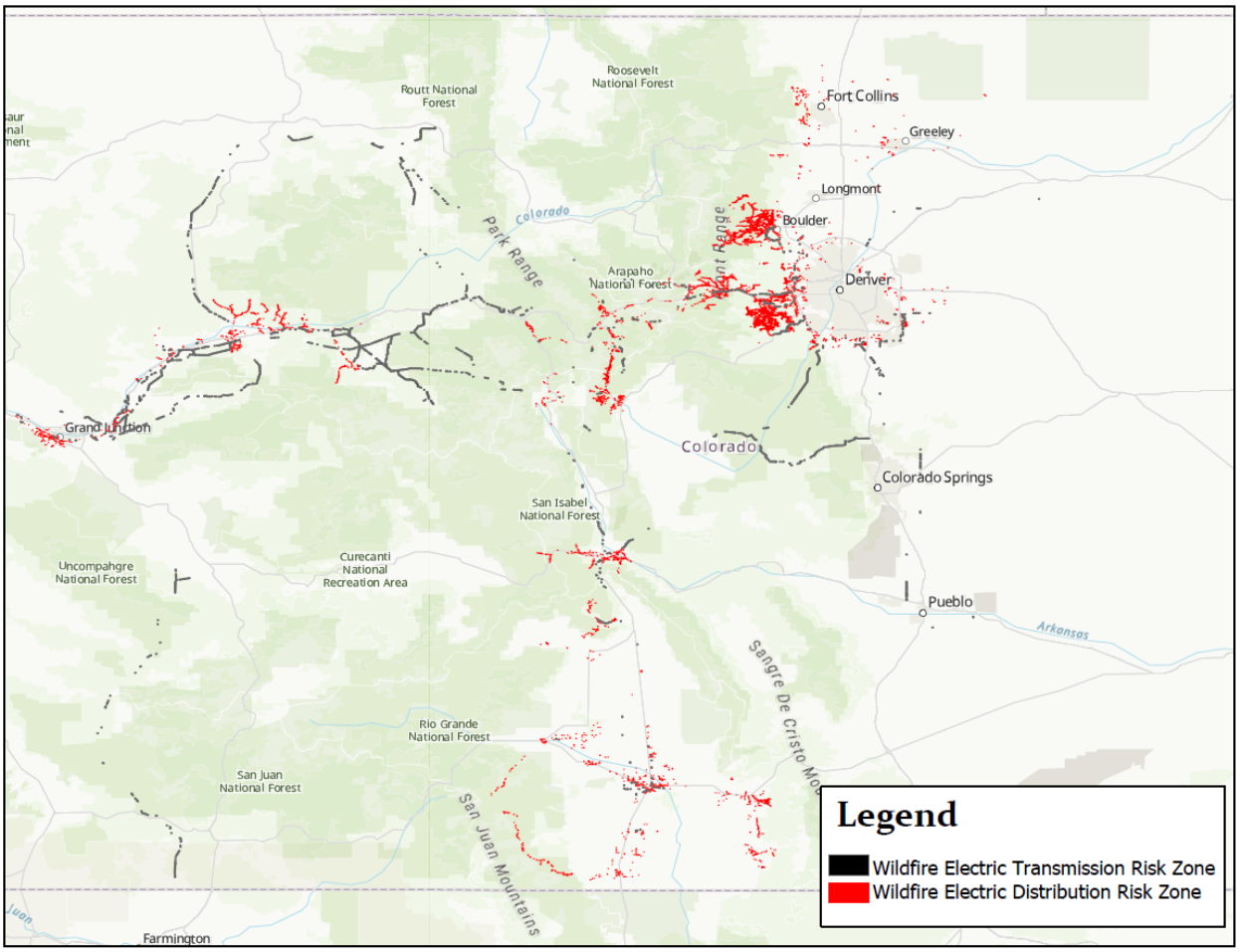



*Figure 4-4: Wildfire Risk Zone Map*

To help analyze its own risk and develop an effective WMP, the Company built a Wildfire Risk Model and ran a Monte Carlo Simulation to estimate the potential impact of wildfire risk within the Company's service territory. The risk mitigated by specific programs is determined by comparing the extreme results (the highest impact events) of the Simulation with and without a particular mitigation program or action. These programs are prioritized with consideration of the potential risk mitigated and their cost. Note that this is not an all-encompassing prioritization, but rather one data point based on assumed program impact and effectiveness used to provide input into the overall effort.

This WMP contemplated many different programs, including System Protection, Inspection and Replacement, and Vegetation Management. Engineering and project managers determined the type of ignition the program would mitigate and in which wildfire risk areas, and then estimated the general effectiveness of that mitigation in terms of preventing a potential ignition. As more data and information becomes available, the Wildfire Risk Model will be updated to reflect our most current understanding of wildfire risk.

**Overall Architecture**

The Wildfire Risk Model allocates the average number of expected wildfires derived from historical outage data across various utility ignition sources. Each of these ignition sources has a unique distribution of potential acres burned. The distribution of acres burned are derived from California Public Utilities Commission utility wildfire data from 2014 to 2017 (the most recent available) and normalized for Colorado, where an average wildfire in Colorado is 20 percent smaller in terms of acres burned based on National Interagency Fire Center ("NIFC") data for the same time period. The potential impact in dollars per acre burned is based on historically significant fires in Colorado.

The Wildfire Risk Model assigns a number of acres burned to each assumed utility ignition event, then converts from acres burned to potential dollars of impact as an estimate of risk. The figure below illustrates the Wildfire Risk Model's modeling process.

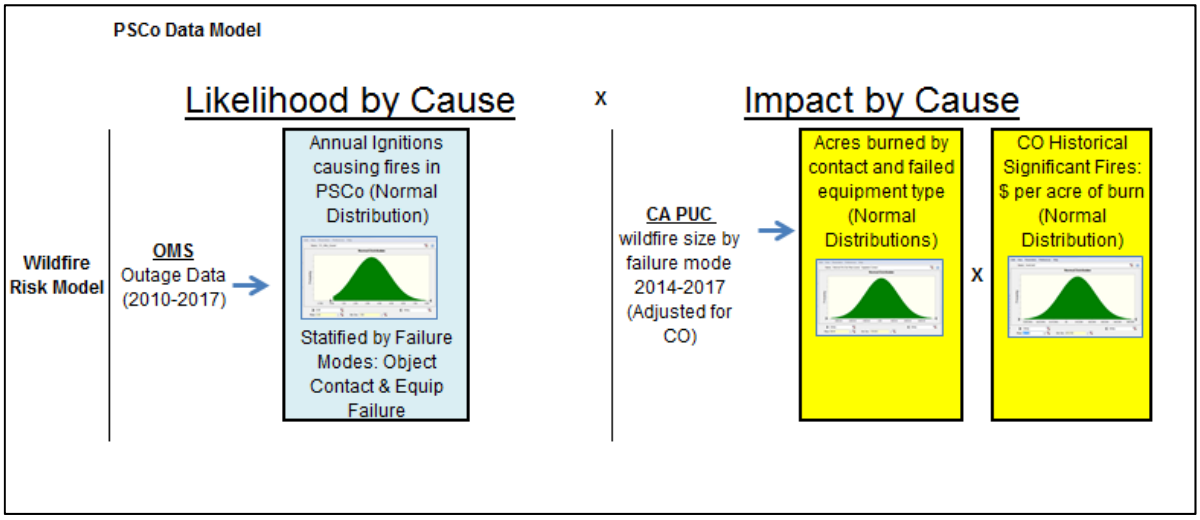



*Figure 4-5: Wildfire Risk Modeling Process*

**Other Assumptions**

- Utility-caused fires:[3]
    - Average per year = 15; standard deviation = 3
- The likelihood of types of ignitions given a wildfire event (based on historical fires) is applied as a binomial distribution:

[3] Source: Outage Management System Colorado data (2010-2017).

- *Contact from Object:* 17 percent (Vegetation Contact making up 50 percent of this category)
- *Equipment/Facility Failure:* 75 percent (Conductors, Insulators, and Switches making up 68 percent of this category)
- *Other:* 8 percent

- Cost per acre burned:
  - Average cost per acre burned = $8,762; standard deviation = $13,722
- Distributions of acres burned by each type of ignition[4] are adjusted for Colorado by a factor of 0.8.[5]

**Monte Carlo Simulation and Initial Results**

In developing its Plan, the Company used the Wildfire Risk Model to simulate the annual potential wildfire impact using a Monte Carlo process with 10,000 trial runs. A Monte Carlo simulation performs risk analysis by building models of possible results by substituting a range of values—a probability distribution—for any factor that has inherent uncertainty. It then calculates results over and over, each time using a different set of random values from the probability functions. The result is a distribution of impacts. This distribution is skewed right (*i.e.*, has a long "tail") where most of the impacts are zero for than simulated year; however, there are outcomes in the simulation where significant impacts occur. The figure below shows the results of the Simulation, including those long tail results for the distribution of impacts.

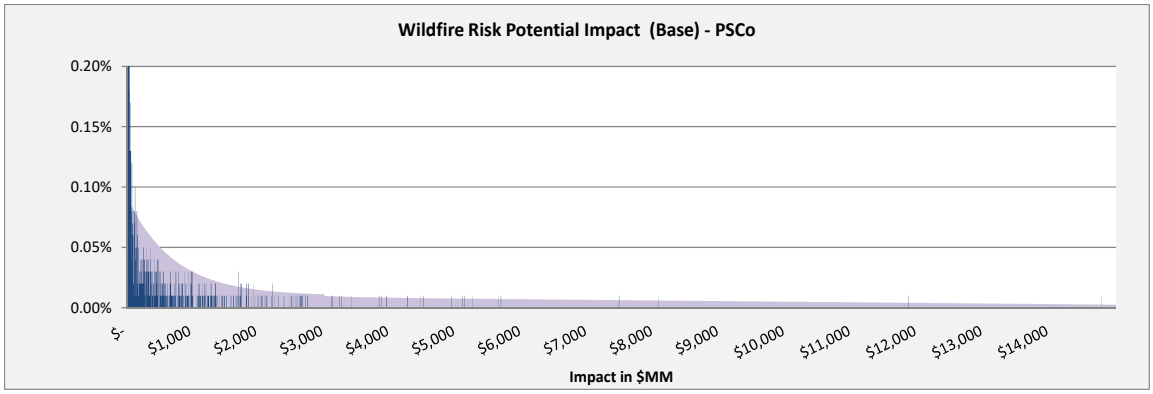



*Figure 4-6: Simulation and Tail Results*

[4] Source: California Public Utilities Commission Fire Incident Data (2014-2017).
[5] Source: NIFC data (2014-2017). The average number of acres burned per wildfire in Colorado was approximately 80 percent of the average number of acres burned per wildfire in California.

The table below breaks down the Simulation results, focusing on the tail results. The effectiveness of a mitigation program is measured by how well these high-impact years can be reduced. The goal is less about moving the average of the results than eliminating the chance of a significantly high impact event.

*Table 4-1: Initial Simulation Results*

| Percentage of Results | Potential Wildfire Risk Impact |
|---|---|
| 90% | Less than $9.7 million |
| 95% | Less than $84.5 million |
| 99% | Less than $1.24 billion |
| Average of top 1% | $2.60 billion |
| Overall average | $46.1 million |
| Median | $0 |

The Simulation results have a median value of $0, with 67 percent of simulated years having no impact. Most of the time, there is an expectation that there will not be a wildfire risk impact; however, it is within the unlikely scenarios that significant impacts are possible. The average of the top one percent of results is **$2.6 billion** – similar to a one-hundred year flood, the Simulation shows that Company equipment could cause a significant wildfire with an expected $2.6 billion impact once in 100 years. This is the assumed risk without the proposed WMP.

In order to simulate the results after the WMP is implemented, there are two data points needed: the number of assets corrected and their corresponding wildfire risk score, and the assumed effectiveness of the program. For example, wood pole cross arms historically cause 1.4 percent of ignitions and are assumed to have a mean burn of 29 acres. There is a distribution of cross arms across the Wildfire Risk Zone with wildfire risk scores of between 1 and 5. The total wildfire risk for cross arms is spread out across those assets. If a program proposes to correct the cross arms of 50 percent of the assets with scores of 3, 4, and 5, then this program is assumed to be mitigating a percentage of that total wildfire risk from cross arms. In addition, if the program is considered to be 75 percent effective, then that percentage is applied to the percent of risk mitigated as well. The result is that each program has a ratio of risk mitigated determined by the number of assets scoring 3, 4 and 5 corrected and an applied effectiveness ratio. Re-running the simulation creates an expected output with full WMP implementation. The table below shows those results compared to the initial simulation.

*Table 4-2: Results with WMP Compared to Initial Simulation*

| Total Potential Impact (Simulation Results) | | |
|---|---|---|
| **Percentage of Results** | **Potential Wildfire Risk Impact - No WMP** | **Potential Wildfire Risk Impact - After Full WMP Implementation** |
| 90% | Less than $9.7 million | Less than $5.4 million |
| 95% | Less than $84.5 million | Less than $43.0 million |
| 99% | Less than $1.24 billion | Less than $0.55 billion |
| Average of top 1% | $2.60 billion | $1.01 billion |
| Overall average | $46.1 million | $19.4 million |
| Median | $0 | $0 |

As shown in the table above, the simulated tail risk (the average impact of the top 1 percent of results) decreases from $2.6 billion to $1.0 billion following full WMP implementation. Thus, the financial impact of a 100-year wildfire event is significantly reduced by $1.6 billion.

The WMP can be generally categorized into buckets in terms of risk reduction: vegetation management, protection, and inspection/replacement. The 1 percent tail risk reduction, as mitigated by the type of mitigation program, can be seen in the figure below.

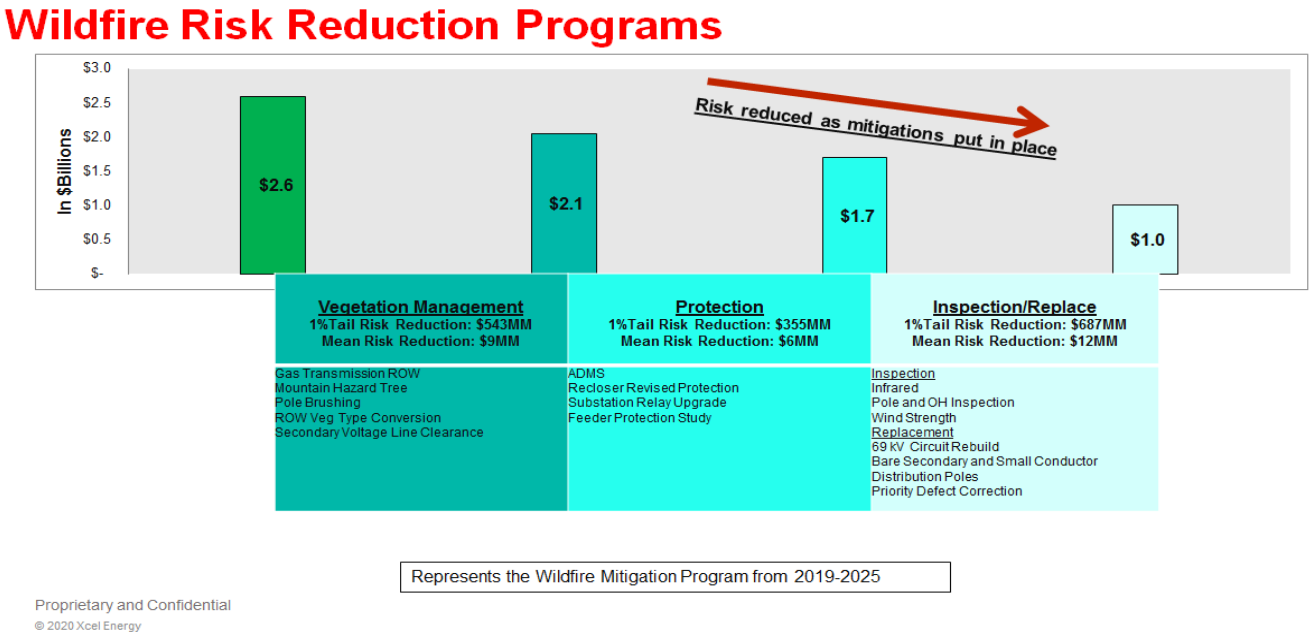



*Figure 4-7: Risk Reduction by Type of Mitigation Program*

These simulations capture the difference in the impact of possible outcomes with and without implementation of the WMP. The Company relied on this to help prioritize its wildfire programs by specifically looking to the impact of the "tail" of the distribution of possible outcomes with and without a given program. The WMP

seeks to eliminate the catastrophic wildfire events. Using the difference between the base case simulation and the simulation when mitigation programs are included quantifies the benefit of a given activity. This is not an all-encompassing prioritization, but rather one data point based on assumed program impact and effectiveness which provides input into the overall effort.

# 5. Situational Awareness

Situational awareness refers to the ability to monitor environmental conditions to make critical operational decisions more quickly and effectively. It covers a broad range of systems that inform operational and/or response actions for both the transmission and distribution systems. Currently, the Company's meteorologists provide pertinent weather data including Red Flag Warning or High Fire Risk information gathered from various public sources, such as the National Weather Service. That information covers the entire State of Colorado, and for our WMP, the meteorology team overlays the weather warnings over the WRZ. Some utilities utilize a variety of situational awareness tools, such as meteorologists, weather stations, cameras, super computers, and fire science. For Public Service's WMP and related initiatives, the focus has been primarily on meteorology and weather monitoring to gain an understanding of the frequency of occurrence and locations of Red Flag Warning days as we incorporate proactive operating procedures as a wildfire mitigation tool.

In 2020, the Company will be implementing a Fire Spread Modeling program that will allow System Operators to predict fire spread of any fire in or near our service territory real-time as well as simulate fire starts at any of our equipment assets to determine fire spread consequences. The program uses weather forecasts and other key input to perform millions of simulations to determine fire potential and risks to populations, buildings, and Company assets. It will also provide real-time simulation modeling to determine potential fire impacts for active response activation or weather event planning.

The Wildfire Mitigation Team will continue to evaluate the addition of situational awareness tools including a select few optimally-placed weather stations to provide current, location-specific weather data. Prior to implementing any operational protocols that could impact customer reliability, it is important to have the most up-to-date localized weather information to inform those decisions. The Company will also evaluate the use of cameras as a means to quickly locate wildfires and proximity to Company assets in our highest population areas. Currently, the Company relies on dispatching field personnel to verify the location and intensity of any fire they are noticed of from a variety of information sources. This is both time-intensive and costly and will be studied further as more data is gathered in the 2020 fire season. The table below provides a high-level overview of the Company's current situational awareness tools and those under consideration for possible future use.

*Table 5-1: Situational Awareness Tools*

| Situational Awareness | Present | Potential Future |
|---|---|---|
| Meteorology – Part-Time | X | |
| Meteorology – Dedicated to WMP | | X |
| Additional Weather Stations | | X |
| Indji Watch Real Time Monitoring | X | |
| Public Sources | X | |
| Field Spotting | X | |
| Spread Modeling | X | X |
| Cameras | | X |

# 6. System Hardening Programs

Public Service has a robust set of system hardening programs to address potential wildfire risks. The Company categorizes its system hardening program into the following areas:

- Inspections and modeling;
- Repair and replacement;
- System protection; and,
- Vegetation management.

The updated WMP expands on and accelerates existing efforts, adds new programs and activities, and will help identify additional program enhancements where a need is identified. In 2019, the Company accelerated wildfire mitigating programs such as intrusive pole inspections and subsequent repair and replacement activities, developed pilot programs to detect potential sources of ignition such as infrared inspections and wind loading analysis, and initiated efforts to utilize available technology such as new reclosers and relays to enhance operational flexibility and precision.

Through the development of its WMP, Public Service has gained valuable knowledge of new modeling and inspection technology and set the stage to further refine projects and programs focused in the areas of highest ignition risk. The Company expanded critical vegetation management programs, and developed new programs focused on clearing vegetation around assets to provide defensible space. In 2020, Public Service continued accelerated inspections, scaled pilot programs based on positive results, and identified new programs to address risk across our service territory.

The WMP has evolved based on the lessons learned from the various programs and activities, and through learning gained from evaluating other utilities' practices and emerging industry practices. The following table lists the WMP's system hardening programs and implementation status.

*Table 6-1: System Hardening Programs*

| System Hardening Programs | Business Unit | 2019 | 2020 | 2021 + |
|---|---|---|---|---|
| **Inspection and Modeling** | | | | |
| Groundline Intrusive Pole Inspection | Distribution | Accelerated | Accelerated | Ongoing |
| Groundline Intrusive Pole Inspection | Transmission | Ongoing | Ongoing | Ongoing |
| Above Groundline Inspection | Distribution | Initiated | Ongoing | Ongoing |
| Visual Inspection | Transmission | Accelerated | Accelerated | Accelerated |
| Infrared Inspection | Distribution | Initiated | Ongoing | Ongoing |
| Infrared Inspection | Transmission | Initiated | Evaluation | Complete |
| Wind Strength Review | Distribution | Initiated | Ongoing | Ongoing |
| Wind Strength Review | Transmission | Initiated | Complete | N/A |
| Overhead Secondary Open Wire Quantification | Distribution | Initiated | Complete | N/A |
| Overhead Visual Inspection | Distribution | N/A | N/A | Initiate 2022 |
| Risk Modeling | System | N/A | Initiate | Ongoing |
| Situational Awareness Tools | System | N/A | N/A | Initiate 2021 |
| **Repair and Replace** | | | | |
| Pole Repair/Replace | Distribution | Accelerated | Accelerated | Ongoing |
| Equipment Upgrades | Distribution | Initiated | Ongoing | Ongoing |
| High Priority Defect Correction | Transmission | Accelerated | Ongoing | Ongoing |
| Major Line Rebuilds | Transmission | N/A | Initiate | Ongoing |
| Bare Secondary Conductor Replacement | Distribution | N/A | N/A | Initiate 2021 |
| Small Conductor Replacement | Distribution | N/A | N/A | Initiate 2021 |
| Covered Conductor | Distribution | N/A | N/A | Initiate 2021 |
| OH Rebuilds | Distribution | Ongoing | Ongoing | Ongoing |
| **Protection** | | | | |
| Protection Study for Feeders | Distribution | Initiated | Complete | N/A |
| Design/Construct Revised Protection Schemes | Distribution | N/A | Complete | N/A |
| Substation Relay Upgrade for Remote Non-Reclosing Programs | Distribution | Initiated | Ongoing | Ongoing |
| ADMS Enhanced System Protection | Distribution | N/A | N/A | Initiate 2021 |
| Recloser Communications Network | Distribution | Initiated | Complete | N/A |
| Substation Relay Communications Upgrade | Distribution | Initiated | Ongoing | Ongoing |
| **Vegetation Management** | | | | |
| Mountain Hazard Tree Program | Distribution | Initiated | Ongoing | Ongoing |
| Mountain Hazard Tree Program | Transmission | Initiated | Ongoing | Ongoing |
| Defensible Space Around Poles | Distribution | Initiated | Ongoing | Ongoing |
| ROW Vegetation Type Conversion | Transmission | Initiated | Ongoing | Ongoing |
| Secondary Voltage Line Clearance | Distribution | Initiated | Ongoing | Ongoing |

Public Service has comprehensive inspection, modeling, and data collection programs to provide information about the assets in the WRZ. This information provides the basis for various replacement programs. The asset data includes identification of degradation issues, and classification of assets by age, size, type of construction, and strength.

The Inspection and Modeling programs in particular have made significant strides since 2019. The following sections describe the progress, evolution, and outlook of each of the individual Inspection and Modeling programs.

The Groundline Intrusive Pole Assessment and Treatment Program evaluates wood poles supporting electric distribution and transmission lines that are normally targeted for a 12-year inspection cycle. As shown in the figures below, the program consists of drilling into the pole to identify internal decay, estimating the pole's remaining strength, and either applying treatments to protect and extend the life of the poles, or replacing the entire pole. The assessment identifies poles that are significantly weakened through decay, weathering, or other physical damage and do not meet National Electric Safety Code ("NESC") remaining strength requirements at groundline. These weaknesses compromise a pole's remaining strength and if severe enough, render it unsuitable for reliable continued service. Decayed and weakened poles can fail, causing the energized conductors they are supporting to contact other objects or surfaces. In turn, this can result ignitions and pose other safety hazards. Periodic assessment and treatment of wood poles followed by corrective action supports safe and reliable distribution of electric power. This program accelerated the normal cycle by two years to ensure that all wood poles within the WRZ are inspected to evaluate their structural integrity.

*Figure 6-1.: Inspection crew excavating a pole in mountainous area*

*Figure 6-2: Finding external decay*

*Figure 6-3: Close-up of external decay to be removed in preparation for external treatment*

The Groundline Intrusive Pole Inspection Program also includes an Overhead Safety Inspection ("OHSI"), which consists of visually inspecting the pole from the ground for any obvious defects. If there are any issues discovered during the OHSI process, the poles are flagged for additional above ground inspections, which are discussed in later sections.

**Progress**

In 2019, Public Service inspected over 67,000 distribution poles. Almost 5,900 were found to have groundline strength defects and were rejected, and another nearly 23,000 were identified for a detailed above groundline ("AGL") inspection. About 2,700 poles were replaced, with 2,300 of those being in the WRZ.

As of May 23, 2020, Public Service has inspected a total of approximately 98,000 distribution poles throughout its service territory over the last two years, which includes both WRZ and non-WRZ areas. The inspections identified approximately 8,300 poles that needed to be repaired or replaced and 39,000 poles with requiring an enhanced AGL inspection since 2019.

*Table 6-2: Distribution Inspection Progress*

| Year | Inspections | Rejects | Reject % | Potential AGL Defects Identified | Requires AGL Inspection |
|---|---|---|---|---|---|
| 2019 | 67,162 | 5,876 | 8.8% | 22,870 | 34.1% |
| 2020 | 30,750 | 2,392* | 7.8%* | 16,292* | 53.0%* |
| total | 97,912 | 8,268 | 8.4% | 39,162 | 40.0% |

*Projected Reject Rate

**Future Plans**

Public Service will return to its normal program for pole assessment and treatment as part of the normal 12-year cyclical plan in 2021. The figure below shows the current 12-year distribution inspection plan. We will continue to evaluate the cycle length to determine if any change in frequency is warranted. Changes to the cycle could be driven from risk assessment, analysis or inspection results, project and programmatic changes, or other factors.

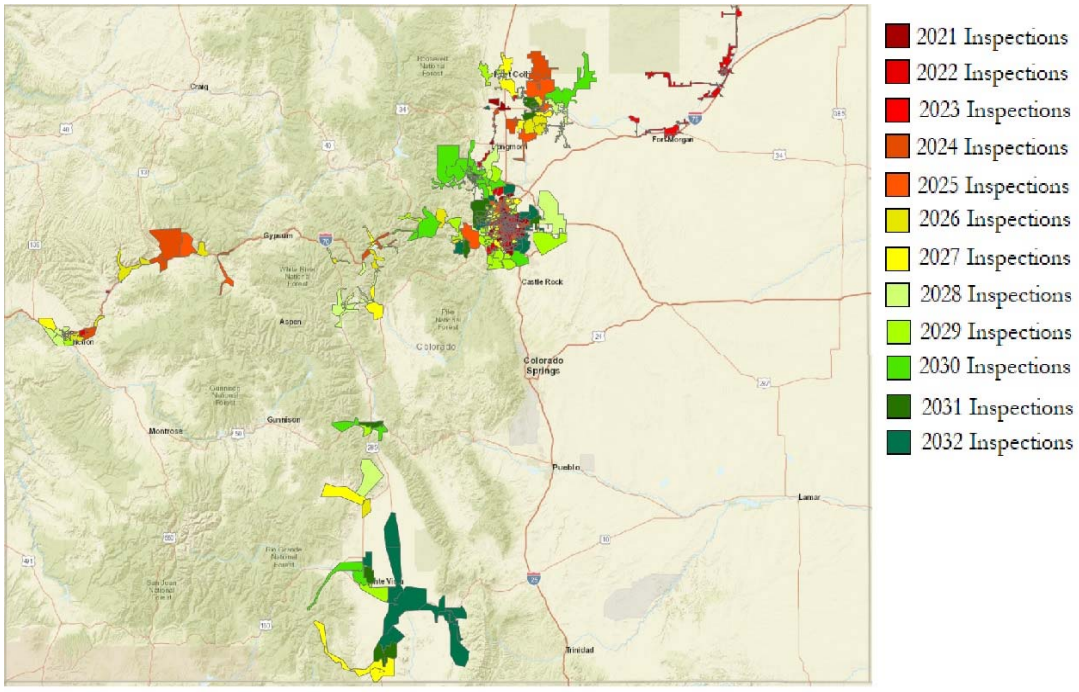



*Figure 6-4: 12-Year Distribution Proposed Inspection Plan for Public Service*

The AGL Inspection Program expands the groundline inspection of the pole to address the condition of AGL components such as cross-arms, insulators, and guying systems. These components may be at risk of failure due to deterioration caused by aging and environmental conditions or may have suffered damage from external forces such as trees falling against lines, or vehicle damage. Failure of AGL components can result in energized conductors contacting other objects, potentially resulting in electrical arcing and ignition.

The AGL inspections are initiated when potential deficiencies are identified during the OHSI process, which is included in the Groundline Intrusive Pole Inspection Program described in the previous section. The OHSI consists of visually inspecting the pole from the ground for any obvious defects. If the poles have significant pole top issues, the pole is rejected. If the pole has any imminent hazards, those are reported for immediate remediation. For other issues discovered during that process, the poles are flagged for an enhanced AGL inspection. The AGL Inspection Program can also identify deficiencies that may have been missed during the Groundline Intrusive pole inspection.

While the AGL Inspection Program began as a pilot program in 2019, it has since been enhanced by the use of Unmanned Aerial System ("UAS") technology. A UAS pilot captures imagery of the pole from multiple angles including the top surface of the pole, the crossarm, or other equipment attached to the pole. The imagery is then virtually inspected to identify any deficiencies. Any defects identified are addressed through the Repair and Replace Programs. The image data collected is also added to a database that can aid with future design considerations. The figure below shows a UAS pilot collecting imagery.

*Figure 6-5: UAS Pilot Collecting AGL Inspection Imagery*

**Progress**

Public Service initiated the AGL Inspection Program as a pilot program in 2019. The initial program consisted of inspecting over 1,300 distribution poles *via* foot patrol by internal resources and did not provide a condition of the top of the pole or cross-arm. The results of the pilot AGL inspections found that approximately 22 percent of the 1,300 poles required repair or replacement. The 2019 AGL Inspection Program verified the need to continue AGL inspections and that the inspections should include the evaluation of the top of the pole and crossarms to accurately capture all pole top defects that may not otherwise be visible from the ground.

Therefore, the Company decided to improve the AGL Inspection Program by adding the use of UAS to its 2020 and 2021 inspection process. A third-party vendor was selected to perform the work, and they have begun collecting and reviewing UAS imagery. The figure below shows the inspection dashboard of the progress made.

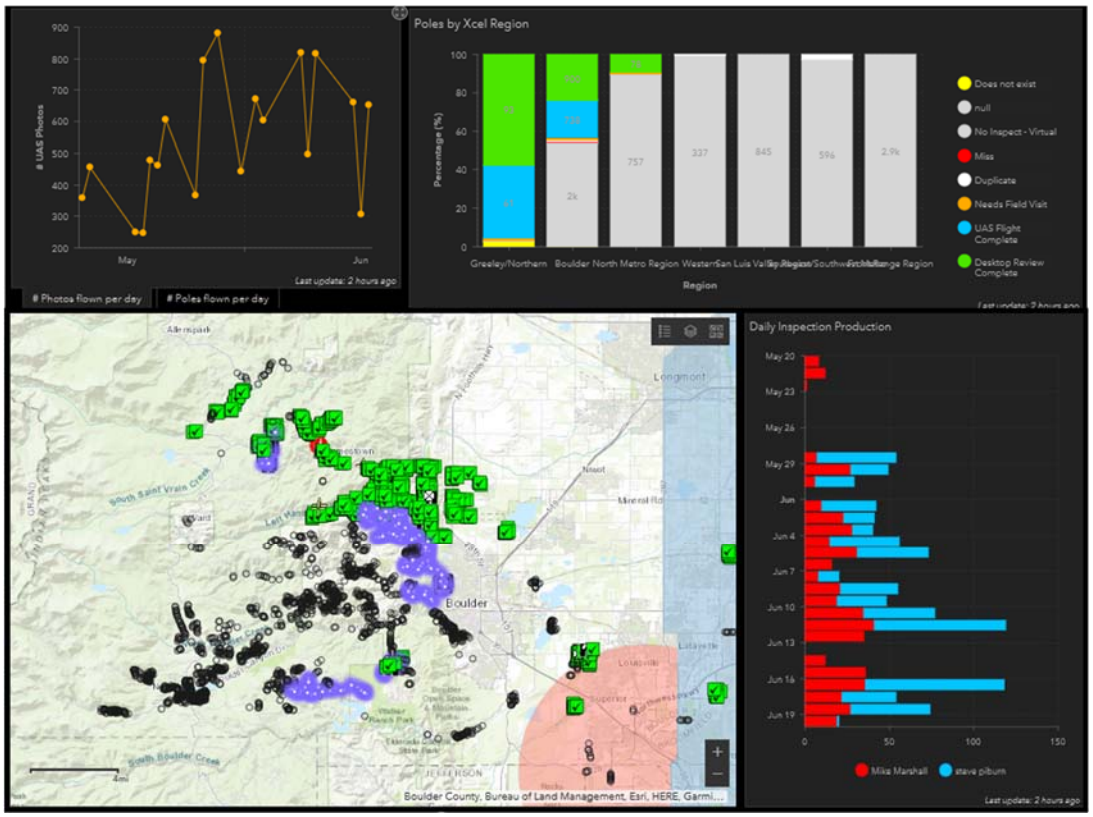



*Figure 6-6: AGL Inspection dashboard showing imagery collection progress*

**Future Plans**

Public Service will continue with the AGL Inspection Program through 2021 on facilities identified as potentially having overhead safety concerns through the Groundline inspection crews. The current projection is to complete an estimated 9,000 pole inspections in 2020 and an additional 10,000 pole inspections in 2021.

The Transmission Visual Inspection Program has been a routine program that consists of both aerial and ground inspections. Typically, visual aerial inspections are conducted annually *via* helicopter, where feasible for all transmission circuits above 200 kV. Visual ground inspections are performed annually for those circuits above 200 kV that cannot be conducted *via* helicopter. A combination of aerial and ground inspections is performed on sub-200 kV circuits based on operational needs. Visual aerial inspection can quickly identify obvious issues associated with the upper portion of structures and ROW encroachments. Visual ground inspections are more time-consuming and labor intensive, but a ground visual inspection allows for a more thorough assessment of transmission assets because of the proximity of the inspection.

This enhanced Visual Ground Inspection Program improves the Company's ability to identify defects on various components, including poles, cross-arms, insulators, braces, hardware, and wires, before they fail. Due to the

elevated risk of wildfires, Public Service started conducting visual ground inspections on 100 percent of the electric transmission lines that are in or cross the WRZ. Performing annual ground visual inspections will ensure that defects in the WRZ can be identified more accurately and addressed promptly. This inspection enhancement is in addition to the routine annual visual aerial inspections.

**Progress**

In 2019, Public Service completed visual ground inspections of every transmission line in or crossing the WRZ, which consisted of approximately 2,900 miles of transmission. We will continue to perform visual ground inspections of every line in the WRZ in 2020.

**Future Plans**

Public Service intends to continue annual visual ground inspections. However, the Company will monitor and evaluate the type and rate of the defects being identified to determine optimum aerial and ground inspection frequency for the circuits crossing the WRZ.

Infrared ("IR") inspections utilize thermal imaging technology to identify thermal hotspots in electrical connections and equipment that cannot be seen during traditional visual inspections. Thermal hotspots often indicate faulty or failing components such as conductor splices, connectors, and hardware that could lead to equipment failure and the potential for downed lines. If equipment fails, sparks and arcing can occur, potentially causing ignition. The Distribution Infrared Inspection Program targets electrical equipment devices and conductors on all distribution feeders in the WRZ. The program is implemented by qualified inspectors that survey the facilities and equipment from the ground, using IR cameras to locate thermal hot spots. If a hotspot is identified, a profile is created with pictures, videos, and results data. The results of the inspection are then analyzed, and action is taken to repair the facilities. By performing these inspections and associated repairs, risk of equipment failure can be mitigated before it occurs. This also improves safety and reliability and reduces long-term costs.

**Progress**

In 2019, the Company initiated the Distribution Infrared Inspection Program to assess the value of IR inspections in the WRZ. In 2019, the Company utilized internal thermographers to inspect 14 high-risk distribution feeders, consisting of approximately 400 miles lines in the WRZ. The program identified five potentially hazardous hot spots, verifying the cost effectiveness of the IR cameras and the efficacy of the inspection. Based on the 2019 results, the Company continued and expanded the Distribution IR Program, and has inspected 430 miles on 40 feeders with a goal of performing IR inspections on 830 miles in 2020.

**Future Plans**

Public Service will continue the Distribution IR Inspection Program for feeders in the WRZ. The goal is to inspect 2,100 miles of high-risk Distribution feeders by 2021.

The Transmission IR Inspection Program utilizes the same technology as the Distribution IR Inspection Program. However, the transmission inspections are performed by helicopter.

**Progress**

In 2019, Public Service contracted with a third party that completed aerial IR inspection of the approximately 2,900 miles of transmission line in the WRZ and identified no thermal hotspots. To confirm the inspection results, the Company's own IR technicians conducted a review of the inspection videos of several randomly selected segments. This review revealed the need to explore a more advanced IR technology and inspection strategy since the results can be heavily influenced by the IR camera resolution and the amount of electricity flowing on a line at the time of inspection. The Company will continue working to address these limitations and develop a more reliable Transmission IR Inspection Program.

**Future Plans**

Public Service will continue to evaluate IR inspection technology and strategy to determine optimum IR inspection frequency for transmission circuits in the WRZ.

Overhead power lines must be able to withstand a variety of conditions. The NESC sets minimum wind loading standards that the Company follows to ensure safe and reliable operation. Line strength and the ability to meet standards can be affected by age, environment, and modifications to the lines themselves. For example, conductor clearance can change due to road or building construction and those changes can affect wind strength loadings. The Distribution Wind Strength Review Program ensures that the NESC standards are met or exceeded in the WRZ. The objective of the program is to identify physical strength of the distribution structures and clearance of the supported overhead lines in the WRZ. This is accomplished by using helicopters to inspect the lines using LiDAR technology. The LiDAR data is used to build accurate models using Power Line System Computer-Aided Drafting and Design ("PLS-CADD") software. The models provide an accurate assessment of an asset's strength capacity in as-built condition and identifies structures with insufficient strength to withstand extreme wind conditions. The LiDAR survey was initiated by starting with sets of structures and lines (small segments of feeders) in various parts of the WRZ that were selected based on the potential experience high wind loading.

The Distribution Wind Strength Review Program will enhance the Company's ability to identify potential structural weaknesses before failure by evaluating the results and utilizing predictive analysis to determine

how the program can or should be expanded to include other lines in the WRZ. Identifying potential structural weakness before failure allows the Company to preemptively address potential weaknesses before they arise. This ultimately reduces ignition risk, improves safety, and reduces costs.

**Progress**

The Company selected 20 distribution segments to initiate the Distribution Wind Strength Review Program. The segments were chosen to be representative of the overall WRZ distribution lines. Data has been gathered and analyzed for those 20 segments. The results indicate that approximately 93 percent met or exceeded the wind loading criteria, and approximately 88 percent met clearance criteria. However, some segments exhibited loading and/or clearance issues, and they will be subject to additional review. The analysis also resulted in creating a predictive model that may be used to prioritize other distribution lines in the WRZ for additional wind strength evaluation.

The following figures show the locations of the initial distribution segments selected for the Distribution Wind Strength Review Program and the higher-risk poles identified through that review process.

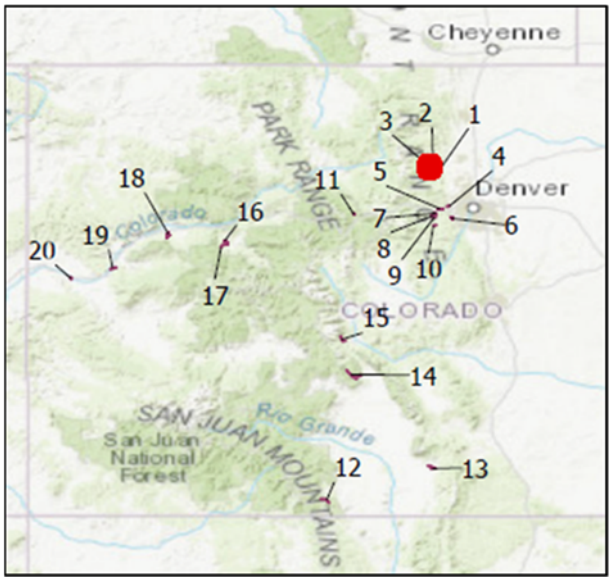



*Figure 6-7: Locations of Distribution Segments*

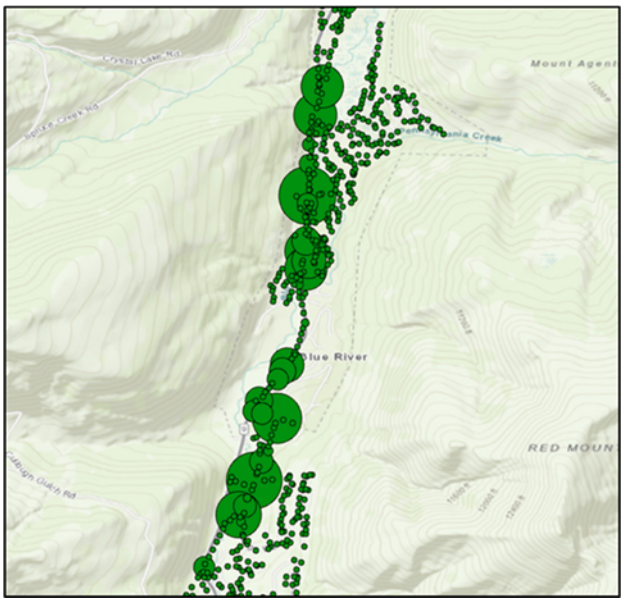



*Figure 6-8: Higher-Risk Pole Identification Results*

**Future Plans**

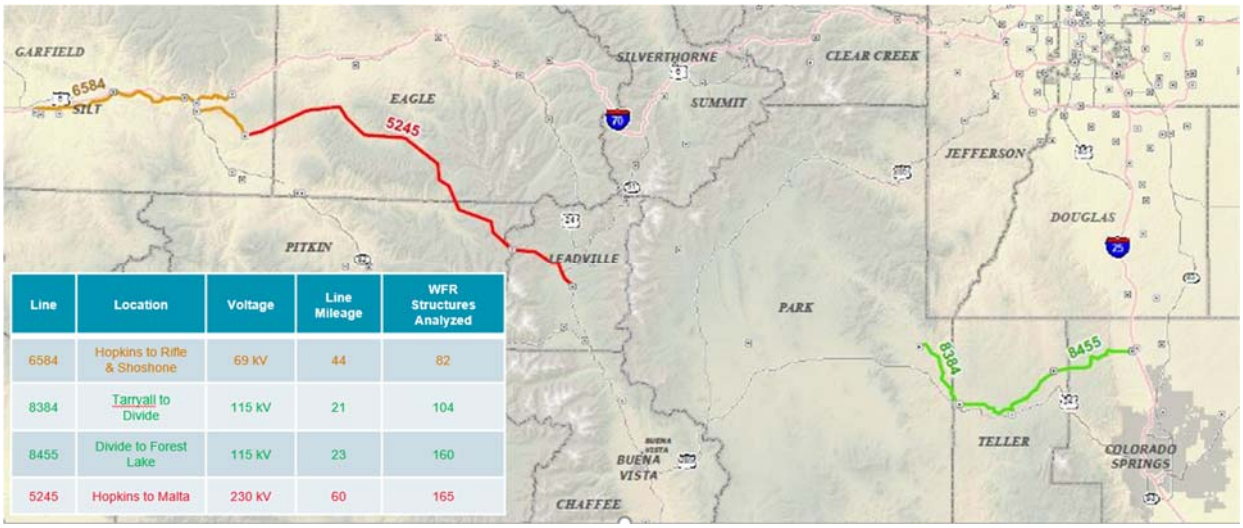
The Company intends to continue evaluating the initial results to determine the future direction of this program. The Company is working closely with the vendor to determine all possible use cases for the data including vegetation management, driving additional inspections based on predictive modeling, and using the platform as a modeling tool for reconductor and major line rebuild modeling. The Company is also considering how the results of the Distribution Wind Strength Review Program may be used as to help determine whether some segments might benefit from replacement with covered conductor.

The Company will also continue to evaluate the prioritization of additional LiDAR data collection for modeling distribution assets and wind strength review and analysis

The Transmission Wind Strength Review Program is similar to the distribution program in that the objective is to evaluate and verify the capability of the existing electric transmission line structures located in the WRZ to meet criteria for wind loading set by the NESC. The Transmission Wind Strength Review Program will enhance the Company's ability to identify potential structural weaknesses before failure and allows the Company to preemptively mitigate the failure risk. This ultimately results in reduced ignition risk, improves safety, and reduces costs.

**Progress**

The Company selected four transmission lines as a sample group representative of various voltage levels and structure types that are used throughout the Company's service territory. This study utilized existing and new PLS-CADD models and LiDAR data to verify the structure strength against extreme wind loadings. Additional electrical clearance analysis was performed on the 69 kV line that was one of the four included in the sample group. Electrical clearance analysis was not performed for the other three lines because they were previously evaluated through a North American Electric Reliability Corporation ("NERC") Facility Ratings Alert, which was required as part of standard compliance. The program revealed that only the 69 kV line exhibited potential loading and clearance issues and will therefore require additional review. However, no significant issues were identified on the other three lines analyzed. The figure below provides information on the four transmission lines included in this study.




| Line | Location | Voltage | Line Mileage | WFR Structures Analyzed |
|---|---|---|---|---|
| 6584 | Hopkins to Rifle & Shoshone | 69 kV | 44 | 82 |
| 8384 | Tarryall to Divide | 115 kV | 21 | 104 |
| 8455 | Divide to Forest Lake | 115 kV | 23 | 160 |
| 5245 | Hopkins to Malta | 230 kV | 60 | 165 |

*Figure 6-9: Electric Transmission Lines Targeted for the 2019 Pilot Wind Strength Review Study*

**Future Plans**

Based on the study results, the Transmission Wind Strength Review Program will focus on the 69 kV transmission lines crossing the WRZ. The issues found on the 69 kV circuit that was studied indicated that there may be a need to expedite the Major Transmission Line Rebuild Program discussed in Section 6.2.4. Transmission circuits that are subject to rebuild in the near future may not need to undergo wind strength analysis.

In 2020, Public Service will analyze one 69 kV transmission line consisting of 12 structures that crosses the WRZ and is not included in the Major Transmission Line Rebuild plan.

Secondary Wire refers to lower voltage (typically 120/240 volts) distribution conductors. They are sometimes run below the primary conductors, and other times strung individually and independent of the primary conductors. Open wire is uninsulated or "bare" conductor which tends to be older installations, since it is no longer common practice to have open secondary wire installed. Secondary open wires can present the potential for ignition, as with primary distribution or transmission lines, if they come into contact with vegetation or other objects. The Secondary Open Wire Quantification Program is a distribution inspection program with the objective of locating and then replacing the bare wire with insulated conductor. This program also helps ensure the accuracy and completeness of the Company's GIS, which is the system that captures, stores, and manages geographic data and geographically referenced information. The data from the inspection program is being provided to the GIS group, that then updates the GIS database. The Company has been focusing efforts on the distribution circuits that are within or partially within the WRZ. These circuits were inspected by a ground survey collecting attribute details of the conductor.

**Progress**

The Overhead Secondary Open Wire Quantification Program completed analyzing all 95 distribution feeders in 2020. The analysis found that approximately 68 miles, or 39 percent of the secondary wire was open in the WRZ on the target feeders. See Appendix D for the Overhead Secondary Open Wire Quantification Program Dashboard.

**Future Plans**

Public Service will use the results of the Overhead Secondary Open Wire Quantification Program to begin repair and replacement of the secondary open wires.

The intent of the Distribution Overhead Safety Inspection Program is to increase the frequency of visual inspection of every pole more frequently than the Groundline Intrusive Pole Assessment cycle. The current plan is to inspect one third of the system every year, but the frequency will continue to be evaluated.

For the Risk Modeling Program, the Company plans to contract with an expert vendor that provides wildfire spread modeling software to conduct a limited study to determine overall benefits. This state-of-the-art software is able to predict fire behavior for a given set of conditions. The program considers current and forecasted weather conditions, ground fuels and terrain, and models how a fire at any given location will spread and quantifies damages. Millions of simulations can be performed to provide the Company with vital information on the risk of potential ignitions. That information can then be used to aid in a multitude of decision-making processes, especially with regard to prioritizing future wildfire mitigation efforts.

**Progress**

The Company is in the early stages of evaluating this technology and is negotiating a contract with a fire-spread modeling vendor. The preliminary program will model four counties in the Company's service territory to simulate wildfire behavior through the 2020 wildfire season. The results of this preliminary program will provide valuable experience and information, and will help validate the current Wildfire Risk Model.

**Future Plans**

Public Service will use the results of Risk Modeling Program to prioritize future work and to determine the need to utilize additional capabilities of the program.

Having a robust collection of situational awareness tools is invaluable for comprehensive understanding of the risk of wildfire and the Company's ability to respond. As previously mentioned, Public Service relies primarily on Company meteorology and public weather sources. However, there are a multitude of situational awareness tools available that could significantly assist with the Company's WMP. The objective of the Situational Awareness Tools Program is to expand and add to the existing situational awareness systems that are already in place. California utilities have strengthened their awareness through additional weather stations, cameras, spread models, and emerging technologies that combined can compile the information to provide real-time, detailed data that can inform critical operational practices and decisions. The Situational Awareness Tools Program will consider adding weather stations to focus on specific areas of the WRZ, and cameras that can quickly locate existing fires and better inform risk to Company assets.

**Progress**

The Risk Modeling Program is one step toward additional situational awareness that the Company will be implementing in 2020. In addition, the Company has been looking at publicly-available weather and fire information that can be utilized to enhance existing sources. The Company is also meeting with outside consultants to explore available services and technologies that might be utilized in the future.

**Future Plans**

Public Service will continue to evaluate the addition of situational awareness tools, such as weather stations and cameras.

The Repair and Replacement program is the largest of the Public Service initiatives and has focused primarily on equipment identified through the various Inspection and Modeling programs described in the previous section. In 2019 and 2020, the Repair and Replacement programs have been expanded due to increased volume of identified defects through accelerated and additional inspections and modeling. The Company has updated equipment standards for the WRZ and continues to evaluate the benefit of new materials in the WRZ.

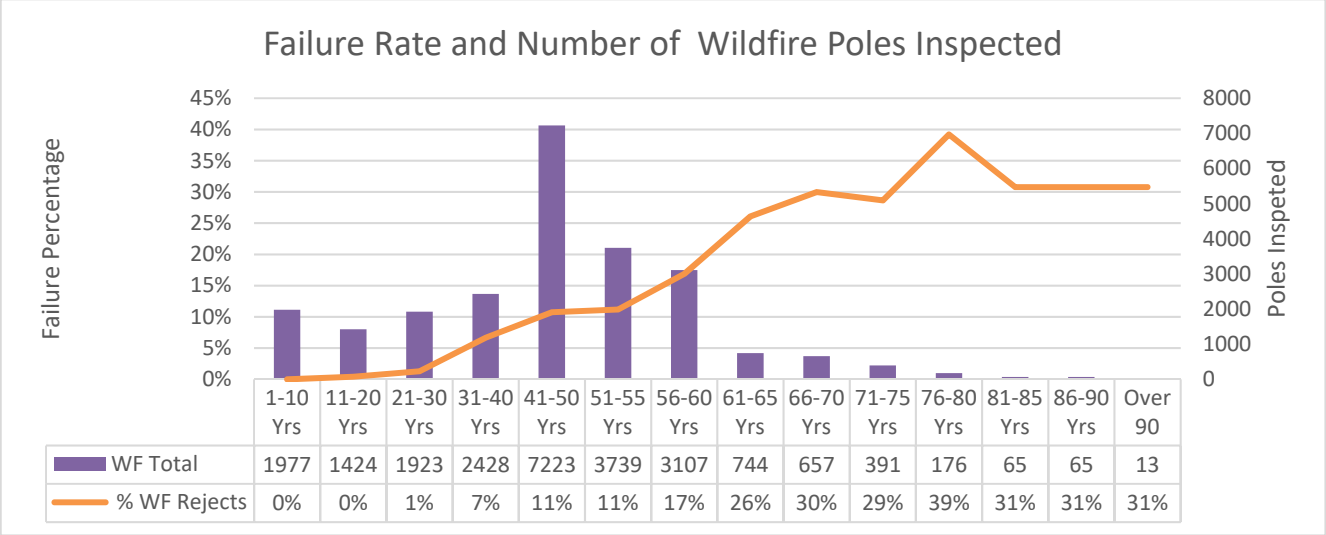
Public Service has also identified additional programs to replace certain types of conductors in order to minimize the chance of fault-induced ignitions.

The following sections describe the individual Repair and Replacement programs.

The Distribution Pole Repair and Replacement Program is a companion to the pole inspection programs. As the Company increased the number and cycle frequency of inspections, the amount of equipment identified for repair and replacement increased. The Company identifies poles for repair and replacement through the following inspection programs:

- The Groundline Intrusive Pole Assessment and Treatment Program determines the poles that are significantly weakened through decay and results in replacement or reinforcement of the pole;
- The AGL Inspection Program looks at potential pole top defects that could create a hazard; and,
- The Wind Strength Review evaluates the as-built pole construction to handle high winds.

In addition to performing repair and replacement based on the inspection programs, the Company also determined that it would be prudent to initiate a replacement program based on the age and condition of poles. In 2019, the Company began analyzing the overall age of its distribution assets, comparing age date with reject data to draw a correlation between age and condition. As inspections continued, more age data became available, and those analyses resulted in a condition-based replacement program based on age. For distribution, as expected, the older the pole the more likely an inspection would result in a reject pole. The Company determined that replacing all poles at age 70 and older in the WRZ was reasonable, recognizing that those in the 66 to 70-year age category would turn 70 over the next five years and also be targeted for replacement. As seen in the figure below, once a pole reaches 60 years old, about 30 percent of poles are found to have deficiencies.




| | 1-10 Yrs | 11-20 Yrs | 21-30 Yrs | 31-40 Yrs | 41-50 Yrs | 51-55 Yrs | 56-60 Yrs | 61-65 Yrs | 66-70 Yrs | 71-75 Yrs | 76-80 Yrs | 81-85 Yrs | 86-90 Yrs | Over 90 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WF Total | 1977 | 1424 | 1923 | 2428 | 7223 | 3739 | 3107 | 744 | 657 | 391 | 176 | 65 | 65 | 13 |
| % WF Rejects | 0% | 0% | 1% | 7% | 11% | 11% | 17% | 26% | 30% | 29% | 39% | 31% | 31% | 31% |

*Figure 6-10: Distribution Pole Condition / Age (2019 Inspections)*

**Progress**

The Distribution Pole Repair and Replacement Program has resulted in the Company replacing over 2,300 distribution poles. In 2020, the Company is targeting replacing 3,800 poles, and as of early June 2020, 980 poles have been replaced.

**Future Plans**

Public service will continue the Distribution Pole Repair and Replacement Program to address deficiencies identified in the inspection and condition/age programs. As a result of both the groundline and AGL inspections, the Company is forecasting that we will replace over 13,000 poles through 2025. In addition to the inspection programs listed previously, the Company also intends to replace all distribution poles in the WRZ that are 70 years or older by 2025. We estimate that there are approximately 2,380 poles that meet that criteria, including those that will meet the 70-year requirement in the next five years. Figure 6-11 below shows estimated pole ages in the WRZ.

*Table 6-3: Goals for Distribution Pole Replacements*

| Failure Source | 2020 Poles | 2021 Poles | 2022 Poles | 2023 Poles | 2024 Poles | 2025 Poles | 2021-2025 Poles | 20-25 Total |
|---|---|---|---|---|---|---|---|---|
| Groundline Inspections | 2,160 | 400 | - | - | - | - | 400 | |
| AGL Inspection | 640 | 3,000 | 670 | 670 | 670 | 670 | 5,680 | |
| Wind Strength Review | - | 180 | 180 | 180 | 180 | 180 | 900 | |
| Condition/Age Based | 1,000 | 900 | 370 | 370 | 370 | 370 | 2,380 | |
| **Total** | 3,800 | 4,480 | 1,220 | 1,220 | 1,220 | 1,220 | 9,360 | 13,160 |

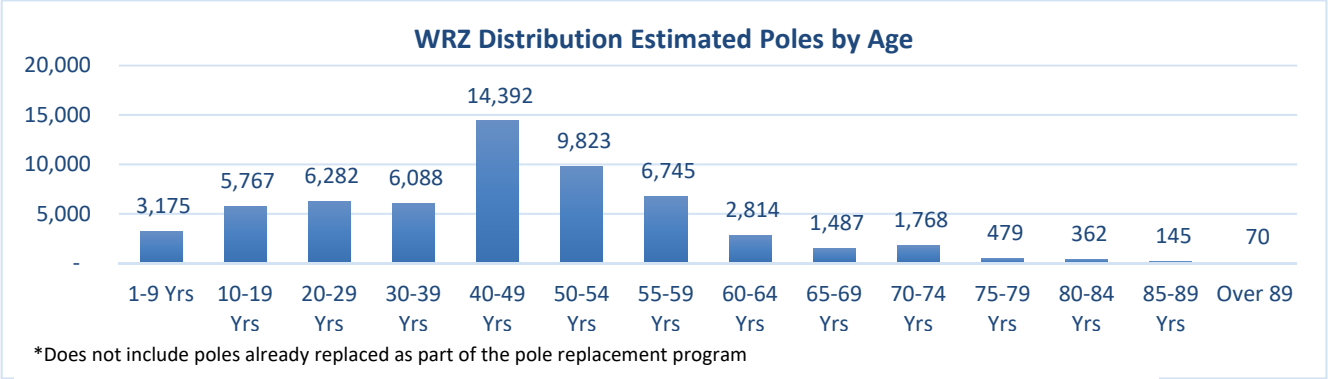



*Figure 6-11 WRZ Distribution Pole Ages*

The objective of the Distribution Equipment Upgrade Program is to replace distribution protective equipment that have the potential for causing ignition with modern, ignition-resistant, non-expulsion devices. The devices that are addressed with this program primarily include fuses (also called cut-out or expulsion fuses) and lightning arresters that have the potential to cause ignition during operation or failure. The California Department of Forestry and Fire Protection ("CAL FIRE"), in conjunction with the three major investor-owned utilities in California, has developed a guide to minimize wildfire ignitions due to electric utility equipment. Equipment, such as non-expulsion pole top equipment, are rated as "exempt" in the California Powerline Fire Prevention Field Guide are not subject to the vegetation clearance requirements. These non-expulsion devices have been tested and proven not to ignite flammable material in standard operation or in failure mode.

Fuses and arresters are found adjacent to every overhead transformer, every transition point from overhead to underground lines, and many other pieces of equipment. In addition, fuses are located along the lines to sectionalize areas to minimize power outages. An expulsion fuse is designed to quench a fault with water

vapor from internal elements. Hot material can be expelled from the fuse tube when it operates, which can lead to ignition. Arresters are devices that are designed to mitigate lightning surges by providing a path to the ground, away from conductors. They can be a potential source of ignition when they fail, which can happen when a lightning surge produces energy beyond the capacity of the arrester.

This program replaces existing fuses and arresters with non-expulsion devices. The existing devices will be replaced in conjunction with the Distribution Pole Repair and Replacement Program when a failure of existing equipment has occurred. Replacing existing fuses and arresters will provide additional reliability, eliminate potential ignition sources, and reduce the need for the Defensible Space Around Pole Program described in Section 6.4.2 (also known as pole brushing). A training program has also been implemented so that field crews are aware of the new standards and equipment.

**Future Plans**

The Company will continue to incorporate ignition-resistant equipment into the WRZ. This will happen both through the inspection programs described in the previous section and through systematic replacement.

The High Priority Defect Correction Program is a transmission pole and component replacement program that is a companion to the Groundline Intrusive Pole Inspection Program and the Visual Inspection Program. If unaddressed, critical defects identified by these inspections could increase chance of ignition risk. The plan addresses critical defects found in the inspection programs by repairing or replacing all defective structures and other components on transmission facilities in the WRZ such as poles, cross-arms, insulators, braces, hardware and wires. This program provides a focused effort to address those deficiencies in a timely manner. The Company is also planning to replace some of its higher risk existing wood structures with steel or composite structures since they provide more consistent design strength and are more resilient against fire.

**Progress**

In 2019, 72 high priority defects located in the WRZ were addressed. In 2020, the Company is targeting approximately 230 defects located in the WRZ and as of July 2020, 51 high priority defects located in the WRZ have been addressed. The Company is working toward addressing all 230 defects but various factors such as environmental restrictions, permitting requirements, construction access and outage limitations, and weather could impact the schedule.

*Table 6-4: 2019 Targeted Defects for High Priority Pole and Component Replacement*

| 2019 Targeted Defects | |
|---|---|
| Component | Defect Count |
| Crossarm | 17 |
| Conductor | 2 |
| Insulator | 1 |
| Marker Ball | 1 |
| Pole | 51 |
| **Total** | **72** |

*Table 6-5: 2020 Targeted Defects for High Priority Pole and Component Replacement*

| 2020 Targeted Defects | |
|---|---|
| Component | Defect Count |
| Anchor | 1 |
| Avian Protection | 1 |
| Conductor | 5 |
| Crossarm | 61 |
| Crossarm Brace | 8 |
| Ground Wire | 26 |
| Guy Wire | 2 |
| Insulator | 16 |
| Marker Ball | 5 |
| Pole | 72 |
| Right-of-way | 3 |
| Shield Wire | 11 |
| Sign | 3 |
| Structure | 3 |
| Tower | 2 |
| Vibration Damper | 3 |
| X-brace | 7 |
| **Total** | **229** |

**Future Plans**

Public Service will continue with this program to address high priority poles and components in the WRZ. The scope of this program will continue to evolve as new inspection results become available. Also, the overall condition of the circuits with known high priority defects in the WRZ will be evaluated to determine if a full or partial rebuild of a circuit would be a more cost-effective solution rather than replacing components. The age of the structures will also be taken into account when making that decision.

The 2021 High Priority Defect Correction Program currently includes defects that may be addressed through future line rebuild projects. However, further development and evaluation of the scope for the Major Transmission Line Rebuild Program described in the next section may determine which defects being targeted in 2021 can be deferred.

The Major Transmission Line Rebuild Program is an alternative solution to the High Priority Defect Correction Program and the Transmission Wind Strength Review Program described in Section 6.1.7. If the majority of the assets on a transmission line have reached the end of life or if the amount of required corrective action is too large to be mitigated through a few structure or component replacements, a full or partial rebuild of the line may be the most cost-effective alternative to improve reliability and mitigate ignition risks. The condition assessment based on visual and intrusive pole inspection results and the pilot wind strength review results have indicated that the most cost-effective risk mitigation solution for the eight 69 kV transmission lines that cross the WRZ is to completely or partially rebuild the line. Therefore, rebuild of these lines will be expedited to be completed within the next five years.

**Progress**

A plan to rebuild the eight 69 kV transmission lines in the WRZ has been developed. In 2020, Public Service is initiating and refining the rebuild plan by evaluating the rebuild scope, schedule, construction sequence, and cost in detail.

**Future Plans**

Public Service intends to rebuild the eight 69 kV transmission lines within the next five years. The planned schedule is shown in the table below. Various factors can impact the cost and schedule of these projects, including updated engineering and design, permitting issues, and operational considerations.

*Table 6-6: Major Transmission Line Rebuild Plan*

| Preliminary 69 kV Circuit Rebuild Target List & Schedule | | | |
|---|---|---|---|
| Rebuild Circuits/Segments | Mileage | Planned start date | Planned ISD |
| 6584 Mitchell Creek - Rifle + Shoshone Segment | 31 | 2021 | 2024 |
| 6670 Ute Rifle - Cameo | 45 | 2021 | 2024 |
| 6671 Vinelands- Grand Junction | 8 | 2025 | 2025 |
| 6913 - Alamosa - Sargent | 33 | 2023 | 2024 |
| 6905 Villa Grove - Poncha | 15 | 2020 | 2021 |
| 6935 Alamosa - Mosca | 18 | 2021 | 2021 |
| 6683 - Uintah - Fruita | 3 | 2022 | 2022 |
| 6914 Alamosa - Antonito | 39 | 2022 | 2022 |

Public Service is developing additional wire replacement programs to expand system hardening. These programs result from previous analysis to target specifically vulnerable areas of the distribution system to mitigate the risk of uncovered, small, and aged wire. These replacements are prioritized based on severity criteria and replaced in a timely manner.

The Overhead Secondary Open Wire Quantification Program identified approximately 55 miles that will need to be replaced in the WRZ. Public Service will replace this open wire with insulated, 600V lashed aerial cable. The insulation will provide protection from arcing should the conductor fall to the ground or abrade against tree limbs. Also, the bare neutral that the 600V insulated conductor is lashed to provides a ground path so upstream protection can operate more quickly should the insulation be compromised.

**Progress**

To date, 68 miles have been identified as open secondary wire. This program builds on the information collected from the Secondary Wire Quantification Program, and replacement work will begin in 2021.

**Future Plans**

The Company anticipates that it will complete replacement of the approximately 68 miles of open secondary wire in the WRZ by 2022.

In addition to the inspection-based replacement programs, the Company is also systematically replacing what is referred to as “small” distribution conductors in the WRZ. These smaller conductors are generally #4 and #6

full copper wire conductors, and #4 Aluminum Conductor Steel Reinforced ("ACSR") conductors. These conductors are used on some of the oldest line construction in the Company's service territory and are smaller relative to what is now used for standard construction. Due to their age, these conductors have been exposed to accumulated damage from lightning strikes, tree contacts, and phase to phase impacts that can cause surface damage such as pitting, which compromises their strength. Because of their smaller size, these conductors are also susceptible to heavy electrical loading and corrosion, which can weaken the conductors and lead to clearance issues.

The Company plans to replace the smaller conductors with at least #2 ACSR conductors. However, due to the age of the small conductors, additional repair or replacement work may be needed on the distribution lines, including to poles, arms, braces, insulators, pins, or associated hardware. If the repairs needed are extensive, a total rebuild may be more cost-effective.

**Progress**

The Company has evaluated the quantity of smaller conductors and estimates that there are approximately 300 miles in the WRZ.

**Future Plans**

The Company plans to completely replace all of the small conductors in the WRZ over the next five years, beginning in 2021.

The Company has been exploring the use of covered conductors for select applications in the WRZ. Distribution lines typically have bare conductors attached to insulators on the supporting structures. A covered conductor is encased with a composite material that minimizes the chance of ignition from fault-inducing events such as contact with vegetation or other conductors, and failures that result in the wire contacting the ground. The covering is less than that used on fully insulated underground cables and covered conductors are attached to insulating supports similar to bare conductors. Covered conductor is both heavier and has a higher wind loading profile than standard bare conductor. As result it puts greater stresses on supporting structures compared to the common bare conductor. The most cost-effective application of covered conductors is in areas where there is increased risk of lines contacting vegetation, or where lines may need to be rebuilt for other reasons.

There are two primary configuration alternatives for covered conductors. One involves installing the conductor in the same manner as bare conductor, using the same type of structure and mounting. The other is sometimes referred to as "spacer" configuration. The conductors are grouped in a bundle and insulating spacers are used to keep the individual phase conductors separated from one another. The spacers are inserted between the phase conductors at periodic locations between the supporting structures. The spacer

construction is suspended from high strength messenger cable. This high strength design also makes the line less susceptible to mechanical failure from vegetation falling on the line. The figure below shows an example of a covered conductor and the two alternative covered conductor configurations.

*Figure 6-12: Example of Covered Conductor (Top: Conductor Layers. Middle: Traditional or "Tree-Wire" Configuration. Bottom: "Spacer" or "Messenger" Configuration.)*

**Progress**

The Company has initiated a plan to replace a portion of feeders within the WRZ that have been identified as having deficiencies through either the Distribution Small Conductor Replacement Program, or the Distribution Wind Strength Review Program. The Company plans to replace 18 miles with covered conductor. The Covered Conductor Replacement Program will provide the Company with experience on construction, operation, maintenance and performance of covered conductor and will be evaluated at some point in the future for additional installations in the WRZ.

**Future Plans**

The Company plans to replace approximately 18 miles of existing distribution lines in the WRZ with covered conductor in 2021. We will continue to evaluate the program to determine benefits for additional installations in the future.

The System Protection Program minimizes risks associated with sparks that could be created if a fault occurs on distribution feeders. The System Protection Program focuses on the ability of the distribution system to detect faults, sectionalize, and ultimately reduce the risk of fire due to a fault. The program involves replacing electromechanical devices that can cause a spark through normal operation as well as upgrading legacy relays and reclosers with devices that can house additional settings groups and potentially detect high impedance faults. The program is targeted at the highest-risk feeders in the WRZ to improve overall fault detection and provide operational options to minimize ignitions caused by faults and protection equipment. The following sections describe the individual System Protection programs.

The Company plans to upgrade existing field reclosers in and around the WRZ with equipment that can communicate with the Company's control center. The upgraded equipment will include the capability for alternate settings groups to accommodate seasonal weather conditions and Red Flag Warning days. The Protection Study for Distribution Feeders includes a review of existing protection to ensure that protective devices are located appropriately and that settings for new and existing protective equipment coordinate to best protect the system. The Protection Study for Distribution Feeders optimizes the location of protective devices, protection settings, reclosing and sectionalizing schemes, and fusing and coordination from substation feeder breakers and throughout the feeder. The new recloser controllers will allow for additional wildfire settings groups that some legacy devices were not capable of enabling. The new settings and devices will help reduce risk by providing additional sectionalization and coordination, as well as a new Wildfire settings group, which will be enabled during high fire threat conditions.

The Protection Study for Distribution Feeders for the 95 feeders in the WRZ began in 2019 and was completed in 2020. The results have been collected and protection settings are in the process of being updated. These feeder reviews provided a systematic look at protective devices, and the results included custom one-line diagrams for each feeder, and protection settings for each device on the feeders. The study also resulted in revisiting the distribution protection philosophy to standardize parameters, such as clearing times and sensitivity, for the overall system and for the WRZ.

**Future Plans**

The Company plans to start implementing proposed modifications to the protection scheme on a small set of feeders in 2020. Substation relaying standards have been finalized and will be moved into implementation in late 2020 and early 2021. The Company may perform additional studies and make recommended updates based on future risk modeling.

Replacement and installation of new protective equipment is based on the results of the Protection Study for Distribution Feeders. The Design and Construct Revised Protection Scheme Program includes design and replacement of select reclosers, installation of new reclosers, and relocation of reclosers in accordance to the Protection Study. The purpose of the program is to add sectionalizing capabilities by installing new reclosers and replacing legacy devices to provide increased safety for the highest risk feeders.

The upgrades and new devices associated with this program will provide Public Service with additional sectionalizing capability and provide additional insight to faults that occur on the high-risk feeders in real time. This capability will help minimize risk of ignition during high fire threat conditions such as Red Flag Warning conditions.

**Progress**

The Company is in the process of implementing the replacements and upgrades, and as of June 2020, six reclosers have been installed of the identified approximately 90 reclosers. The new reclosers being installed are custom devices and have been subject to delays from the manufacturer.

**Future Plans**

The Company plans to complete implementation of the Design and Construct Revised Protection Scheme program in 2020. This will include installing approximately 90 as outlined in the Protection Study for Distribution Feeders. There may be additional adjustments to the target device installation due to further risk evaluation, material and crew availability, and additional compatibility analysis of legacy devices with current controller.

The Recloser Communications Network entails installing of the communications equipment to enable remote control of reclosers on high risk feeders. The communications devices will allow two-way communication from the devices to the control center, enabling transmission of fault data and reception of commands initiating alternative settings groups. The communications equipment will operate over the cellular network if reception is available at the location of the device. In other cases, devices will be installed to communicate *via* satellite.

**Progress**

The Company is in the process of designing and installing communications devices. The communication device installation follows the installation of the reclosers in the Design and Construct Revised protection Scheme. There have been none installed year to date.

**Future Plans**

The Company will begin installation of devices for this program in late summer and fall of 2020 and will continue into 2021. 50 communications devices will be installed in 2020 of approximately 90 devices outlined

in the Protection Study for Distribution Feeders and Design Construct Protection Scheme Programs. The remaining devices will be installed in 2021. There may be additional adjustments to the target device installation due to further risk evaluation, material and crew availability, and additional compatibility analysis of legacy devices with current controller.

The Substation Relay Upgrade for Remote Non-Reclosing Program consists of upgrading existing distribution substation feeder relaying to allow for setting changes that will provide more flexibility and reliability, especially on feeders that may be more susceptible to ignition risk in the WRZ. Additional settings will allow for faster clearing, options for recloser lock-out, and increased fault sensitivity. This project will help mitigate risk to safety and reliability during high wildfire risk times on distribution feeders. Faster trip times and disabling automatic reclosing will reduce wildfire risk. Reducing this risk will increase safety for crews and customers.

Feeders in the WRZ are being upgraded to modern microprocessor-based relaying with High Impedance Fault ("HIF") Detection Capability. Of the high-risk substation feeders, approximately two-thirds lack capabilities necessary to implement multiple relay settings and will be upgraded to a relay which contains the capability. The remaining existing relays which did not need to be replaced will have wiring upgrades to account for multiple relay setting groups.

**Progress**

To date, the program has identified three groups of projects to implement. The first includes feeders where the Company will modify existing substation relays without replacement. The second group includes the installation of new relays. The third group requires new relays and a new breaker or recloser. The Company is currently working on the first group and has completed engineering and pre-construction on four substations. The completion of the first two substations is scheduled for the first quarter of 2021.

**Future Plans**

The first relays will be completed in early 2021, and engineering, design, and construction will occur in parallel for the remaining feeders on a substation-by-substation basis. The Company will complete the Relay Upgrades for 95 feeders by 2022, with a potential for extension to 2023 based on outage constraints.

The Substation Relay Communication Upgrades Program provides the necessary communications upgrades for the high-risk feeders inside the substation to remotely enable alternate relay settings during high threat conditions. This program works in tandem with the Substation Relay Upgrade program described in the previous section on the sites identified as needing remote terminal unit ("RTU") upgrades to support the relay functionality. For substations without a fiber connection, this program provides the upgrades necessary for the two-way communication needed to change the settings remotely. This program includes upgrading the

communications required to achieve the desired functionality. The communications upgrades vary based on the current infrastructure at each substation.

**Progress**

To date, the program has identified the necessary upgrades to the substations and feeders. Engineering is ongoing, and the upgrades are scheduled to begin in 2021.

**Future Plans**

The Company will be performing the necessary communications upgrades to the highest-risk 95 feeders and associated substations by 2023.

Public Service is in the process of implementing an Advanced Distribution Management System ("ADMS") that will allow greater control, visibility and analysis of the distribution system. It is part of the Company's Advanced Grid Intelligence and Security ("AGIS") initiative. ADMS will enhance resiliency and reliability, particularly with operational needs associated with wildfire mitigation and it will be integrated with the Supervisory Control and Data Acquisition ("SCADA") system, which is used to control the functionality and can adjust protection settings depending on system needs.

The ADMS Module Additions include an Adaptive Relay Protection Module that will support the tracking of protection devices on the feeder, and Selective Coordination Analysis Tool that provides the ability to select combinations of devices to enhance the flexibility to coordinate system protection.

This includes near-real-time validation or alarms regarding protection coordination for control center operators when wildfire settings are enacted on a Red Flag Warning day. Operations engineers and protection engineers will also be able to monitor overall protection scheme health through these modules. These module functions are specifically beneficial for wildfire feeders because these feeders are more likely to experience feeder topology or protective scheme settings changes.

The installation of these modules will automatically alert operators to protection changes required when system configurations change. The modules also enable the alternate settings groups to minimize ignition risk when conditions warrant, such as during Red Flag Warning days.

**Progress**

The company has developed scoping documents for ADMS coordination and is preparing for ADMS integration in the distribution control centers in the Fourth Quarter of 2020. The Company is currently working with the vendor to determine compatibility of the Adaptive Relay Protection Module, and the Selective Coordination Models.

**Future Plans**

The additional models are being analyzed for future development.

Public Service's Vegetation Management programs are another critical function in assisting with the Company's safe reliable services to its customers and reducing the risk of wildfire. The Company's Vegetation Management programs are responsible for managing vegetation along the distribution and transmission facilities throughout the Colorado service territory. Vegetation is controlled through various specific programs, patrols, work plans, and quality control audits.

Public Service partners through master service agreements with contractors specializing in utility vegetation management work to complete nearly all the identified vegetation work, including removing, pruning and mowing of vegetation and the treatment of vegetation of vegetation herbicides. The vegetation management guidelines are based on best management practices outlined by the International Society of Arboriculture and in standards set forth by the American National Standards Institute ("ANSI").

**Existing Vegetation Management Activities**

Public Service has a robust vegetation management program. Vegetation management activities have been performed for years to ensure safe and reliable operation. A summary of the existing vegetation management activities is provided in the following table. These activities are performed year-round in compliance with applicable NERC standards.

*Table 6-7: Existing Vegetation Management Activities*

| Existing Vegetation Activities | Distribution | Transmission | Substations | Wildfire Related |
|---|---|---|---|---|
| Cyclical Maintenance | X | X | | X |
| Mid-Cycle Patrols: Mountain Hazard Tree | X | X | | X |
| Transmission Wildfire Protection | | X | | X |
| Weed Abatement & Landscaping | | | X | X |

**Cyclical Maintenance**

The base and the largest vegetation program at Public Service is its Cyclical Maintenance Program. This activity includes the pruning and removal of vegetation, on a time-based interval. This interval varies from one year to five years dependent on several variables such as line voltage, line location, vegetation biomes, and regulatory compliance. Maintenance activities start with field patrol inspections that focus on trees and other vegetation that is getting too close to conductors and identification of "hazard" trees, which are structurally unsound

trees that could strike lines when they fail. Trees that are identified through this activity are then remediated as part of normal transmission and distribution management maintenance.

The maintenance includes addressing vegetation along primary voltage electrical lines as well as secondary voltage, service drops, and pole climbing space as needed. Public Service's contractors follow ANSI concepts for utility directional pruning, which supports tree health. A combination of cyclical maintenance, mid-cycle patrols, and field patrols (ground and aerial based inspections) are used to monitor tree-to-conductor clearances and hazard tree identification. Any vegetation remediation needed as a result of the patrols is assigned and completed.

**Mountain Hazard Tree Program**

In addition to the cycles listed above, Public Service also performs additional patrols in mountain areas that are more prone to hazard trees. Trees in the mountainous areas are more susceptible to drought and harmful insects that can lead to higher mortality rates. The Mountain Hazard Tree ("MHT") Program includes both transmission and distribution lines and was first implemented in 2008 in response to pine and spruce beetle infestations within Company service territory. The MHT program is considered a "mid-cycle" activity. Mid-cycle activities are typically undertaken two years after cyclical maintenance. The MHT Program is intended to reduce the likelihood of dead, dying, or damaged trees or limbs making contact with electrical conductors by proactively remediating the hazard. Historically, the need for the MHT Program only existed in areas where pine and spruce trees are the predominating tree species. Geographically, this includes a portion of the Company's identified WRZ.

**Transmission Wildfire Protection Program**

The Transmission Wildfire Protection ("TWP") Program involves reducing the fuel load in a prescribed radius around transmission structures in the Company's mountainous regions. The objective of the program is to reduce fuel so that there will be less impact (and lower temperature) from a passing wildfire, and therefore lessen the risk of losing transmission assets. The TWP Program involves removing vegetation growing in the ROW, selectively removing vegetation outside the ROW for trees that may grow over the transmission line (also referred to as "crown closure") and moving existing logs on the ground further from structures. The work is generally performed in conjunction with other vegetation management cyclical maintenance.

**Weed Abatement and Landscaping Program**

The Weed Abatement and Landscaping Program prevents herbaceous vegetation from growing within substations. This is vital to provide safe and reliable electrical operations. The prevention of herbaceous and grassy vegetation from establishing within substations allows electrical technicians to work safely, prevents vegetation from growing into electric equipment, lessens the presence of insects and animals, and assists with keeping equipment in substations clear of fuel. It also aids in the defense against a passing wildfire.

**Incremental Vegetation Management Activities**

In addition to existing vegetation activities, Public Service is supplementing some activities and undertaking new activities to further enhance its overall vegetation management program. These additions are directly related to wildfire mitigation efforts in light of changing forest conditions, increased populations in the WUI, and heightened awareness of risk related to operating electrical lines in the WRZ. The table below summarizes the new and enhanced vegetation activities.

*Table 6-8: Incremental Vegetation Management Activities*

| New Incremental Vegetation Activities | Distribution | Transmission | Substations | Wildfire Related |
|---|---|---|---|---|
| Enhanced Mountain Hazard Tree Program | X | X | | X |
| Defensible Space Around Pole | X | | | X |
| Right-of-Way Conversion | | X | | X |
| Secondary & Service Line Clearance | X | | | X |

As previously mentioned, the Company's existing MHT Program for transmission and distribution systems was developed in response to pine and spruce beetle infestations within its service territory. Historically, these patrols are performed in areas where pine and spruce trees are the predominating tree species. Geographically, this included a portion of the Company's identified WRZ. Because the WRZ covers an extensive portion of the Company service territory, we started proactively conducting hazard tree patrols for the WRZ. The enhanced MHT Program now includes proactive mid-cycle patrols for the WRZ in addition to the pine and spruce forest patrols throughout the service territory. This will result in more miles being proactively patrolled for hazardous vegetation conditions in the WRZ and lower the risk of ignition caused by vegetation.

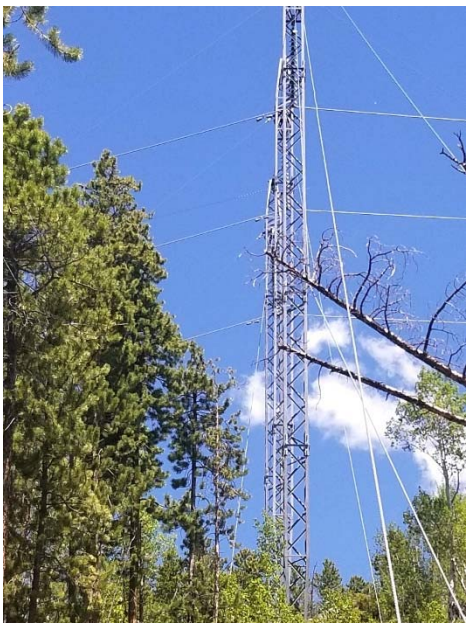


*Figure 6-13: Example of Hazard Tree*

**Progress**

In 2019, the decision was made to enhance the MHT Program to ensure remediation of additional dead and declining hazard trees in the WRZ. 2019 proved to be a classic example of the unpredictable nature of forest health. Over the past several years, the impacts of mountain pine beetle and spruce beetle infestations have somewhat stabilized; however, the Company has discovered that there are years for which there are localized pockets of elevated pine and spruce mortality. For some years the mortality pockets are far away from electrical lines; in other years the pockets are next to electrical lines. In 2019, we found localized mortality close to transmission lines.

In 2020, Public Service plans to patrol eight additional transmission lines and twelve additional distribution feeders as part of the MHT Program, in addition to the 12 transmission circuits and 18 distribution feeders that were part of the MHT Program.

**Future Plans**

Public Service plans to continue the enhanced MHT Program by regularly including the WRZ in its mid-cycle patrols.

The Defensible Space Around Poles ("DSAP") Program is directed at distribution feeder poles that have electrical equipment mounted on top, such as fuses and arresters. The objective of the program is to establish a vegetation-free zone around equipment-mounted distribution poles to reduce ignition risk in the vicinity of poles that have equipment that could spark. The DSAP Program is also referred to as "pole-brushing". It

consists of clearing a ten-foot radius around certain distribution poles so that there is no fuel, such as wood or grass within that radius.

**Progress**

In 2019, relatively few equipment poles were identified that would not have equipment change outs as a result of additional hardening and replacement programs. Pole mounted capacitors have some potential for ignition risk, but there is not a good ignition-resistant alternative at this time. Therefore, the Company focused its efforts on those poles in the WRZ with pole-top capacitors. The Company performed DSAP on approximately 27 poles. The cycle and frequency will continue to be evaluated to monitor for new growth. The figures on the following page show examples of conditions both before and after treatment carried out under the DSAP Program.

*Figure 6-14: Before DSAP Treatment (left)*

*Figure 6-15: After DSAP Treatment (right)*

In 2020, the DSAP activities will depend on progress of the Distribution Equipment Upgrades Program. The Company plans to perform DSAP on poles in the highest risk zones until the new CAL FIRE rated non-expulsion fuses and arrestors can be installed over the next two years. This will provide extra assurance in the interim to reduce ignition risk. In 2020, the plan is to perform DSAP on approximately 4,000 poles.

**Future Plans**

Going forward, the Company plans to continue treatment of poles until fuses and arresters are replaced with CAL FIRE-rated equipment in the WRZ. Future budgets will allow approximately 4,000 new locations per year to be treated. Previously treated locations will continue to be monitored to determine whether the pole will need be retreated.

Public Service's Vegetation Management programs have been successful in preventing vegetation and trees from coming in contact with transmission conductors. The Company's past practice along transmission lines has been to selectively prune trees on a prescribed cycle to meet regulatory compliance and prevent vegetation from encroaching into conductors. The ROW Conversion Program expands the existing practices by proactively removing smaller trees and other types of vegetation from the ROW. By not allowing the smaller vegetation to grow, the program reduces the potential fuel levels in the ROW, and therefore reduces ignition risk. The program provides fire breaks and additional access for maintenance, inspections, and emergency situations. It also improves operational safety and reliability.

**Progress**

In 2019, approximately 27 acres or 2.22 miles were completed as part of the ROW Conversion Program, and work is continuing in 2020.

**Future Plans**

The expanded ROW conversion program will continue over the course of the WMP with a similar target as was completed in 2019. ROW Conversion progress is affected by field implementation strategy, location, and growth type and condition, and the resulting target progress metrics will vary based on specific location each year.

Historically, Public Service has focused its vegetation management activities around higher voltage, or primary distribution lines. The Secondary Voltage Line Clearance Program targets lower voltage lines, such as service and streetlight cables. Although there are fewer vegetation-caused issues associated with these secondary lines, due to the potential ignition risk, it is prudent to expand the vegetation maintenance scope to include secondary voltage lines in the WRZ.

The Secondary Voltage Line Clearance Program will include additional dedicated vegetation inspections to proactively prune vegetation around distribution lines with secondary voltages, streetlights, and service lines within the WRZ. The work is done in conjunction with cyclical maintenance. Conducting line clearance along secondary voltages will also enable Public Service to manage and monitor vegetation conditions, which may contribute to an unintended ignition source. Tree clearance practices on secondary lines will focus on hazard tree mitigation and preventing encroaching limbs from deflecting and or weighing down the secondary conductors.

This activity will increase reliability, reduce wear and tear on conductors, harden conductors to storms, and reduce the operational risk of a secondary voltage line being an ignition source.

**Progress**

The Secondary Voltage Line Clearance Program will take one full four-year maintenance cycle. The program was initiated in 2019 and approximately 98 trees. In 2020, a total of approximately 408 trees have been pruned along secondary lines. As work progresses, the Company is improving its processes, tracking and reporting mechanisms.

**Future Plans**

The Secondary Voltage Line Clearance Program is an ongoing program. Secondary pruning work will continue to be completed as an expansion of scope during scheduled routine cyclical maintenance along distribution circuits.

Public Service recognizes that numerous emerging technologies are developing and may play a role in building the resiliency of the system. Public Service will continue to monitor available technologies in future WMPs. Two of these are described below.

This project between Oak Ridge National Laboratory ("ORNL"), Lawrence Livermore National Laboratory ("LLNL") and Pacific Gas and Electric Company ("PG&E") consists of a high-fidelity sensor cluster on an electric distribution feeder to capture grid signatures that can be used as early indicators of arcing to identify and mitigate fire risk. To capture real signatures, ORNL and LLNL are working with PG&E to install a sensor cluster in an operational utility service area. The novelty of the project is in both the high-fidelity sensor technology and analytical methodology on a custom purpose platform.

Compression connectors in overhead transmission lines have been shown to be a weak link because of the unique configuration. The connectors are susceptible to increasing degradation due to thermal cycling and overloading. Loosening of connectors leads to sagging of transmission lines, which can result in outages and

other severe events such as fire. Many utilities currently conduct routine line inspections, but they cannot always provide information required to evaluate the mechanical performance of connectors. Researchers from the Materials Science and Technology Division ("MSTD") of the Oak Ridge National Laboratory (ORNL) have developed a "smart patch" to monitor the structural health of compression connectors used in transmission lines. The technology incorporates piezoelectric transducers and electromechanical impedance analysis, and these smart patches will enable the prediction of connector lifetime in real time. The structural health monitoring ("SHM") technique will allow utility companies to optimize the operation and maintenance of overhead transmission lines and further prevent wildfires.

# 7. Stakeholder Outreach

Community and stakeholder outreach involve communicating with various groups, educating them on the work being done for wildfire mitigation, answering questions about the WMP and receiving feedback that may be used to enhance and strengthen the Company's efforts in this area. Public Service has a solid history of partnering with public and private sectors, academia, and government agencies to address new and emerging issues in innovative ways. The Company is actively meeting with the communities across the state—and especially those in the identified WRZ—to share our Plan, receive feedback, and develop alignment. We have also been holding stakeholder meetings with community and regulatory stakeholders to share information and gather feedback on ways we can advance and improve the WMP.

The Company's community outreach started with the county governments where wildfire mitigation activities began taking place, to provide an overview of those activities and an open forum for information exchange. The Company actively participates in several local community wildfire preparedness committees, coalitions, and task forces. The following table summarizes the community outreach meetings that have been held to date in 2020.

*Table 7-1: Summary of 2020 Community Outreach Meetings*

| Date | Meeting |
|---|---|
| 3/2/20 | Boulder Multi-Agency (MAC) |
| 3/3/20 | Clear Creek County Board of County Commissioners |
| 3/5/20 | Gilpin County Commissioners Meeting |
| 3/13/20 | Boulder County Sheriff's Office Wildland Firefighting Training |
| 3/17/20 | Summit County Board of County Commissioners |
| 3/19/20 | Jefferson County Wildfire Risk Reduction Task Force |
| 3/30/20 | Lake County Board of County Commissioners |
| 4/7/20 | Summit County Board of County Commissioners |
| 4/16/20 | Conejos County Board of County Commissioners |
| 4/20/20 | Rio Grande County Board of County Commissioners |
| 4/21/20 | Jefferson County Board of County Commissioners |
| 5/11/20 | Chaffee County Board of County Commissioners |
| 5/11/20 | Garfield County Board of County Commissioners |
| 5/13/20 | Alamosa County Board of County Commissioners |
| 6/2/20 | Costilla County Board of County Commissioners |
| 6/3/20 | Xcel Energy Virtual Town Hall |
| 6/4/20 | Boulder County Forest Collaborative |
| 6/8/20 | Xcel Energy Virtual Town Hall |
| 7/7/20 | Upper Clear Creek Watershed Association |
| 7/7/20 | Saguache County Board of County Commissioners |
| 7/9/20 | Upper Clear Creek Watershed Association |

Generally speaking, there has been great appreciation for the information the Company is providing surrounding our WMP and the WMP has been well-received. Because of the ongoing COVID-19 pandemic in 2020, many Colorado counties have redeployed Office of Emergency Management and other local leads to dedicate their efforts to pandemic needs, limiting the deployable resources available for wildfire response and making the Company's mitigation activities even more critical. Public Service has made great inroads in collaborating with and educating elected officials through public meetings. The Company continued its outreach through two virtual town hall meetings in 2020 to further include customers, stakeholders, the general public, and others within our 16-county service territory who may be impacted by or otherwise interested in our WMP. In addition to scheduled meetings, the Company's community outreach is also promoted through social media, targeting customers by zip code, and asking county leaders to post information to county websites and share it with their social network.

Public Service hosted two virtual town halls in June 2020 as a forum to provide information about and solicit feedback for the Company's Wildfire Mitigation Program. For the virtual town halls, key stakeholders considered during the notification period included the Colorado State Forest Service, elected officials, local county governments, and local emergency managers within the Program area. Public outreach activities began prior to the virtual town halls and will continue through implementation of the WMP. The purpose of the virtual town halls was to provide a platform to inform the key stakeholders, the interested public, and the media about the Company's planned WMP activities through 2020 and address questions and concerns posed by the public. Public Service originally intended to host in-person public meetings to discuss the WMP. However, to reduce the risks associated with person-to-person contact due to the COVID-19 pandemic, Public Service instead chose to host these public meetings as virtual town halls.

The virtual town halls were held on June 3 and June 8, 2020. Public Service provided a PowerPoint presentation for each virtual town hall which can be found on the Company's Wildfire Mitigation Program website.[6] The presentation was broadcasted over the live-stream Broadnet portal and included information about the Program team, Public Service as a company, operational and situational awareness, new technologies, wildfire risk across the state, WMP goals and activities, accomplishments, future actions, and community engagement efforts. Company representatives from various disciplines were available during the Q&A session to discuss topics including Plan components, vegetation management distribution, program communications, transmission system planning, distribution system planning, system operations, and specific county-related inquiries.

Public Service presented its first WMP in 2019 as part of the Company's 2019 Rate Case. A number of parties intervened in the regulatory process, many of which were focused on the Company's WMP, and as a result of collaboration and negotiation with interested parties, the unopposed Wildfire Settlement Agreement was executed in November 2019. Parties to the 2019 Rate Case proceeding included Commission Staff; the Colorado Office of Consumer Counsel; AARP; Colorado Energy Consumers; the City and County of Denver; the City of Boulder; the Colorado Energy Office; CF&I Steel, L.P. d/b/a EVRAZ Rocky Mountain Steel; Climax Molybdenum Company; the Department of Energy; Energy Outreach Colorado; the International Brotherhood of Electrical Workers, Local No. 111; Leslie Glustrom; Sierra Club; the Southwest Energy Efficiency Project; Vote Solar; Walmart, Inc.; and Western Resource Advocates. As part of the Wildfire Settlement Agreement, the Company agreed to host semi-annual stakeholder meetings to update stakeholders on the progress of the

[6] http://www.xcelenergywildfireprotection.com.

2020 WMP, including project implementation and metric tracking. The Company hosted two virtual stakeholder meetings in 2020. The first was held on April 6, 2020 and the second was held on June 10, 2020.

To help ensure consistency with other utilities in the state, the Company initiated conversations with multiple Colorado electric transmission and distribution owners and operators to discuss wildfire risk and actions being implemented to mitigate that risk. There was great interest in bringing together leaders from each of these utilities to share best practices and lessons learned. On January 10, 2020, Public Service sponsored a Colorado Wildfire Summit and invited all other Colorado utilities to participate. Attendees included Holy Cross Energy, Tri-State Generation and Transmission, Black Hills Energy, United Power, Platte River Power Authority, Colorado Springs Utilities, the Western Area Power Administration, and IREA. While some utilities are taking more aggressive steps than others, all are interested in wildfire mitigation. A second (virtual) meeting was held April 20, to discuss updates as well as presenting the Public Service response process and wildfire annex. The Company will continue to coordinate efforts with the other Colorado utilities.

Going forward, Public Service will maintain the communication channels outlined in the Table 7-2 below. The Wildfire Mitigation Program website will include information such as future town hall meetings and updated WMP and filing information. Public Service will continue to communicate with and engage the community and key stakeholders throughout the implementation of the Program. Public Service will continue to hold stakeholder meetings and presentations to advance and improve the Program and meet with neighboring utilities to share information and lessons learned.

*Table 7-2: Wildfire Mitigation Program Communication Channels*

| Channel Type | Contact Method | Description |
|---|---|---|
| Website | xcelenergywildfireprotection.com | The website hosts information on the Program, community engagement, system operations, system improvements, future planning and activities, wildfire safety information, and methods to contact the Program team. |
| Email Address | Info@XcelEnergyWildfireProtection.com | The Program email address is checked daily to ensure all inquiries are addressed in a timely manner. Messages are responded to by Program representatives within 24 hours. |
| Hotline | 833.352.0087 | The Program hotline provides brief information about the Program and alternate Program communication channels that are available. The hotline allows stakeholders to leave voice messages with questions, comments, or concerns for the Program team. Messages are responded to by Program representatives within 24 hours. |

# 8. Operational Procedures

Safety and reliability are integral tenets to Public Service's operational practices and procedures. The Company has implemented and is considering additional operational procedures to address fire risk and mitigation, as identified below.

Many electric utilities, including Public Service, utilize automatic reclosers on their transmission and distribution lines to open or sectionalize sections of a system that has experienced a fault. An automatic recloser can close a line section back in quickly after the line is opened to reduce outages in instances where the fault was momentary, such as a lightning strike. However, automatic reclosing can sometimes introduce a risk of ignition. Public Service has been exploring modifying automatic recloser settings when conditions warrant, such as during fire season. One modification is to set the recloser such that it does not close the line back in automatically. This is sometimes referred to as "lock-out." By setting a recloser to lock-out, it can reduce the risk of ignition. However, this can also impact reliability, since customers are out of service longer.

The Company has initiated efforts to utilize available technology such as new reclosers and relays that can be programmed to enhance operational flexibility and precision.

Transmission operational changes will require that when a transmission line experiences a fault and cycles through its planned protection scheme, additional attempts to close the breaker or automatic recloser will not be initiated until the line is fully patrolled. If a permanent fault exists, the mitigating operation will prevent additional energization of a faulted line, which reduces the risk of a wildfire ignition. The Company is in the process of upgrading existing reclosers in and around the WRZ with equipment that can communicate with the Company's control center through ADMS. The upgraded equipment will include settings groups to accommodate alternate settings for seasonal weather conditions, such as Red Flag Warning days. The settings will also enable functionality in the event the Company decides to pursue Public Safety Power Shutoffs ("PSPS") in the future.

Public Service is deploying a focused recloser program to evaluate the impacts of enabling alternative protection settings on a small set of existing reclosers during the fire season. The program will cover up to 5 distribution feeders in the WRZ. Specified feeders will be protected by reclosers that have controls and settings intended for use on days that there are higher chances of wildfires. The reclosers will have multiple settings, including a "Wildfire Mode" setting, which can be controlled through SCADA. Initially, the program will be tested for 30 days, and then evaluated to determine program extension and expansion to include other distribution feeders.

The program will not only reduce the risk of ignitions for the implemented circuits, but will also provide valuable data as to the reliability impacts in terms of extended outage times that customers may experience.

Public Service is working to implement an ADMS that will allow greater control, visibility and analysis of the distribution system. It is part of the AGIS initiative and some of the functions were described in the System Hardening section. Full implementation of the ADMS will take several years, but the final system will enhance resiliency and reliability, particularly with operational needs associated with wildfire mitigation. Some examples include:

- Automatic Recloser Programming: ADMS can enable the ability to program the reclosers within the WRZ to be set to lock-out when conditions warrant, to add protection against ignition risk. It will allow operators to have additional flexibility for protection and provide situational awareness.
- Switching Operations: ADMS can also provide more abilities to sectionalize the grid when needed, and therefore minimize impacts to customers by only switching out sections that are necessary to maintain reliability. This can also be useful if the Company implements any PSPS programs in the future.

The Red Flag Warning information is used to adjust operations protocols and field crew work practices to ensure employee safety. Company meteorologists monitor weather information and provide Red Flag Warning notifications to the Wildfire Mitigation Team as well as internal employees. The Wildfire Mitigation Team then distributes this information to all external contractors and vendors, who are asked to review and adhere to any prescribed work practices coinciding with forecasted weather risks. The work practice zones are shown in Figure 8-1:

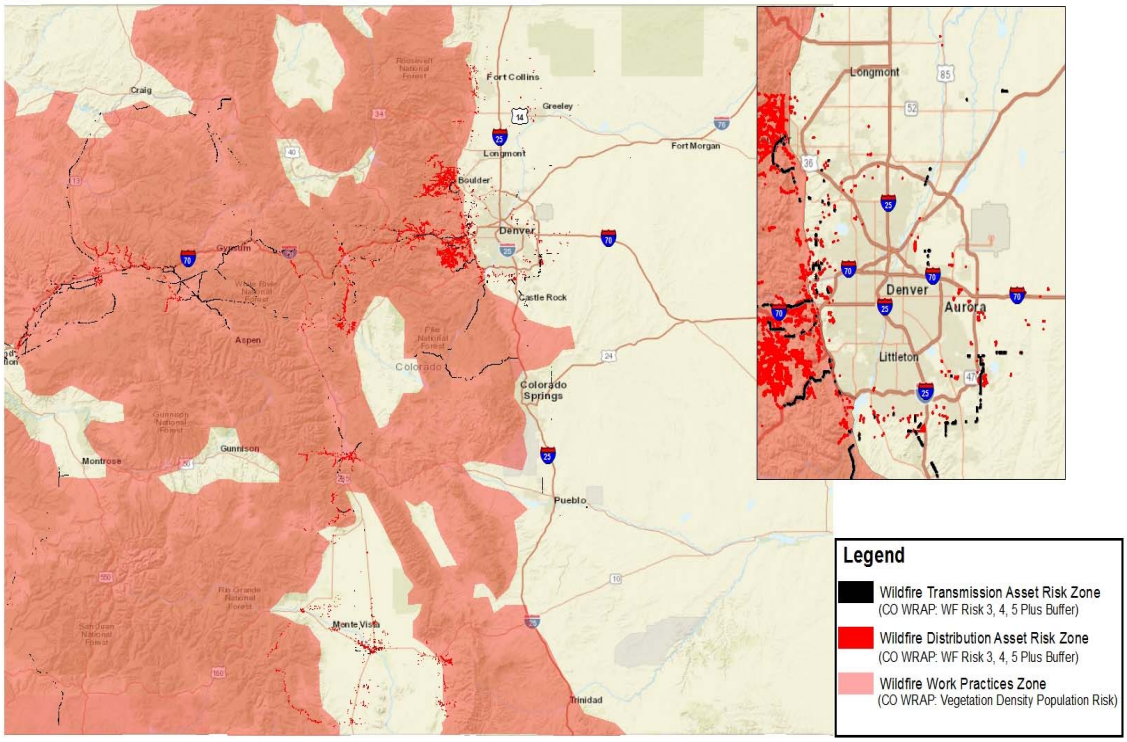



*Figure 8-1: Work Practice Zones and Wildfire Risk Zone Map*

The following practices must be observed by all Company personnel and contractors, especially those working in the field, when Red Flag Warning protocols are in place:

- No open fire/burning is permitted;
- All fires will be extinguished if safe to do so;
- All non-critical line clearance tree pruning, and removal activities should be moved to less risky areas, such as urban, road side, and accessible areas;
- All blasting will be discontinued;
- All grinding and welding will discontinue, except in enclosed buildings or within areas cleared of all flammable material for a radius of 15 feet;
- Vehicular travel will be restricted to established designated roads except in case of an emergency. In no case will vehicles with hot exhaust systems be driven over or parked in grassy areas;
- Smoking is prohibited in high-risk fire areas;
- Extra caution should be used when performing any of the activities described as operational, and while using all-terrain vehicles ("ATV") and off-road equipment, particularly within the WRZ;
- Adherence to fire prevention practices and use of required tools (i.e., spark arrestors, properly maintained equipment, welding blankets) is critical; and

- The presence and use of firefighting tools (shovels, water packs, welding blankets) while working within the WRZ is required.

Appendix C provides an example of the Red Flag Warning map, which will be attached to the Company's Red Flag Warning notifications.

The Company is diligently working to maintain and operate its distribution and transmission system to minimize risk of ignitions. However, in the WRZ, there may be instances where the risk of fire outweighs the reliability impacts. Therefore, as a last resort, the Company could shut off power on select parts of the system to further reduce the potential risk of asset-caused fires. This process to preemptively turn off power is commonly referred to as a PSPS. A PSPS is a last resort measure but may be necessary in certain circumstances. Preemptive power shutdowns are designed to reduce wildfire risk by halting the flow of power through electrical lines when there is a probability of extreme fire danger. The PSPS programs are widely used by California utilities following destructive fires that were caused by utility electrical assets.

In the near-term horizon, Public Service will be flexible in its approach to PSPS, since the precise methodology would be different depending many factors, such as weather, fuel conditions, location, and critical customer impacts. Some of the various factors and considerations that will be discussed in more detail below. If an actual PSPS is initiated, the Company will make all reasonable efforts to will notify its customers, regulators, and agency partners ahead of an event, and will restore power as quickly as possible.

As with other companies, Public Service has discovered that implementation of PSPS in a way that minimizes impacts to customers and communities as low as possible is not so much about having a prescriptive methodology, but more about situational awareness and the ability to make informed decisions based on accurate data.

# 9. Training

The Company developed annual training to inform employees about fire prevention and fire-safe work practices. Fire Prevention training is for operations and field personnel to understand the causes of wildfires, recognize the high fire risk area, best fire-safe work practices while working in a high-risk area, and incorporate wildfire prevention items on daily job briefings. The training describes Red Flag Warning notification procedures, and what the field crews must do in the event of a fire in the area they are working in. The training is conducted on an annual basis for operations personnel prior to the highest fire risk season and the list of employees required to take the training includes field employees, control centers, and supervisors from electric transmission and distribution. The Fire Prevention Training is an online training through the Company's Learning Management System. In addition to the online training, a follow-up in-person training was developed to provide additional managerial and Supervisory emphasis on fire-safe field practices prior to the wildfire season. The combination of the online and in-person training emphasizes the importance of understanding the fire threat, Red Flag Warning notification and work practices, and reporting procedures to field employees and their management.

Downed line and Ignition Reporting Training is for Company field personnel who respond to equipment issues and outages and describes the report required to document any potential source of ignition such as a wire on the ground. The training emphasizes the purpose of being able to gather quality reporting metrics to help inform our engineering efforts, electrical equipment standards, and helps reduce risk through gathering the data needed to analyze events that could potentially lead to an ignition. The training ensures the field crews responding to events in the field know how to log Downed Lines and Ignition Reports and was conducted locally at each service center until the training was converted to video training due to social distancing precautions related to COVID-19.

Electric Distribution Standards training provides guidance to construction crews, first responder crews, and designers on how to incorporate and install distribution non-expulsion equipment such as fuses, arrestors, and cutouts as described in Section 6.2.2. The training consists of updated standards regulations describing when and where to use the new equipment. The training was converted to video training with a library of reference documents due to social distancing precautions related to COVID-19.

# 10. Wildfire Emergency Response

Public Service's incident response process, called the Enterprise Event Management Framework ("EEMF"), outlines the communication, decision-making, and response process for any type of event, including response to a wildfire. The EEMF is patterned after the National Incident Management System ("NIMS"), the federally accepted model for event response, and is based on the premise that the event should be managed at the most local level. The EEMF is easily scalable based on the severity, complexity, and scope of event. The EEMF allows users to adopt an integrated organizational structure to match the complexities and demands of single incident or multiple incidents without being hindered by jurisdictional boundaries. The structure also avoids multiple levels of approval for decision-making, helps avoid delay of time critical actions, and ensures the safety of responders and public, while achieving tactical objectives with the efficient use of resources.

Public Service has established an all-hazards Incident Response Plan ("IRP") Program. The all-hazards IRPs would be used to provide the operational area response to a wildfire. The IRP program ensures that operational areas' incident response capability is fully understood from an operational or a support role as well as how the response capability fits within the overall EEMF. Standardization of IRPs across the enterprise promotes a consistent and effective approach to prevent, prepare for, mitigate, and respond to incidents and emergency events. Additionally, the IRP Program provides general concepts and guidance for aligning business area incident response management protocols with NIMS.

All Business Area IRPs contain guidance for after action reviews within two weeks following any event, including a wildfire. The event's lessons learned, strengths, opportunities and action items are documented in an After Action Report ("AAR"). The AAR would include internal as well as external partner lessons learned.

A specific interim Wildfire Response Annex has been developed for use in the Public Service operating region for the 2020 wildfire season. This guidance aligns aspects of wildfire response across the Enterprise's operational areas of Gas Distribution, Gas Transmission, Electric Distribution, and Electric Transmission, and provides guidance specific to handling response to a wildfire. This guidance also includes communication with the Enterprise Command Center ("ECC"), a 24/7 watch floor, and has considered activation of the EEMF. This guidance is interim, and the Company plans to continuously improve and update the guidance based on lessons learned, new monitoring tools, and any new mitigation strategies.

The Wildfire Response Annex supports the Operational areas' all-hazard IRPs, with response actions specific to wildfire monitoring, internal notification and communications, which leads to each operational organization

classifying the fire within the common all-hazard threat matrix. The Company's Strategic Communications group supports the EEMF at all levels and communicates out to the public and media during any event, including a wildfire. Additionally, our Community Relations organizations engage with the Office of Emergency Management, Sheriff, or other local representative/agency designated to manage complex or large incidents. Outward focused communications for wildfire will continue to be explored and developed as Public Service continues to develop wildfire response plans as well as customer care and community outreach programs regarding wildfire. The Wildfire Response Annex outlines monitoring for wildfires using several sources. These sources include, but are not limited to:

- Indji Watch, a multiple hazard monitoring tool;
- InciWeb, an interagency all-risk incident information management system;
- Colorado Division of Homeland Security and Emergency Management, Department of Natural Resources, and National Forest Service;
- National Oceanic and Atmospheric Administration ("NOAA");
- Internal monitoring or reports from other Xcel Energy real time desks, control centers, individual field workers, the Security Operations Center, the ECC, or Meteorology;
- Local law enforcement reports; and,
- Social media, news outlets, or other media sources.

When a wildfire is identified within Colorado, it is initially reviewed to determine how close the fire is to Company assets. If within 30 miles, an initial notification is sent to the operational organizations to check asset location, terrain, and fuel between the fire and asset, and review meteorology reports to vet the information and determine an initial classification of the wildfire for the specific operational organization. The classification correlates to IRP actions. The goal is to complete this quickly and respond back on the initial notification with full information so that the entire organization is aware of the threat and understand the level of response for each organization. The classification levels, with corresponding IRP actions, are shown in Table 10-1 below. Note that at these incident response levels, Strategic Communications, Customer Care, Key Account Managers, and Community Relations departments are notified and brought into the response as needed. Wildfire-specific response, communication, and outreach will continue to be evaluated and changed based on lessons learned and information from partners and communities.

*Table 10-1: Wildfire Event Classification*

| Threat Level | Description | Incident Response Plan Actions |
|---|---|---|
| **Normal Monitoring (Level 5)** – Normal Operations | No immediate threat. Wildfire is NOT within 30 miles or does NOT have the potential to encroach on Company assets in less than 96 hours | None |
| **Green (Level 4)** - Normal Operations (Actively Monitoring) | Wildfire identified within 30 miles or the potential to encroach on Company assets in less than 96 hours | Begin working IRP Section 4.0, "Pre-planning" and Wildfire Annex |
| **Yellow (Level 3**) – Minor incidents handled at operational level (Escalated operations) | Wildfire identified to have the potential to encroach on Company asset in less than 72 hours | Escalated Operations – follow normal response process using IRP and Wildfire Annex |
| **Orange (Level 2)** - Potential serious threat to operations (Escalated operations) | Wildfire identified to have potential to encroach on Company asset in less than 48 hours | Escalated Operations – follow normal response process using IRP and Wildfire Annex, potential EMT activation |
| **Red (Level 1)** - Significantly disrupt operations or result in serious safety impacts (Escalated Operations) | Company Assets impacted, involved or at risk<br>Potential De-energization plan is to be implemented in the next 24 hours | Escalated Operations – follow normal response process using IRP and Wildfire Annex, potential SMT activation |

Identified fires will be monitored and recorded in the Weekly Wildfire Summary Report, even if the fires are outside of 30 miles from Company assets. The 30-mile distance and the times were not based on fire growth or spread since current monitoring capabilities do not account for this. Rather, the distance and times were based on what operational organizations determined they would like for pre-planning or for the activities they would be performing at each classification level. These levels are noted as interim and are likely to change as the Company gains experience with the use of the wildfire annex and with the addition of more sophisticated monitoring tools for predicting fire spread. Appendix C contains an overview of the Wildfire Interim Response Annex's communication process and an example of the communication.

The Company's Community Relations Managers provide support to the Emergency Operations Centers ("EOC") during localized and large-scale complex incidents, including wildfires, by communicating the challenges faced in responding to and recovering from an incident where our assets are damaged or involved in the incident. These communications are used to make tactical decisions by emergency management. In addition, Community Relations Managers can identify and communicate the need for leadership at the Operational,

Regional, or enterprise level to engage in local or state EOC briefings and any media interviews with Emergency Management Partners. Key points of contact for local and state government are included in emergency response plans and associated guidance documents.

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At the Federal level, the Company has numerous levels of engagement depending on the severity and type of incident. The Company's Federal Affairs and Emergency Management Liaison would provide high level support to Federal agencies. The Electric Sector Coordinating Council ("ESCC") engages the Xcel Energy Chief Executive Officer ("CEO") (and CEO's from US Utilities) at the strategy and policy level. If a crisis event meets the ESCC escalation criteria, a call is scheduled with CEO's of the impacted utilities to discuss the incident.

As noted earlier, Corporate Strategic Communications is involved in all levels of the EEMF. Corporate Strategic Communications may also engage with government partners. Corporate Communication's connection would be through Joint Information Centers or Public Information Centers to develop shared messaging and ensure response efforts are communicated clearly.

The Government Liaisons will be contacted by the office of the Governor for information sharing purposes and requests between the Company and a State Governor during a crisis. The Xcel Energy CEO, On-Call Executive, or Liaison may also contact a State Governor's office directly.

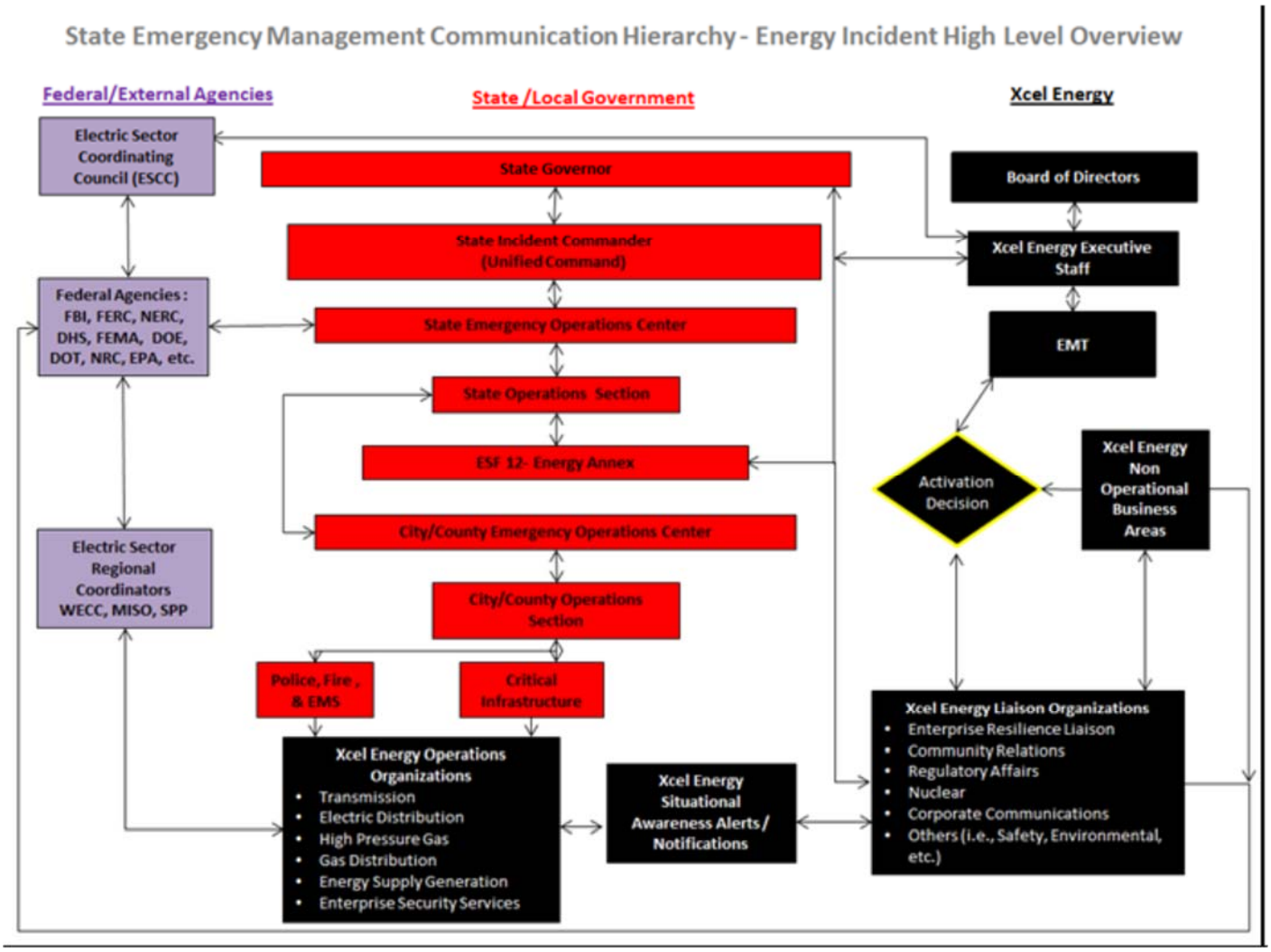



*Figure 10-1: State Emergency Management Communication Hierarchy*

# 11. Metrics, Tracking, and Reporting

The WMP metrics are intended help track progress and performance of actions taken towards reducing wildfire risk. Over time, they will provide a measure of the Company's contribution to safety, reliability, and long-term objectives, and help inform the effectiveness of programs. The Company has committed to track and report to the Commission on multiple metrics, including program and activity targets, as well as other outcome and progress metrics. Program targets measure the Company's progress and accomplishments of planned programs and activities identified in the WMP. Other metrics are designed to track concrete actions toward reducing wildfire risk. Progress and outcome metrics include absolute tracking of such things as weather conditions, downed wires, and actual fires. The Company has committed to track and measure multiple metrics, and report on them annually to the Commission. These include the following:

- The number of ignitions associated with electric overhead powerlines within the Wildfire Risk area;
- The number of downed transmission and distribution wires within the Wildfire Risk area;
- The number of Red Flag Warning Days in Colorado;
- The communities or areas which experienced Red Flag Warnings, as well as the dates they occurred;
- The total number of wildfires in the Company's service territory;
- The total actual annual investment in the Wildfire Mitigation Plan, per year; and,
- Additional metrics related to completed activities.

The following sections describe the process for tracking some of the metrics listed above. The metrics tracking process is new and the Company was not able to accurately track all metrics in 2019. However, going forward, Public Service is committed to tracking metrics over time to verify and validate effectiveness, inform decision-making, track the overall progress of programs and activities. The Company will continue to look for ways to effectively record important data and in future years determine appropriate methods to show trending information to further inform the wildfire mitigation planning process.

This WMP describes in detail the programs and activities that the Company has undertaken. The Company tracks each of those programs against the scope and targets. Some program targets may change depending on the results, interaction with other programs, and evolution of the WMP, based on new information and lessons learned.

In Colorado, the primary metric for monitoring fire-related weather is the Red Flag Warning. Public Service has meteorologists on staff in the Commercial Operations group that support the wildfire mitigation efforts on a

part time basis and are responsible for providing and tracking this information. The National Weather Service, which is part of NOAA, is the primary source of wildfire warning information. The National Weather Service provides daily updates to Red Flag Warnings as well as Fire Weather Watch. A Red Flag Warning is issued when a combination of temperature, humidity, and wind are expected to combine to produce an increased risk of fire danger. The Company began tracking Red Flag Warning days in 2019 as part of the 2019 WMP and will continue monitoring Red Flag Warning days in Colorado as well as the communities or areas which experienced Red Flag Warnings, as well as the dates they occurred.

The WMP programs are intended to reduce equipment or conductor failures that could result in a ignition. In 2019, the Company began formalizing a process to report on downed power lines and ignitions. The process wasn't fully implemented until first quarter of 2020. The effort is referred to as "Wires Down" reporting and covers both distribution and transmission lines. Company field personnel that respond to equipment issues and outages have received supplemental training on how to document any observed incidents of distribution or transmission wires on the ground or detached from a pole, and other ignition incidents. These responders, such as linemen and troublemen, not only initiate the process for appropriate repairs, but they also complete a Wire Down Reporting Form which is collected for further analysis. The information collected includes any evidence of ignition or fire. The information is utilized to assist with analyzing and further hardening the system to prevent facilities from failing and mitigating the risk of wildfire and other public safety hazards. This will be an on-going training process to improve consistency with the logging of the information. The first responders' primary responsibility is to repair any damaged equipment and return power to customers safely.

The Company has historically monitored active wildfires in its service territory for proximity to Company assets to determine what precautions should be taken to minimize risk to public safety. In 2020, the Company developed the Wildfire Interim Response Annex, described in Section 10, to provide guidance and the responsibilities for wildfire monitoring, initial decision making, initial notification, classification, and communication.

The Company will report actual expenditures of both capital and operation and maintenance costs for distribution and transmission efforts for the prior year in appropriate regulatory filings as required.

# 12. Conclusion

Public Service has developed this WMP as part of its commitment to delivering electricity to our customers in a safe, reliable, and cost-effective manner. The updated WMP demonstrates that commitment through its continuing and proactive measures to reduce the risk of asset-caused ignitions and minimize the potential for wildfires in its service territory.

This updated WMP builds on the foundational efforts of the 2019 Plan, focusing heavily on understanding assets through a variety of inspection processes, and following up with a comprehensive set of programs to address, repair and replace any facilities found to be deficient. The Company has also enhanced its vegetation management and operational processes to further mitigate the potential for ignition. In the last year, Public Service has further expanded the WMP to include more programs and activities and explore how emerging technologies can be strategically introduced into the Plan.

We will continue to expand our outreach efforts to ensure communication and coordination with customers, fire officials and organizations, first responders, communities, regulators and other interested stakeholders.

Public Service is committed to progressing and maturing its WMP in the coming years and looks forward to continued engagement in this important area with its regulators, customers, community partners, and other interested stakeholders.

# APPENDICES

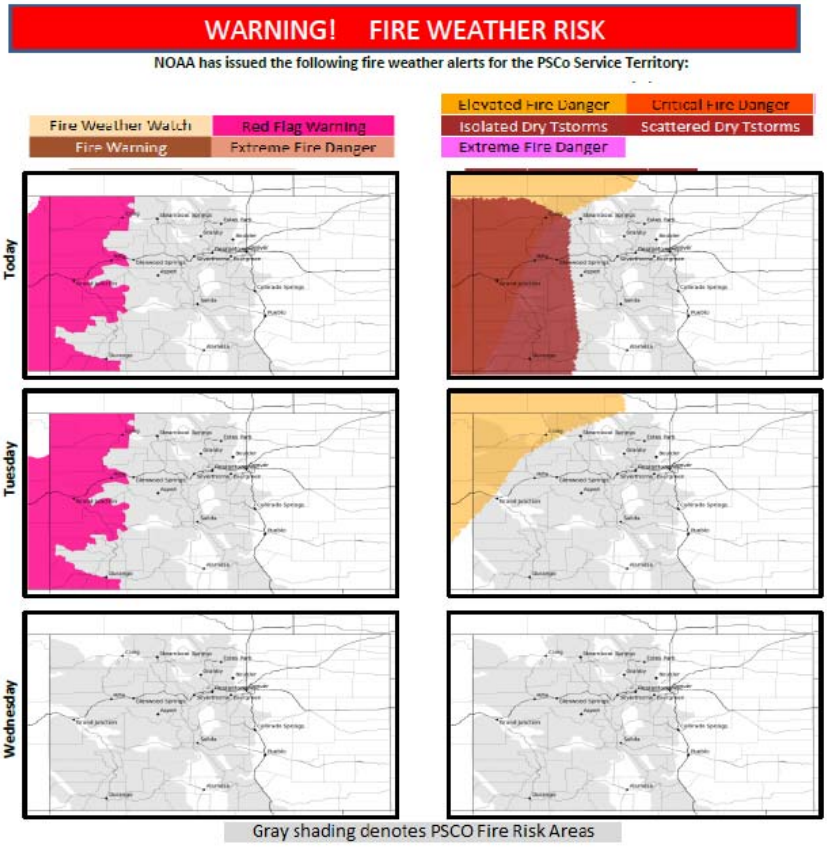
# Appendix A. Glossary of Acronyms and Defined Terms

| Terms | Description |
|---|---|
| ACSR | Aluminum Conductor Steel Reinforced; type of conductor or line |
| ADMS | Advanced Distribution Management System; a software platform that integrates numerous utility systems and provides automated outage restoration and optimization of distribution grid performance |
| Anchor | Connects transmission tower guy lines to the ground as part of the structure stabilization |
| Arrester | Device for taking extreme overvoltage off the system (Lightning) |
| Avian protection | Equipment to discourage birds from perching on electrical structures |
| Bare secondary wire | 120/240 voltage wiring that does not have any insulating covering |
| Capacitor Bank | Equipment that supplies capacitance to the distribution system to increase Voltage and overall power delivery |
| Circuit Breaker | Device that interrupts fault current on the distribution or transmission system but does not have its own measurement or sensing of the fault but depends on signals from a relay |
| Compression Connector | Device used to splice electric conductors |
| Connector | Makes an electrical and mechanical connection between two conductors |
| Covered conductor | Wire that has in insulating layer over the conductor but is not necessarily rated for insulating the voltage |
| Cross-arm | Wood/fiberglass arm mounted to the pole that holds the conductor |
| Cut-out | Device that holds a fuse and creates a visible open when fault current causes it to operate |
| Drone | Unmanned aerial reconnaissance vehicle, also referred to as a UAS (unmanned aerial system) or UAV (unmanned aerial vehicle) |
| DSAP | Defensible Space Around Poles to minimize ignitions from pole top equipment |
| Electro-mechanical relay | Devise that has an operating mechanism of electro-magnetic forces and mechanical parts used to detect fault currents as part of system protection device |
| Expulsion fuse | A vented fuse in which the expulsion effect of the gases produced by internal arcing, either alone or aided by other mechanisms, results in current interruption |
| Feeder | A circuit from the substation that forms the high current carrying backbone of the distribution system |
| Fuse | A device that melts when subject to a fault current of sufficient magnitude |
| GIS | Geographic Information System used to map utility assets |
| Guy | A steel wire at a pole that offsets the conductor tension where the conductor turns an angle or comes to an end |

| | |
|---|---|
| High impedance fault | A fault that has impedance sufficiently high with resulting low currents that cannot be easily detected by conventional protection equipment, such as when a conductor contacts a tree, structure, or ground |
| Insulator | A polymer or porcelain device that insulates the conductor from a structure or ground potential |
| IR inspection | Infrared Inspection used to identify temperature gradients or "hotspots" on electrical equipment |
| Isolator | An insulator in a guy which breaks the conductive path of the steel wire |
| LiDAR | Light Detection and Ranging method for measuring distances by illuminating the target with laser light and measuring the reflection with a sensor. It is used to develop models used for engineering analysis. |
| Marker Ball | Devices on electrical conductors to improve visibility, especially for aviation. |
| Microgrid | A complete source of power for the customer that is not dependent on receiving power from a utility distribution or transmission system |
| Micro-processor-based relay | A voltage and current measuring device that does not use electro-mechanical parts to sense or measure voltage or current |
| Monte Carlo simulation | Risk analysis tool to show potential decision outcomes |
| Pins | Connectors used for attaching a variety of electrical equipment |
| Pole | The main component of the structure which raises the conductor and electrical equipment off the ground |
| PSPS | c |
| Recloser | Device that interrupts fault current on the transmission or distribution system and includes its own measurement and sensing of the fault. |
| Relay | A sensing and measurement device either solid state or electro-mechanical that works to operate equipment or do measurement |
| Remote Terminal Unit | Microprocessor-controlled device that interfaces with SCADA to transmit data to a master system to allow device control. |
| SCADA | Supervisory Control and Data Acquisition used to remotely monitor and operate the system |
| Secondary conductor | Conductor that has customer level voltage |
| Sectionalizer | A device that will open an electrical circuit when the voltage and current are at zero |
| Single phase | A conductor or piece of equipment that operates with only one energized conductor being present |
| Small conductor | Conductor of a smaller size than the conductor sizes currently used for feeders, typically found on feeders older than 70 years old and made of copper |
| Spacer configuration | Covered conductor configuration that utilizes a messenger support system |
| Splice | Connection between two conductors; term usually used for two conductor ends being butted together |
| Substation | The point of connection and isolation between the transmission |

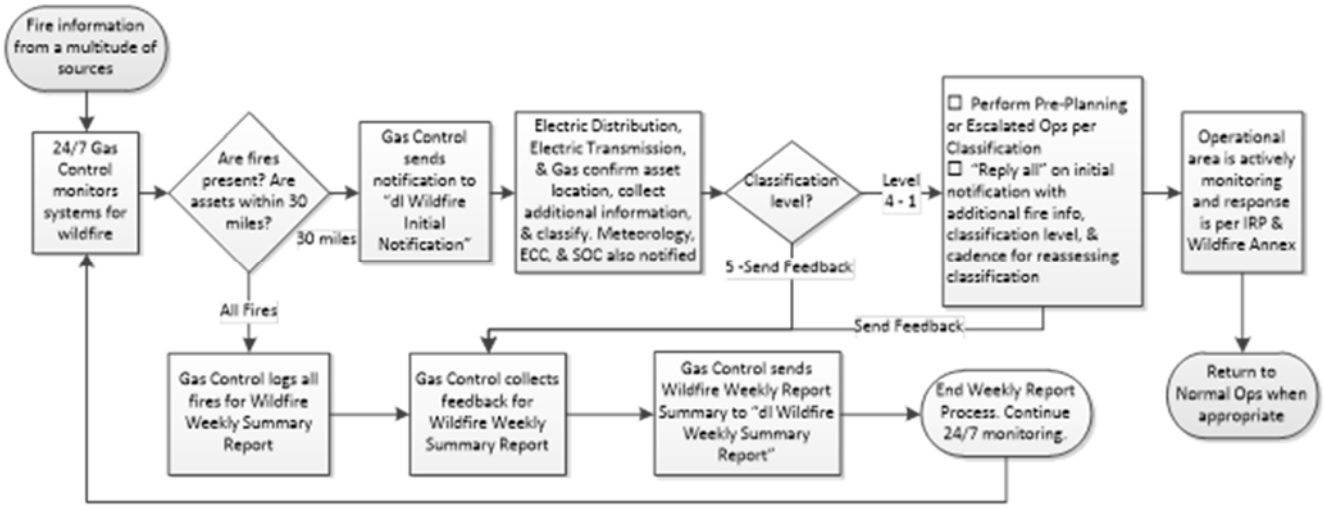
| | |
|---|---|
| | system and the distribution system which lowers the voltage to the transmission level and the distribution level - location where the feeder for the distribution system begin |
| Three phase | Conductors or piece of equipment that operates with only three energized conductors being present |
| Transformer | A device that transforms a voltage from a higher voltage to a lower voltage |
| UAS | Unmanned aerial system or drone |
| Vibration damper | Device connected to electrical conductors to minimize oscillations |
| Wildfire modeling software | Software that combines, fuel, terrain, wind, moisture, structures density population and other parameters to estimate fire spread and risk to an area of the distribution system |
| X-brace | Cross braces used on wood pole H-frame transmission structures |

# Appendix B. Example of Red Flag Warning Map (Attachment to Red Flag Warning Email)



# Appendix C. Wildfire Interim Response Annex

The internal notification, communication, and classification process of the wildfire interim response annex is depicted in the flowchart below. An example of an initial notification email is below.



**From:** [redacted]
**Sent:** Sunday, June 21, 2020 8:26 PM
**To:** [redacted]
**Subject:** New Wildfire Identified - Dry Gulch Fire
**Importance:** High

A new wildfire has been identified that may impact Electric or Gas Operations:

| Location of fire (nearest address, field stencil, GPS coordinates, crossroads, etc.) | State | County | Fire Department/ Responders on site | Distance from Gas Transmission | Distance from Gas Distribution | Distance from Electric Transmission | Distance from Electric Distribution | Area (in acres, if known) |
|---|---|---|---|---|---|---|---|---|
| Lat/Long: 39.28 , -108.71 | CO | Mesa | COGRD | <2 mi from 8" Asbury/Garmesa | ~6 mi North of Fruita | | | 1.5 |

Map of Location, if available:


Response(s) currently enacted:

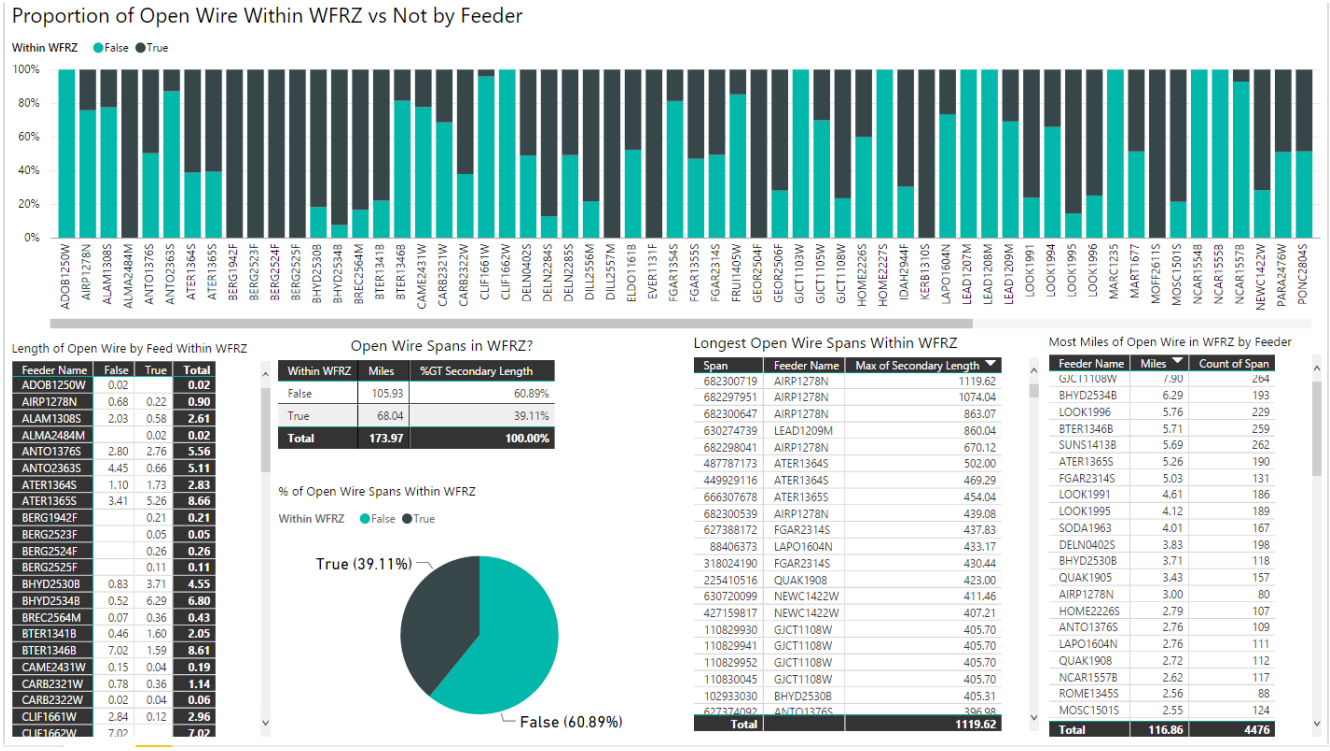
**Please reply with:**

1. **Acknowledgement of the fire**
2. **Provide the name of the manager/supervisor who will continue to provide updates from the operational area for this fire.**
3. **Report the distance from your teams assets, or statement assets are > 30 miles from fire. If available, include a screen shot or snippet of the map from your monitoring tool showing asset & fire locations**
4. **Provide the name of the Assets affected:**
5. **Report the classification level/color and, if appropriate, acknowledge you are monitoring the fire in your control center. If still obtaining information to classify, note that and provide a timeframe the classification will be made.**
6. **What specific actions is your operational area taking (or a statement that no actions are necessary).**
7. **Provide a time or cadence for next report back to Gas Control on fire monitoring or fire response status (or a statement that no follow-up report is necessary).**

[redacted]
**Xcel Energy | Responsible By Nature**
Supervisor, Gas Control Operations
[redacted]

# Appendix D. Dashboard

Overhead Secondary Open Wire Quantification Program Dashboard




Length of Open Wire by Feed Within WFRZ

| Feeder Name | False | True | Total |
|---|---|---|---|
| ADOB1250W | 0.02 | | 0.02 |
| AIRP1278N | 0.68 | 0.22 | 0.90 |
| ALAM1308S | 2.03 | 0.58 | 2.61 |
| ALMA2484M | | 0.02 | 0.02 |
| ANTO1376S | 2.80 | 2.76 | 5.56 |
| ANTO2363S | 4.45 | 0.66 | 5.11 |
| ATER1364S | 1.10 | 1.73 | 2.83 |
| ATER1365S | 3.41 | 5.26 | 8.66 |
| BERG1942F | | 0.21 | 0.21 |
| BERG2523F | | 0.05 | 0.05 |
| BERG2524F | | 0.26 | 0.26 |
| BERG2525F | | 0.11 | 0.11 |
| BHYD2530B | 0.83 | 3.71 | 4.55 |
| BHYD2534B | 0.52 | 6.29 | 6.80 |
| BREC2564M | 0.07 | 0.36 | 0.43 |
| BTER1341B | 0.46 | 1.60 | 2.05 |
| BTER1346B | 7.02 | 1.59 | 8.61 |
| CAME2431W | 0.15 | 0.04 | 0.19 |
| CARB2321W | 0.78 | 0.36 | 1.14 |
| CARB2322W | 0.02 | 0.04 | 0.06 |
| CLIF1661W | 2.84 | 0.12 | 2.96 |
| CLIF1662W | 7.02 | | 7.02 |

Open Wire Spans in WFRZ?

| Within WFRZ | Miles | %GT Secondary Length |
|---|---|---|
| False | 105.93 | 60.89% |
| True | 68.04 | 39.11% |
| **Total** | **173.97** | **100.00%** |

% of Open Wire Spans Within WFRZ




Longest Open Wire Spans Within WFRZ

| Span | Feeder Name | Max of Secondary Length |
|---|---|---|
| 682300719 | AIRP1278N | 1119.62 |
| 682297951 | AIRP1278N | 1074.04 |
| 682300647 | AIRP1278N | 863.07 |
| 630274739 | LEAD1209M | 860.04 |
| 682298041 | AIRP1278N | 670.12 |
| 487787173 | ATER1364S | 502.00 |
| 449929116 | ATER1364S | 469.29 |
| 666307678 | ATER1365S | 454.04 |
| 682300539 | AIRP1278N | 439.08 |
| 627388172 | FGAR2314S | 437.83 |
| 88406373 | LAPO1604N | 433.17 |
| 318024190 | FGAR2314S | 430.44 |
| 225410516 | QUAK1908 | 423.00 |
| 630720099 | NEWC1422W | 411.46 |
| 427159817 | NEWC1422W | 407.21 |
| 110829930 | GJCT1108W | 405.70 |
| 110829941 | GJCT1108W | 405.70 |
| 110829952 | GJCT1108W | 405.70 |
| 110830045 | GJCT1108W | 405.70 |
| 102933030 | BHYD2530B | 405.31 |
| 627374092 | ANTO1376S | 396.98 |
| **Total** | | **1119.62** |

Most Miles of Open Wire in WFRZ by Feeder

| Feeder Name | Miles | Count of Span |
|---|---|---|
| GJCT1108W | 7.90 | 264 |
| BHYD2534B | 6.29 | 193 |
| LOOK1996 | 5.76 | 229 |
| BTER1346B | 5.71 | 259 |
| SUNS1413B | 5.69 | 262 |
| ATER1365S | 5.26 | 190 |
| FGAR2314S | 5.03 | 131 |
| LOOK1991 | 4.61 | 186 |
| LOOK1995 | 4.12 | 189 |
| SODA1963 | 4.01 | 167 |
| DELN0402S | 3.83 | 198 |
| BHYD2530B | 3.71 | 118 |
| QUAK1905 | 3.43 | 157 |
| AIRP1278N | 3.00 | 80 |
| HOME2226S | 2.79 | 107 |
| ANTO1376S | 2.76 | 109 |
| LAPO1604N | 2.76 | 111 |
| QUAK1908 | 2.72 | 112 |
| NCAR1557B | 2.62 | 117 |
| ROME1345S | 2.56 | 88 |
| MOSC1501S | 2.55 | 124 |
| **Total** | **116.86** | **4476** |