NORTHWESTERN ENERGY'S

2024 WILDFIRE MITIGATION PLAN

Version 2.0

NorthWestern Energy

Delivering a Bright Future

Contents

Revision History ... 3
Definitions & Acronyms ... 4
Message from Brian Bird, President & Chief Executive Officer ... 7
Section 1 – Introduction ... 10
1.1 – NorthWestern Energy ... 10
1.2 – NorthWestern Energy's Historical Wildfire Investments ... 11
1.3 – Understanding a Changing Environment ... 13
1.4 – Understanding How to Assess Risk ... 14
1.4.1 – Wildfire Risk in Montana ... 14
1.4.1 – NorthWestern Wildfire Risk Models ... 15
1.5 – Wildfire Mitigation Plan Methodology ... 16
Section 2 – Plan Summary and Accomplishments ... 20
2.1 – Wildfire Mitigation Plan Summary ... 20
2.2 – Previous Year Accomplishments (2023) ... 21
Section 3 – Situational Awareness ... 26
3.1 – Overview and Key Activities ... 26
3.2 – Established Activities ... 26
3.3 – Enhanced Plan Efforts ... 27
3.3.1 – Situational Modeling ... 27
3.3.2 – Situational Monitoring ... 27
Section 4 – Operational Practices ... 30
4.1 – Overview and Key Activities ... 30
4.2 – Established Activities ... 31
4.3 – Enhanced Plan Efforts ... 32
4.3.1 – System Performance ... 32
4.3.2 – System Operations Defense Strategies ... 33
4.3.3 – Work Practices ... 36
Section 5 – System Preparedness ... 38
5.1 – Overview and Key Activities ... 38
5.2 – Established Activities ... 38
5.3 – Enhanced Plan Efforts ... 40
5.3.1 – Assessment & Repair ... 40
5.3.2 – Construction ... 42
5.3.3 – Implementation and Engineering Resources ... 42
Section 6 – Vegetation Management ... 44
6.1 – Overview and Key Activities ... 44
6.2 – Established Activities ... 44
6.3 – Enhanced Plan Efforts ... 45
6.3.1 – Vegetation Maintenance ... 45

6.3.2 – Fuel Mitigation 46
6.3.3 – Implementation Resources 46
Section 7 – Communication & Outreach 48
7.1 – Overview and Key Activities 48
7.2 – Established Activities 48
7.3 – Enhanced Planned Activities 50
7.3.1 – Enhanced External Communication and Customer Support 50
7.3.2 – Stakeholder Engagement 51
Section 8 – Conclusion 54
Appendix A – Historical Program Details 56
Distribution System Infrastructure Program 56
Forest Management Program 57
Mitigation of Outage: Asset Replacement (System Hardening) 58
Proactively Manage Risk: New Technology Systems, Updates to Existing Systems 59
Hazard Tree Program 60
Section Reliability 61
Reliability Data Details 62
Pole Replacement Criteria 62
Outage Remediation Solutions 63
Appendix B – Outage Reporting and Reliability 64
Appendix C – Wildfire Risk Prioritization 66
Static Risk Model Inputs 66
Additional Information 66
Scoring Methodology 67
Appendix D – Estimated Enhanced Costing Details 68
Appendix E – Estimated Established Costing Details 70
Appendix F – Public Safety Power Shutoff Implementation Plan 71
1 Revision History 71
2 Acronyms 71
3 Public Safety Power Shutoff Introduction 72
4 PSPS Approach 76
5 Situational Awareness Strategy 85
6 Operational Strategy 87
7 Communication Strategy 90
Appendix A – NorthWestern Energy PSPS Operations Process 97
Appendix B – NorthWestern Energy PSPS Stakeholder Communication Channel Strategy 98

Revision History

Review Date	Revision	Revisions
July 2022	1.0	The Enhanced Wildfire Mitigation Plan was filed with the Montana Public Service Commission and posted on the NorthWestern Energy website.
April 2024	2.0	NorthWestern Energy redesigned the Enhanced Wildfire Mitigation Plan to be a comprehensive plan, including both established wildfire strategies and the enhanced components from the plan published in 2022. This redesign included document restructuring, expanded context on efforts prior to the 2022 plan, updated risk methodology, inclusion of NorthWestern's Public Safety Power Shutoff plan, and a 2023 update.

Definitions & Acronyms

Advanced Metering Infrastructure (AMI) – This describes a modern class of utility meters equipped with computers and communication equipment that enable real-time, remote communication and monitoring. This technology allows customers and utilities to better understand how usage patterns may change over time and can also provide general information such as service outage, service quality, or safety alerts.

Assessment – An engineering assessment to gather data visually on transmission or distribution systems for considerations of future repairs or upgrades. The method, aerial or ground, and the cadence in which assessments are completed are based on the individual strategy. This may also be referred to as inventory.

Breaker – Also referred to as a circuit breaker or a substation breaker, these devices are used to interrupt short circuits or overload currents that may occur on the system.

Consequence model – Computer models used to predict events and the associated impacts. In the case of wildfire, this typically includes items such as population density, structure density, identified critical infrastructure, sensitivity of the surrounding landscape, and so forth.

Cutout – A device that is attached to a crossarm or pole to hold a fuse. When the fuse is left open, the cutout must be capable of insulating the downstream system from the live overhead lines. Historically, these were porcelain. Modern cutouts can also be made of a polymer-based material.

Cycle trimming – This term describes a standard utility process of trimming the encroaching vegetation on a circuit at given time-based intervals. The length of this interval varies on a circuit-by-circuit basis.

Distribution – Any electrical infrastructure below a transmission or sub-transmission voltage. On the Montana system this includes any non-service voltage below 50 kV. A distribution system will carry electricity from a substation to the customers at their residences or places of business.

Electrical Section Identifier (ESID) – Generated by NorthWestern Energy, this identifier describes a section of line between two protective devices.

Enhanced Powerline Safety Settings (EPSS) – System protection settings that lower the risk of electric infrastructure ignitions during wildfire risk conditions. EPSS may include, but is not limited to, faster de-energization of equipment when a fault is detected and/or settings which disable automatic reclosing.

Exception – A general term adopted by NorthWestern Energy to describe any identified asset in the field that is deemed to have a general status that is outside of acceptable original install. Examples of an exception include, but are not limited to, loose guy wires, dropped insulating pins, or missing raptor protection.

Fault – In general terms this describes any abnormal electrical current on the system. In the case of a utility, faults will often come in the form of tree contacts or downed electrical wires. Depending on the source, this is not always a sizeable current draw and can be difficult to operate a protective device as a result.

Fire spread model – A computer generated model, these will attempt to predictively describe the fire behavior of an ignited fire. Key inputs include but are not limited to fuels in the area, meteorological data, and topographical data. Outputs of the model describe the rate of fire spread, direction of spread and generated heat.

Fuse – An electrical device which protects the system against over-current. Fuses can be used to isolate individual customers or sectionalize larger unprotected sections of line. The most common form of this device converts overcurrent energy into heat energy and produces an expulsive release of energy when it operates.

Galloping – This is a term used to describe an osculating movement of an electrical line with a high amplitude, low frequency motion. When this occurs in rare wind conditions, conductors can come in close proximity to one other.

Grid hardening – This a utility's process to assess potential risks to the electrical system and take proactive actions to mitigate those risk through strategic infrastructure maintenance and upgrade programs..

Hazard tree – The United States Forest Service defines a hazard tree as a tree that has a structural defect that makes it likely to fall in whole or in part. NorthWestern Energy observes hazard trees in and near its right of ways that could possibly make contact with the power lines.

Hot spotting – A targeted tree trimming process that looks at specific locations, one at a time. At NorthWestern Energy, this is typically driven by a Vegetation Coordinator or a trained arborist to locally identify potentially problematic vegetation.

Incident Command System (ICS) – This is a nationally recognized and standard approach to the command, control and coordination of emergency response. NorthWestern Energy usually has a part in this for responses to wildfire, flooding, winter, or other severe events.

Interruption – A broad definition of any loss of power to a customer or piece of equipment. The term can describe momentary operations or sustained outages.

Momentary operations – Commonly referred to as 'momentaries', this describes an incident of a single fault current that initiates the single operation of a protective device, such as a recloser or breaker. This is followed immediately by the restoration of power to the system without a sustained outage. This can be the result of galloping wires getting too close, trees encroaching on lines, or any other of a host of causes.

National Electric Safety Code (NESC) – Synonymous with ANSI Standard C2, this is the generally accepted United States standard of the safe installation, operation, and maintenance of electrical power and communication utility systems. It includes standards on power substations, overhead lines, and underground lines.

Patrol - Line patrol is a visual inspection to evaluate overhead assets to identify system deficiencies, prioritize repairs, and perform repairs and/or mitigate system problems requiring immediate attention. This is typically performed by ground and the cadence in which assessments are completed are based on the individual strategy.

Protection strategies – A general term used to describe the engineering approaches used to minimize any undesirable flow of electricity across the electrical system or to the surrounding environment. These strategies can be made from various perspectives. Common protection strategies for a utility include, but are not limited to, the mitigation of ignition potential, the maintaining reliability of service, or the physical protection of devices.

Protective device – This term includes any electrical equipment that is designed to break load at the occurrence of a current draw above set thresholds. By breaking the connection and preventing the flow of electricity, the device protects both the system and customer. Some examples of these devices are Fuses, Breakers, Reclosers, and Switchgear.

Public Safety Partner – This term describes any company or entity with which NorthWestern Energy works closely. In context to an ICS, these often show themselves as government entities and firefighting agencies.

Public Safety Power Shutoff (PSPS) - Is the practice of proactively de-energizing electric equipment during times of extreme weather in high fire-risk areas to reduce the probability of electric company infrastructure causing a wildfire ignition.

Rate review – A legal process, also known as a 'rate case', which occurs between a publicly owned utility and its public governing body which allows the utility to present a case to adjust the rates of service to its customers in order to recuperate cost for capital expenditures over the previous years. In Montana, this body is known as the Public Service Commission.

Recloser – A recloser is a device with variable settings that can balance reliability and system sensitivity. In the case of an identified fault current, the recloser will 'operate' or 'open' causing a temporary interruption. Immediately following said operation, the device may 'close' and re-energize the line, depending on device settings, to verify if the fault cleared itself. If the fault is still present this process can be repeated. The amount of reclose attempts and the trip speed are adjustable which is what makes this device a cornerstone of protection strategies.

Rejected pole – Coined from NorthWestern Energy's Operation & Maintenance Guidelines, rejected poles are deemed to have lost 33% or more of their original installed strength at the time of inspection. Following their identification, these poles are sought out for timely replacement.

Protective Relay – These work in conjunction with a protective device, typically a breaker or recloser, comparing system information, such as voltage or current, to engineered set points controlling how that device operates.

Right-Of-Way (ROW) – This describes the legal right of utilities or other entities to pass through a defined route on lands or property belonging to another. NorthWestern uses many of these agreements to establish and maintain the transmission and distribution networks that serve its customers.

Risk tree – Broader than a hazard tree, a risk tree describes any tree that may make contact with a power line if it falls. Given the relationship of the width of utility right of ways and the height of mature trees, risk trees are found both in and out of the right of way.

Severe Fire Danger index (SFDI) – Spatial fire danger index that can be used to assess historical events, forecast extreme fire danger. Developed by fire scientists at the Rocky Mountain Research Station, the United States Forest Service utilize this index to provide critical decision support information to firefighters and fire-prone communities.

Supervisory Control And Data Acquisition (SCADA) – Refers to a category of software applications for controlling industrial processes. In the condition of a utility, the system usually provides remote visibility and, in some cases, control of devices on an electrical system.

System Average Interruption Duration Index (SAIDI) – A commonly used reliability index in the utility industry, this describes the length of time that every meter on the system would have been out of power, had the total number of outage minutes over the last twelve months been evenly distributed to each meter. It is fully defined in the IEEE – 3166 standard.

Splices – A method of connecting two ends of a wire. This often looks like a small sleeve over the wire to re-join a damaged span or section.

Sub-transmission – This describes a band of electrical delivery in between transmission and distribution. On NorthWestern's Montana system, this includes 50 kV and 69 kV lines.

Sustained outage – NorthWestern Energy defines this as a system outage of five minutes or greater where customers do not have power. These can be planned or unplanned in nature.

Transmission – Also known as "bulk electric", transmission power primarily refers to electric lines carrying more than 69 kV. NorthWestern's Montana system specifically includes 100 kV, 115 kV, 161 kV, 230 kV, and 500 kV.

Vegetation fuels – This term broadly describes any burnable natural material, whether alive or dead.

Wildland Urban Interface (WUI) – The US Fire Administration describes this as the zone of transition between unoccupied land and human development. In these zones, structures or other human development often intermingle with undeveloped wildland or vegetation.

Message from Brian Bird, President & Chief Executive Officer

NorthWestern Energy has over 100 years of history providing safe and reliable service to the customers and communities in which we serve. Due to the growing threat of catastrophic wildfires, we embarked upon a journey in 2022 to develop and execute a plan that enhances historical initiatives while leveraging new strategies focused on utility wildfire mitigation.

Our Wildfire Mitigation Plan represents our commitment to protecting our customers and the communities in Montana from this growing threat. We have worked with numerous community stakeholders, first responders, and peer energy companies in the development of this Plan, while also leveraging the expertise of our internal teams who have an in-depth understanding of our electrical infrastructure.

There are inherent risks with operating an electrical grid in wildfire-prone areas. The purpose of this plan is to identify those risks and implement strategies to reduce or manage these risks. Strategies within this plan include grid hardening, increased maintenance, and vegetation management to reduce ignition potential. To manage near term environmental conditions that influence wildfire risk, the plan also includes enhanced situational awareness that will guide operational defense strategies, such as, Public Power Safety Shutoff in the most extreme scenarios.

We expect this risk to continue to grow in the coming years and decades, but NorthWestern Energy continues to be committed to providing safe and reliable energy to our customers. Our Wildfire Mitigation Plan is key to achieving that mission.

Section 1 - Introduction

NorthWestern Energy

NorthWestern Energy’s Historical Wildfire Investments

Understanding a Changing Environment

Understanding How to Assess Risk

Wildfire Mitigation Plan Methodology

Section 1 – Introduction

NorthWestern Energy (NorthWestern) is committed to providing safe and reliable service to its customers. With the increasing risk of wildfires, NorthWestern has expanded its established practices to include enhancements and new activities to continue delivery of safe and reliable service into the future.

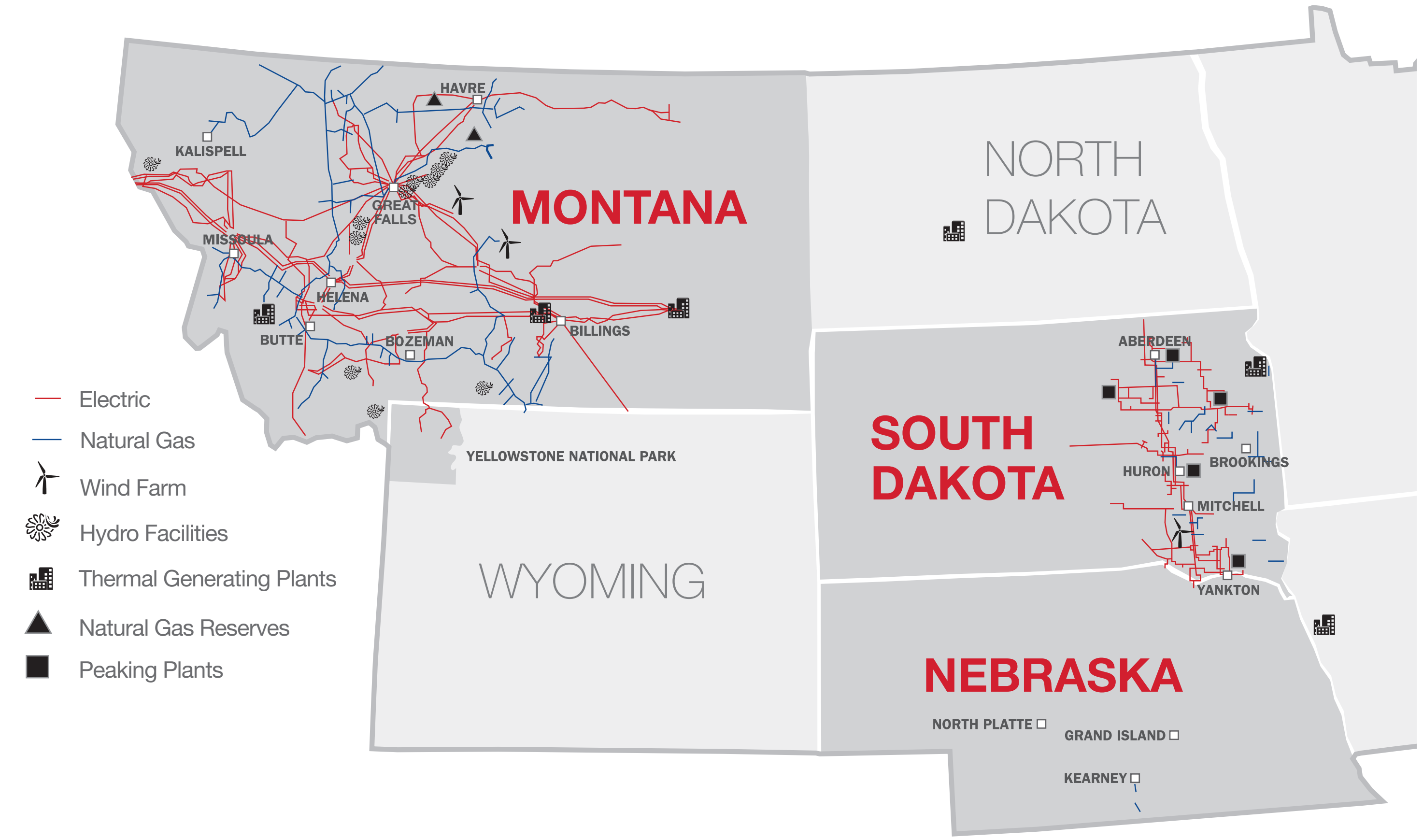
The intent of this document is to provide a comprehensive plan on existing, new, and enhanced efforts of mitigating wildfire risk. The plan highlights the increased wildfire risk that NorthWestern is facing, details out the plans to manage these risks, and provides a current year update on those activities. The document was originally developed and publicly introduced in 2022 as the Enhanced Wildfire Mitigation Plan. It will henceforth be known as the Wildfire Mitigation Plan (the Plan) and it will continually be updated to reflect activity progress and advancements to mitigate wildfire risk.

Wildfire risks are materially increasing due to factors that are both inside and outside of NorthWestern's control. Factors such as warmer weather, drought, insect infestation, forest health cycles, and human migration into the Wildland Urban Interface (WUI) are all outside of NorthWestern's direct control. The Plan's objectives are targeted toward categories of activities that NorthWestern can conduct to directly control the mitigation of risk by reducing ignition potential and managing the impact of a fire near the utility infrastructure. These categories will be primarily broken down into activities that are measurable, attainable, and provide a positive impact toward reducing the probability or consequence of ignitions.

1.1 – NorthWestern Energy

NorthWestern is a regional provider of electricity, natural gas and related services to approximately 775,300 metered customers in Montana, South Dakota, and Nebraska. The electric system has more than 29,600 miles of electric transmission and distribution power lines and associated facilities serving 318 communities and surrounding rural areas in Montana and eastern South Dakota. The natural gas system includes approximately 10,000 miles of transmission and distribution pipelines and storage facilities serving 168 communities and surrounding rural areas in Montana, South Dakota, and Nebraska. NorthWestern employs approximately 1,580 full time personnel to operate, maintain, and grow this system.

Most of the wildfire risk that NorthWestern experiences is in the Montana service territory due to the state's heavily forested areas and extensive rural grasslands that have both been subjected to drought and insect infestations. Because of this, the activities laid out in the Plan are primarily focused on the Montana service territory. With an ever-changing environment there is a potential to expand the effort into other service territories in the future. The Montana operations provide regulated electric and natural gas transmission and distribution services to approximately 431,500 electrically metered customers, 213,600 natural gas metered customers, and 600 propane metered customers across Montana and into Yellowstone National Park in Wyoming.



NORTHWESTERN ENERGY'S SERVICE TERRITORY

1.2 – NorthWestern Energy's Historical Wildfire Investments

NorthWestern has demonstrated a long history of commitment to safe and reliable service to its customers and communities. While previous investments have not focused specifically on wildfire mitigation, effective management of the transmission and distribution assets provided a foundational core to reduce wildfire risk. NorthWestern has always prioritized reliability and safety as an operator of the electric system in Montana. These priorities have enabled the organization to react to changing conditions, including heightened wildfire risk.

The Distribution System Infrastructure Project (DSIP), spanning from 2011 through 2017, has been a corner stone investment on the distribution system. The vision was for a distribution system that is reliable, able to grow, optimized, responsive to all customers, energy efficient, cost effective, and state of the art. The objectives identified to achieve this vision were to arrest or reverse the trend in aging infrastructure, restore margin capacity back into the system, maintain reliability over time, increase reliability for customers, and position NorthWestern to adopt new technologies. Details on this program can be found in Appendix A.

Emerging out of DISP in 2017, NorthWestern had successfully improved reliability while providing ancillary benefits to reduce wildfire risk by hardening the system and reducing future ignition potential. NorthWestern currently performs within the top quartiles in reliability as compared to its peers. Further details on reliability improvements can be found in Appendix B.

NorthWestern is committed to maintaining system assets, providing top tier reliability and continuing efforts to modernize the grid. There are a number of ongoing programs on the transmission and distribution systems that achieve these goals. While they aren't specifically focused on wildfire mitigation, the technology advancements and stable systems have enabled NorthWestern to manage the historical wildfire risk.

In 2018, NorthWestern recognized that targeted wildfire mitigation programs should be incorporated with the traditional reliability and asset life focused programs to address the increased wildfire risk. During that time frame, the Hazard Tree and Forest Management programs were developed and implemented. The Hazard Tree Program was designed to mitigate risk and enhance safety by addressing hazard trees inside of and outside of right-of-ways (ROW). The Forest Management Program was a targeted hardening strategy on transmission and distribution systems within forested areas. Details on those programs can be found in Appendix A. Although these programs were an appropriate starting point for dedicated wildfire mitigation, changing environmental conditions drove the need to evaluate current and new programs to address wildfire risk.

Historical System Infrastructure Programs	Current System Infrastructure Programs	Current Wildfire Risk-Focused Programs
2010-2018	**2018-Current**	**2019-Current**
Distribution System Infrastructure Program (DSIP) • Invested $214M Capital, $37M Expense • Pole Replacement (Poles): 29,982 • Patrol Repairs: 8,366 • T&D Tree Trimming (OH Miles): 7,161 • Rural Reliability (Circuits): 12 • Substation Refurbishments (Subs): 111 • MT Automation (T/D/S): 601 Devices	**Transmission System Infrastructure Program (TSIP)** • Pole Replacement • Approximately $5-10M/yr **Substation System Infrastructure Program (SSIP)** • Component Based • Approximately $6.5-10M/yr **Reliability and Asset Life Programs** • Distribution Pole Replacement • Approximately $9-12M/yr • Section Reliability • Approximately $2.5M/yr	**Hazard Tree Program** • T&D Risk Based • Approximately $3M/yr **Forest Management Program (FM)** • Targeted T&D Approach • Approximately $12M/yr
Asset Stabilization	**Modernization**	**Focused Risk Mitigation**

Figure 1 - NorthWestern Energy's Journey to the WMP

1.3 – Understanding a Changing Environment

Increased wildfire activity highlights the risks which energy companies face by owning and operating assets in wildfire prone areas. The threat of wildfires continues to increase in conjunction with a rise in projected length of fire seasons. In an article published by the National Oceanic and Atmospheric Agency titled The Risk of Very Large Fires Could Increase Six Fold by Mid-Century in the US, the author included the map in Figure 2 stating "This map shows the projected increase in the number of 'very large fire weeks' in which conditions are favorable to the occurrences of very large fire– by mid-century (2041-2070) compared with the recent past (1971-2000)."[1] The map depicts a potential for a 600% increase in fire season length throughout much of NorthWestern's service territories. Should this forecast prove correct, parts of Montana could potentially expect a severe wildfire at nearly any time of year, winter included.

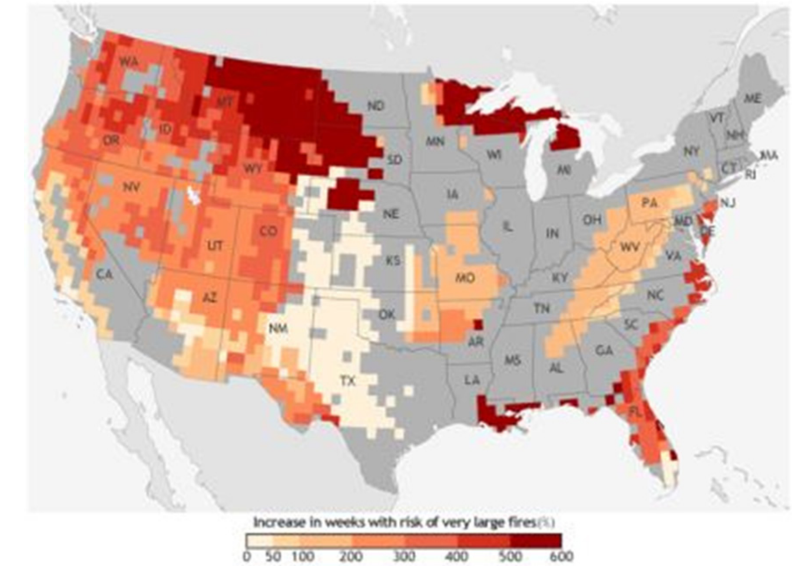


Figure 2 - Growth in Fire Weeks

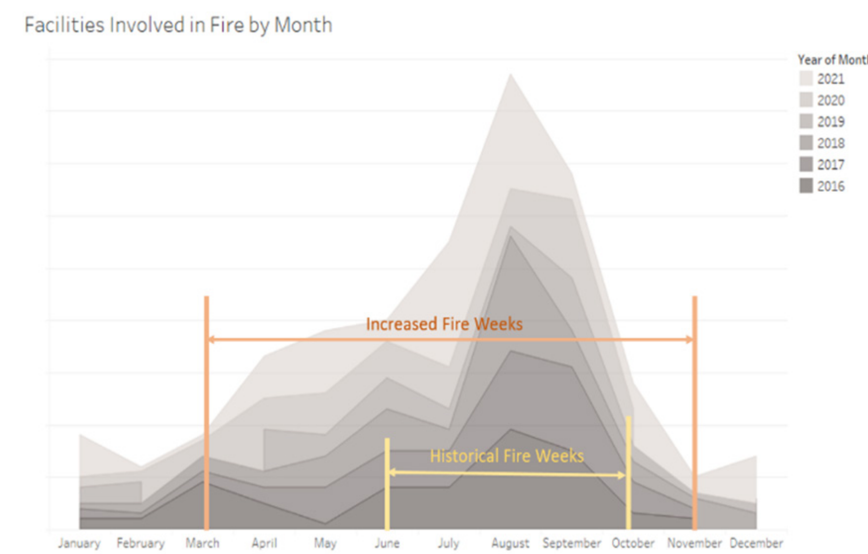


Figure 3 - NorthWestern Energy Distribution Electric Facilities Involved in fire

NorthWestern's internal data supports this article's conclusions regarding the length of the fire season. The graph in Figure 3 shows outages associated with fire activity on NorthWestern's distribution system spanning 2016 through 2021. This figure displays an aggregate view of outages where NorthWestern's facilities were directly or indirectly involved with fire activity and shows an increase in fire weeks over the past five years.

In addition to the escalating risk of prolonged fire seasons, a growing number of individuals are relocating to WUI zones, amplifying the overall system vulnerability due to heightened probabilities and consequences associated with fire ignition. A team of scientists studied areas in the western United States to map locations where the vegetation is creating the highest potential for fire. This data was compared to data reflecting the locations where people have been relocating into the WUI areas. The graph in Figure 4 shows the population growth in the WUI exists in the same areas where the wildfire threat is the greatest. The highest hazard areas have seen growth as high as 160%. With the growth in these highly sensitive areas, the opportunity for fires to ignite rises, as does the number of people at risk.[2]

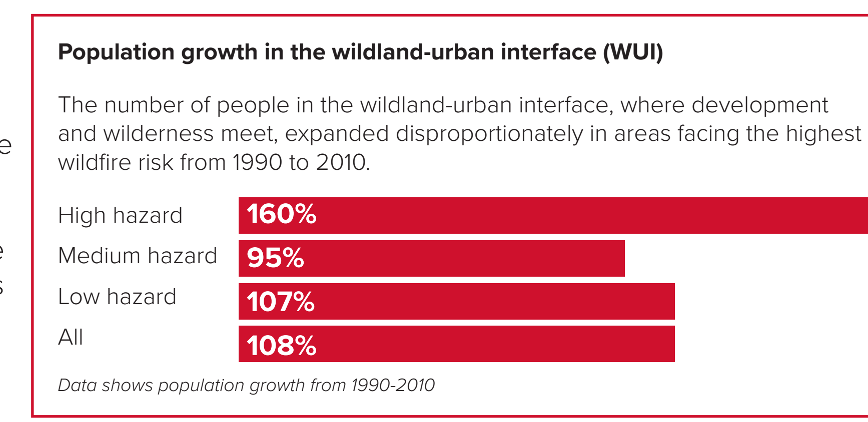


Figure 4 – Population Growth in the WUI

1 Caitlyn Kennedy, "Risk of Very Large Fires Could Increase Six fold by Mid-Century in the US," NOAA, Climate.gov, August 26, 2015, https://www.climate.gov/news-features/featured-images/risk-very-large-fires-could-increase-sixfold-mid-century-us

2 Krishna Rao, Alexandra Konings, Marta Yebra, Noah Diffenbaugh and Park Williams February 9th, 2022 "The Fastest Population Growth in the West's Wildland-Urban Interface is in Areas Most Vulnerable to Wildfires" The Conversation | The West is Growing Rapidly in Fire Areas - Bay Nature

1.4 – Understanding How to Assess Risk

Due to constantly evolving changes in the environment, including both climate change and human population migration, it is becoming more critical to relatively quantify the impacts that NorthWestern's system and the environmental conditions have on wildfire risks in the service territories. Therefore, in order to arrest or reduce the growing risk from these factors, the Plan focuses on tasks and activities that are measurable, attainable, and provide an impact on reducing the risk of fire ignitions.

Preventative maintenance programs have been in place for decades at NorthWestern but have traditionally been based on reliability or asset life drivers. Today, the risk of igniting a fire in wildfire prone areas drives the need to change the scope and frequency of some existing initiatives. Additionally, there has been significant advancement in tools and technology targeted to help electric utilities manage wildfire risk.

Generally, fire ignitions are created by the same type of events that cause outages. Occasionally, momentary contacts with live electrical equipment could create an ignition event that would not evolve into an outage. Actively managing the reduction of all electrical contacts while exercising situational awareness during the contacts reduces the probability of an ignition and potentially its associated consequence.

1.4.1 – Wildfire Risk in Montana

Fire behavior is the result when weather, terrain, and fuels interact. To determine how wildfire risk is changing for NorthWestern, it is important to gain an understanding of those fire behavior impacts for the state of Montana.

The US Forest Service's Rocky Mountain Research station created an index model, called Wildfire Hazard Potential (WHP), designed for quantifying the relative likelihood of wildfires in challenging-to-control areas.[3] This model uses seven factors to quantify the interaction of weather, terrain, and fuels and the consequences of those interactions.

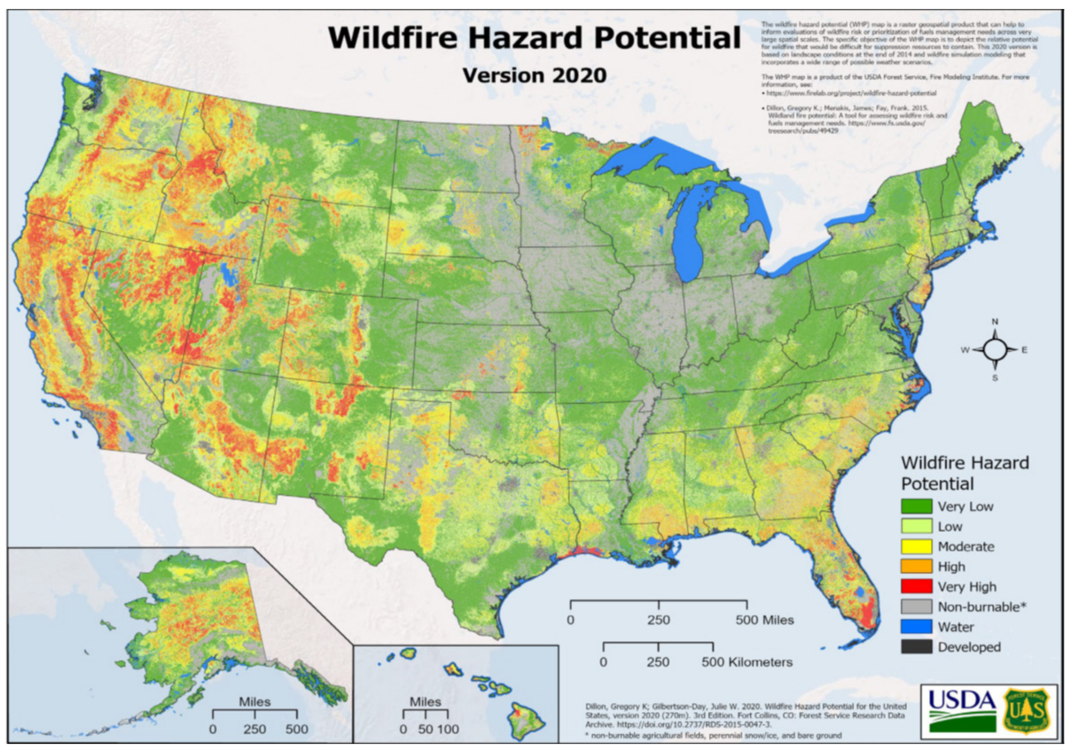


Figure 5 – U.S. Map of WHP

According to the WHP index, as shown in Figure 5, a majority of Montana falls into very low to low categories with portions in the western and southern parts of the state in the moderate to high categories. A very small percentage of the state falls within the very high category. The model is a static view and does not take into account NorthWestern's facilities nor the changing environmental conditions.

3 Dillon, G.K.; J. Menakis; and F. Fay. 2015. *Wildland Fire Potential: A Tool for Assessing Wildfire Risk and Fuels Management Needs. pp 60-76 In Keane, R. E.; Jolly, M.; Parsons, R.; and Riley, K. Proceedings of the large wildland fires conference; May 19-23, 2014; Missoula, MT. Proc. RMRS-P-73. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 345 p.*

Developed by the Department of Natural Resources (DNRC), Figure 6 depicts the historical reported wildfires in Montana with an overlay of the transmission and distribution systems. Upon review of this data, the majority of wildfires over the past several decades have occurred in the forested areas with very few in proximity of NorthWestern facilities.

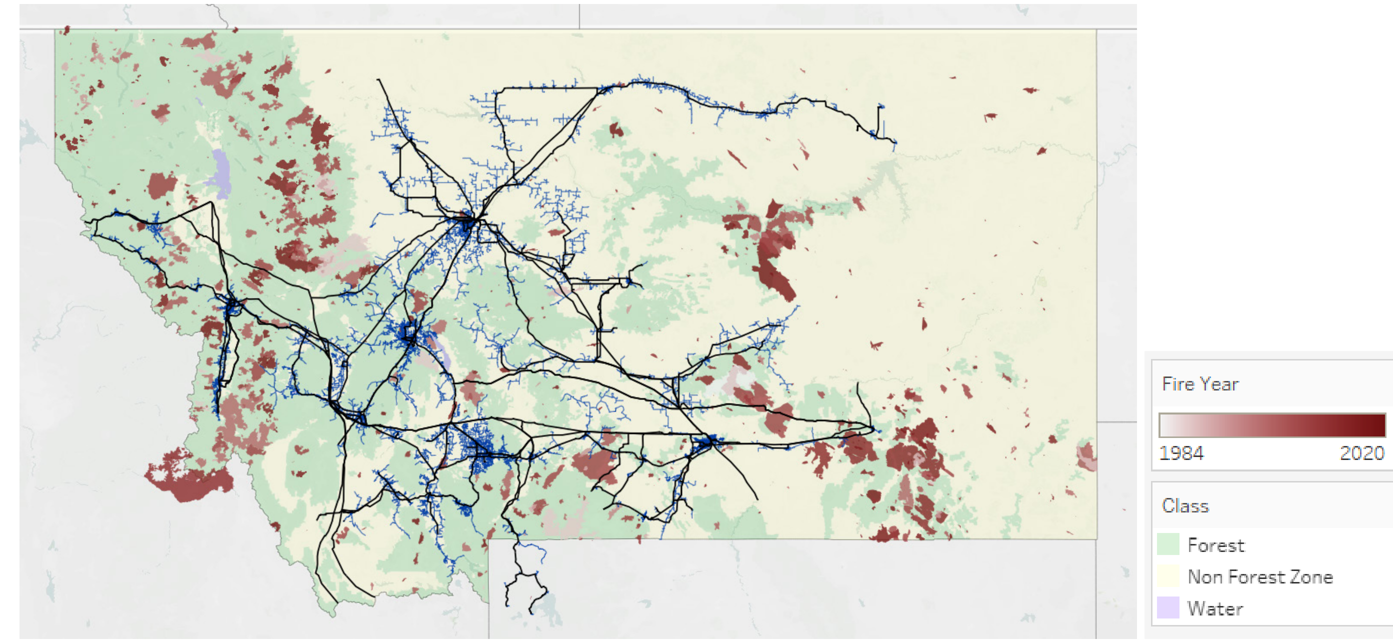


Figure 6 – Montana Transmission and Distribution GIS Overlay with DNRC Forested Designation and Historical Fires (1984 – 2020)

1.4.2 – NorthWestern Wildfire Risk Models

NorthWestern approaches risk as the combination of the probability and the consequence of an event occurring. In relation to wildfire, NorthWestern defines probability as the potential or likelihood of an ignition source on the electrical system based on how that system performs. Consequence is reviewing the potential impact to the environment and the public, should an ignition result in a wildfire. Overall wildfire risk at NorthWestern is viewed as the combination of the system's performance and the environmental exposure.

The Plan calls for two risk models at NorthWestern to use this methodology, the static risk model and dynamic risk model. Both risk models break the system down into sections to give a more granular view of the location and type of risk present. This provides an opportunity to determine the appropriate mitigation and operational practices. The distribution system is broken into ESIDs which are areas between two protective devices. Due to the configuration of the transmission system, it is broken into approximate five-mile segments. There are approximately 33,000 distribution and 2,000 transmission sections in the Montana static risk model.

The static risk model examines the system and environmental data to quantify a relative system risk. This model is used to drive long-term investment decisions by relatively quantifying the type of risk and prioritizing where the mitigation work should take place in the coming years. Using system data, the static risk model allows NorthWestern to understand the probability of a potential ignition source. The consequence portion of the model is quantified using WHP and population density. This aggregated data set is applied to each span on the system and then aggregated into ESIDs or transmission sections. A statistical analysis is performed to derive a system performance score, environmental score, and an overall system wildfire risk score. Additional details on the model parameters can be found in Appendix C.

Based on these scores, each section is placed into a risk tier which drives mitigation priority and methods. An example of the tiered results is found below in Figure 7 and Figure 8. This model is continually evaluated to determine changes in system risk as a result of the system's performance and environmental conditions.

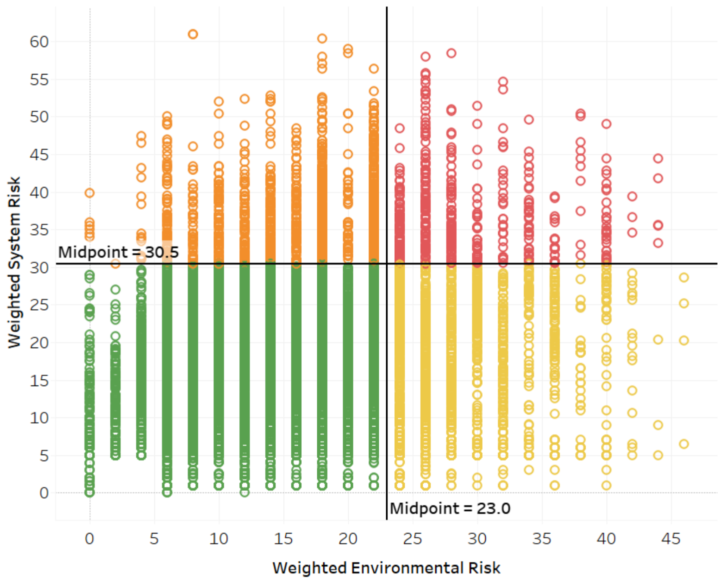


Figure 7 - Example of Distribution Risk Tier Results Figure 8 - Example of Transmission Risk Tier Result

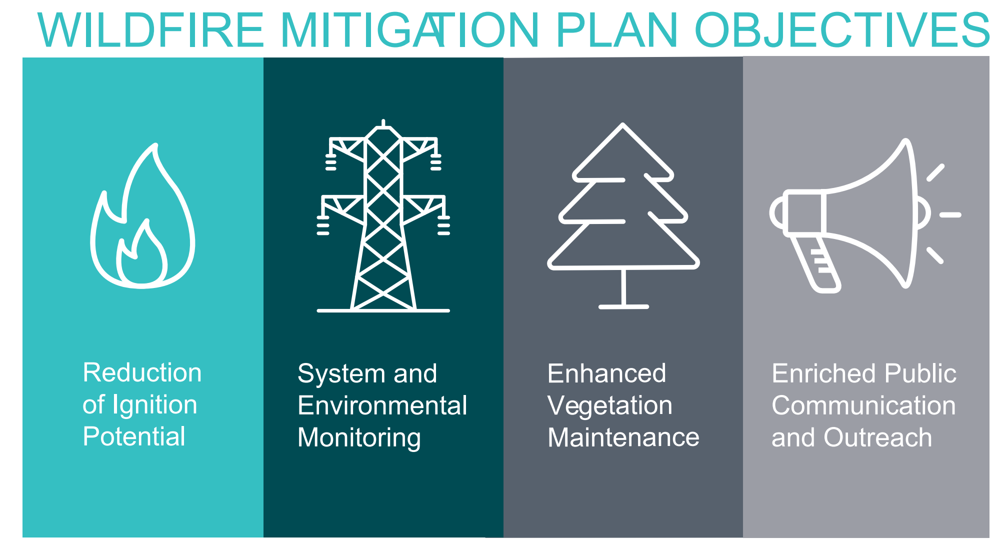
While the static risk model provides the ability for long term planning and project prioritization, NorthWestern also understands the necessity for a dynamic risk model. This type of model, using a similar approach, is focused on the near-term wildfire risk dependent on changing conditions and is typically designed to support operational protection strategies, decision making, field practices and to provide indications of wildfire risk conditions that may prompt a PSPS event.

Conceptually the dynamic model uses environmental, statistical and scientific data to determine a short-term wildfire risk forecast for NorthWestern's Montana service territory. Variables considered within the dynamic model include but are not limited to: fire danger (current and forecasted), weather conditions (current and forecasted), fuel moisture content (live fuel moisture and dead fuel moisture), asset health and associated consequences. Further discussion on the dynamic risk model can be found in Section 3.

1.5 – Wildfire Mitigation Plan Methodology

Given the increased fire threat in recent years in the West, NorthWestern recognizes the need to assess established activities and practices to understand where enhancements are needed to address the growing wildfire risk. NorthWestern joined in discussions with the Pacific Northwest Utility Wildfire Working Group (PNUWWG) in 2020, to gain an understanding of what neighboring energy companies are doing to assist with managing assets in wildfire-prone areas. The energy companies making up the PNUWWG include: Avista, Idaho Power, Chelan County PUD, Rocky Mountain Power, Portland General Electric, Pacific Power, and Puget Sound Energy.

As part of the PNUWWG, NorthWestern conducted a gap analysis by reviewing the plans developed by these neighboring energy companies. The gap analysis scored NorthWestern's transmission and distribution programs in multiple areas against the peers mentioned above. It showed that NorthWestern was leading in several areas across neighboring peers, however, it assisted NorthWestern in gaining a better understanding of potential improvements to existing practices or where new practices could be implemented when comparing to other utilities outside of the Pacific Northwest that had more mature plans. Based on the gap analysis, four main objectives for developing the Plan were identified:



NorthWestern's largest gap in both transmission and distribution was in the company's ability to be situationally aware of wildfires. The next largest gap was in the PSPS Program strategy and implementation. Operational practices, assessment, and repair as well as wildfire hardening scored very close to the neighboring energy companies' assessments.

This gap analysis conducted by NorthWestern helped inform the Plan components and identified: (1) established programs that need to be maintained at current levels, accelerated, or expanded; (2) new programs that need to be developed and implemented; (3) enhancements to NorthWestern's operation and maintenance practices.

A second gap analysis was subsequently conducted internally to provide insight into how the enhanced items within each category compare to their status prior to the implementation of the Plan. Each activity was scored to understand the percent improvement of current practices with the proposed change or new addition as it relates to impacting NorthWestern's ability to mitigate wildfire. Programs were then cataloged and sorted across five categories targeted at achieving the Plan's four primary objectives.

To bridge the gaps identified in the series of analyses and achieve the four plan objectives, NorthWestern's Wildfire Mitigation Plan was established and consists of the following five, primary categories:

- Situational Awareness – Understanding changes in the operating environment and how those changes affect the probability and consequence of a wildfire to determine appropriate operational defense actions.
- Operational Practices – Close monitoring of momentary outages, development of standard work practices, and establishing of multilayer operational defense strategies to be deployed on the system.
- System Preparedness – Enhanced proactive maintenance, targeted grid hardening and deployment of technology on the transmission and distribution systems with the focus of reducing ignition potential.
- Vegetation Management – Focused proactive efforts to mitigate vegetation contacts, maintain healthy forests and decrease fuel loading near NorthWestern's ROWs.
- Communication & Outreach – Pre-emptive education of customers, real time event communication, and public outreach to affected parties during an emergency event.

Section 2 - Plan Summary & Accomplishments

Wildfire Mitigation Plan Summary

Previous Year Accomplishments (2023)

Section 2 – Plan Summary and Accomplishments

2.1 – Wildfire Mitigation Plan Summary

Recent years have shown a steady increase in wildfire activity in the western portions of the United States. Montana has faced events in recent history such as drought and insect infestation that have materially increased the risk of wildfire in both forested areas and grasslands. To combat this growing danger, NorthWestern first formalized and began implementing its Wildfire Mitigation Plan in 2022 to consolidate and focus the efforts that the company executes toward mitigating wildfires. These efforts and activities come in many forms but can be generally grouped into the five categories shown below in the table. Plan activities range from grid hardening techniques, to fuel reduction strategies, customer education, and alternative protection strategies. These activities are described at length in the remaining sections of this document.

The Plan consists of both established and enhanced activities within the five categories. Established activities are strategies that NorthWestern has had in place and will continue to pursue in addition to the enhanced activities as laid out in the Plan. Established costs are not reflected in some categories because they are part of routine activities and are not individually tracked.

Estimates of the total five-year costs for each of the categories are summarized in the table below. These costs were established in the original 2022 plan and are not all-inclusive for established activities. Actual and forecast costing is updated on an annual basis for enhanced and established activities. The details can be found in Appendix D and E, respectively. Five years is the expected timeline for completion of the majority of the Plan, however, some activities will have on-going costs into perpetuity. As the Plan is implemented each year, NorthWestern will continually re-evaluate and revise these activities to understand their impact and efficiencies and how to best reduce fire risk.

Plan Category	Summary	Ignition Reduction	System & Environmental Monitoring	Enhanced Vegetation Maintenance	Enriched Public Communication and Outreach	% Category Improvement vs. Historical	5 Year Estimated Established Cost	5 Year Estimated Enhanced Cost
Situational Awareness	Monitoring of high risk zones with current forecasts to influence operational decisions	✓	✓		✓	97%	-	$8.8M
Operational Practices	Investigation of system performance and adjustment operational practices based on current conditions	✓	✓		✓	53%	-	$1.9M
System Preparedness	Enhanced proactive maintenance, targeted grid hardening and deployment of technology with the focus of reducing ignition potential	✓	✓	✓		44%	$175.6M	$227.6M
Vegetation Management	Proactive efforts to mitigate vegetation contacts, maintain healthy forests and decrease fuel loading	✓		✓		65%	$49.7M	$47.7M
Communication & Outreach	Improved communication and stakeholder outreach on wildfire mitigation efforts and response strategies				✓	100%	-	$2.1M

2.2 – Previous Year Accomplishments (2023)

This section summarizes the previous year's achievements and completed tasks toward the complete execution of the Plan. The work completed in 2023 focused on adding staff, further development of strategies, and implementation planning for execution in 2024 and beyond. During the year, NorthWestern created multiple new positions to formalize the cross functional efforts that are necessary to keep wildfire risk at bay. In that time, much has been learned about the necessary changes in program scope, multiple third-party vendors have been sought out as additional resources, and new protection strategies have been evaluated to balance customer reliability and minimize ignition potential. The five categories of activities assessed for the Plan are listed below, each with a description of the primary high-level achievements from 2023. These updates are focused on enhanced activities while established activities continued as normal.

Situational Awareness

- A focused Wildfire Operational department was developed with teams covering situational awareness, electric line maintenance, and vegetation management.
- Situational Awareness Team was initiated, including three active full time employees: a Manager, a Specialist, and a Geospatial Data Analyst.
- Development of an environmental consequence model from data gathered in performing wildfire spread modeling using third party vendors.
- Conceptual dynamic risk model completed, with further development in 2024.
- Vendors under evaluation for installation of wildfire cameras and associated software.

Operational Practices

- Two initial positions established for the System Performance Team.
- White paper drafted for Momentary Interruption Review Program.
- Piloted processes laid out in the white paper on the transmission system.
- Plans to expand the pilot to the distribution system in 2024 and dispatch further funding to address more momentary fault source issues.
- Wildfire Risk Index under development to guide operational decisions, including EPSS in the field.
- PSPS Plan kicked off development in 2023, with plans to finalized in 2024.
- Standard Operating Procedures, including Work Practices, under development.

System Preparedness

- Distribution Operation's Central Construction department was restructured, and leadership was added to support increased capital investment with transmission and distribution system mitigation projects.
- Distribution Operation's Central Maintenance department was restructured to support increased maintenance activities associated with the Plan.
- Aerial assessments of the transmission and sub-transmission systems continued as normal while a vendor is still being recruited for the distribution system.
- Ground assessments continued at the normal rate. The first RFP (Request For Proposal) for the accelerated efforts issued late 2023.
- The inventory equipment list is currently in the process of being established, and the field work itself is slated to begin toward the end of 2024.
- The segment list for Lidar acceleration is currently underway and will be initiated in 2024.
- An inventory of 668 distribution and 761 substation protective devices were completed to reflect current protection and communication schemes. This inventory will determine the locations requiring electronic breaker and communication upgrades based on static risk model.
- New protective technologies have been deployed in several locations to test functionality. Identification of optimal relay upgrade locations is currently under way.
- A static wildfire risk model was developed and implemented to begin the Wildfire Mitigation Hardening Program prioritization. Construction will begin in the following update year with nearly 200 miles of overhead lines identified for mitigation.
- One Project Manager was established with plans for a second employee in 2024 to assure objectives laid out in the Plan are achieved by monitoring scope, schedule and budget.
- One resource was established for the Plan Development & Maintenance team, with plans for two more employees in 2024 to monitor system data ensuring the mitigation strategies are meeting the objective to reduce overall wildfire risk and adjusting where appropriate.

Vegetation Management

- One Vegetation Coordinator was hired to facilitate the enhanced efforts of proactive vegetation management.
- A third-party vendor has been identified to pilot remote sensing and analysis of the vegetation growth in and around NorthWestern's ROWs.
- Cycle trimming and proactive vegetation maintenance continued as it has previously with funds to enhance this effort starting in 2024.
- The Hazard Tree Program continued as normal with plans to expand this into the Risk Tree Program.
- Vegetation Hot Spotting continued as normal. See Section 6.3.1 for more detail.
- Efforts toward fuel reduction partnerships are in process, primarily with the U.S. Department of Agriculture Forest Service (USDAFS) through the National Cohesive Wildland Fire Mitigation Strategy Initiative.

Communication & Outreach

- Peer to peer relationships with neighboring utilities have been actively maintained through virtual meetings and in-person events such as the Western Energy Institute (WEI) conference, Pacific Northwest Utility Wildfire Working Group (PNUWWG) meetings, and others.
- Public Safety Partnerships were actively grown through attendance in groups such as Fire Adapted Montana Learning Network (FAMLN), Fire Adapted Gallatin Working Group (FAGWG), Fire Adapted Big Sky (FABS), Tri-County Fire Safe Working Group (TCFSWG), Fire Safe Montana, Missoula Fire Science Laboratory, and others. See Section 7.3.2 for more detail.
- Enhanced training resources are actively being developed for NorthWestern field crews and personnel to cover basic wildland fire terminology, identification of key wildfire components (fuels, weather, topography, etc.), use of standard tools, equipment, and methods of extinguishing a fire. This will also include training on system defense strategies, including but not limited to: EPSS and PSPS.

Section 3 - Situational Awareness

Dedicated Wildfire Situational Awareness Team

Dynamic Risk Dashboard

Consequence Modeling

System Monitoring

Weather Monitoring

Section 3 – Situational Awareness

3.1 – Overview and Key Activities

This category describes the programs and tools that NorthWestern employs to be situationally aware of the electrical transmission and distribution systems. Situational awareness is the ability to understand the current system and environmental conditions. This is important for proactive monitoring of wildfire conditions, and it informs reactive decision-making should an event occur. The Situational Awareness initiative gives NorthWestern an opportunity to understand how changes in the environment can affect the probability and consequence of an ignition. These items will provide the situational awareness necessary to guide Operational Practices.

Key Activities

- Dedicated Wildfire Situational Awareness Team to monitor system and environmental conditions.
- Dynamic risk dashboard with wildfire consequence modeling to monitor real time conditions and drive operational decisions.
- Enhanced weather information through a hybrid approach of a third-party weather data and network of strategically placed weather stations
- Remote system visibility via wildfire cameras

3.2 – Established Activities

In years prior to this Plan, environmental monitoring has been performed through public, readily-accessible data to assess proactive and reactive actions needed. When threatening conditions arise, a Fire Notification email list is generated to share pertinent weather and other impactful information throughout the organization.

Historically, NorthWestern has used third party weather data to drive a number of system and operational decisions. Wildfire risk modeling requires an additional need for this type of information. NorthWestern will be employing a hybrid approach to weather monitoring using third party data integrated into an internal dashboard providing improved the granularity for NorthWestern's operating area.

With the increased wildfire risk and the arising technologies to address that risk, NorthWestern has recognized an opportunity to enhance the practices described above. The necessary Situational Awareness activities can be described in two main groups of situational modeling efforts and situational monitoring efforts. Modeling will use various data sources to assess current and future state events. The monitoring efforts will increase NorthWestern's awareness of the current conditions and feed information into the system models.

3.3 – Enhanced Plan Efforts

3.3.1 – Situational Modeling

Dynamic Risk Dashboard (New) – The dynamic risk dashboard will utilize a range of internal and external data to provide a comprehensive assessment of wildfire risk by weighing the probability of starting a fire against the consequence of a fire being started. This enhanced data management platform is intended to assist the Wildfire Situational Awareness Team in their responsibilities. It will provide a dynamic view of wildfire risk based on forecasted changing environmental conditions. This can become a forward-looking tool for preemptive decision making with operational practices rather than an informal, seasonally-based process as it has been previously.

Consequence Modeling (New) - Fire modeling is a science that companies use to understand the impact of fire ignitions in different locations along their system. A data set with fire modeling will allow for more strategic and logical prioritization of preventative maintenance, work practices, and operational practices. NorthWestern intends to contract the work necessary to generate a consequence fire model for the state of Montana. This will be integrated into the Dynamic Risk Dashboard and aid in the situational awareness that is drawn from this tool.

3.3.2 – Situational Monitoring

System Monitoring (New) –The deployment of technologies such as field cameras will increase NorthWestern's capacity to monitor the system for wildfire. Modern technologies use video footage and advanced detection algorithms to identify wildfires. Given Montana's mountainous geography, certain existing asset locations could be dual purposed as wildfire lookout points for these cameras.

Weather Monitoring (New) – This initiative will provide weather monitoring to understand changing environmental conditions across our service territory. Through deployment of internally owned or contracted weather stations, NorthWestern can better understand local weather patterns. NorthWestern plans to use the risk models to drive the priority and location of these installations. The supplemental weather data from these devices will be connected to the Dynamic Risk Dashboard to help drive the forecasted risk of the system in real time.

Dedicated Wildfire Situational Awareness Team (New) – This team is dedicated to monitoring the climatic and demographic conditions of the grid and driving operational responses to reduce wildfire risk. The team should consist at minimum of a Manager, a Wildfire Specialist, and a Geospatial Data Analyst. Additional resource needs are constantly being evaluated based on NorthWestern's ability to deploy the technology and improved awareness described above.

Section 4 - Operational Practices

System Performance

Enhanced Powerline Safety Settings (EPSS)

Public Safety Power Shutoff (PSPS)

Standard Operation Procedures

Section 4 – Operational Practices

4.1 – Overview and Key Activities

Operational Practices encompass monitoring of the system, guides system operations, and necessary adjustments to work practices as environmental conditions change. Advancing system technologies provide utilities with the ability to actively change and guide how the electrical grid operates during faulted conditions. With the rapid growth in fire risk, NorthWestern can leverage existing installed devices paired with new operational strategies to balance reliability and ignition probability throughout all seasons. This will present itself in the form a more layered Operational Practices strategy than the company has used in the past.

In parallel to this, the system performance initiatives are to assess and respond to momentary electrical line operations. Unintended line contacts are typically momentary in nature. To manage this, the industry had developed protective devices such as breakers and reclosers which have technologies to identify a contact through a spike in current and open the circuit. This isolates the conductor from the energy source. After a pre-determined amount of time, the device will close the circuit and re-energize the conductor. If the current has returned to acceptable levels and the contact has cleared, the circuit will remain closed, preventing a sustained outage. This occurrence is known as a momentary operation.

Historically, NorthWestern has approached this type of system operation analysis from a reliability stance. This means that sustained outage events have taken priority to investigate, correct, and mitigate. Reliability-driven programs have served NorthWestern and its customers well through the harsh climate that prevails in their service territory. Environmental shifts, fire season changes, and the population increases in the WUI have shifted NorthWestern's focus to mitigating ignition events, which includes some momentary interruptions, not simply sustained outages. Through monitoring of the momentary operations on the system and environmental conditions, proactive mitigation of system issues can be executed which will reduce both current and future ignition potential.

As situational awareness on the distribution and transmission system increases, it enables NorthWestern to employ strategies on how work is performed and the system is operated during evaluated conditions. Depending on model forecasts and local knowledge, operational defense strategies may include actions such as modifying system protective settings to eliminate reclosing or increase operating speeds to initiating a PSPS. NorthWestern may also use this information in active high fire risk zones to adjust work practices such as tool choice, vehicle access routes, or the potential stoppage of proactive work.

Key Activities

- Dedicated team evaluating system performance by investigating momentary operations on transmission and distribution systems.
- An established process and budget to mitigate system issues causing momentary operations.
- EPSS to optimize safe reclosing during high-risk events.
- PSPS strategy for conditions indicating extreme wildfire hazard.
- Operating procedures to guide work before, during, and after wildfire events.

4.2 – Established Activities

There are several programs at NorthWestern that address reliability. However, several of these focus on sustained outages impacting customer reliability or transmission availability, not necessarily momentary system operations. By further addressing momentary operations on the system, NorthWestern can better mitigate the system issue proactively before it results in a sustained outage. Additionally, by decreasing system operations the probability of ignitions will also decrease. At the Plan's inception, there was not a dedicated team reviewing strictly momentary operations, compared to programs in place to address reliability as a whole incorporating both sustained outages and momentary operations. The Plan calls for a development of a new team specifically monitoring momentaries and identifying mitigations to reduce ignition potential. More details can be found in the following sections.

Section Reliability has been, and continues to be, a reliability-based program focused on sustained outages. Its purpose is to take a targeted approach to improve reliability on the electric distribution system. A majority of sections between protective devices was assigned an ESID that is connected to outage data. NorthWestern uses several outage metrics to prioritize sections with chronic reliability issues. This approach provides a strategy to mitigate sections on circuits that may not meet the criteria for traditional circuit-wide reliability approaches. This program also provides the ancillary benefits of mitigating sections of line that have a high volume of operations that could results in an ignition. Additional details can be found in Appendix A.

NorthWestern has historically been committed to modernizing the grid especially since its DSIP efforts and has continued to expand to the transmission system by upgrading aging electromechanical relays to modern microprocessor relays (Reference Appendix A for further details on the DSIP). Modern relay technology allows for a communication network to be installed that can centralize the operational visibility and control of all connected relays. These modern microprocessor-based relays allow NorthWestern to situationally adjust protection schemes during varying conditions based on the relevant data. At the Plan's inception, 89% of the existing transmission and 65% of the distribution relays were microprocessor based. On the distribution side specifically, there are also a significant amount of modern microprocessor relay-based protection systems in service in downstream devices that provide functionality that is similar to modern microprocessor relay installations typically located within substations. With modern microprocessor relays, NorthWestern has gained the ability to situationally adjust protection schemes during varying conditions that allow for alternate protection modes with increased sensitivity, faster operating speeds, and reclosing functionality disabled.

Each year as fire season approaches, NorthWestern takes additional precautions to support not only safe and reliable operations of the electrical power system but also to reduce the risk of ignitions. Once fire season begins, individual protection devices can be set to preemptively block reclosing during fire season on a case-by-case basis. It is common practice, in most cases, during fire season to complete a patrol of the faulted line prior to re-energization to provide a visual assessment on the condition of the line, reducing the potential of closing in on a fault that could cause an ignition event.

PSPS is the practice of proactively de-energizing electric equipment during times of extreme weather in high fire-risk areas to reduce the probability of electric company infrastructure causing a wildfire ignition. Historically, NorthWestern has utilized a similar approach in past practices on an individual basis during safety-sensitive situations. Moving forward, NorthWestern plans to adopt a more official PSPS plan as described in Section 4.

When employing EPSS or PSPS, NorthWestern recognizes the importance of the balance between safe operations of the system and maintaining reliable service. As previously discussed, NorthWestern has historically used a segmentation approach on distribution circuits. By breaking the approximately 600 distribution feeders into 33,000 ESIDs, NorthWestern is not only able to model the risk at a granular level but is also able to utilize this approach to minimize customer outages when employing EPSS or PSPS. The future installation of additional protection devices with the ability to adjust protection settings will further aid in finding this balance by improving situation awareness and the opportunity to further segment distribution feeders.

NorthWestern's operational practices are based on the guidelines in the Standard Operating Procedure document that are focused on mitigating actions that can be taken when the risk of wildfire increases. These practices were designed to provide consistent direction to NorthWestern employees on accepted procedures before, during, and after an active fire impacting NorthWestern's facilities. Operational practices guide employees through steps in establishing contact and working with local authorities including the Incident Command System (ICS) process. The Standard Operating Procedure document also describes appropriate changes NorthWestern may make to the protection settings of its system and necessary changes to work procedures due to elevated wildfire risk based on changing environmental conditions.

When responding to wildfire events within its Montana service territory, NorthWestern may initiate an ICS process in coordination with its Public Safety Partners, including local Montana Disaster and Emergency Services (DES) Coordinators, local and state government entities, DNRC, U.S. Bureau of Land Management (BLM), and USDAFS, etc. The ICS process is a nationally established cross-organization process that enables private and public entities to work in collaboration to respond to an emergency incident, including wildfires.

4.3 – Enhanced Plan Efforts

4.3.1 – System Performance

System Performance Team – One Superintendent and two Engineers are to be established within NorthWestern's Asset Management department as the System Performance team. The intent of this group is to provide dedicated resources for monitoring system operations, primarily momentary operations, and directing appropriate follow-up responses.

System Observations – The primary objective of this category of the Plan is to use existing technologies deployed on the system to observe momentary operations and identify their root cause location. The technologies available for this vary widely from the transmission to the distribution system. For instance, on the distribution system one method of observing outages and operations is at the meter level. The AMI meters installed on the system can report momentary interruptions in service and System Performance Engineers can observe which circuits are experiencing a specific threshold of operations with data visualization tools such as the one shown in Figure 9. These devices are critical for a comprehensive view of the effects of momentary interruptions as well as reporting sustained outages.

Investigative Follow-Ups – An investigative follow-up is initiated by a momentary operation(s) to discover the root cause of the outage and assess the risk of it recurring. Most often, the investigation will be performed through an in-office assessment, a field assessment, or a targeted inspection of the operation's source. Because of the variety of sources creating a momentary operation, these investigations will only be performed as the situation requires. In doing so, NorthWestern can accurately assess the source and cause of the momentary operation.

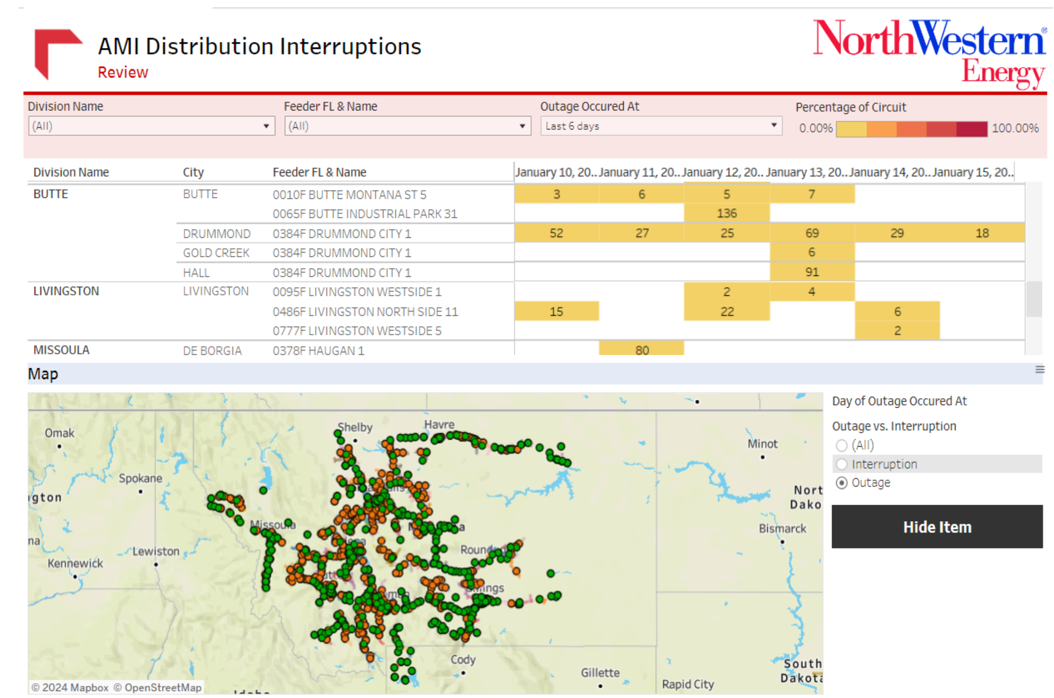


Figure 9 – Example of AMI Reporting Dashboard

Operations Follow-Ups – After an investigative follow-up, necessary teams from Transmission or Distribution Operations can be dispatched to resolve the root-cause location. It is not feasible to use a dedicated construction team due to the dramatic variance in solutions required. The resolution may come in the form of transmission reconstruction, distribution reconstruction, or a simple tree removal.

4.3.2 – System Operations Defense Strategies

Enhanced Powerline Safety Settings (Enhanced) – Transmission and distribution protective devices allow for dynamic response to changing conditions, including heightened wildfire risk. While NorthWestern has historically implemented a non-reclose strategy during wildfire season which was typically driven by the time of year, the dynamic risk model will provide a more comprehensive understanding of current and near future environmental conditions. With this information, the model will help drive decisions about activating operational defense strategies, such as modified protective settings.

The enhancement is the development of a Wildfire Risk Index to determine when more advanced protection schemes should be considered to minimize wildfire risk for current conditions. NorthWestern recognizes that schemes that are more sensitive will reduce wildfire risk but sacrifice customer reliability that could cause hazardous situations, such as de-energizing critical suppression, in the event of a fire. The transmission microprocessor relays and various smart devices across the distribution grid will be enabled with multiple levels of protections schemes to balance reliability and wildfire ignition probability. Protection schemes considered will include: standard operation with reclosing, non-reclosing, and wildfire protection schemes with adjusted trip curves. NorthWestern may adjust operational protection schemes based on wildfire risk (see, for example, Figure 10) and other relevant factors.

	Wildfire Risk	Risk Description	Operational Defense Strategy
Safety Risk Based Operation	Extreme	Fire Start Imminent Uncontrollable	PSPS Evaluation
	Very High	Fire Start Easily Control Limited	Fire Season Operating Mode 2
	High	Fire Start Caution Control Challenging	Fire Season Operating Mode 1
	Moderate	Fire Start Challenging Control Achievable	Normal Operations
Reliability Performance Based Operation	Low	Fire Start Difficult Control Easily	Normal Operations

Figure 10 – Example of an Operational Defense Strategy Matrix

Public Safety Power Shutoff Implementation Plan (Enhanced) – In addition to the technologies, procedures, and protection schemes discussed above, NorthWestern Energy also recently developed a PSPS strategy designed to address situations where the risks of continuing to operate electrical equipment are unacceptably high. This strategy describes how NorthWestern may proactively de-energize sections of its electrical infrastructure as a tool to help protect life and property dependent on current wildfire conditions. The use of PSPS events as a method for combating wildfire risk has been made possible by modern advancements in the flexibility of electrical infrastructure and improvements in the accuracy of environmental models and forecasts. NorthWestern developed its PSPS implementation strategy following a thorough review of its own existing emergency response and planned outage procedures, as well as a review of peer utility PSPS plans. This approach enabled NorthWestern to appropriately tailor its PSPS strategy to its own unique situation.

NorthWestern Energy's PSPS Implementation Plan is principally composed of three distinct strategies:

1. A situational awareness strategy, which describes how NorthWestern will monitor environmental conditions that may warrant a PSPS event and how it will make decisions to escalate and deescalate PSPS events;
2. An operational strategy, which describes how NorthWestern will prepare for and carry out a de-energization and re-energization with considerations on customer impact; and
3. A communication strategy, which describes how NorthWestern will communicate internally and externally about a PSPS event.

In addition, NorthWestern's three-staged approach to conducting PSPS events, as seen in Figure 11, mirrors the approach used by many other utilities.

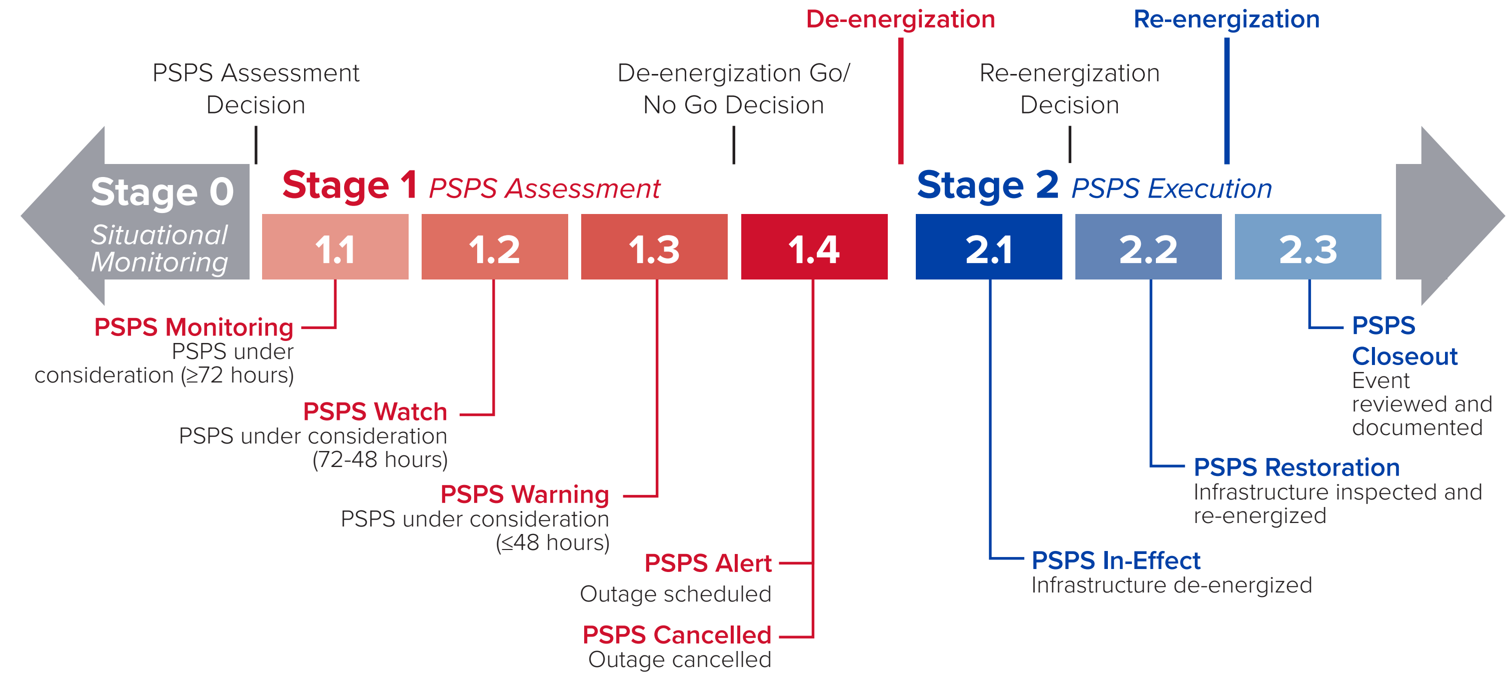


Figure 11 – NorthWestern Energy's Multi-Staged Approach to PSPS Events

Stage 0, or Situational Monitoring, is always in effect, even during times when no specific PSPS events are being considered. During this stage, NorthWestern's Situational Awareness Team actively monitors environmental conditions, potential customer impacts, current operational considerations and the possibility of PSPS events to address apparent and forecasted risk factors.

The point at which NorthWestern begins considering a specific and localized PSPS event, is Stage 1 of the PSPS strategy, known as PSPS Assessment. During this stage, NorthWestern assembles a broad interdepartmental team of subject matter experts and decision makers. This team closely monitors conditions and risk factors alongside the Situational Awareness Team and adjusts the necessary planning and communications based on the likelihood and timing of the potential PSPS de-energization that is being considered.

Finally, Stage 2 of NorthWestern's PSPS implementation strategy, PSPS Execution, begins if and when electrical equipment is de-energized. This stage continues until the system has been fully re-energized and the PSPS event has been reviewed and documented. Ultimately, by establishing this deliberate and disciplined approach to PSPS events, NorthWestern is equipped to utilize PSPS events as a tool for mitigating wildfire risks as appropriate. NorthWestern Energy's complete PSPS Implementation Plan can be found in Appendix F.

PSPS Stakeholder Readiness (New) – As NorthWestern began to develop its PSPS implementation strategy, it recognized the need to educate a wide variety of internal and external stakeholders about PSPS events concerning how and when those measures may be utilized. Not only is this a crucial effort for initially educating stakeholders as NorthWestern prepares to roll out the enhanced PSPS strategy, it is an ongoing, essential undertaking for NorthWestern to utilize and refine its PSPS strategy. To this end, NorthWestern also established a PSPS Stakeholder Readiness team and tasked them with developing the strategy for educating internal and external stakeholders about NorthWestern's approach to PSPS events. Further customer communication strategies can be found in Section 7.

4.3.3 – Work Practices

Standard Operating Procedures (Enhanced) – NorthWestern will update the established operational procedures which are designed to provide consistent direction to NorthWestern employees on accepted practices, before, during, and after an active fire that impacts NorthWestern facilities. This includes, but is not limited to, procedures such as: planning work during high-risk times, establishing clear work defenses to guard against accidental ignition, the ICS described above, fire notification, and changes to protection settings.

Shown in Figure 12 is an example of how Standard Operating Procedures may be adjusted based on consequence zones and SFDI. This is to be used as a general guideline for adjusting how work is performed on systems within these areas during changing conditions.

NorthWestern Energy Risk and Work Practice Matrix

Severe Fire Danger Index (SFDI)	Zone 1 (Low Consequence)	Zone 2 (Elevated Consequence)	Zone 3 (High Consequence)
Severe	Non-Emergency Work **Approval Required** Follow Wildland Fire Restrictions including Agency Issued Exemptions If Applicable Utilization of Prevention Field Practices	**Stop No Work** Emergency Work **Approval Required**	**Stop No Work** Emergency Work **Approval Required**
Very High	Proceed with Work Follow Wildland Fire Restrictions including Agency Issued Exemptions If Applicable Utilization of Prevention Field Practices	Non-Emergency Work **Approval Required** Follow Wildland Fire Restrictions including Agency Issued Exemptions If Applicable Utilization of Prevention Field Practices	Non-Emergency Work **Approval Required** Follow Wildland Fire Restrictions including Agency Issued Exemptions If Applicable Utilization of Prevention Field Practices
High	Proceed with Work Follow Wildland Fire Restrictions including Agency Issued Exemptions If Applicable Utilization of Prevention Field Practices	Proceed with Work Follow Wildland Fire Restrictions including Agency Issued Exemptions If Applicable Utilization of Prevention Field Practices	Proceed with Work Follow Wildland Fire Restrictions including Agency Issued Exemptions If Applicable Utilization of Prevention Field Practices
Moderate Low	Proceed with Work	Proceed with Work	Proceed with Work

Figure 12 - Example of NorthWestern's Risk and Work Practice Matrix

Section 5 - System Preparedness

Aerial Assessment

Aerial Exception Repairs

Ground Assessment

Ground Exception Repairs

Pole Inspection, Treatment, & Replacement

Rejected Component Repairs

Inventory

Section Refurbishment

Lidar

Substation Equipment Upgrades

Wildfire Mitigation Hardening Program

Targeted Cutout Replacement

Critical Communication Resiliency Zones

Project Management Team

Plan Development & Maintenance Team

Construction & Operations Engineering

Section 5 – System Preparedness

5.1 – Overview and Key Activities

This category groups the construction and maintenance activities NorthWestern employees perform that directly mitigate wildfire risk or have the ancillary benefit of so doing. Activities range from enhanced proactive maintenance, to targeted grid hardening or deployment of advanced technologies on the transmission and distribution systems, all with the intent of reducing ignition potential. The system preparedness portion of the Plan is the largest component in terms of work, resources required, and estimated time of completion.

Key Activities

- Increased scope and cadence of ground and aerial assessments with additional maintenance budget to repair exceptions.
- Additional inventory and Lidar to evaluate portions of the system that require refurbishment or hardening to reduce ignition potential.
- Targeted hardening strategy for transmission and distribution driven by a static risk model to mitigate system and environmental conditions.
- Accelerated installation of substation and communications equipment to add situational awareness and operational flexibility to the transmission and distribution systems.

5.2 – Established Activities

NorthWestern has a strong history of asset replacement and maintenance strategies. Since 2010, NorthWestern has made significant investments to stabilize asset life profiles, improve reliability, and modernize the grid. Although these investments were not originated to specifically address wildfire risk, there were ancillary benefits of reducing ignition potential and preparing the grid for the wildfire mitigation components discussed in the Plan.

Maintenance of the transmission and distribution systems has always been of utmost priority for NorthWestern to continue providing safe, reliable service.

NorthWestern uses its annual aerial and ground patrol to assess and repair concerns on the transmission and distribution systems. An aerial assessment is performed on the entire transmission system annually. A ground patrol is performed biennially on the distribution system. The objective of these programs is to locate and report line exceptions that pose safety or reliability concerns on the overhead distribution system. Exceptions are collected, prioritized, and dispatched with appropriate corrective action.

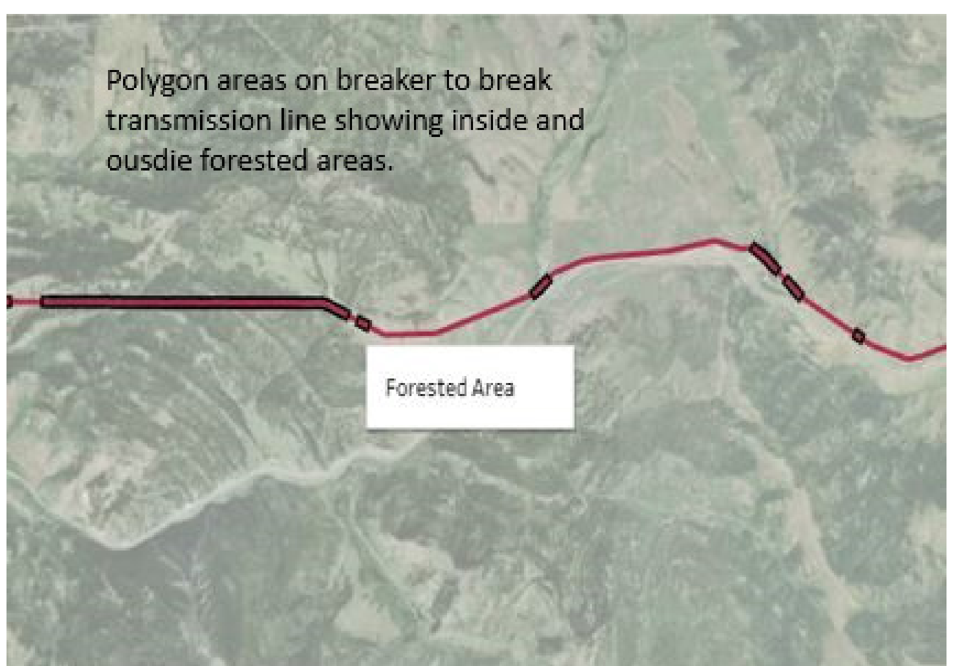


Figure 13 – Example Transmission Polygons

The Transmission and Distribution Forest Management Program was designed to reduce risk exposure in forested areas throughout the system (Reference Appendix A). This program was initiated in 2019 and will evolve to encompass the entire system as part of the Wildfire Mitigation Hardening program as discussed below. The Forest Management program is intended to identify and prioritize the segments of the electric system at greatest risk of experiencing a wildfire only within forested areas. The strategy uses a comprehensive methodology to identify a particular segment's risk. This segment risk is the combination of environmental risk and system performance risk. Targeted segments are prioritized for engineering investigation of appropriate mitigation efforts to reduce wildfire risk based on their segment risk values.

Breaking the grid into smaller sections provides an opportunity to take a targeted approach to mitigate higher perceived segment risk. Under this approach, the distribution circuits have been split into sections delineated by protective devices along the circuit. The distribution sections are also referred to as ESIDs. Transmission circuits were split up into polygons based on a specified distance to a forested area(s) as shown in Figure 13.

Each identified segment is risk-ranked by the combination of the probability (measured by the system's performance) and consequence (environment and population) scoring metrics. These sections were prioritized for NorthWestern's engineers to model and analyze for the best possible solution to mitigate the fire risk.

Due to varying size and complexity, NorthWestern has taken different approaches to evaluate distribution segments as opposed to transmission segments. Distribution segments are assessed in the field by an engineer at which time precise locational data and visual assessments are gathered. The data is subsequently modeled in a design software to evaluate a number of exceptions that could cause a fault, including galloping and blowout.

Transmission line data is collected with Lidar technology that is incorporated into a design software looking for the same anomalies. An engineered solution is then developed to mitigate those exceptions, reducing risk. Reference Figure 14 and Figure 15 for an example of the Lidar data, blowout analysis, and galloping analysis.

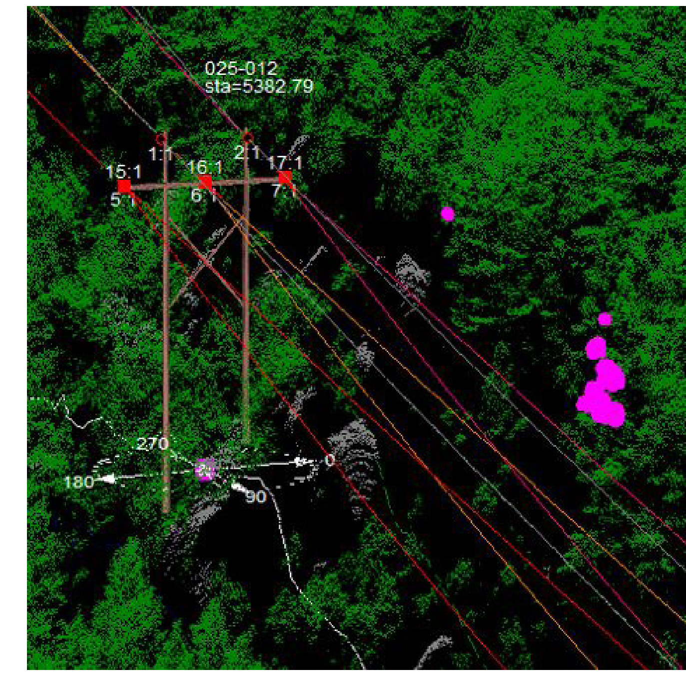


Figure 14 – PLS CADD Snip Showing Vegetation Blowout

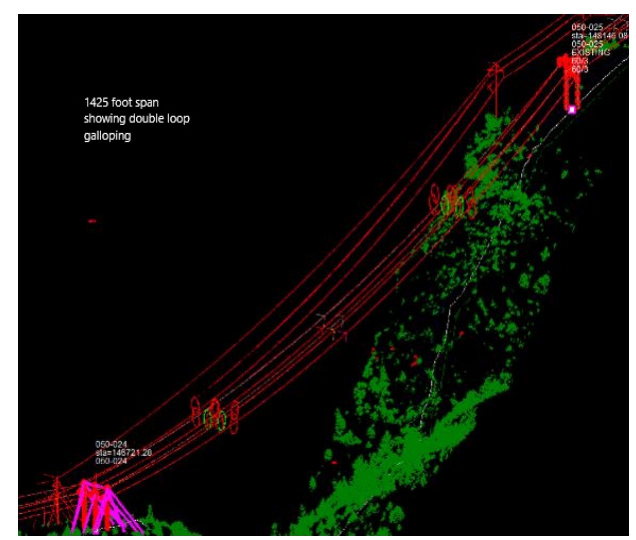


Figure 15 – PLS CADD Snip Showing Galloping

It is important to note that not all ESIDs or transmission segments will have exceptions. Solutions will range from complete structure rebuilds to installing underground cable or vegetation management recommendations. The Vegetation Management group provides consultation on nearly every line with encroaching trees. A coordination study is also completed to assess proper relaying and fuse sizing which can reduce sparks from unnecessary fuse operations.

The transmission and distribution pole inspection and treatment program was established to maintain the integrity of the pole plant and evaluate where proactive replacement is warranted. This inspection allows another visual assessment of the system in addition to the ground and aerial patrols listed above. Both transmission and distribution are currently set up on a 10% per year inspection and/or treatment meaning each pole will be inspected once every 10 years. During the inspection, the appropriate poles are treated to extend the remaining life of the asset. At the same time each pole is also tested to determine remaining design strength. If the pole does not meet these testing requirements, it is proactively replaced to avoid asset failure that could result in an outage or ignition source.

In addition to this, on the distribution system specifically, ELF current-limiting dropout fuses are also being installed in designated areas. The ELF current-limiting dropout fuse is a fuse technology that interrupts fault currents quickly while also preventing the release of any gas, sparks, or debris when compared to traditional expulsion dropout fuses. These features decrease the probability of an ignition event occurring.

Of these efforts made by NorthWestern prior to the formalization of the plan, most will transition into an enhanced effort moving into the future. Between these enhanced efforts and the addition of new assessments and personnel resources to manage this effort, NorthWestern strives to comprehensively address the preparedness of the system for wildfire.

5.3 – Enhanced Plan Efforts

5.3.1 – Assessment & Repair

Engineering Aerial Assessment (Maintained (T), New (D)) – It is industry best practice to have multiple vantage points, from aerial and ground, to do a comprehensive assessment of the condition of a structure and associated components. This portion of the Plan calls for the continuation of 100% of the engineering aerial assessments on the transmission facilities on an annual basis and the incorporation of an engineering aerial (drone) assessment of approximately 20% of the distribution system annually. During this engineering assessment, exceptions are gathered and then processed into a work plan for future repair.

Aerial Exception Repairs (Maintained (T), New (D)) – Aerial exceptions gathered during the annual transmission aerial assessment will be continued to be repaired. As part of the new distribution aerial program, exceptions gathered will be repaired on an annual basis.

Engineering Ground Assessment (New (T), Enhanced (D)) – NorthWestern will begin 100% engineering ground assessment of the sub-transmission system for five consecutive years. A 20% engineering ground assessment of the transmission system will be completed for five consecutive years with a 100% cycle completion within five years. The engineering ground assessment will be conducted by a contracted resource focused on wildfire specific exceptions as part of the data gathering process. Once the exceptions are processed, they will then be processed into a work plan for future repair.

NorthWestern will also accelerate distribution ground assessments to cover 100% of the distribution system for five consecutive years. Half of the system will continue to be patrolled by qualified journeyman lineman as a comprehensive base ground patrol, while the other half of the system will be subject to an engineering assessment focused on wildfire specific components. The schedule will alternate every other year, so the entire system is receiving both a comprehensive and wildfire specific assessment every two years.

While both the ground patrol and engineering ground assessment are gathering data to capture exceptions, the ground patrol is performed by workers with specific skill sets that can perform immediate repairs, where required, during the patrol. The engineering assessment will only be the data collection part of the process and the repairs will be processed within the work plan to be completed within 12 months where plausible.

Ground Exception Repairs (New (T), Enhanced (D)) – Applicable ground exceptions gathered during the annual ground assessments and patrols should be repaired within 12 months from the date of collection where plausible.

Pole Inspection, Treatment, and Replacement (Maintained) – Continuation of inspection and treatment of transmission and distribution poles on a 10-year cycle, completing approximately 10% of the system annually. In this inspection, poles are rated based on remaining pole strength. A pole being rejected during this inspection will be proactively replaced. For transmission, major components are also rated based on condition.

Rejected Component Repairs (Enhanced) – When the components on a transmission structure are rejected during inspection but the pole(s) is not rejected, those components are replaced on a case-by-case basis. This activity will actively formalize a process to proactively replace rejected components, regardless of pole rating, moving forward.

Inventory (New) – Creation of an inventory of specific items in the field that could have an increased risk of ignition from the system. This will aid in engineering efforts of the section refurbishment initiative listed below.

Section Refurbishment (New) – Based on findings from the Inventory initiative, NorthWestern will develop engineered solutions, as necessary, for the refurbishment of the system to reduce ignition potential on sections of the transmission and distribution systems.

Lidar (Accelerated) – Accelerated completion of Lidar for the remaining transmission and sub-transmission system within three years from the adoption of the Plan. Lidar is required to complete the engineering model for the Wildfire Mitigation Hardening Program and Section Refurbishment.

5.3.2 – Construction

Substation Equipment Upgrades (Accelerated) – NorthWestern will accelerate the existing long-term plan of modernizing substation and line device equipment. This effort includes replacement of manual devices with electronically controlled breakers and reclosers supported by a communication backbone to fully recognize their protection and operational benefits. This also includes installation of advanced relaying technology to enable open phase detection and preemptive notification of potential line contacts. One of the highest impacts to wildfire risk is at the substation level; therefore, this strategy will focus on high-risk substations with the plan to expand to downstream devices in the future. The benefit of the initiative is additional situational awareness through SCADA indication, protection flexibility, and expedited operational response.

Wildfire Mitigation Hardening Program (Enhanced) – This program is an extension of the Forest Management Program and now reflects the intent of a targeted approach to harden the transmission and distribution systems to reduce wildfire ignition sources based on the static risk model described in Appendix C. This initiative was expanded to include distribution as well as transmission both in and out of designated forested areas. It will now build upon the Forest Management Program's engineering approach of field-based risk identification to determine appropriate mitigation solutions to reduce the likelihood of ignition. Grid hardening solutions include, but are not limited to:

- Overhead construction moved to underground construction to eliminate ignition potential.
- Reframing structures or inserting poles to reduce galloping.
- Vegetation clearing to mitigate conflicts.
- Upgrading to current design standards to reduce ignition sources.
- Installing new, larger conductor to eliminate splices and address aging conductor health.

Targeted Cutout Replacement (New) – Porcelain cutouts have the potential to crack, potentially resulting in mechanical failure. This initiative calls for proactive replacement of porcelain cutouts with a polymer-based cutout to reduce failures that result in an ignition.

Critical Communication Resiliency Zones (New) – Targeted at remote, critical communication sites, this will create outage resiliency zones by installing small micro grid applications or burying electric facilities to ensure these sites have little to no interruptions of service through severe weather events and wildfires.

5.3.3 – Implementation and Engineering Resources

Project Management Team (New) – The Project Management Team will consist of one full time employee to ensure successful completion of the Wildfire Plan's construction activities by monitoring scope, schedule, and budget.

Plan Development & Maintenance Team (New) – This will be a dedicated team of three employees within Asset Management to continue to develop and update Plan strategies through data analytics, targeting the highest risk components while working closely with the Construction and Wildfire Mitigation Teams to ensure the Plan objectives are met.

Construction & Operations Engineering (New and Existing) – This team will consist of both engineering and supervision for construction and maintenance activities related to wildfire mitigation. The size and resources needed for this initiative will be adjusted to ensure successful execution of activities within the Plan.

Section 6 - Vegetation Management

Aerial Assessment

Ground Assessment

Remote Sensing & Analysis

Proactive Maintenance Program

Right Tree, Right Place

Risk Tree Program

Vegetation Hot Spotting

Fuel Reduction Partnerships

Clear Fall ROW Zones

Vegetation Analyst & Scheduler

Vegetation Coordinator

Section 6 – Vegetation Management

6.1 – Overview and Key Activities

Trees are an important part of any landscape and are common within power line corridors. Coexisting in the same general space leads trees to be one of the primary causes of electric service interruptions. The historical best practices related to energy company vegetation management put an emphasis on three main components: public safety (climbable trees), compliance (transmission interruptions), and service reliability. This strategy has served NorthWestern well for years in providing safe and reliable electrical service.

The operating environment is now much different from prior years. Factors such as where communities are being built, to the general health of urban and rural forests, are contributing to this difference. These components add to the complexity of an already difficult task surrounding the management of living organisms. Due to this changing operating landscape, the vegetation management scope within the enhanced activities below, strengthens the existing programs at NorthWestern while also increasing situational awareness with a focus on risk mitigation of vegetation-related faults.

Key Activities

- Enhanced vegetation-focused ground and aerial assessments with additional maintenance budget to address vegetation conflicts.
- Increased proactive maintenance that is technology and data driven to target high wildfire risk zones.
- Fuels mitigation through partnerships and ROW clear fall zones.

6.2 – Established Activities

The Mountain Pine Beetle (MPB) infestation resulted in increased tree mortality across all of NorthWestern's Montana operating areas. This increased tree mortality subsequently increased the probability associated with vegetation fall-ins (dead or diseased trees falling into power lines), a known risk condition. The design of the Hazard Tree Program was to mitigate risk of fall-ins and enhance safety by addressing hazard trees inside of and outside of ROW. The Montana Public Service Commission approved the Hazard Tree Program in NorthWestern's 2018 Electric Rate Case.

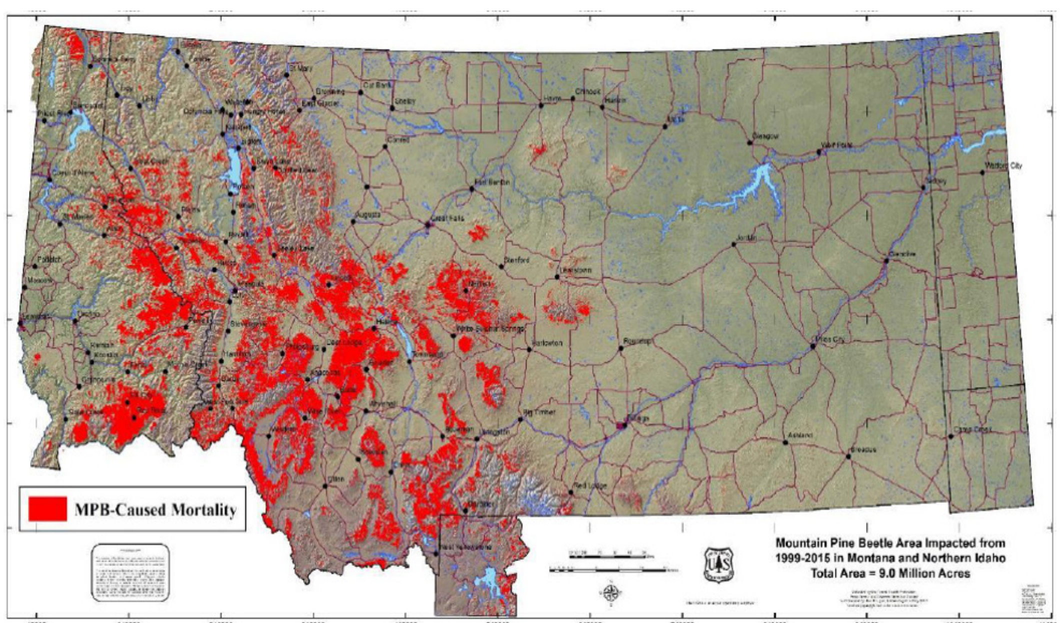


Figure 16 - Mountain Pine Beetle Infested Areas

NorthWestern's Hazard Tree is well established and designed to reduce the probability of beetle-killed trees contacting or falling into its electric facilities. Established in 2018, the Hazard Tree Program's goal was to mitigate risk and enhance safety by trimming or removing trees outside of ROWs that could fall into transmission and distribution lines. This program became an absolute priority due to the MPB infestation, as illustrated in Figure 16. Since its inception, this program has cleared more than 1,200 miles of impacted forests and reduced the risk specific to the MPB infestation. Reference Appendix A for further details on this program.

Ground assessments are currently completed on NorthWestern's distribution system according to the Electric Operation and Maintenance Guidelines. Much like the aerial program, resources are coordinated during the assessment process for efficiency. Trees that have grown into or close to the lines are recorded and scheduled for hot spotting. The initiation of this action has historically been addressed by Vegetation Coordinators who assess locations with trees growing toward the lines. Coordinators facilitate the trim or removal of trees as necessary to maintain reliable service.

Most tree encroachments are addressed through NorthWestern's long established vegetation maintenance programs. The foundation of the Proactive Maintenance Program assumes a healthy forest and matches performance-based and time-based cycles to balance the needs of the system, the public, and the vegetation itself. This approach has allowed NorthWestern to maximize the time between maintenance cycles while still providing industry acceptable reliability. This historic maintenance approach puts a premium on safety and service reliability.

NorthWestern has a good history of working closely with local emergency responders and fire protection agencies. This relationship started with a safety focus to educate these agencies on the hazards surrounding NorthWestern facilities during an emergency. On a limited basis, this cross communication has proven fruitful and has historically occurred in conjunction with the United States Forest Service and slash pile cleanups. By getting these piles removed, fuel sources are removed from the forest floor near and around the overhead power lines.

6.3 – Enhanced Plan Efforts

6.3.1 – Vegetation Maintenance

Aerial Assessment (Maintained (T), New (D)) – Maintain the existing aerial transmission vegetation assessment program and expand the program to include the distribution system. This added aerial assessment may be either a manned or unmanned flight depending on operational efficiencies and will be coordinated with other internal maintenance stakeholders.

Ground Assessment (Enhanced) – The Plan adds a vegetation-specific ground assessment on NorthWestern's transmission system completed by a utility arborist on a 4-year cycle. Adding the ground assessment to the transmission ROW provides a ground level, detailed view of the vegetation condition not available during the aerial assessment. This method will greatly reduce the opportunity for at-risk vegetation to turn into a hazardous condition before NorthWestern has an opportunity to perform proactive maintenance.

Remote Sensing & Analysis (New) – There are now several proven remote technologies (satellite imagery analytics, PhoDAR, Lidar, etc.) with specific advancements in the vegetation space providing expanded situational awareness. These remote methods of data collection and associated analytics will provide both an aggregate view of NorthWestern's system over time as well as very specific, detailed vegetation conflicts. The Plan calls for investment in a third-party vendor to provide the Vegetation Management team an additional non-biased resource to enhance the strategy of our proactive maintenance program.

Proactive Maintenance Program (Enhanced) – The environment in which NorthWestern's system operates has changed with specific impacts to vegetation maintenance based on the following: extreme localized weather conditions, ecosystems in drought, and population increases within the WUI areas. NorthWestern is enhancing the cycle approach to harden the system against vegetation encroachments while also aggressively increasing pruning practices in areas of high consequence, thereby reducing ignition potential based on vegetation conflicts.

Right Tree, Right Place Program (Enhanced) – Full tree mature height is often overlooked when trees are planted near existing power lines, eventually requiring ongoing maintenance for adequate clearances. This program reviews vegetation within the ROW corridors and works with property owners to promote the "right tree" in the "right place" to reduce power outages and wildfire potential for all. Where it is acceptable to the customers and deemed a "wrong tree" in the "wrong place" NorthWestern can provide funding to replace the tree(s) for the customer, leaving them with the "right tree" in the "right place".

Risk Tree Program (Enhanced) – The Risk Tree Program increases the scope of the Hazard Tree Program to consider all bug infestations in contrast with the narrow focus that was specific to the MPB. It will also include a broader data model which considers additional risk factors such as terrain, accessibility, vegetation density, wildfire history, prevailing wind direction and operations within the WUI.

Vegetation Hot Spotting (Enhanced) – Vegetation hot spotting will continue as it has in the past to respond to the ground assessments and aerial assessments of the system. With increased assessments, there will likely be an increase of hot spotting to follow. This will be coordinated by the Vegetation Coordinator resource listed below.

6.3.2 – Fuel Mitigation

Fuel Reduction Partnerships (New) – Through collaboration with local, state, and federal agencies (or even private landowners), NorthWestern can continue pushing forward with these groups to reduce the impact of wildfires. This initiative aims to establish win-win partnerships within NorthWestern's Montana operating area that help reduce fuel sources and protect the critical infrastructure of power lines.

Clear Fall ROW Zones (New) – Regardless of where electrical lines are located, there are zones in which fire-start models indicate an increased risk toward life and property and, thus, requires a program to limit line fault opportunities. By working with local landowners, this program would establish a "clear zone" for falling vegetation to reduce or eliminate the probability for vegetation contact in these critical areas.

6.3.3 – Implementation Resources

Vegetation Analyst & Scheduler (New) – This role is targeted at maintaining and updating external data connections with field data. The analyst portion of this role will include setting and maintaining control points for improved implementation efficiency and quality assurance. The scheduling portion of this role will encompass scheduling of cycle trimming crews and various other contractors as necessary through the year.

Vegetation Coordinator (New) – Heavy dependence is placed on the existing Vegetation Coordinators to evaluate the risk associated with each piece of vegetation. The Coordinator, a certified utility arborist, works out in front of field crews determining the proper mitigation methods, planning work scope, and working with impacted landowners for successful outcomes for all stakeholders. The Plan calls for one new Vegetation Coordinator to be focused on wildfire mitigation efforts.

Section 7 - Communication & Outreach

Print and Media Communication

Direct Customer Communication

Mobile Generating Units

Internal Training

Peer to Peer Relationships

Public Safety Partnerships

Section 7 – Communication & Outreach

7.1 – Overview and Key Activities

Ensuring the safety of customers and the public is of utmost importance to NorthWestern. The strategy to achieve this includes informing the public on NorthWestern's efforts to mitigate wildfire risk, proactively communicating as event conditions change, potentially causing interruption to electric service, and outreach after an event has occurred to keep the public apprised of the situation. In addition to communicating with the public, development and continuity with NorthWestern's Public Safety Partners before, during, and after a wildfire event is paramount. This also parallels opportunities with partners to align wildfire mitigation efforts. Communication and education internally are also a key component to ensure the safety of employees and the public.

Key Activities

- Stakeholder engagement with interfacing agencies to leverage opportunities for partnership.
- Customer communication strategy to ensure customers' understanding of what NorthWestern is doing to mitigate wildfire risk.
- Customer communication strategy to ensure customers' understanding of NorthWestern's active efforts during a wildfire event and any possible effects they might experience as a result.
- Public Safety Power Shutoff stakeholder readiness and implementation strategy ensuring successful PSPS execution should an event occur.
- Enhanced internal fire safety training for field personnel on proactive measures during high-risk conditions and reactive measures during wildfire events.

7.2 – Established Activities

NorthWestern serves a small population over a large geographic service territory within the state of Montana. In fact, nearly two thirds of the towns in Montana have less than 1,000 people. With this demographic, NorthWestern prides itself in being directly embedded within all of the communities served. This presents itself in many ways, such as, community volunteering, employee's holding local governmental or first responder roles, to helping the neighbor's cat down from a tree with a bucket truck.

Being this established in communities within the service territory, provides a solid foundation of a trusted relationship between NorthWestern, its customers and public agency partners. In fact, in the many small communities that NorthWestern serves, employees often have a relationship with most of the customers at some capacity. Customers are often employee's family, friend, neighbor, or at a minimum an acquaintance in some way. Even NorthWestern's largest communities are "small" communities by many other utility's measures. By comparison to most in the utility industry, this provides a unique and effective channel in understanding the customer's needs, and a direct insight to providing effective communications.

The diversity in customer demographic between rural and more urban also creates a need to recognize NorthWestern's customer's expectation of reliability and communication varies. While a rural customer may be resilient to a long duration outage and expect no form of communication on restoration time, an urban customer may be looking for an immediate notification of an outage with specific details. NorthWestern acknowledges that this requires communication strategies to meet multiple levels of customer expectations.

NorthWestern understands the relationship between safe and reliable utility service and the economic vitality of the areas that are served. NorthWestern also recognizes the importance of clear and concise public communication, especially during times of possible service interruption and safety incidents such as wildfires, flooding, winter storms, etc. Although a variety of tools are utilized to keep customers informed of potential impacts to the systems, NorthWestern works closely with local, state, and federal partners to ensure that consistent, clear messaging is provided.

NorthWestern Resources

Wildfire Safety:

https://northwesternenergy.com/safety/community-safety/wildfire-safety

Outage Map:

https://northwesternenergy.com/outages/outage-map

Customer Service and Contact Info:

https://northwesternenergy.com/customer-service

NorthWestern publishes general information for customers about emergency phone numbers, wildfire preparation tips, NorthWestern's wildfire mitigation efforts, hazard tree removal, and how customers can update their contact information in the system. Throughout the year, a variety of informational pieces are provided to assist customers with planning and preparing for events such as wildfires, earthquakes, floods, and outages. This includes the use of billing inserts, door hangers, brochures, social media posts, NorthWestern's YouTube channel, and various other forms of media. NorthWestern utilizes two 24/7 contact call centers and numerous walk-in offices to serve as information sources for customers and the general public.

Another tool within the contact call centers is a voice response unit (VRU). The VRU provides pre-recorded messages that relate directly to the service area of impacted customers. This tool is particularly valuable in the incidence that a large volume of customers needs to be contacted within a shorter period of time.

NorthWestern's online Outage Map is another tool that is especially valuable in communicating information. This tool provides customers with a geographic view of system outages, number of customers impacted, and expected restoration times. The Outage Map is dynamic in nature and is updated in real time.

When system outages are planned, NorthWestern utilizes numerous sources to inform customers of the interruption. This includes public service announcements (radio and television), face-to-face notifications, and pre-recorded telephone messages. Once the interruption has been resolved, follow-up telephone notifications can be conducted to inform customers of their current service status. In the case of unplanned outages, the primary communication methods are the online Outage Map, the VRU, and NorthWestern's contact centers and walk-in offices. Additionally, depending on the magnitude of the outage, NorthWestern may utilize social media, public service announcements and proactive telephone calls. NorthWestern will continue to build on the current state strategies identified above.

As part of the ICS discussed in Section 3.2, a Public Information Office (PIO) role across participating organizations that works with the media is established during active emergency events. This is a key component to communicating with customers and the public during and after a wildfire event.

During a wildfire emergency the DES representative, incident commander, or PIO handle the public communication and NorthWestern's role is to support these Public Safety Partners' outreach efforts. NorthWestern's primary role within the ICS process is focused on maintaining safe, reliable service to its customers and emergency responders, as well as, maintaining communication to its customers. Customers rely on NorthWestern to notify them if a disruption in service is expected and provide estimated return-to-service timelines.

7.3 – Enhanced Planned Activities

7.3.1 – Enhanced External Communication and Customer Support

Print and Media Communication (Enhanced) – This initiative is targeted at increasing public awareness on wildfire prevention and outage preparedness via various media channels including fact sheets, media articles, community presentations, social media, and a website for customers. During the fire season, NorthWestern also intends to expand collaboration efforts with Public Safety Partners to coordinate media outreach efforts.

Direct Customer Communication (Enhanced) – Following its complete deployment, NorthWestern can leverage AMI technology and the accompanying Preference Center for customer contact on system issues and proactive outage management efforts. Although the AMI deployment is not scheduled to be complete until mid-2025, NorthWestern is already working on a variety of communication tools and process methodologies to assist with both planned and unplanned outages, providing additional benefits for customers into the future.

As part of its development of a PSPS implementation strategy, NorthWestern focused efforts on general stakeholder readiness to ensure all internal and external stakeholders who may be directly or indirectly impacted by a PSPS event understand, and are prepared for, a PSPS event. Within the PSPS Implementation Plan, NorthWestern Energy also developed a comprehensive PSPS communication strategy to ensure that it is communicating effectively, efficiently, transparently, and accurately for any and all PSPS events. The plan recognizes the differences of internal and external stakeholders need to be kept informed during PSPS events, the information about PSPS events that will be provided, when that information will be available during a PSPS event, and what channels of communication will be used to provide that information. Reference Appendix F or further details on the PSPS Implementation Plan and its communication strategies.

Mobile Generating Units (New) - In an effort to assist customers during emergency events, the Plan calls for the acquisition of mobile generating units to be used as temporary or back-up power while the system is being restored. These units will be placed at strategic locations as emergencies arise and may also be used to power an emergency communication center with NorthWestern representatives on site during extreme events.

Internal Training (Enhanced) - Annual enhanced training for field personnel on effectively responding and communicating with the public in wildfire situations to include stakeholder engagement efforts. These efforts will focus on system integrity and reliability; how NorthWestern is proactively and responsibly addressing wildfire risks; further collaboration with federal, state, and local government agencies (Public Safety Partners); keeping NorthWestern's customers informed; and informing employees and contractors. NorthWestern will identify ways to enhance internal fire safety training and information for employees. This will include identifying information front line employees need and providing information on NorthWestern's internal website, called iConnect.

7.3.2 – Stakeholder Engagement

Peer to Peer Relationships (Maintain) – NorthWestern will continue to seek out and maintain relationships with peer utilities with the intent of continuing the company's understanding of how its efforts are faring against its neighbors. A strong network of peer utility companies will also help keep NorthWestern aware of new and innovative technologies within the industry that can grow and enhance the existing Plan.

Public Safety Partners (Enhanced) – With designated wildfire mitigation personnel at NorthWestern, the company will make enhanced efforts to maintain ongoing relationships with Public Safety Partners across the service territory at the state, county, and local levels.

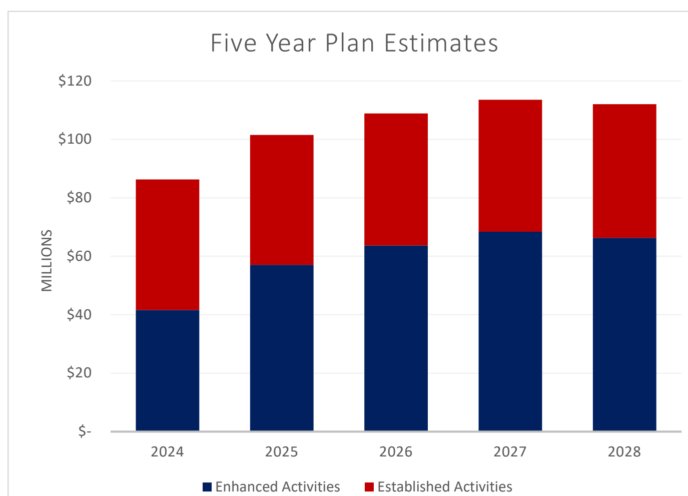
Section 8 - Conclusion

Section 8 – Conclusion

NorthWestern is well aware of the risks associated with owning and operating an electric system within wildfire-prone areas. The continually changing environment has a direct relationship with the exposure and risk faced by a utility. An increasing fire season length and rapidly growing WUI population in Montana represent two of the current shifts in the environment causing elevated risk. Recognizing these challenges, NorthWestern identified the top four objectives for this Wildfire Mitigation Plan which are reducing ignition potential, monitoring of the system and the environment, enhancing vegetation management and enhancing public communication and outreach.

In order to reduce the growing risk, NorthWestern's Wildfire Mitigation Plan focuses on items that are measurable, attainable, and provide positive impact on reducing the probability and consequence of fire ignitions. This Plan builds off of a strong foundation of standards established through a history of dedication to the safe and reliable service of customers.

As laid out in the Plan, over the next five years NorthWestern estimates over $500M of investments to be made between established and enhanced activities on the transmission and distribution systems to mitigate wildfire risk within the state of Montana. These investments will support NorthWestern's commitment to keeping customers and communities within Montana safe into the future.



Appendices

Historical Program Details

Outage Reporting and Reliability

Wildfire Risk Prioritization

Estimated Enhanced Costing Details

Estimated Established Costing Details

PSPS Implementation Plan

Appendix A – Historical Program Details

Distribution System Infrastructure Program

One program that has been foundational to NorthWestern's reliability efforts is the Distribution System Infrastructure Program (DSIP). The program spanned from 2011 through 2017. The vision was for a distribution system that is: reliable, able to grow, optimized, responsive to all customers, energy efficient, cost effective and state of the art. The objectives identified to achieve this vision were: to arrest or reverse the trend in aging infrastructure, restore margin capacity back into the system, maintain reliability over time and increase it for customers as well as position NorthWestern to adopt new technologies. In the financial summary shown below, the primary projects of the program that are applicable to wildfire mitigation are listed and their associated costs split to Capital and Expense, DSIP, and Base cost.

	DSIP	Base	Project Units Complete
Expense Projects - $64.1M			
Tree Trimming	$21,256,400	$16,610,585	12,238 Circuit Miles
Pole Inspections	$9,161,793	$4,820,341	14,174 Circuit Miles
OH Electric Repairs (P2's)	$3,936,884	$-	8553 Repairs
Rural Reliability Improvement	$5,324,441	$-	14 Circuits
Substation Upgrades	$1,321,565	$-	*111 Substations
Automation	$853,464	$-	*76 Substations *35 Base Stations
Farm Taps	$62,423	$-	*24 Farm Taps
Gas Repairs (G1's)	$756,204	$-	7,254 Repairs

Capital Projects - $296.5M			
Pole Replacement	$84,305,064	$20,964,951	32,172 Poles
Underground Cable Replacement	$80,023,261	$13,921,908	1,802,557 Trench Feet
Substation Upgrades	$21,814,271	$-	*111 Substations
Capacity Upgrades	$21,075,627	$-	27 Projects
Gas One Plan (Includes Gas Historic Block Refurbishment)	$39,357,724	$5,238,424	276 Blocks
Rural Reliability Improvement			
Automation	$9,375,685	$-	*76 Substations *35 Base Stations
Farm Taps	$442,441		*24 Farm Taps

**Combination of Capital and Expense*

While not all of this work was aimed at just the wildfire-prone areas, there was a large number of poles replaced to current standards, rural reliability improvements completed, and over 12,000 circuit miles of vegetation trimmed or removed affecting those areas. The automation platform started with DSIP and allows the Distribution Operations Center (DOC) to react quicker to needed changes in operational practices given changing environmental conditions. The DSIP work is also responsible for the initiation of the current pole inspection protocol that has become a standard yearly operation for NorthWestern, even past the completion of the DSIP. This program inspects every pole on the system, treats the poles that can be treated, and replaces those that are deemed a rejected pole. Rejected poles are essentially a pole that has reached the end of its design strength. By proactively replacing these poles, NorthWestern mitigates both outages and ignition events throughout its service territories.

Forest Management Program

This program goal is to develop a risk methodology to prioritize appropriate mitigation strategies for the approximately 20,000 distribution and 9,500 transmission spans identified within forested areas that NorthWestern operates. It was designed by Asset Management with the intent of reducing risk exposure in forested areas throughout NorthWestern's electrical system. The risk model evaluates a combination of environmental and system performance risk to calculate an overall risk exposure by segment. A risk assessment will be completed for each line segment on the transmission and distribution system that is identified as a forested area. The methodology looks like:

Overall Segment Risk=Environmental Risk+Segment Risk

Risk Category	Transmission Risk Indicator	Transmission Risk Description	Distribution Risk Indicator	Distribution Risk Description
Environmental	Number of Spans in Forested Areas	Count by Segment	Number of Spans in Forested Areas	Count by ESID
Environmental	Potential Forest Exposure	Weighted number WHP by Segment based on length of FIDs	Potential Forest Exposure	Weighted number WHP by ESID based on length of FIDs
Environmental	Fire Potential	Wildfire Hazard Potential by Segment	Fire Potential	Wildfire Hazard Potential by ESID
Environmental	Customer Impact Potential	Maximum premise count within 2 mile buffer	Customer Impact Potential	Maximum premise count within 2 mile buffer
Environmental	Single Egress	Percentage of FIDs with single egress within 0.5 miles	Single Egress	Percentage of FIDs with single egress within 0.5 miles
System	Number of Outages	3-Yr Count, includes momentary and sustained. Excludes planned and major events.	Number of Outages	3-Yr Count, excluding Catastrophic, MED and Planned
System	Line Assessment Expectations	Total count of P1s over 3-yrs	Line Patrol Expectations	Total count of P1s and P2s over 6-Yr, approximately 3 cycles
System	Pole Condition	Count of 3 and 4 rate poles	Pole Condition	Count of 3 and 4 rate poles
System	Span Length	Ave span length within Segment	Span Length	Max span length within ESID
System	Poles per Structure	Weight number based on average pole count	Number of Conductors	Weight number based on length
System	Voltage Level	Voltage	Voltage Level	Voltage
System	Distribution Underbuild	Total count of distribution attachments	Pole Equipment / Attachments	Total count of additional equipment or attachments

Although there may be several mitigation strategies, the following solutions should be used to prevent or manage fire risk potential in forested areas. The strategy implemented will depend on the segment and its associated risk.

Mitigation of Outage: Asset Replacement (System Hardening)

Utilize system hardening strategies by proactively replacing aging assets (poles, crossarms hardware, etc.). Replacements utilizing current construction framing standard that increases conductor spacing reduce the potential for conductor contacts. Assure conductor galloping concerns are addressed during segment refurbishments. Any vegetation concerns on an ESID identified for correction should be referred to the Vegetation Management department.

In order for a 3-LPP to meet replacement criteria it must also have one of the following items (does not pertain to any 4 rated poles):

- Deteriorating Cross Arm, including but not limited to:
  - ↳ sunk/leaning (steel or wood pins)
  - ↳ cracked or split wood
  - ↳ arms are racked off in the center pulling away from pole
  - ↳ burn marks
  - ↳ heavy moss
- Wood Pins
- Porcelain Equipment
- Tight clustered equipment/TX Banks (not to clearance standards, creating animal/squirrel issues)
- Span lengths greater than 325 feet

In addition to the pole replacement criteria above, the conductor size, type and condition should also be considered in determining replacement for reliability and/or asset condition risk concerns. Conductors in question include #6Cu, #8Cu as well as solid and stranded Steel (iron) wire. Both stranded and solid Steel (Iron) wire are extremely difficult to distinguish standing at ground level from #6Cu or 3-Strand #8 Copper, for example, therefore conductor size and type listed in GTViewer (especially when GTViewer indicates anything other than an ACSR conductor) should be verified with local personnel to determine its properties.

Any stranded or solid iron wire, along with #8Cu, should be automatically considered for replacement/re-conductor. Any verified #6Cu should be further investigated to determine its asset life or other factors that may drive a re-conductor. Factors to consider for replacement/re-conductor of #6 Cu:

- Spans or areas with multiple splices.
- Spans or areas where conductors are sagged noticeably unequally.
- Spans or areas where local knowledge is aware of a history of reliability issues such as conductors slapping together in the wind, spans that over the years now have multiple splices in them, spans that over the years are no longer sagged equally, conductors once having fallen to the ground that have not cleared faults quickly, etc.
- Spans of mixed conductor such as #6 Cu with #4 ACSR. The issue here is that conductors with unequal properties and characteristics will typically require more spacing between them to accommodate differences in sagging under a full range of loading conditions and differences in behavior when blown by the wind. Note that this should not be an automatic consideration for a reconductor since sufficient horizontal and/or vertical spacing can be designed into the framing to accommodate this. Replacement/reconductoring to eliminate mixed conductors should be considered where local knowledge is aware of reliability issues with the mixed conductor spans.

When reconductoring, typically #4 ACSR would be the conductor of choice, however, due to location of the ESID and potential loading factors, an upgrade to 1/0 may be required. Those factors are:

- Ampacity considerations: Current or future loading reaching 50 A, which is typically about 70 residential premises, of #4ACSR Capacity, re-conductor choice should be a minimum of 1/0.
- Location of ESID: Those areas close to the main line with potential for growth beyond the ESID in question, re-conductor choice should be a minimum of 1/0.

Other items to consider when replacing wire in an ESID:

- Pole loading: Conductors of different size will have different tensions with opposing forces on a pole. These considerations should be taken into account and the pole should have an adequate design to support those differences.
- Fuse coordination: Collaborate with the coordination group to understand effects of different conductor sizes on the holistic coordination scheme for the circuit.
- Planning considerations: If both upstream and downstream segments are a larger than #4 ACSR conductor, it warrants a review to see if the segment being addressed should be reconductored for capacity reasons. Also consider loop feed possibilities to other sources in the downstream analysis when assessing conductor sizing. Consult the Distribution Planning group for input on conductor sizing if any of these considerations apply.

Depending on main outage contributor for selected ESID, the following are recommendations of potential mitigations. All expense items should be identified but will be handled under a separate program.

- Conductor spacing with consideration to wind loading – increase horizontal distance between phase and neutral by replacing 3-LPP with current framing standards and check for sagging issues. Re-sag, reconductor or additional mid span pole insertion may be required. Even though this is for fire mitigation, snow bracket installation should be considered at time of construction.
- Lightning – See Risk Prevention
- Animals – replace 3-LPP or 4 rated poles with current framing standards and/or install animal protection specific to species (raptor, squirrel, etc.) for ESID's that would require at least $25,000 of mitigation. Identify any non-standard framing that would require additional animal protection.
- Equipment – replace obsolete equipment, such as porcelain, or equipment with visible deterioration that would cause an outage on 3-LPP or 4 rated poles.

Proactively Manage Risk: New Technology Systems, Updates to Existing Systems

The following technology strategies can be implemented to reduce forest management risks.

Recloser Strategy

For ESID's targeted under this program protected by an electronic or hydraulic recloser, evaluate the recloser supplying this ESID for replacement or upgrades as follows:

1. If the device is currently a hydraulic recloser and communications is not possible at the existing location, replace with a new hydraulic recloser if the trip parameters can be adjusted to reduce fault clearing time or if the existing fault current interrupting rating is exceeded.
2. If the device is currently a hydraulic recloser and communications is possible at the existing location, replace with an electronic recloser with the ArcSense firmware activated and communications installed. The ArcSense feature can only be used at recloser locations where the minimum loading is greater than 50 Amps of load. The ArcSense feature deactivates and has to re-tune the algorithm when loading drops below 50 Amps.
3. If the device is currently an electronic recloser with communications at the existing location, upgrade the relay firmware to activate the ArcSense firmware if minimum loading through the recloser is greater than 50 Amps.

ELF Fuse Strategy

1. For ESID's targeted under this program with fused taps being supplied from the targeted ESID, deploy ELF tap fuses using the following guidelines:
2. ELF fuses only provide a benefit when fault current levels are 800 Amps or greater due to the ELF fuses' reduced fault clearing energy in this fault current region.
3. ELF fuses are not recommended at less than 800 Amps of fault current because the fault clearing energy is similar to standard K fuses and ELF fuses do not coordinate well in series with downstream devices (including other ELF fuses).ELF fuses are only rated for 3 phase 12.47 kV applications that fit our existing standard 110 kV BIL cut-outs for the following ELF fuse sizes and voltage rating: 6 Amp, 8 Amp, 12 Amp, 18 Amp, and 20 Amp ELF fuses at the 15 kV ELF fuse voltage rating.
   - ↳ ELF fuses rated at 15 kV and 25 Amps or larger will NOT fit our standard 110 kV BIL cut-outs.
   - ↳ ELF fuses 25 Amps or larger that fit our 110 kV BIL cut-outs are only rated at 8.3 kV and can only be installed on single phase installations.
4. In general, ELF fuses do not coordinate when placed in series. They should be limited to deployment on short taps and service transformer installations to reduce the impact of this mis-coordination.
5. Because of the aforementioned application limitations of the ELF style fuse, only 8 Amp ELF and 20 Amp ELF fuses will be stocked in inventory and used in the field on small taps.

Fault Indicator Strategy

For ESID's targeted under this program that have save fuses and main-line solid doors located downstream of reclosers planned to be seasonally used in the non-reclose state, install fault indictors using the following guidelines:

1. Install fault indicators immediately after any save fuse or main-line solid door locations that are downstream of any reclosers that are planned to be seasonally used in the non-reclose state.

Important to note these fuses will require the replacement of any downstream fuse locations to a current limiting fuse for coordination to be maintained. (Refer to supplemental document)

Other Additional Technology

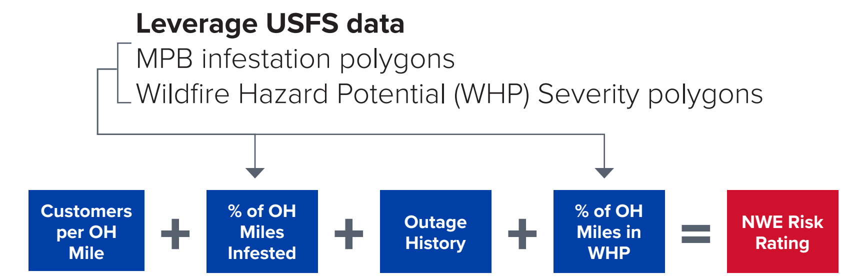
1. ABB Surge Arrestor with SPU (Spark Prevention Unit). A surge arrestor designed to be used in place of a traditional arrestor although with an added component designed to limit sparks produced when clearing an over-voltage situation.
2. Osmose, FireSheath or other pole wrap materials can be used with ESIDs identified as critical use. The use of these could limit the amount of damage seen in a fire, resulting in faster times to restoration.
3. During pole replacement, put consideration into the use of composite structures in ESIDs identified as critical use to limit the amount of damage seen in a fire, resulting in faster times to restoration.
4. Underground – considerations made to the potential B/C of burying certain ESID's in high fire threat areas.

Hazard Tree Program

A major part of NorthWestern's power line maintenance comes in the form of vegetation management within ROWs. These ROWs are typically 10-40 ft. for distribution lines and 40-100 ft. wide for transmission lines. The threat addressed by the Hazard Tree Program are the hazard trees which lay outside of the ROWs. The American National Standards Institution (ANSI) standard A300 defines a danger tree as any tree on or off of the ROW that could contact an electrical supply line when it fails. A hazard tree is defined as a structurally unsound danger tree.

The Mountain Pine Beetle (MPB) infestation has increased tree mortality rate in and around NorthWestern's ROWs. These leaves the overhead lines in these affected areas at a hirer risk for fall-ins and thereby possible fire ignitions. The goal of the Hazard Tree Program is to mitigate risk, enhance safety and improve reliability of T&D electric infrastructure by proactively addressing hazard trees.

Because of the immense size of the beetle infestation, the volume of hazard trees located near NorthWestern's ROWs have increased over 100 fold. Ten years prior to the infestation, NorthWestern might have cleared 30 hazard trees per 10 line miles and now can clear nearly 3,000 hazard trees per 10 line miles. This increase in hazard trees poses dangers to NorthWestern's customers, first responders and forests. Fall-ins are one of the driving sources of outages in the forested areas of the system. It is essential for NorthWestern to maintain reliable power to its customers in the harsh weather seasons that are common in Montana. If a fall-in tree remains in contact with a line after falling, it can energize the surrounding earth and possibly become an ignition source for a wildfire. These consequences are threatening to people working on public lands, people recreating on public lands, and first responders.



Prioritization of lines was completed based on available data such as customer density, vegetation related outages, mountain pine beetle severity index, WHP index, area access, land permitting, resource efficiency and so forth. The above image describes the general approach and where the MPB severity plays a role in increasing an areas risk. Certified utility arborists known as Vegetation Coordinators within NorthWestern, are tasked with working with inspecting trees and working with landowners for access and permitting. They work ahead of crews, identifying hazard trees and coordinating crews to remove them. Below is shown the historical costing information for the program since 2018.

	Program	2018A	2019A	2020A	2021A	2022A	2023A
Transmission	MT Veg Mgmt-ET Proactive	$878,398	$698,460	$482,094	$598,932	$818,679	$1,220,704
Transmission	MT Veg Mgmt-ET Hotspot	$269,795	$860,770	$492,162	$519,338	$905,533	$1,003,508
Transmission	MT Veg Mgmt-ET Hazard	$794,096	$1,674,342	$1,039,205	$1,798,426	$650,864	$108,800
Distribution	MT Veg Mgmt-ED Proactive	$1,896,099	$2,733,840	$3,145,282	$3,828,850	$2,614,987	$3,973,575
Distribution	MT Veg Mgmt-ED Hotspot	$414,299	$739,025	$597,502	$173,554	$2,164,707	$516,863
Distribution	MT Veg Mgmt-ED Hazard	$2,467,039	$5,801,071	$2,991,351	$2,135,949	$2,786,538	$3,166,346

Section Reliability

The purpose of this program is to take a targeted approach to improve reliability on the electric distribution system. Each section of line between protective devices is assigned an Electric Section Identifier (ESID) and connected to outage data. Several outage metrics are used to prioritize sections with chronic reliability issues. This approach provides and a strategy to mitigate sections on circuits that may not meet the criteria for a traditional circuit-wide reliability program.

The program began in Q3 of 2020 with the goal of quantitatively measuring SAIDI reduction at a cost of $1M/SAIDI minute or less through a prioritized and targeted approach by sections of circuit. Firstly, sections that qualify for the targeted process are identified and evaluated. Detailed review of the selected sections is completed to identify the appropriate remediation solutions based on the known outage data. Costs are estimated outage remediation on the section to identify if it qualifies or exceeds the program goal. Work is then reviewed across relevant stakeholders to confirm that other remediation efforts have not already been made and work is not already planned under another program for the same section.

Reliability Data Details

Catastrophic and Major Event Days are excluded from the analysis as these outages occur when the system is under stresses beyond that of normal operating conditions. Planned outages are excluded from the analysis as well as vegetation-caused outages as these are covered under a different program. The intent of this program is to identify outages caused by Distribution components and therefore Generation, Substation and Transmission-caused outages are not included in the analysis.

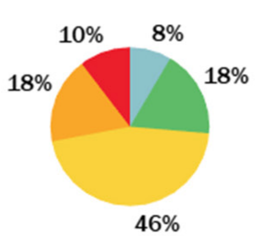
A factor increasing the weight of more recent metrics based on outage year is then applied (i.e. for 2021 program the 2020 data is multiplied by 2.0, 2019 data is multiplied by 1.5, etc.):

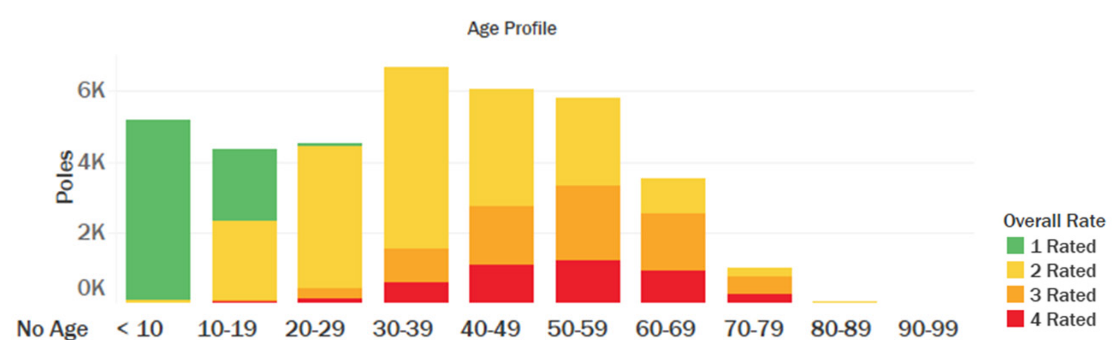
- 1 year prior: 2.0
- 2 years prior: 1.5
- 3 years prior: 1.2
- 4 years prior: 1.1
- 5 years prior: 1.0

This weight factor is used with Circuit SAIDI (Customer Minutes Interrupted (CMI)/Number of Customers on Circuit) and Outage Count. Circuit SAIDI is based on circuit customer count and is therefore used instead of System SAIDI to normalize circuits that may not have very many customers but are still experiencing extended outages. Sections that have both a Weighted Circuit SAIDI greater than or equal to 250 minutes and a Weighted Outage Count greater than or equal to 10 are selected for a detailed evaluation.

Pole Replacement Criteria

As of 2022, pole rejection rates have increased year over year for the last three years. While the average age of the rated 3 poles was 47 years old, the inspection data at the inception of the program shows there is a bubble of 3 rated Lodge Pole Pines (3-LPP) in the 50-60-year-old range, as shown below. Replacing the 3-LPP will proactively manage the volume of 3-LPP approaching the rejection criteria while targeting reliability improvements.





In order for a 3-LPP to meet replacement criteria it must also have one of the following items:

- Deteriorating Cross Arm, including but not limited to:
  - ↳ Sunk/leaning (steel or wood pins)
  - ↳ Cracked or split wood
  - ↳ Arms are racked off in the center or pulling away from pole
  - ↳ Burn marks
  - ↳ Heavy moss

- Wood Pins
- Porcelain Equipment
- Tight clustered equipment/Tx Banks (not to clearance standards, creating animal/squirrel issues)
- Span lengths greater than 325'

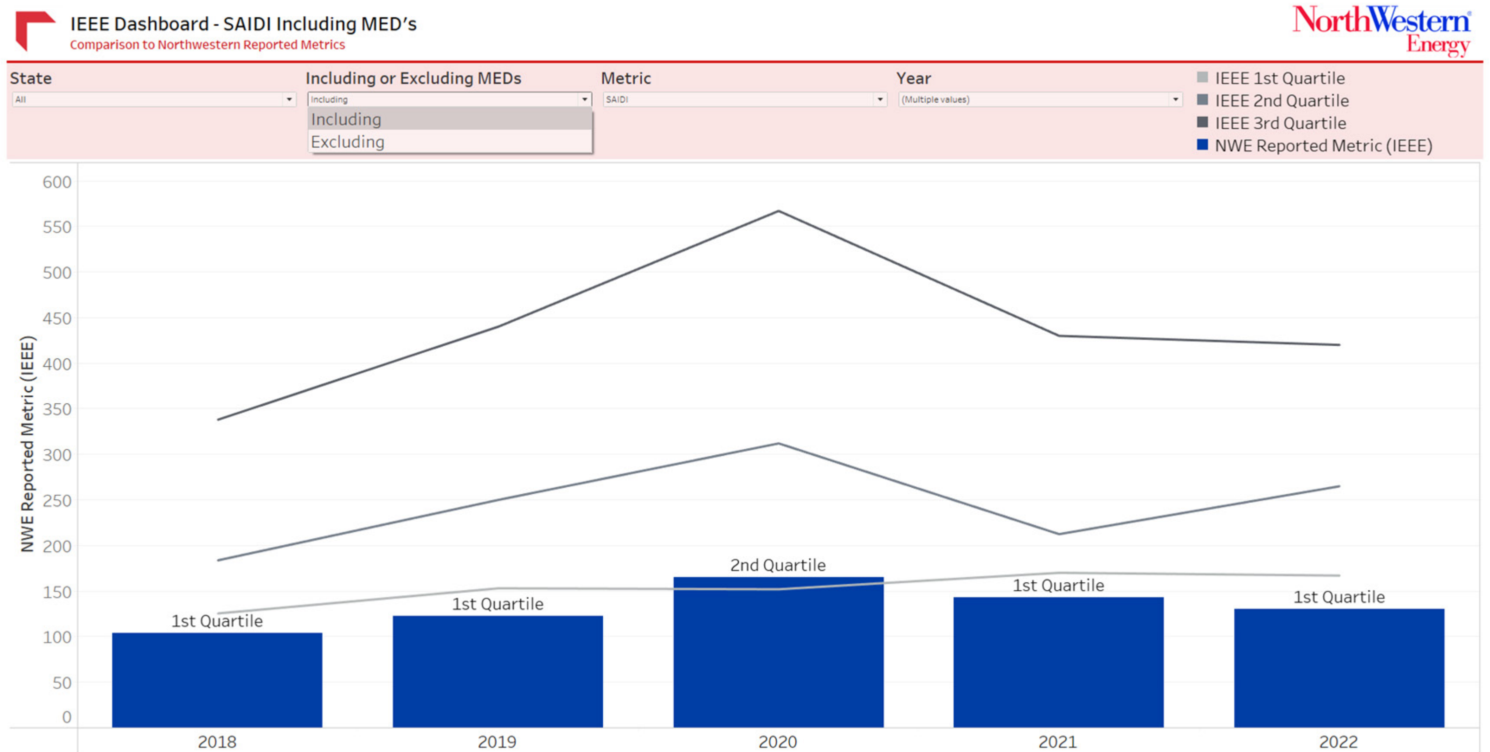
Outage Remediation Solutions

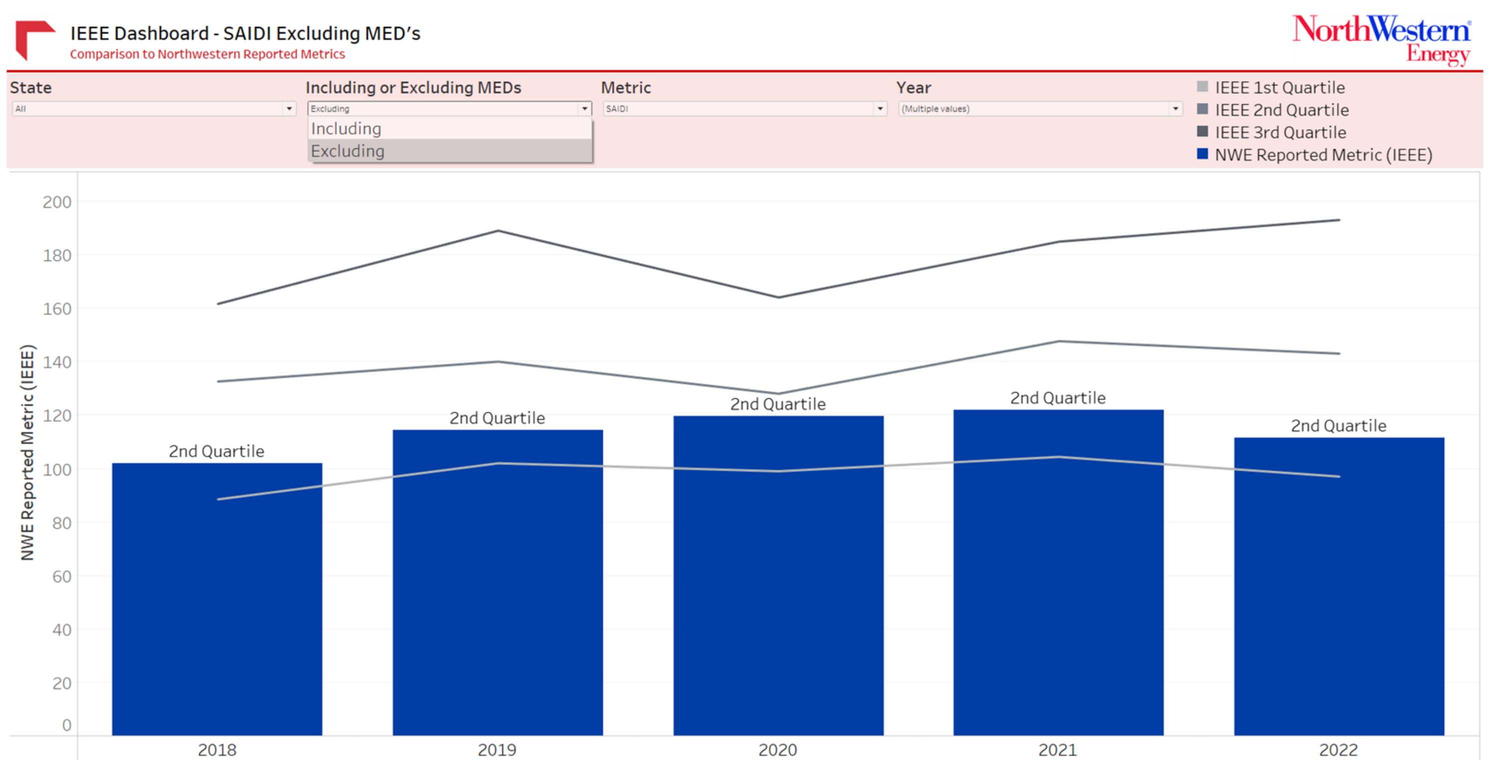
Depending on main outage contributor for selected section, the following are recommendations of potential mitigations. All expense items should be identified but will be handled under a separate program.

- Conductor Spacing, including Wind and Snow/Ice Loading- increase horizontal distance between phase and neutral by replacing 3-LPP with current framing standards and check for sagging issues. Re-sag, reconductor or additional mid span poles may be required. If snow issues, install snow brackets.
- Lightning- add arrestors to replaced 3-LPP.
- Animals- replace 3-LPP with current framing standards and/or install animal protection specific to species (raptor, squirrel, etc.) for sections that would require at least $25,000 of mitigation. Identify any non-standard framing that would require additional animal protection.
- Equipment- replace obsolete equipment, such as porcelain, or equipment with visible deterioration that would cause an outage.
- Underground- refer to underground programs.

Appendix B – Outage Reporting and Reliability

NorthWestern's Montana electric distribution customers have seen consistent reliability in recent years. Annual benchmarking with IEEE (Institute of Electrical and Electronics Engineers) and EEI (Edison Electric Institute) ranks NorthWestern steadily in the 1st-2nd Quartiles including Major Event Days and 2nd-3rd Quartiles excluding Major Event Days. These benchmarks include peer utilities nationwide. NorthWestern's Montana customers have seen large storms in recent years where the system experiences devastating stresses beyond those normally expected. These events are deemed as catastrophic. These events, which include the mid-January windstorm in central Montana in 2021 and the major snowstorm in the Hi-Line region in October of 2017, are reported and analyzed separately.





Outages most often reported in fire season range from tree limbs brushing into lines to equipment failures to animal contacts. NorthWestern strives to provide reliable electric service to its customers. As a result of the reliable system that NorthWestern operates, one of the largest contributors to outages is due to scheduled maintenance and construction on the distribution system. These shorter planned outages help prevent longer reactive outages from occurring. Transmission and supply also cause a significant percentage of outages, from NorthWestern transmission lines to lines fed into the system from other utilities in the region. Areas with more customers and therefore more assets on the system, such as Billings, Bozeman, Missoula and Great Falls, tend to experience more outages or shorter durations. Rural areas with many miles of line are also subject to fewer but often longer outages due to the difficulty of access and remote locations. Montana is a large territory with varying geography, climate and rural-urban interfaces. It is impossible to prevent all outages from occurring, but with better data available and innovative new programs, NorthWestern has worked to reduce interruptions to customers. Additional information on Montana distribution reliability is in NorthWestern's annual reliability report filed with the Montana Public Service Commission.

From a transmission perspective, the majority of system operations do not result in a distribution customer outage. Nearly one-third of outages experienced on the NorthWestern Transmission system are momentary 'blinks.' These are often caused by weather or unknown sources. Of the remaining outages, three-quarters are due to maintenance. When maintenance takes a line out of service, customer service continues through other methods, whether it be a different transmission line or portable substations. Weather is the largest cause of unplanned outages on the transmission system followed by unknown causes and hardware. As with the distribution system, rural areas with many miles of line are often the locations of these unknown outages due to the difficulty of access and remote locations.

Appendix C – Wildfire Risk Prioritization

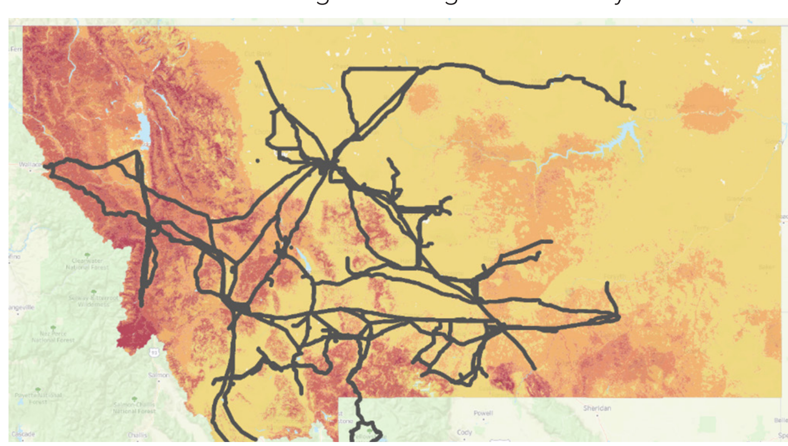
Static Risk Model Inputs

The following data was used for distribution to develop the scoring for the 2022 static risk model:

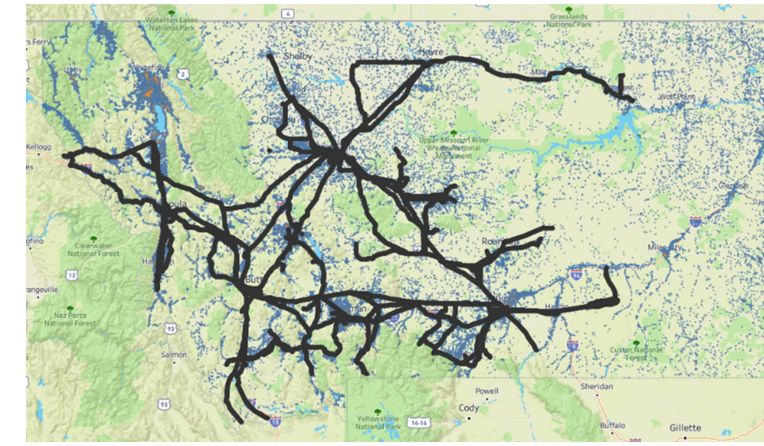
	Risk Category	Calculation	10 Score Description (D/T)
System Performance Risk (Probability)	Outages	Weight count - 5 yrs	18+/64.8+ outages
	Exceptions	Count of exceptions - 6 yrs (D), 3 yrs (T)	12+/34.7+ exceptions
	Pole rate	Count of 3- and 4-rate poles	32+/486+ poles
	Span length	Maximum OH (D), Average OH (T)	627.6'+/828.6'+ span
	Number of phases (D)	Weighted num phase by OH length	All conductor is 3-phase
	Poles per structure (T)	Average num poles per structrue	2.5+ poles/structure
	Voltage	System voltage	4.16kV/50kV
	Pole attachments	Apparatus Count + Circuit Count	51+/504.6+ attachments
Environmental Risk (Consequence)	Wildfire Hazard Potential (WHP)	Weighted WHP by length	4+/3.482+ WHP
	Housing density	Weighted housing density by FID count	520+/3327+ structures within 1 sq km

Additional Information

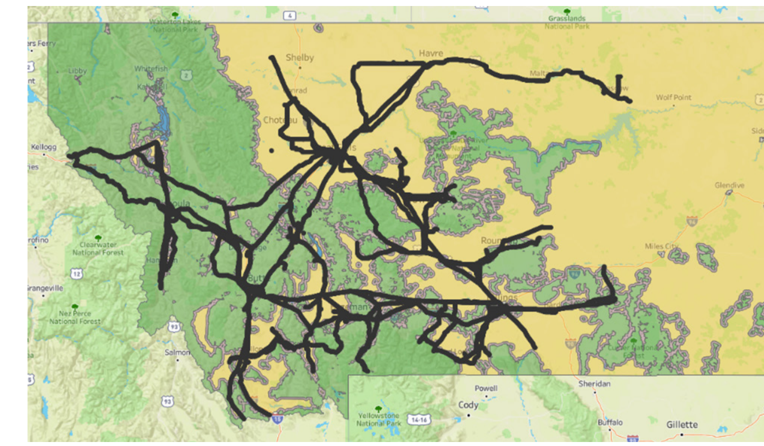
- Wildfire Hazard Potential (WHP) - Index that quantities the relative potential for wildfire that may be difficult to control developed by USDA FS. Additional Information can be found: https://wildfirerisk.org/download.
  - ↳ On its own, WHP is not an explicit map of wildfire threat or risk, but when paired with spatial data depicting highly valued resources and assets such as structures or powerlines, it can approximate relative wildfire risk to those specific resources and assets. WHP is also not a forecast or wildfire outlook for any particular season, as it does not include any information on current or forecasted weather or fuel moisture conditions. It is instead intended for long-term strategic fuels management. The figure to the right shows the overlay of the WHP and NorthWestern's transmission system.
  - ↳ An index developed by the Forest Service to inform prioritization of fuel treatment needs at a national scale.
  - ↳ Integrates wildfire likelihood and intensity with additional factors including historic ignition density of small fires and the relative resistance to control posed by wildfire in different fuel types.
  - ↳ Uses BP and FLP rasters as input. Other input data included the Existing Vegetation type and Fire Behavior Fuel Model rasters from LANDFIRE 2017, as well as the most recent national Fire Occurrence Database.
  - ↳ Includes the following risk indices: Conditional Flame Length, Flame Length Exceedance Probability (4 and 8 ft), Exposure Type, Risk to Potential Structures, Conditional Risk to Potential Structures, Burn Probability.



- Housing Density- Used Montana Spatial Data Infrastructure (MSDI) data set. Spatial analysis performed to determine number of structures within a determined distance from facility.
  - ↳ This information is used for scoring and to develop WUI areas. A WUI at NorthWestern is an internally derived model using the standard WUI definition of: Interface: > 6 premises within 1 sq km buffer within 2.4 km buffer of forested.
  - ↳ The figure to the right depicts areas with > 6 premise within 1 sq km.



- Mitigation Class- Based on DNRC data, location classifications were used to determine forested and non-forested areas.
  - ↳ This information is used to understand the appropriate type of mitigation based on location and to develop the WUI area using the definition above.
  - ↳ The figure to the right depicts forest buffer areas that are within 2.4 km buffer of forest.



Scoring Methodology

For each input, sections were scored based on a statistical analysis where each item was box plotted and banded for percentiles. These bands are described below. Each item was then weighted to derive a weighted score. From there, the system performance score and the environmental score were added together to develop a total weighted score by ESID or split segment.

Box Plot Value	Score
(99th %+1)+	10
(95th %+1) – 99th %	8
(85th %+1) – 95th %	6
(75th %+1) – 85th %	4
(50th %+1) – 75th %	2
(25th %+1) – 50th %	1
0 – 25th %	0

Appendix D – Estimated Enhanced Costing Details

				Actuals		Budgeted	
				2023		2024	
Category	**Capital**	**Expense**	**Grand Total**	**Capital**	**Expense**	**Capital**	**Expense**
Administrative		**$13,998,896**	**$13,998,896**		**$519,091**		**$2,695,961**
Salaries		$12,697,821	$12,697,821		$487,016		$2,442,161
Travel		$496,363	$496,363		$22,363		$94,800
Education		$346,204	$346,204		$3,704		$68,500
Other		$95,142	$95,142		$2,642		$18,500
Fleet		$363,366	$363,366		$3,366		$72,000
Situation Awareness		**$5,982,471**	**$5,982,471**		**$68,471**		**$1,254,000**
Predictive Services		**$5,982,471**	**$5,982,471**		**$68,471**		**$1,254,000**
GIS/ESRI		$502,471	$502,471		$68,471		$254,000
Predictive Fire Modeling/Mapping		$4,000,000	$4,000,000				$1,000,000
Remote Sensing Technology		$1,480,000	$1,480,000				$-
Operational Practices		**$1,252,098**	**$1,252,098**				**$252,098**
Assessment and Repair		**$1,252,098**	**$1,252,098**				**$252,098**
Line Operations Followup		$1,252,098	$1,252,098				$252,098
System Preparedness	**$189,248,249**	**$34,275,820**	**$223,524,069**		**$403,675**	**$24,500,295**	**$6,597,205**
Inventory and Lidar		**$1,171,853**	**$1,171,853**				
Inventory		$1,171,853	$1,171,853				
Distribution Assessment & Repair		**$14,326,768**	**$14,326,768**		**$201,838**		**$3,041,864**
Assessment (Aerial/Ground)		$9,104,435	$9,104,435				$2,000,435
Repair		$3,312,657	$3,312,657				$550,000
Activities over Base		$1,909,676	$1,909,676		$201,838		$491,429
Transmission Assessment & Repair		**$17,577,199**	**$17,577,199**		**$201,838**		**$3,555,342**
Assessment (Ground)		$2,705,180	$2,705,180				$299,936
Repairs & Rejected Components		$9,823,957	$9,823,957				$1,450,977
Lidar		$3,138,386	$3,138,386				$1,313,000
Activities over Base		$1,909,676	$1,909,676		$201,838		$491,429
Construction	**$189,248,249**	**$1,200,000**	**$190,448,249**			**$24,500,295**	
Dist Wildfire Mitigation	$49,000,000		$49,000,000			$9,800,000	
Trans Wildfire Mitigation	$51,000,000		$51,000,000			$10,200,000	
Sub WM - Electronic Breakers	$40,750,295		$40,750,295			$4,000,295	
Sub WM - Communications	$20,500,000	$1,200,000	$21,700,000			$500,000	
Sub WM - ART	$2,500,000	$-	$2,500,000				
Cutout Refurbishment Program	$5,500,000	$-	$5,500,000				
Section Refurbishment	$13,500,000	$-	$13,500,000				
Repeater Resiliency Zone	$6,497,954	$-	$6,497,954				
Vegetation Management		**$49,384,599**	**$49,384,599**		**$920,469**		**$5,819,198**
Assessment and Repair		**$38,578,349**	**$38,578,349**		**$920,469**		**$5,819,198**
Customer Call Hotspot							
Ground Assessment and Hotspot		$5,278,414	$5,278,414				$925,000
Proactive Maintenance		$22,280,988	$22,280,988				$4,099,316
Right Tree, Right Place		$106,250	$106,250				
Risk Tree							
Remote Sensing and Analysis		$7,007,818	$7,007,818				$350,000
Aerial Assessment Hotspot		$760,000	$760,000				
Activities over Base		$3,144,879	$3,144,879		$920,469		$444,882
Asset Protection		**$10,806,250**	**$10,806,250**				
Fuel Reduction Partnerships		$1,900,000	$1,900,000				
ROW Clear Fall Zone		$8,906,250	$8,906,250				
Communication and Outreach	**$1,800,000**	**$712,000**	**$2,512,000**				**$512,000**
Training and Public Response	**$1,800,000**	**$712,000**	**$2,512,000**				**$512,000**
Internal Fire Safety Training	$-	$712,000	$712,000				$512,000
Mobile Units	$1,800,000		$1,800,000				$-
Grand Total	**$191,048,249**	**$105,605,884**	**$296,654,133**		**$1,911,706**	**$24,500,295**	**$17,130,462**

	Future Year Estimates							
	2025		2026		2027		2028	
Category	**Capital**	**Expense**	**Capital**	**Expense**	**Capital**	**Expense**	**Capital**	**Expense**
Administrative		**$2,695,961**		**$2,695,961**		**$2,695,961**		**$2,695,961**
Salaries		$2,442,161		$2,442,161		$2,442,161		$2,442,161
Travel		$94,800		$94,800		$94,800		$94,800
Education		$68,500		$68,500		$68,500		$68,500
Other		$18,500		$18,500		$18,500		$18,500
Fleet		$72,000		$72,000		$72,000		$72,000
Situation Awareness		**$1,680,000**		**$1,000,000**		**$980,000**		**$1,000,000**
Predictive Services		**$1,680,000**		**$1,000,000**		**$980,000**		**$1,000,000**
GIS/ESRI		$180,000						
Predictive Fire Modeling/Mapping		$750,000		$750,000		$750,000		$750,000
Remote Sensing Technology		$750,000		$250,000		$230,000		$250,000
Operational Practices		**$312,500**		**$312,500**		**$250,000**		**$125,000**
Assessment and Repair		**$312,500**		**$312,500**		**$250,000**		**$125,000**
Line Operations Followup		$312,500		$312,500		$250,000		$125,000
System Preparedness	**$39,700,000**	**$8,635,962**	**$43,037,500**	**$6,517,613**	**$43,687,500**	**$6,078,168**	**$38,322,954**	**$6,043,197**
Inventory and Lidar		**$732,408**		**$439,445**				
Inventory		$732,408		$439,445				
Distribution Assessment & Repair		**$2,779,509**		**$2,779,509**		**$2,779,509**		**$2,744,538**
Assessment (Aerial/Ground)		$1,776,000		$1,776,000		$1,776,000		$1,776,000
Repair		$699,407		$699,407		$699,407		$664,436
Activities over Base		$304,102		$304,102		$304,102		$304,102
Transmission Assessment & Repair		**$4,824,044**		**$2,998,658**		**$2,998,658**		**$2,998,658**
Assessment (Ground)		$601,311		$601,311		$601,311		$601,311
Repairs & Rejected Components		$2,093,245		$2,093,245		$2,093,245		$2,093,245
Lidar		$1,825,386						
Activities over Base		$304,102		$304,102		$304,102		$304,102
Construction	**$39,700,000**	**$300,000**	**$43,037,500**	**$300,000**	**$43,687,500**	**$300,000**	**$38,322,954**	**$300,000**
Dist Wildfire Mitigation	$9,800,000		$9,800,000		$9,800,000		$9,800,000	
Trans Wildfire Mitigation	$10,200,000		$10,200,000		$10,200,000		$10,200,000	
Sub WM - Electronic Breakers	$10,000,000		$10,150,000		$10,800,000		$5,800,000	
Sub WM - Communications	$5,000,000	$300,000	$5,000,000	$300,000	$5,000,000	$300,000	$5,000,000	$300,000
Sub WM - ART	$500,000		$750,000		$750,000		$500,000	
Cutout Refurbishment Program	$1,200,000		$1,200,000		$1,200,000		$1,900,000	
Section Refurbishment	$3,000,000		$3,750,000		$3,750,000		$3,000,000	
Repeater Resiliency Zone			$2,187,500		$2,187,500		$2,122,954	
Vegetation Management		**$10,398,441**		**$11,075,747**		**$11,081,997**		**$10,088,747**
Assessment and Repair		**$7,554,691**		**$8,231,997**		**$8,238,247**		**$7,813,747**
Customer Call Hotspot								
Ground Assessment and Hotspot		$1,064,168		$1,112,539		$1,112,539		$1,064,168
Proactive Maintenance		$4,381,126		$4,600,182		$4,600,182		$4,600,182
Right Tree, Right Place		$25,000		$25,000		$31,250		$25,000
Risk Tree								
Remote Sensing and Analysis		$1,479,515		$1,849,394		$1,849,394		$1,479,515
Aerial Assessment Hotspot		$160,000		$200,000		$200,000		$200,000
Activities over Base		$444,882		$444,882		$444,882		$444,882
Asset Protection		**$2,843,750**		**$2,843,750**		**$2,843,750**		**$2,275,000**
Fuel Reduction Partnerships		$500,000		$500,000		$500,000		$400,000
ROW Clear Fall Zone		$2,343,750		$2,343,750		$2,343,750		$1,875,000
Communication and Outreach	**$200,000**	**$50,000**	**$1,600,000**	**$50,000**		**$50,000**		**$50,000**
Training and Public Response	**$200,000**	**$50,000**	**$1,600,000**	**$50,000**		**$50,000**		**$50,000**
Internal Fire Safety Training		$50,000		$50,000		$50,000		$50,000
Mobile Units	$200,000		$1,600,000					
Grand Total	**$39,900,000**	**$23,772,864**	**$44,637,500**	**$21,651,821**	**$43,687,500**	**$21,136,126**	**$38,322,954**	**$20,002,905**

Appendix E – Estimated Established Costing Details

NorthWestern Energy Established Wildfire Plan

	Future Year Estimates				
	2024	2025	2026	2027	2028
System Preparedness	**$34,715,640**	**$34,541,900**	**$35,294,450**	**$35,226,930**	**$35,811,963**
Transmission Pole Replacements	$5,000,000	$5,155,828	$5,155,828	$5,155,828	$5,249,325
Distribution Pole Replacements	$10,380,160	$9,614,588	$10,148,732	$10,188,049	$10,682,875
Section Reliability	$1,951,427	$2,689,575	$2,687,603	$2,549,131	$2,577,914
Transmission Forest Management	$6,178,969	$6,186,993	$6,186,993	$6,186,993	$6,186,993
Distribution Forest Management	$6,048,572	$6,048,573	$6,042,498	$6,042,517	$6,010,493
MT Patrol/Inspect Activities	$690,368	$680,370	$680,370	$680,370	$680,370
MT Proactive Activities	$2,448,956	$1,978,955	$1,978,955	$1,978,955	$1,978,955
MT Inspection and Maint	$575,000	$575,000	$575,000	$575,000	$575,000
Distribution Test and Treat	$961,459	$1,077,874	$1,090,670	$1,122,286	$1,122,236
Transmission Test and Treat	$480,729	$534,144	$747,801	$747,801	$747,801
Vegetation Management	**$9,941,308**	**$9,941,308**	**$9,941,308**	**$9,941,308**	**$9,941,308**
MT Veg Mgmt-ET Proactive	$818,679	$818,679	$818,679	$818,679	$818,679
MT Veg Mgmt-ET Hotspot	$905,533	$905,533	$905,533	$905,533	$905,533
MT Veg Mgmt-ET Hazard	$650,864	$650,864	$650,864	$650,864	$650,864
MT Veg Mgmt-ED Proactive	$2,614,987	$2,614,987	$2,614,987	$2,614,987	$2,614,987
MT Veg Mgmt-ED Hotspot	$2,164,707	$2,164,707	$2,164,707	$2,164,707	$2,164,707
MT Veg Mgmt-ED Hazard	$2,786,538	$2,786,538	$2,786,538	$2,786,538	$2,786,538
Estimated Totals	**$44,656,948**	**$44,483,208**	**$45,235,758**	**$45,168,238**	**$45,753,271**

Appendix F – Public Safety Power Shutoff Implementation Plan

The following pages should be treated as a standalone document. All text and imagery originate directly from the Public Safety Power Shutoff Implementation Plan as last revised in April of 2024.

1 Revision History

Review Date	Revision	Revisions
April 2024	1.0	Original version

2 Acronyms

AAR — After Action Review

ADMS — Advanced Distribution Management System

AM — Asset Management

CC — Customer Care

CSR — Customer Service Representative

CRI — Composite Risk Index

DOC — Distribution Operations Control

ETR — Estimated Time of Restoration

NCC — NorthWestern Control Center (Grid Operations)

IC — Incident Command

IVR — Interactive Voice Response

MPSC — Montana Public Service Commission

NOAA — National Oceanic and Atmospheric Administration

NWE — NorthWestern Energy

NWS — National Weather Service

PSPS — Public Safety Power Shutoff

SA — Situational Awareness

SME — Subject Matter Expert

SFDI — Severe Fire Danger Index

WFRI — Wildfire Risk Index

WMP — Wildfire Mitigation Plan

3 Public Safety Power Shutoff Introduction

3.1 Overview

As part of its continued commitment to delivering safe and reliable energy to meet the needs of customers and communities, NorthWestern Corporation d/b/a NorthWestern Energy (NorthWestern Energy or NWE) developed a Wildfire Mitigation Plan (WMP). The fundamental goal of the WMP is to reduce overall wildfire risk associated with the company's electric transmission and distribution systems through targeted programs that increase system resiliency. Due to the operation of electrical infrastructure, amid increasingly difficult environmental circumstances and a growing population living in wildfire-prone areas, many utilities, including NorthWestern, have begun looking for new tools and techniques that go beyond historical best practices and traditional protective devices to help manage this risk. One increasingly common method for mitigating these risks is to implement power outages known as Public Safety Power Shutoff (PSPS) events. These outages involve de-energizing electrical infrastructure in specific areas, during periods of time where the risks of continuing to operate electrical infrastructure are unacceptably high.[4] The feasibility of this approach has increased in recent years due to improvements in the accuracy and granularity of environmental models and data as well as the flexibility of modern electrical infrastructure. Recognizing the value of this strategy and the increasingly challenging environmental conditions its system faces, NorthWestern elected to develop its own procedures for implementing PSPS events as a tool for addressing environmental conditions that threaten the health and safety of communities, customers, and other stakeholders. This document, the PSPS Implementation Plan (the Plan), describes NorthWestern Energy's strategy for conducting such PSPS events.

3.2 Background

One of NorthWestern Energy's first steps in developing its PSPS implementation strategy was to understand the strategies employed by other utilities who face similarly challenging environmental conditions. This review provided a detailed understanding of industry practices and, in doing so, also highlighted the significant value provided by NorthWestern Energy's long-standing commitment to safe and reliable service. For example, NorthWestern Energy's system infrastructure and wildfire risk programs (which formally began in 2011),[5] continue to support investments in equipment and vegetation management practices – drastically increasing the reliability, resiliency, and flexibility of NorthWestern Energy's electrical systems. These deliberate investments have provided NorthWestern Energy with a strategic head start in addressing the present-day wildfire risks facing many utilities. Furthermore, the review of utility industry practices also clearly demonstrated the distinct nature of NorthWestern Energy's operating area, stakeholders, and customer-base. In comparison to many of its peer utilities, NorthWestern Energy serves a relatively small number of customers across a geographically-diverse and large service territory – presenting NorthWestern with a number of challenges not faced to the same degree by many of its peer utilities. Examples of such challenges include: the need to monitor and maintain an expansive electrical system, the corresponding diversity of environmental conditions facing the system, and a well-known customer dependency on private water systems and wells. However, NorthWestern Energy's unique operating environment has also provided the utility with opportunities including the ability to cultivate meaningful connections within the communities it serves and operates. These connections, allow NorthWestern to more effectively consider and address the needs, of its customers and stakeholders – a particularly useful asset during critical periods such as the implementation of PSPS events. In short, this review of peer utility PSPS strategies (and the resulting observations) ultimately reinforced NorthWestern's decision to develop its own approach and highlighted many opportunities to tailor the strategy to its distinct operating area, stakeholders, and customer-base.

In the course of its review of existing strategies and approaches, NorthWestern also recognized that robust PSPS implementation strategies include a comprehensive approach for monitoring and responding to environmental conditions. As such, in the development of its WMP, NorthWestern established a Situational Awareness Team tasked with quantifying environmental risks. The insights and techniques developed by this team provide NorthWestern with the opportunity to develop and refine its approach for measuring and reacting to environmental risks – a key component of a PSPS implementation strategy.

4 PSPS events are inclusive of periods of time before, during, and after the de-energization of electrical equipment. In other words, the terminology "PSPS event" does not solely refer to the duration of the outage. NorthWestern Energy's approach to PSPS events will be covered in greater detail in Section 3.

5 Additional detail regarding NorthWestern Energy's historical investments related to system performance and wildfire risk reduction can be found in its Wildfire Mitigation Plan.

Alongside the development of its situational awareness strategy, NorthWestern also conducted an internal review of its pre-existing plans, policies, procedures, and strategies meant for managing emergent events similar to PSPS events. This review included an assessment of its Incident Command Structure (ICS), Continuity of Operations Plan, and Crisis Action Team Standard Operating Procedures among others. It became clear that, although many of these existing procedures provided a useful basis for the operational strategy necessary to carry out a PSPS de-energization and re-energization, they did not comprehensively address the proactive external communication obligations that are present throughout the entirety of PSPS events. In general, many of NorthWestern Energy's existing emergency response procedures were created to help NorthWestern Energy respond reactively to a generalized variety of one-off urgent (and often unpredictable) events focused on making prompt and prudent operational decisions. In contrast, PSPS events tend to be forecasted, follow a slightly longer and more consistent progression, and require extensive external communications before, during, and after operational decision-making.

Recognizing the need for robust communication throughout PSPS events (i.e., before, during and after de-energization) and recognizing that planned outages[6] are more similar to PSPS events in terms of their advanced notice and external communication approaches, NorthWestern also reviewed its planned outage processes and communication strategies. NorthWestern found that many aspects of these procedures could inform the formation of a PSPS communication strategy but did not fully accommodate the communication obligations of PSPS events. For example, one major distinction between PSPS events and planned outages is that, in most cases, communications for planned outages only need to reach the customers who will be directly impacted by the outage whereas the communications for PSPS events typically need to reach a much broader audience that includes stakeholders beyond impacted customers (e.g., government agencies, cellular providers, emergency services, etc.). While the progression and timeline of planned outages tend to be in the control of the utility (and thus more predictable), PSPS events are primarily driven by dynamic environmental factors with weather-based forecasted durations. This makes it challenging to rely solely on traditional planned outage communication approaches as they can often be too slow to react to the fast-paced and variable nature of PSPS events. Overall, this review of planned outage procedures suggested that NorthWestern Energy's existing planned outage communication approaches are appropriately tailored for its unique customer base. However, NorthWestern also identified opportunities to enhance its communication strategies to better accommodate the dynamic nature of PSPS events.

In conclusion, after taking into consideration its reviews of utility industry best practices, existing emergency and incident response plans, and planned outage processes, as well as establishing a Situational Awareness Team, NorthWestern Energy recognized a clear need to develop its own comprehensive, standalone, PSPS Implementation Plan that fits the needs of its customers, communities, and stakeholders across its Montana service territory.

6 Planned outages are routinely initiated by utilities to conduct system maintenance and repairs.

3.3 Guiding Principles

To maintain alignment with its core business values and to provide direction in developing the PSPS Implementation Plan, NorthWestern Energy established the following guiding principles:

- Uphold NorthWestern Energy's commitment to sustainable, affordable, and reliable service.
- Recognize the opportunity to utilize PSPS events as one of many tools for ensuring the safety of employees, customers, the public, communities, and the environment.
- Maintain a robust situational awareness strategy for monitoring and quantifying environmental conditions and risks.
- Follow a disciplined operational strategy for executing PSPS events when it is necessary to do so.
- Adhere to a consistent communications strategy to ensure that internal and external communications about PSPS events are clear, timely, and accurate.

3.3.1 Care for Customers

One common theme found throughout NorthWestern Energy's core business values, PSPS guiding principles, and its PSPS Implementation Plan, is its customer- and community-centric philosophy. In particular, NorthWestern Energy has built, maintained, and strengthened a long-standing company culture committed to providing sustainable, affordable, and reliable service to its customers and the hundreds of large and small, rural and urban, communities it serves across its service territory. In order to uphold this commitment within its PSPS strategy, it is imperative to acknowledge NorthWestern Energy's unique operating environment. As discussed above, NorthWestern Energy operates an expansive electrical system which serves a comparatively small customer base. This dynamic provides NorthWestern with an opportunity to understand the concerns and situations of its customers on a much more personal level than many of its utility peers. However, this dynamic also poses challenges specific to the utilization of PSPS events.

NorthWestern Energy considers its operating area unique as compared to many western investor-owned utilities due in large part to its rural landscape in which it operates. By the numbers, NorthWestern serves 318 distinct communities spread over 97,500 square miles via an expansive transmission and distribution electric system of approximately 25,000 miles. Based on its roughly 390,000 Montana electric customers, this is approximately 1 customer per 160 acres served. Recognizing this challenge, one way NorthWestern has been able to deliver on its commitment to safely and reliably serving these customers is through its employees who live within, and serve, these communities. NorthWestern Energy's employees not only operate the system providing essential electric service, but they are engaged and invested in their communities fulfilling roles that make communities thrive. NorthWestern is proud of its employees who provide additional service to our communities by coaching basketball, refereeing football games, teaching hunter's education, or acting as the mayor to name just a few. Through this engagement, NorthWestern is not just supplying a commodity to these communities but serving the community themselves. As members of these communities, NorthWestern's employees know and understand its customer base on a personal level as, together, they navigate the sometimes-harsh conditions of rural life. For these reasons, NorthWestern is uniquely positioned to apply a balanced approach to the consideration and implementation of PSPS events – one that considers the potential impacts posed by environmental conditions alongside the impacts to customers and communities.

3.4 Scope

NorthWestern Energy's PSPS Implementation Plan can be thought of in terms of three distinct strategies that support the overall strategy (Figure 1). Accordingly, the scope of this Plan, and thus the remainder of this document, can be described similarly:

- Situational Awareness Strategy (Section 5)
  - ↳ How NorthWestern Energy will monitor environmental conditions that may necessitate a PSPS event, and how it will make decisions to escalate and deescalate PSPS events.
- Operational Strategy (Section 6)
  - ↳ How NorthWestern Energy will prepare for and perform a system de-energization and re-energization during a PSPS event.
- Communication Strategy (Section 7)
  - ↳ How NorthWestern Energy will communicate internally and externally throughout a PSPS event.

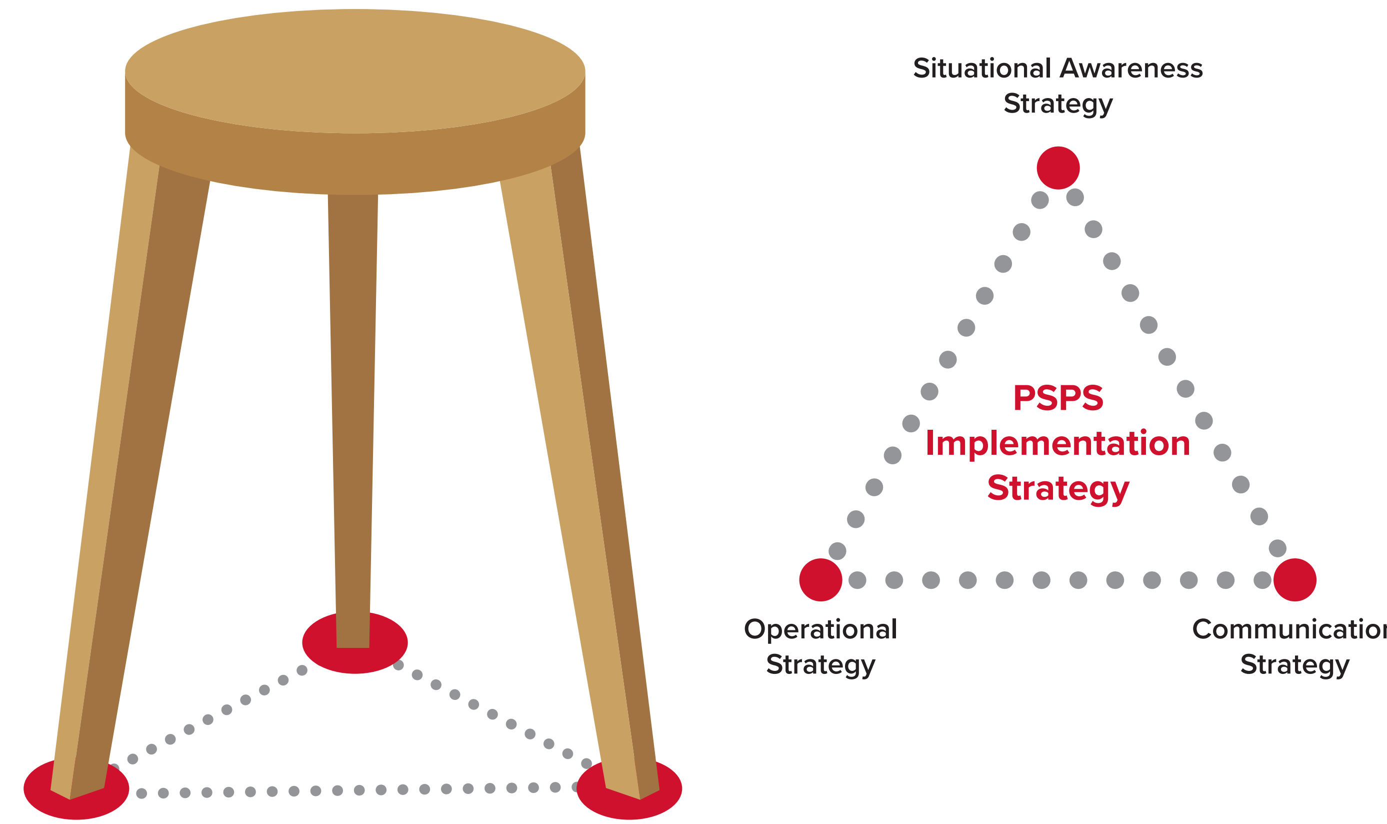


Figure 1 - A depiction of the organization of NorthWestern Energy's PSPS Implementation Strategy. The strategy is primarily comprised of three distinct strategies: the situational awareness strategy, operational strategy, and the communication strategy.

4 PSPS Approach

This section provides a general overview of NorthWestern Energy's PSPS Implementation Plan including the timeline it uses for conducting PSPS events (Section 4.1), the organizational structure used to manage the events (Section 4.2), and the roles and responsibilities of the involved parties (Section 4.3). More detail regarding the specific situational awareness, operational, and communication tasks that will be performed during a PSPS event will be provided in Sections 5, 6, and 7, respectively.

4.1 PSPS Stage Progression

A critical component of any PSPS strategy is a clearly-defined and phased-approach that defines how and when a PSPS event may be declared, escalated, deescalated, and ultimately closed. Not only is this crucial for effective communication and understanding among internal and external stakeholders, it also ensures that all components of the strategy (e.g., situational awareness, operational, and communication strategies) are based upon a consistent and compatible timeline. For these reasons, many utility PSPS plans, including NorthWestern Energy's PSPS Implementation Plan, utilize very similar terminology and approaches. NorthWestern Energy developed a 3-stage approach to PSPS events (Figure 2) which includes:

- Stage 0 – Situational Monitoring
- Stage 1 – PSPS Assessment
- Stage 2 – PSPS Execution

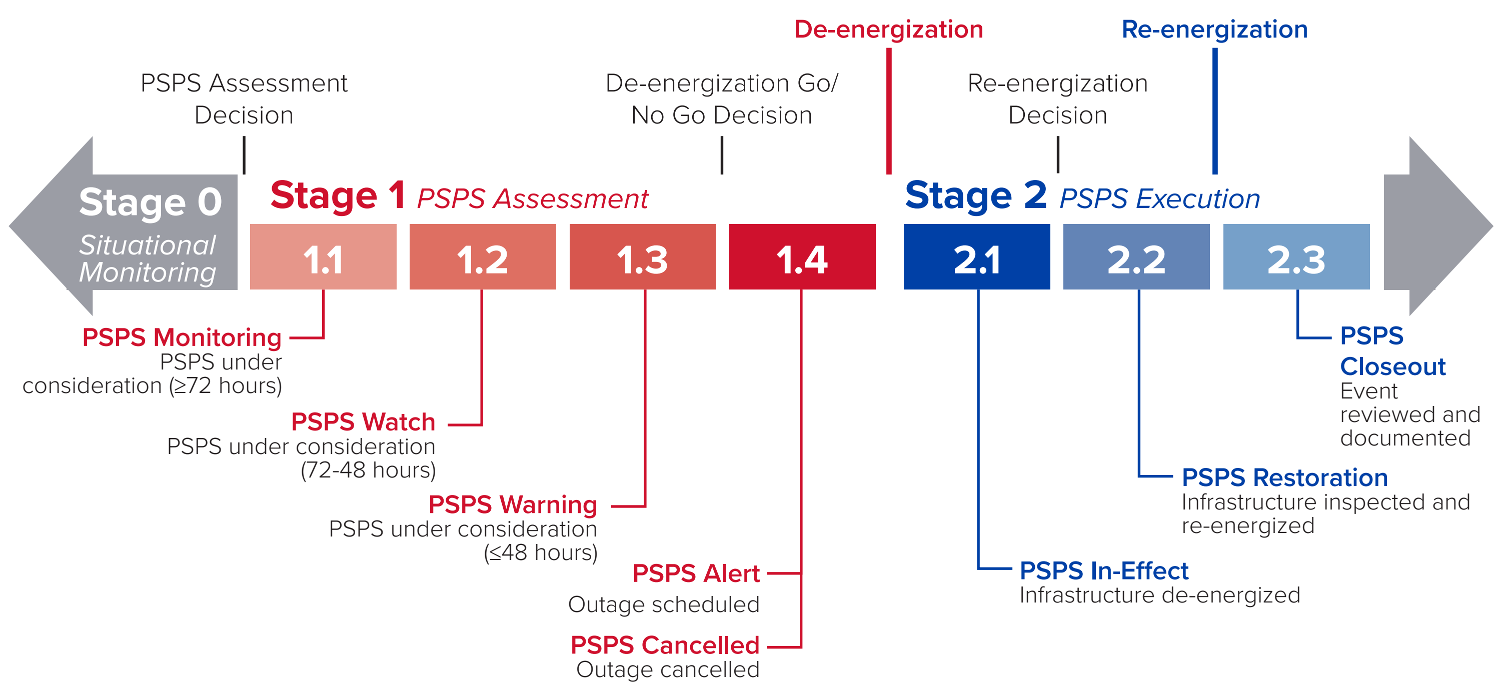


Figure 2 – An illustration of the phased timeline NorthWestern Energy employs for PSPS events.

Stage 0 is in effect at all times. During this stage, NorthWestern Energy's Situational Awareness Team (Section 4.2.1) is actively assessing environmental conditions, forecasts, and risk factors (as described in Section 5). Although no specific PSPS event is being managed during this stage, the general use of a PSPS event as a risk-mitigation tool is always under consideration by the Situational Awareness Team. Accordingly, the Situational Awareness Team may elect, at any time, to formally initiate a PSPS event based on the presence of environmental, system, and weather conditions. This marks the transition from Stage 0 to Stage 1 and serves as the trigger point for several components of NorthWestern Energy's PSPS implementation strategy such as the Operational and Communication Strategies (Sections 6 & 7) which describe how NorthWestern prepares for, carries out, and communicates with internal and external stakeholders about a potential de-energization of electric infrastructure. This declaration also initiates the PSPS Awareness Team (Section 4.2.2) which is comprised of decision makers, operational, and communications-focused personnel among others and allows this broader group of internal stakeholders and subject matter experts (SMEs) to more comprehensively monitor and manage the early stages of the PSPS event.

Stage 1 of NorthWestern Energy's PSPS Implementation Strategy is known as "PSPS Assessment." During this stage, the newly-formed PSPS Awareness Team (and ultimately the Incident Command Team), meet regularly[7] to assess the situation, evaluate the merits of de-energization, and operationally prepare for, and potentially carry out, a de-energization. During this stage these groups are also responsible for providing updates to internal and external stakeholders as described in Section 7. Stage 1 is subdivided into 4 distinct phases based on the anticipated timing of the de-energization:

- Phase 1.1, or "PSPS Monitoring," refers to the period of time during which de-energization of a particular area is being considered, but the anticipated timing is more than 72 hours away. The primary purpose of this phase is to formally initiate the PSPS Awareness Team to a heightened level of monitoring and responding to the situation, as well as engaging operational and communications planning in accordance with the Operational and Communication Strategies.
- Phase 1.2, or "PSPS Watch," refers to the period of time during which de-energization of a particular area continues to be considered, but the anticipated timing is now between 72 and 48 hours away. This phase serves to elevate communications and operational planning in accordance with the overall Communication and Operational Strategies.
- Phase 1.3, referred to as a "PSPS Warning," is initiated at the point in time at which the anticipated de-energization is less than 48 hours away. The purpose of this phase is to mark the formal transition from the PSPS Awareness Team structure to NorthWestern Energy's standard Incident Command Team Structure (ICS) who will then be responsible for managing the PSPS event through de-energization, re-energization, and closeout.[8]
- Phase 1.4, known as "PSPS Alert" - begins if, and when, the Incident Command Team makes the decision to de-energize (i.e., the "go/no-go decision"). Assuming the decision is made to de-energize, a "PSPS Alert" is declared and the de-energization is scheduled. This declaration serves as the trigger point for several key operational and communication obligations (see Sections 6 & 7 for more detail) such as mobilizing personnel to de-energize equipment as well as informing stakeholders of the scheduled de-energization. If instead, the Incident Command Team chooses not to proceed with a de-energization, the PSPS event will then either:
  - ↳ Remain as a PSPS Warning (i.e., Phase 1.3)
  - ↳ Be downgraded to a PSPS Watch or PSPS Monitoring (i.e., Phase 1.2 or 1.1) if de-energization of the area is still being considered, but the timing has been delayed beyond 48 hours
  - ↳ Or be cancelled (resulting in a "PSPS Canceled" followed by a return to Stage 0 – Situational Monitoring)

The next stage of NorthWestern Energy's PSPS Implementation Strategy, Stage 2 or "PSPS Execution," begins when electrical equipment is de-energized. During this stage, the Incident Command Team continues to meet regularly to plan for, communicate about, and ultimately carry out, the re-energization of electrical infrastructure. Much like, Stages 0 and 1, the group continues to evaluate environmental conditions and risk factors, however, the goal of this group shifts to restoring electrical service as quickly and as safely as allowed for by the situation. Stage 2 is also divided into 3 phases based on the status of the re-energization efforts:

- Phase 2.1, or "PSPS In-Effect," is the period during which electrical equipment remains de-energized and personnel are evaluating whether environmental conditions have improved enough to begin the restoration process. During this time, NorthWestern continues to assess the situation, developing a plan for re-energization, and continuing to update stakeholders.
- Phase 2.2, "PSPS Restoration," begins when NorthWestern personnel make the decision to re-energize equipment and ends when the equipment is re-energized. NorthWestern Energy's responsibilities during this period include inspecting the de-energized equipment to ensure it can be safely re-energized, performing repairs as required, communicating with stakeholders (including impacted customers) about the plan to re-energize, and ultimately re-energizing the equipment into service.
- Phase 2.3, "PSPS Closeout," is the final phase of NorthWestern Energy's PSPS Implementation Strategy. Phase 2.3 begins as soon as equipment is re-energized and ends when stakeholder communications are finalized and NorthWestern personnel have conducted an after action review. One purpose of this phase is to review all areas have been fully re-energized and allow NorthWestern personnel time to review and document the event before the ICS team is disbanded.

7 Meeting type can include any and all available options including in-person, virtual, digital, tele-conference, or other

8 It should be noted that, in many cases, the PSPS Awareness Team and the Incident Command Team may share many of the same members and have very similar organizational structure. A key component of this transition is a discussion of who from the PSPS Awareness Team should be included in the Incident Command Team. The primary purpose of this transition is to allow NorthWestern Energy to utilize a more established and 24/7 organizational structure for navigating the time-sensitive de-energization and re-energization of equipment.

It is important to note that the abovementioned phases may, in some cases, occur non-sequentially or be subject to accelerated or decelerated timelines due to the highly-variable and fast-changing nature of the environmental conditions being monitored. For example, a PSPS event may be escalated from a Watch to a Warning or Alert more quickly than anticipated, or may be deescalated from a Warning to a Watch, if the conditions still suggest the potential need to de-energize, but the timing of which has been delayed. NorthWestern Energy's approach to PSPS events is generally location specific. In other words, in situations where multiple PSPS de-energizations are being considered in different sections of the electric system, each event may be evaluated and carried out independently by NorthWestern Energy's personnel.

4.2 PSPS Organizational Structure

NorthWestern Energy's approach to PSPS events involves three teams: the Situational Awareness Team (Section 4.2.1)[9], PSPS Awareness Team (Section 4.2.2), and the Incident Command Team (Section 4.2.3). Ultimately, each of these team's primary responsibility is to manage the PSPS event, in its entirety, while adhering to the approaches described in the Situational Awareness Strategy (Section 5), Operational Strategy (Section 6), and Communication Strategy (Section 7). However, each team's unique structure makes it well-suited to oversee the duties, and respond to the unpredictability, of specific periods of a PSPS event. The division of responsibilities among the Situational Awareness Team, Incident Command Team, and PSPS Awareness Team during different phases of a PSPS event is illustrated below (Figure 3). It should be noted that, due to the importance of the Situational Awareness Team's knowledge in assessing critical fire weather, this team remains involved throughout the duration of a PSPS event by being incorporated into the structures of both the PSPS Awareness Team and the Incident Command Team.

In general, the division of NorthWestern's PSPS implementation responsibilities among three teams can be thought of as an escalation. In Stage 0, the unpredictability of conditions is quite high, while the certainty of de-energization and the need for immediate action and interdepartmental coordination remain low. As such, the Situational Awareness Team, with its targeted focus on monitoring environmental conditions and risk factors, is equipped to manage Stage 0 on its own. In Phases 1.1 and 1.2, the variability of the situation remains relatively high, but interdepartmental coordination becomes increasingly important as the potential for a de-energization rises – increasing operational and communication responsibilities. NorthWestern recognizes the need to incorporate representation from the Situational Awareness Team into a broader team structure, the PSPS Awareness Team, which includes representation from other business groups as well – allowing it to more comprehensively manage the PSPS event. By Phase 1.3 the increasing certainty of forecasted conditions and likelihood of a PSPS de-energization requires frequent decision-making and significant interdepartmental planning and coordination. Accordingly, NorthWestern recognized the value in utilizing its proven and robust organizational structure, the Incident Command Team, which provides an action- and reaction-oriented team structure equipped to navigate the event on a 24-hour basis. This team includes much of the same representation as the PSPS Awareness Team but formalizes a team focused solely on managing this emergency under the authority of the Incident Commander. This allows the Incident Command Team the ability to quickly react to the situation and manage the PSPS event through its conclusion (whether that be de-energization, re-energization, and closeout or cancellation of the event).

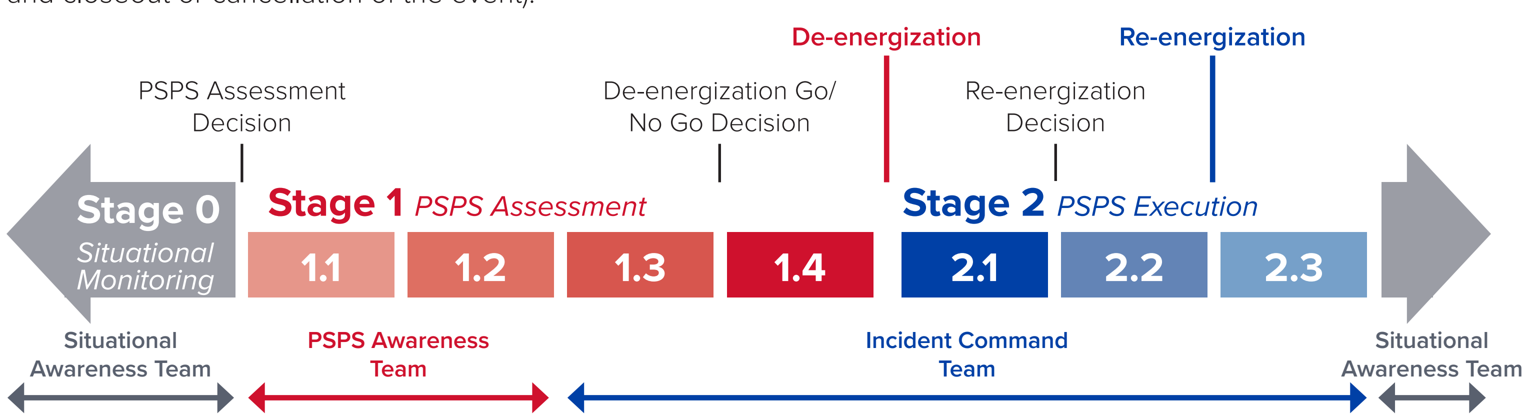


Figure 3 – Timeline representation of the division of responsibilities between NorthWestern Energy's Situational Awareness Team, PSPS Awareness Team, and Incident Command Team.

9 *In addition to being a team within NorthWestern Energy's PSPS implementation strategy, the Situational Awareness Team also exists as a distinct business group within NorthWestern's general organizational structure and has responsibilities beyond PSPS events.*

4.2.1 Situational Awareness Team

The Situational Awareness Team, formally established in the fall of 2022, continuously monitors, assesses, and evaluates environmental conditions as it relates to wildfire risk within NorthWestern Energy's Montana service territory. This encompasses, but is not restricted to, Public Safety Power Shutoff events. Further details regarding the team's function, duties, and overall PSPS event strategy is available in sections 3.3.1 and 4.

4.2.2 PSPS Awareness Team

In addition to NorthWestern Energy's Situational Awareness Team and Incident Command Team, NorthWestern developed a new, PSPS-specific, team known as the PSPS Awareness Team as a key component of its PSPS implementation strategy. The PSPS Awareness Team consists of a wide variety of internal stakeholders and SMEs and is primarily intended to support situational monitoring, operational planning, internal and external communications, and facilitate decision-making in the early phases of a PSPS event before a formal Incident Command Team has been established. In these early phases of a PSPS event, the variability and uncertainty of environmental conditions remains high – making it difficult to accurately predict the likelihood and precise timing of a potential PSPS de-energization. As such, NorthWestern recognized the value in establishing a team that can more easily adapt to this uncertainty than an incident command structure which is generally better equipped for situations in which action and reaction, rather than monitoring and planning, is required. In this way, the PSPS Awareness Team effectively acts as a bridge between the Situational Awareness Team in Stage 0 and the Incident Command Team in Phase 1.3 – helping to ensure a higher degree of continuity in managing the event and consistency of communications with stakeholders throughout the PSPS event.

4.2.3 Incident Command Team

NorthWestern Energy's Incident Command Team is an organizational structure that has been used by the company for many years to respond to a wide variety of emergent events and ensure business continuity. This team is responsible for making strategic decisions, allocating resources, and coordinating response efforts throughout the PSPS event after Phase 1.2. The composition of the Incident Command Team should include, but is not limited to, the following roles:

- Incident Commander (IC): responsible for all aspects of response
- Public Information Officer/Communications Officer: responsible for interface with public, media, and general employee communications
- Liaison Officer: Contact resource for government, emergency, fire, and other similar agencies
- Safety/Permitting/Environmental Officer: Ensures safety and environmental practices are followed
- Officer in Charge: responsible for key operational decisions based on situation
- Operations/Engineering Lead: responsible for all tactical actions directed by the IC
- Distribution and/or Transmission Control Lead: Coordinates all internal system control activities
- Customer Care and Community Connections Lead: coordinates customer response and communication strategy
- Logistics Lead: provides all support service functions for incident response
- Situational Awareness Lead: provides environmental and wildfire situational forecast
- System Integrity Lead: provides system health analysis for assets within PSPS area

4.3 NorthWestern Energy Business Group Representation, Roles, and Responsibilities

The management of a PSPS event requires coordination between many different functional groups within a utility, touching nearly every functional area to some extent. As such, NorthWestern Energy's PSPS implementation strategy either includes direct business group representation or indirect representation through the PSPS Awareness Team and Incident Command Team. This ensures NorthWestern is well-equipped to navigate a wide variety of situations, make informed and timely decisions, and gather input from a variety of internal and external stakeholders and SMEs. While the specific individuals involved in each PSPS event may vary, the representation of NorthWestern business groups remains the same. NorthWestern Energy's PSPS implementation strategy includes representation from a wide variety of NorthWestern business groups who play important roles in PSPS decision making, execution, and communication. Although the specific duties of these groups may vary, it is still valuable to understand the general roles that each of these groups have in the successful consideration, planning, and implementation of a PSPS event.

For instance, one important task throughout a PSPS event is recording meeting minutes for future reference. For this reason, the Risk Management department is tasked with keeping a log of meeting minutes and consolidating meeting notes at the conclusion of any PSPS event for record keeping purposes. All notes should be fact based and should include date and times.

Another important obligation of NorthWestern Energy's PSPS Implementation Plan is once-daily PSPS team meetings.[10] These meetings formally begin at Phase 1.1 with the PSPS Awareness Team and continuing for the Incident Command Team through the conclusion of the event and ensure that:

- Operational- and communication-focused employees are receiving the most up-to-date situational context from the Situational Awareness team – enabling them to make informed decisions that consider customer impacts, stakeholder impacts, system performance, and reliability
- Operational-focused employees regularly discuss the situation (which may change frequently and quickly)
- Communication-focused employees can stay abreast of the situation and provide regular updates to external stakeholders
- Operational-focused employees can make decisions regarding the operation of the system while taking into consideration concerns that may come from, or impact, external stakeholders (via communications-focused employees) – helping to mitigate negative external impacts
- Operational- and communication-focused internal parties receive, provide, and discuss information and make decisions in real-time – enabling them to carry out and/or coordinate their duties via a single meeting
- Updates, information, and operational decisions are uniformly conveyed to all internal parties which facilitates clear, consistent, accurate, and timely external messaging and reduces the potential for miscommunications caused by relying on various internal channels (email, phone, etc.)
- The entire PSPS team has regular opportunities to ensure that the event is being documented via review of the designated participant who is recording discussions and decisions via the centrally housed repository.[11]

10 These meetings may occur more frequently than once daily if the PSPS Awareness Team or Incident Command Team identifies the need to do so.

11 One key purpose of these recurring PSPS meetings is to drive toward efficient and transparent decision making and documentation. It is the intent that any decisions involving the PSPS event will be made and documented during these meetings. If the situation arises where any decisions about the PSPS event are made outside of these meetings (e.g., an emergent situation), the decision-maker is responsible for relaying it back to the complete PSPS Team during the next meeting.

A suggested general agenda for these meetings is outlined below, for illustrative purposes only:

1. **Situational Awareness Report**
   a. Discuss environmental and weather conditions such as drought, wind, fuel moisture content, relative humidity, fire risk indices, etc.
2. **PSPS Status Report**
   a. Discuss current phase(s) of PSPS(s) (e.g., warning, watch, alert, outage duration(s), customers out/restored, etc.)
3. **Round Table**
   a. Each group (DOC, Grid Operations, Asset Management, Corporate Communications, Risk Management, Customer Care, etc.) discusses system health and performance, any new issues, updates, and customer or stakeholder considerations.
4. **Recommended Actions**
   a. Discussions of PSPS status change(s), switching plans, impacted customers/services, restoration plans, resource planning, etc.
5. **External Messaging**
   a. Create language for general PSPS updates and discuss communications with specific external stakeholders (e.g., fire departments, industrial customers, cell providers, schools, and other public safety partners).
6. **Documentation**
   a. Review any decisions that have been made independently since the previous meeting and ensure that all decisions made during the meeting are documented with responsible party, date, and time.
   b. Review previous meeting notes to ensure completeness and accuracy.
7. **Logistics**
   a. Schedule next meeting or other actions to be taken, discuss resource changes, etc.

The following sections provide an overview of the responsibilities that are unique to each of the functional groups represented in NorthWestern Energy's PSPS strategy.

4.3.1 Situational Awareness

- Support PSPS activities such as planning, training, and exercises prior to and during fire season.
- Monitor current and forecasted weather conditions (near and long term), environmental conditions and on-going wildfire incident locations.
- Communicate internally when PSPS conditions are present or circumstances may be necessary.
- Run fire simulation models as appropriate to understand area and potential impacts.
- Assist in PSPS information-gathering, evaluation, and decision-making during a PSPS event.
- Participate in AARs and ensure modifications to PSPS protocol are implemented as necessary.

4.3.2 Distribution Operations

- Formulate and execute safe and reliable PSPS protocols and procedures.
- Coordinate with Situational Awareness to continue evaluating enhancements to PSPS event.
- Ensure training exercises, operations planning and PSPS related activities occur annually.
- Ensure personnel involved are appropriately trained to perform all relevant responsibilities under this PSPS Plan.
- Assist with PSPS evaluation and decision making with consideration for customer and stakeholder impacts, system performance, and environmental conditions.
- Support DOC and Customer Care in developing de-energization and re-energization plans for notification of PSPS events.
- Review the impacted area of the established PSPS to create premise lists and switching plans to be distributed to appropriate departments for notifying and execution of the Plan.
- Establish and schedule staffing resources at appropriate levels for conducting PSPS events.

- Prepare IC structure per PSPS guideline document, identify and notify personnel of IC roles, schedule initial IC meeting.
- Assume Incident Command (IC) responsibility during a PSPS event.
- Confirm availability of crews and equipment to aid and support PSPS events.
- Perform observations, patrols, and other PSPS tasks as necessary before, during, and after the event.
- Perform necessary repairs to safely restore power to the system following established practices.
- Communicate and report ETR to DOC and appropriate departments.
- Request/acquire additional resources as needed including air patrol for line inspection as required following a PSPS event.
- Assist appropriate departments with engaging public safety partners and critical facilities, before during, and after a PSPS event.
- Substation Operations will monitor substations and take necessary steps to support PSPS as required.
- Participate in AAR and Lessons Learned after PSPS event and ensure modifications to PSPS protocol are implemented as necessary.

4.3.3 Distribution Operations Control

- Assist Distribution Operations in developing de-energization and re-energization plans for a PSPS event.
- Support communication efforts by identifying impacted customers and executing designated call campaigns.
- Review and execute switching plans.
- Update planning information in iCommunicate.
- Ensure department employees are trained to manage PSPS events.
- Engage with Operations in the de-energization and re-energization per the approved plan for the PSPS event.
- Monitor the network model during the PSPS event and crews in the field for safety.
- Ensure accurate and updated information is in ADMS so that it gets sent to the customer outage map.
- Confirm system is back to normal, crews are accounted for and final communications are complete after system is restored to normal operating conditions.
- Participate in AAR and Lessons Learned after PSPS event.

4.3.4 Grid Operations

Grid Operations is responsible for maintaining transmission system reliability and managing load/generation balance.

- Evaluate transmission system reliability due to PSPS outage and develop mitigation plans to prevent adverse impacts to system reliability.
- Perform PSPS outage notifications to responsible Reliability Coordinator (RC), impacted utilities and internal parties.
- Determine transmission scheduling impacts of PSPS outage and update OASIS and market transmission availability.
- Review PSPS switching plans for equipment and coordinate switching assignments with responsible Division.
- Coordinate with field personnel in the de-energization and re-energization of PSPS equipment per the PSPS plan.
- Issue and track all transmission PSPS switching orders and clearances to ensure field crew safety.
- Perform real-time operations and monitoring of NorthWestern Energy Transmission Operator and Balancing Authority areas and take necessary actions to maintain system reliability at all times.
- Ensure all field personnel are accounted for and in the clear prior to re-energization of PSPS equipment.
- Verify PSPS equipment has been returned to normal operations and perform notification to impacted parties of termination of PSPS event.
- Participate in AAR and Lessons Learned after PSPS event.

4.3.5 Risk Management

- Ensure that a single source of notes and records is being kept throughout a PSPS event.
- Maintaining an independent record of PSPS events including the customer and stakeholder, environmental, and system performance considerations.
- Lead a review and maintain notes of recent decisions during every PSPS team meeting.
- Lead the AAR, Lessons Learned, documentation, and review efforts during the closeout of a PSPS event (Phase 2.3).
- Notify and engage insurance companies as appropriate.
- Notify Legal as needed for additional resources.

4.3.6 Customer Care

- Respond to customer inquiries about a PSPS event with information provided by Corporate Communications or the IC.
- Assist in customer and stakeholder impact assessments.
- Ensure customer service representatives and customer associates are appropriately trained to manage customer interactions during a PSPS event.
- Work with all other groups to ensure that the PSPS Communication Strategy is being executed during all stages of a PSPS event.
- Flag any additional, or new customer concerns not being addressed through current communication materials.
- Participate in AARs and Lessons Learned after PSPS event.

4.3.7 Asset Management

- Evaluate and communicate asset system heath in PSPS scoping areas.
- Provide/analyze system performance data for PSPS decision criteria.
- Review and provide input for any fire simulations activities related to a PSPS zone.
- Support repairs of damaged infrastructure as needed.
- Support communication responsibilities with the Montana Public Service Commission (MPSC) as needed.
- Participate in AARs and Lessons Learned after PSPS event.

4.3.8 Executive

An Officer in Charge will be established by NorthWestern Executives for the Incident Command Team. Only one Officer in Charge will be established for purposes of the role within the PSPS event planning and execution. Assignment of Officer in Charge is determined as follows:

- The Officer in Charge will be the executive most closely aligned with the systems or outcomes during a PSPS event. Specifically the following should be used for designation of the Officer in Charge:
    1. Vice-President Distribution; OR Vice-President Transmission (alternates and vice versa based on systems impacted)
    2. Vice-President Asset Management
    3. Vice-President General Counsel
- Evaluate inputs from multiple functional departments evaluating risks associated with execution of a PSPS event including, but not limited to, customer and stakeholder impacts, environmental conditions, and system performance.
- Serve as final decision-making authority including authorizing the Incident Command Team to execute a PSPS de-energization should conditions warrant it necessary.
- Participate in AARs and Lessons Learned after PSPS event.

4.3.9 Safety

- Ensure personnel are appropriately trained to perform all relevant responsibilities as needed under the PSPS Plan.
- Ensure adherence to safety manual are followed throughout PSPS events.
- Provide training on PSPS Plan requirements for personnel as needed.
- Work with Corporate Communications to provide timely reviews of any gathered creative assets (photos, videos, etc.)
- Participate in AARs and Lessons Learned after PSPS event and modify PSPS plan as needed.

4.3.10 Corporate Communications

Corporate Communications develops and executes PSPS communications to customers and employees and supports other business units in their communication efforts with regulators, critical facility operators, public safety partners, key accounts, investor relations, and other stakeholders. Corporate Communications will:

- Work with all other groups to ensure that the PSPS Communication Strategy is being executed during all stages of a PSPS event.
- Ensure consistent and accurate information is disseminated.
- Monitor conversations and engage on social media channels as appropriate.
- Provide on-call media response.
- Produce and/or gather creative assets (photos, videos, etc.) to accompany communication materials.
- In coordination with Operations and Regulatory Affairs, work with public safety partners, critical facilities, regulators, and other stakeholders to execute a comprehensive, coordinated, and cohesive customer notification framework.
- With input from public safety partners, develop and implement a general PSPS awareness campaign for customers.
- In the event of a PSPS:
    - To the extent possible and in coordination with Customer Care, Operations, BT, and other groups, notify stakeholders before, during, and after a PSPS event with the following information:
        - Expected timing and duration of the PSPS event.
        - Contact information and communication resources.
        - Provide up-to-date information on NorthWestern Energy website as single point source of the most accurate and current information available to all audiences.
        - Distribute information via appropriate communication channels for specific audiences as needed.
        - Provide scripts for recording and distribution through Distribution Operations Control.
- Participate in AARs and Lessons Learned after PSPS event and modify communication practices as needed.
- Produce any recap reports, presentations as necessary.

4.3.11 Community Connections (Community Relations & Key Accounts)

The Key Account/Community Relation Managers will identify key account/sensitive customers that are affected by the PSPS event and will:

- Work with all other groups to ensure that the PSPS Communication Strategy is being executed during all stages of a PSPS event.
- Respond to customer inquiries about PSPS events.
- Ensure managers are appropriately trained to perform customer interactions during a PSPS event.
- Assist in possible media response.
- Participate in AARs and Lessons Learned after PSPS event.

5 Situational Awareness Strategy

5.1 Introduction and Purpose

The purpose of this Situational Awareness Strategy is to describe NorthWestern Energy's process for monitoring weather and environmental conditions. These conditions might trigger a PSPS event or the various phases of progression within a PSPS event.

By enhancing the understanding of the dynamic conditions involved in these situations, NorthWestern aims to optimize the decision-making process, allocate resources efficiently, and minimize the impact on communities and critical infrastructure. Through the establishment of specific thresholds and proactive monitoring of conditions, this strategy seeks to empower stakeholders at all levels to take timely and appropriate actions to mitigate risks and enhance public safety during PSPS events.

5.2 Overview

Situational awareness in the context of PSPS events is paramount for efficiently managing the associated risks and ensuring the safety of communities and critical infrastructure. PSPS situations, initiated by NorthWestern Energy as a proactive measure to reduce the risk of wildfires or other hazards caused by extreme weather conditions, introduce dynamic and complex operational environments.

Maintaining situational awareness involves continuously monitoring and comprehensively understanding evolving conditions that influence the decision-making process throughout the duration of a PSPS event. This includes factors such as wildfire risk, weather, and vegetation fuel moistures to name a few.

5.3 Weather Monitoring Strategy

Easy access to meteorological, fuel conditions, and wildfire risk data is a crucial aspect of NorthWestern Energy's strategy for mitigating wildfires, as well as for considering a PSPS event. Given the significant diversity in these conditions across the Montana service territory, NorthWestern Energy relies on publicly available models and data, as well as internally developed risk models.

Publicly available information from the National Weather Service (NWS) and the USFS Severe Fire Danger Index (SFDI) are currently included as part of the model. By utilizing these resources, NorthWestern Energy generates assessments of present and future wildfire risks spanning its Montana service area. This wildfire risk information is then used as an input to the decision-making processes and measures regarding wildfire risk. NorthWestern Energy's internal models currently consist of the Wildfire Risk Index (WFRI) and the Composite Risk Index (CRI). These models are also used as inputs to the decision-making process and measures regarding wildfire risk. Further explanation of these models can be found in their respective sections below.

Utilizing multiple weather models allows NorthWestern Energy to understand a possible range of outcomes and provides a more comprehensive understanding of the forecasted conditions that are on the horizon.

5.3.1 National Weather Service

The National Weather Service (NWS) is the operational weather services component of the National Oceanic and Atmospheric Administration (NOAA), an agency of the agency of the United States Department of Commerce. This public platform provides daily meteorological conditions. It considers factors like temperature, humidity, wind speed, and fuel moisture content all which help assess the likelihood and severity of wildfires. By providing timely updates and alerts, the NWS helps communities take proactive measures to mitigate the risk of wildfires and protect lives and property.

NWS issues advisories, watches and warnings to alert the public about hazardous weather conditions. Advisories or notifications are issued for weather conditions that are not as severe as those warranting a warning but could still be hazardous or impactful. A watch is issued when hazardous weather conditions are possible within a specific area and time frame but are not yet occurring or imminent. A warning is issued when hazardous weather conditions are imminent or occurring within a specific area and time frame.

A Red Flag Warning is one example of a forecast issued by the National Weather Service (NWS) to alert the public, firefighters, and land management agencies about weather conditions conducive to extreme fire behavior. These conditions typically include a combination of low relative humidity, strong winds, dry vegetation, and high temperatures. A Red Flag Warning indicates that critical fire weather conditions are either occurring or are expected to occur shortly. When a Red Flag Warning is issued, it is essential for individuals and communities to take extra precautions to prevent fires and be prepared to respond quickly to any wildfires that may occur.

5.3.2 Severe Fire Danger Index (SFDI)

The USFS Severe Fire Danger Index (SFDI) is an index created by US Forest Service and used by fire agencies to assess the level of fire danger in a particular area. It takes into account various factors such as temperature, humidity, wind speed, and fuel moisture content to determine the likelihood and severity of wildfires. The index typically ranges from low to extreme, with severe indicating conditions highly conducive to rapid fire spread and difficulty in suppression efforts. It serves as a warning system to alert authorities and the public about the potential for dangerous fire behavior.

5.3.3 Wildfire Risk Index (WFRI)

NorthWestern Energy's Wildfire Risk Index serves as a valuable tool for assessing, quantifying, and communicating the risk of wildfires, enabling informed decision-making and proactive measures to protect lives, property, and natural resources.

The WFRI converts environmental, statistical and scientific data into an easily understood "short-term" forecast for NorthWestern's Montana service territory. Variables considered within the dynamic model include but are not limited to: The USFS Severe Fire Danger Index, NorthWestern Energy asset health and consequence modeling (risk tiers).

In summary, the WFRI provides a seven-day forecast, updated daily, displayed at the sub-circuit level of the associated wildfire risk. It is used both as an operational parameter (i.e. when devices are set into different operational protection strategy) as well to give early indication of PSPS probable scenarios on the horizon.

5.3.4 Composite Risk Index (CRI)

The Composite Risk Index provides an overall estimate of risk from power line caused fires. The CRI has strong correlation and consideration of wind gust speed and flame length. Thirteen years of hourly gridded (2.5 km resolution) weather data is used to calculate hourly gridded CRI threshold values within defined weather monitoring zones.

5.4 PSPS Threshold Guidance

The overall formulation of a PSPS threshold value is not solely based on one factor. For example, the Composite Risk Index (CRI) provides one data point to consider among other factors (grid resiliency, emergency response capabilities, fire spread modeling, etc.) to consider when analyzing de-energization scenarios. As such, there is no one factor used as a final determining factor for de-energization, but rather a comprehensive assessment of all aspects driving final decision making.

5.5 Situational Awareness Strategy Summary

NorthWestern Energy's Situational Awareness Strategy involves continuous monitoring of factors such as wildfire risk, weather, and vegetation fuel moisture. This is accomplished through utilizing both publicly available models (e.g., NWS, SFDI) and internal models (e.g., WFRI, CRI).

PSPS environmental thresholds are not established to be the sole driver of a PSPS event but are used to empower and educate the operational, communications, and decision-making personnel to make data informed decisions in a near real-time format. Decision making during PSPS events also include a variety of other factors and considerations beyond environmental conditions such as customer and stakeholder impacts as well as system health and performance among others.

6 Operational Strategy

6.1 Introduction and Purpose

NorthWestern Energy's mission statement is foundational to its PSPS Operational Strategy. Namely, via a commitment of safely and reliably serving the customers and communities of NorthWestern Energy. This has resulted in NorthWestern implementing operating procedures and work practices to mitigate the ignition opportunities during periods of heightened wildfire risk.

The primary purpose of NorthWestern Energy's PSPS Operational Strategy is to define how NorthWestern will prepare its personnel and equipment to proactively de-energize electrical facilities to reduce the risk of a utility-ignited wildfire, how it will carry out this de-energization should it be needed, and how it will safely restore its system. This strategy, in conjunction with the overall PSPS implementation strategy, balances the need to reliably serve the customers of NorthWestern while also recognizing NorthWestern Energy's role in maintaining a safe environment when faced with extreme fire weather.

6.2 Overview

To understand how NorthWestern operationally manages PSPS events, it is necessary to first review NorthWestern's general wildfire operational practices. NorthWestern deploys several operational defense strategies as wildfire risk index increases (Figure 4). Each step-change increase in wildfire risk is matched with a strategy to mitigate that risk while providing safe and reliable service for NorthWestern Energy's customers and communities. However, under certain extreme fire weather conditions, the ability to deploy additional protective strategies could be exhausted with exception of de-energizing the system. This extreme risk state thus requires further evaluation regarding the decision of de-energization and must be carefully evaluated to balance the wildfire risk with the impacts of power-off scenarios for NorthWestern Energy's customers and communities.

	Wildfire Risk	Risk Description	Operational Defense Strategy
"Safety Risk Based Operation"	Extreme	"Fire Start Imminent Uncontrollable"	PSPS Evaluation
	Very High	"Fire Start Easily Control Limited"	Fire Season Operating Mode 2
	High	"Fire Start Caution Control Challenging"	Fire Season Operating Mode 1
	Moderate	"Fire Start Challenging Control Achievable"	Normal Operations
"Reliability Performance Based Operation"	Low	"Fire Start Difficult Control Easily"	Normal Operations

Figure 4 – Operational Defense Strategy Matrix

6.3 Stage 0 Operations

Stage 0 Operations is almost entirely performed by the Situational Awareness Team who is generally responsible for the overall environmental monitoring related to wildfire risk. They perform this role by continuously monitoring weather conditions, fire activity, and other relevant factors that could lead to or exacerbate wildfire situations. NorthWestern most likely is already operating their system in a more risk-based mode as wildfire threat is increasing during this stage.

Once the SA team identifies conditions forecasted in the future which meet a wildfire risk threshold for PSPS evaluation, they will consult with the local area manager to discuss their findings. The local area manager brings the operational observations into context. Assuming consensus in their observations, they will formally assemble (typically via remote meeting) the PSPS Awareness team.

6.4 Stage 1 Operations

Stage 1 Operations involves the extensive preparation and planning prior to actual de-energization. Since wildfire conditions are forecasted in the future, there are several time-based sub-phases relevant to this stage. There is no pre-determined time within each operational phase since escalation (or de-escalation) between phases is largely dependent on forecasted weather.

Each of the below sub-phases have additional details for each of the responsible internal departments as visually provided in Appendix A – NorthWestern Energy PSPS Operations Process.

Phase 1.1 – Monitoring:

- Functional areas begin pre-planning for possible PSPS de-energization event, including subsequent meetings with key supervision for planning purposes.
- Initial scoping of systems involved and forecasted impacts to customers.
- Analysis of staffing available during entire period of expected PSPS event.

Phase 1.2 – Watch:

- Refine scoping impact area and customer impact analysis.
- Communication strategy review and implementation per communication plan.
- Staffing reviewed across key departments for duration of PSPS event.
- Internal management and supervisory review for employee education kickoffs.
- Decision to formally establish an Incident Command Structure is determined.

Phase 1.3 – Warning:

- Further detailed analysis of system performance and predicted fire weather.
- Perform system patrol to update asset health and right-of-way conditions to real-time observations.
- Consultation with outside agencies as needed.
- Initial (or continued) notification to external stakeholders of possible de-energization.
- Officer in Charge, with input from all relevant functional locations, grants authority to the Incident Commander to perform the as needed switching to safely execute the PSPS.

Phase 1.4 – Alert:

- Switching instructions finalized, mobilization of field crews, updates to outage maps.
- Final notice and implementation of media campaign to impacted stakeholders, including emergency services, customers, community leaders, and fire agencies.
- Complete switching for de-energization.

6.5 Stage 2 Operations

Stage 2 Operations begins just after the actual switching for de-energization. This stage ends when all customers are fully restored to utility service and the PSPS event has been closed out (i.e., Phase 2.3). The exact duration of these stages is highly dependent on the specific circumstances of each PSPS event. This period requires both the weather conditions to retreat acceptably below fire risk thresholds for the area as well as the electrical system undergoing a series of inspections and repairs, if needed, prior to re-energization.

The following sub-phases describe, in general, the operational responsibilities for this phase of the PSPS event:

Phase 2.1 – PSPS In-Effect:

- Continuously monitor weather conditions, fire activity, and other factors to assess when it will be safe to restore power.
- Communication with emergency response stakeholders on system status and predicted time to restoration.
- Creation of business orders as needed for expected repairs. Mobilization of crew resources, materials, engineer resources, etc. as needed for restoration phase.
- Notification of status on regular basis to stakeholder groups, including MPSC and other government agencies.

Decision to move to restoration phase is made by the Incident Commander based on inputs from the IC team, but in general will not commence until the wildfire risk has decreased below an acceptable risk threshold for the particular PSPS area.

Phase 2.2 – Restoration:

- A detailed ground and/or aerial assessment of the entire system in the area of de-energization.
- Complete repairs as expeditiously as possible.
    - ↳ In general, repairs should begin from the energy source and work outwardly toward the end of service areas.
- Step restoration to re-energize customers without delay where and when possible.
- Customer and community notifications continue as necessary.
- Maintain records of repairs for additional analysis by the wildfire and asset management teams.

Phase 2.3 – Closeout:

- Internal documentation and outage reporting.
- Conduct feedback sessions from stakeholders and community partners to identify areas for improvement in future events, fire simulation at failed component locations to understand risk avoided, end formal Incident Command Structure for PSPS event.
- Risk management compile all PSPS documentation. Close out of all business processing orders.

6.6 Operational Strategy Summary

Wildfire risk and the decision to de-energize the system is a complex and dynamic process. The operational strategy to manage this dynamic risk is founded on data informed decision making to guide the overall PSPS decision making process. PSPS events are cross-functional activities that require involvement from a variety of stakeholders to conduct. Ultimately, the goal is to maintain the safety of customers, communities, and stakeholders by mitigating the threats posed by electric systems operating during periods of elevated fire weather conditions while minimizing the impacts of service interruptions.

7 Communication Strategy

7.1 Introduction and Purpose

A central component to NorthWestern Energy's overall PSPS implementation strategy is its communication strategy. The primary purpose of a communication strategy is to define what types of information will be provided to internal and external stakeholders and what channels (i.e., means of communication) will be used to provide that information to ensure it reaches the intended audience. Other purposes include how, and how often, the information will be provided and who is responsible for creating and distributing the information. A communication strategy is a valuable tool in many situations a utility may encounter, but there are several factors that make it essential for managing PSPS events in particular. For example:

- PSPS events can be more consequential than typical outages and can directly and indirectly impact a variety and number of internal and external stakeholders (e.g., residential customers, business owners, cellular network operators, fire departments, governmental agencies, etc.)
- The variety and number of external stakeholders also generally exceed the relevant external stakeholders for planned and unplanned outages – making it necessary to utilize centralized and public channels (e.g., public website outage map) rather than the purely targeted and private communications used for planned and unplanned outages (e.g., individual text/email alerts).
- Stakeholders all desire and require different levels, frequencies, and types of information as well as different channels for accessing/receiving (e.g., outage map, social media, automated calls, CSRs, key account managers, TV/radio announcements, etc.)
- Not all of these channels are desirable or practical as a method for keeping stakeholders apprised of a PSPS event and some may work better for certain types of information and/or stakeholders.
- Since NorthWestern Energy serves many communities, targeting communications and tailoring response strategies to specific, impacted audiences will be necessary.
- Without a communication strategy, stakeholders may not understand where to go for information, may not receive important information (or may receive conflicting/inaccurate/outdated information), and may attempt to use unsupported or undesirable channels (e.g., large call center volumes, unmonitored social media posts, etc.)
- PSPS events are relatively new practices to utilities and external stakeholders and are often much more dynamic, unpredictable, and time-sensitive than typical planned and unplanned outages – making it difficult to rely solely on traditional communication practices and channels.

7.2 Overview

NorthWestern Energy's PSPS communication strategy can be thought of in two distinct parts – an internal communication strategy and an external communication strategy. Although external communications are often the main focus when it comes to managing a PSPS event, the foundation for effective external communications is a comprehensive internal strategy. A thorough internal communication strategy ensures that internal parties are providing and receiving accurate and consistent information in a timely manner and will define:

- How, when, and where information is transferred internally (i.e., channels/methods).
- Which employees, or groups of employees, must be kept informed.
- Similarly, an external communication strategy is responsible for defining how this internal information is then distributed to the relevant external stakeholders. In general, external communication strategy describes:
    - ↳ What general types of information will be provided to external stakeholders.
    - ↳ When/how/how often that information will be provided to external parties (i.e., channels, timelines, etc.)
    - ↳ What external stakeholders need to be kept informed and to what extent.
    - ↳ What personnel are responsible for creating and distributing the information and what those responsibilities are.

It is important to note that both NorthWestern Energy's internal and external PSPS communication strategies do not, however, explicitly define communications (i.e., the content and language of messaging). Instead, NorthWestern Energy has chosen to rely on these plans to help guide the overall structure (e.g., timing and channels) of communications, but allow the specifics of the communications to be defined by the PSPS Awareness Team and Incident Command Team on a case-by-case basis to accommodate the variable and dynamic nature of PSPS events. In other words, it is impractical to be completely prescriptive about the exact messaging and information that will go out for any generalized PSPS event – instead NorthWestern Energy's internal and external communication plans provide the guidelines and structure for ensuring that effective internal and external communications are a primary focus for its PSPS response teams.

7.3 Internal Strategy

Depending on the situation, NorthWestern Energy utilizes many different approaches (e.g., email, text, phone calls, file sharing, etc.) for relaying information internally across a widely dispersed employee population. While these can be effective channels in some cases (and will be used, in part, during PSPS events), they can also be inefficient for navigating the dynamic, fast-paced, multi-faceted, and multi-participant discussions necessary during PSPS event(s). As such, the foundational principle for NorthWestern Energy's internal communication strategy is that, during PSPS events, both the PSPS Awareness and Incident Command Teams will be part of the meetings as described in Section 4.3. After each of these meetings (and any ad-hoc meetings that may be called to order), communications-focused employees would then be responsible for delivering the agreed-upon messaging via the channels and timeframes defined by the external communication channel strategy (Section 7.4). Depending on the severity and scale of the ongoing PSPS event(s) as well as the agreed-upon messaging, the involved internal stakeholders with external communication responsibilities may vary.

7.4 External Strategy

NorthWestern Energy's external communication strategy describes what channels are used during different phases of PSPS events to relay information to external stakeholders (Appendix B – NorthWestern Energy PSPS Stakeholder Communication Channel Strategy). A central principle of this communication strategy was the decision to establish a default or primary communication channel that would be available to all stakeholders. Since PSPS events are highly dynamic and involve a wide variety of external parties, NorthWestern Energy recognized the need to select a flexible and high-speed communication channel that could provide consistent and up-to-date baseline information accessible to all external parties. Another important element of NorthWestern Energy's strategy is based on the recognition that certain key stakeholders (such as customers directly impacted by PSPS outages, key account holders, large businesses, and governmental bodies) will likely require different, and perhaps more detailed, information than provided in the baseline channel. As such, NorthWestern has identified several other supplemental channels of communication designed to augment the baseline channel and meet the specific needs of these key stakeholders.

To provide baseline PSPS information to all external parties, NorthWestern Energy designated its existing public outage map webpage on its website as its default channel. Not only is it the current default source for providing outage information to external parties (making it familiar to existing stakeholders), it is also a flexible platform that can be updated quickly and regularly. Additionally, it allows users to subscribe to SMS and email notifications for ongoing outages (i.e., Phases 2.1 through 2.2) – allowing interested parties to stay informed about an ongoing PSPS outage without having to refer back to the outage map. NorthWestern will leverage this webpage to provide general information about a PSPS event (beginning in Phase 1.2) such as the location of PSPS events along with regular updates based on the decisions made during the daily, and ad hoc, PSPS team meetings. An example mockup for a hypothetical PSPS event in the Helena, Montana, area is shown below (Figure 5).

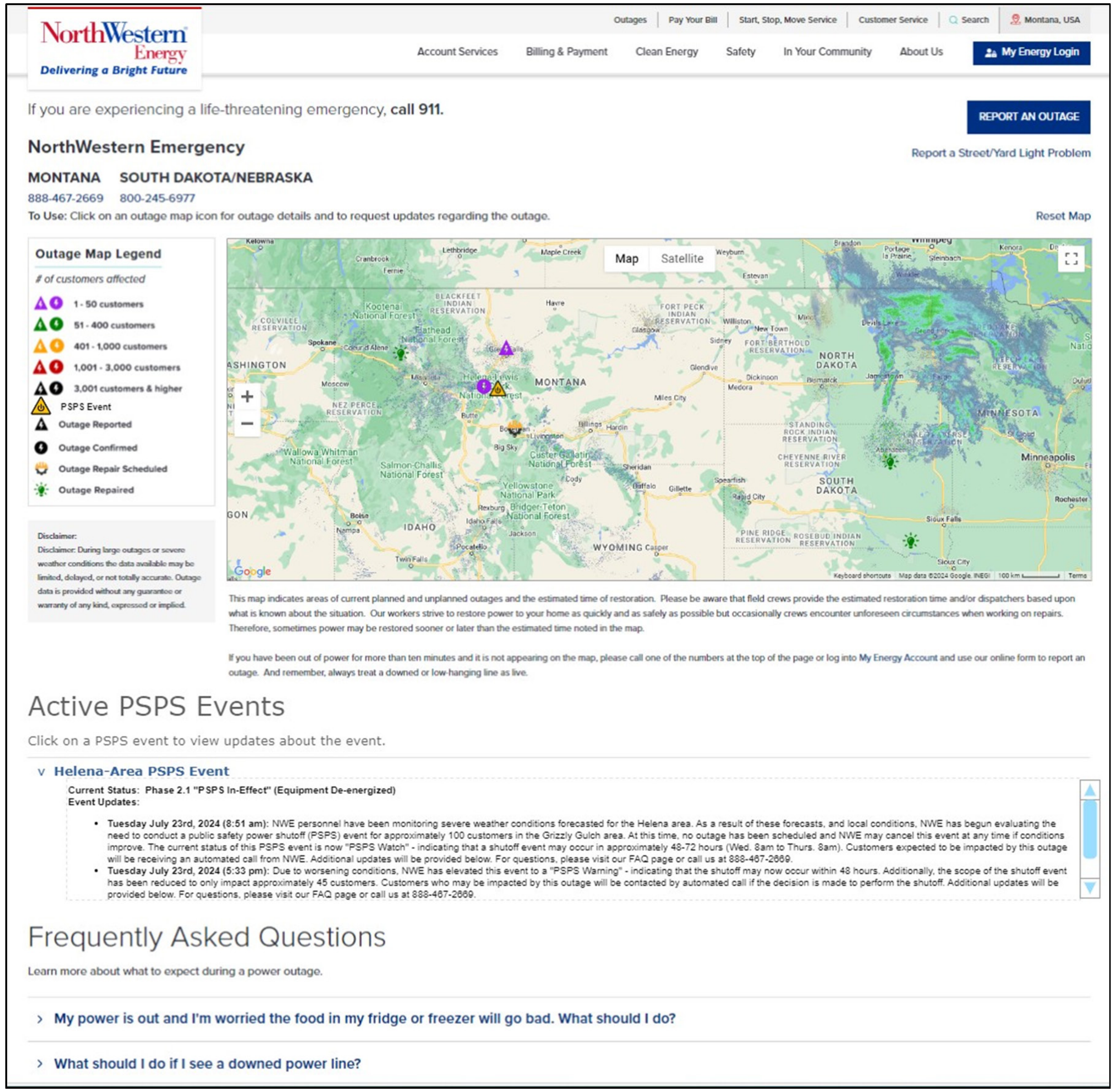


Figure 5 – Example mockup of NorthWestern Energy's outage map webpage displaying a hypothetical PSPS event in the Helena-area.

NorthWestern Energy also identified several supplemental communication channels designed to provide additional information or context to various external stakeholders. Each channel is intended to be applied at different phases of a PSPS event and is targeted toward specific external parties. These channels, each of which will be described in more detail below, include:

- Automated Outbound Call Campaign Direct to Customers
- Interactive Voice Response (IVR)
- NorthWestern Energy Corporate Communications
  - ↳ NorthWestern Energy Website
    - FAQ page
    - Website banner

- NorthWestern Energy Customer Care
  - ↳ Customer Service Representatives
  - ↳ Customer Associates
- NorthWestern Energy Community Connections
  - ↳ Key Account Managers
  - ↳ Community Relations Managers

In addition, other channels, which are not always part of NorthWestern Energy's PSPS Communication Strategy, but in some cases will be utilized when broader awareness is necessary:

- NorthWestern Energy Corporate Communications:
  - ↳ Social media (e.g., Facebook, Instagram, X)
  - ↳ Earned media (press releases distributed to news outlets and posted to website)
  - ↳ Paid media (radio, digital, broadcast ads and PSAs)
- NorthWestern Energy Outage Management System (OMS) [12]:
  - ↳ iTOA
  - ↳ webOMS
  - ↳ OASIS

In addition to identifying communication channels as part of its strategy, NorthWestern Energy also identified and categorized stakeholders to ensure that its communication strategy and channel selection would reach all external stakeholders with a direct or indirect interest in PSPS events. However, it is important to note that individual stakeholders are explicitly identified in NorthWestern Energy's channel strategy (Appendix B – NorthWestern Energy PSPS Stakeholder Communication Channel Strategy) since the specifically relevant stakeholders may vary depending on the PSPS event location, extent, and timing among other factors. As such, only three general stakeholder groups are identified. The identification of (and subsequent communications with) specific stakeholders is left to the PSPS Awareness Team and Incident Command Team. The three stakeholder groups identified in the channel strategy include:

- **All Stakeholders** - Any party seeking PSPS event info (including those listed below).
- **Impacted Customers** - Specific electric customers whose service is, or is expected to be, interrupted during a PSPS event.
- **Target/Key Stakeholders** - Any specific stakeholder or stakeholder group with a special interest in PSPS events. Examples include:
  - ↳ Large Customers (e.g., large businesses, commercial & industrial customers, etc.)
  - ↳ Critical Customers (e.g., hospitals, nursing homes, long-term care facilities, universities, etc.)
  - ↳ Public Safety Partners (e.g., fire departments, police, hospitals, churches, community centers, shelters, Non-profit emergency service providers, etc.)
  - ↳ Service Providers (e.g., co-ops, cellular providers, assistance agencies, water and sewer, transportation such as railroads, EV supply equipment, bus services, etc.)
  - ↳ Government (e.g., local, state, federal, tribal)
  - ↳ Transmission and Supply Organizations (e.g., WECC, NERC, reliability coordinators, adjacent interconnecting entities, ISOs, RTOs, etc.)
  - ↳ Regulators

As mentioned above, each channel is intended to be used during specific phase of PSPS events and are geared toward providing specific types of information to various stakeholders.

12 *These channels may be used for PSPS events with the potential for transmission- or supply-level impacts*

7.4.1 Automated Call Campaign

The automated call campaign is a key channel for targeted communication. It is intended to be used up to three times during a PSPS event to inform NorthWestern Energy electric customers who are (or may be) directly impacted by a PSPS de-energization. Phase 1.2, PSPS Watch, is the first phase in which the automated call campaign is used to contact customers who may be affected by the potential de-energization. In other words, the call campaign would be used to reach out to customers who have been identified to be within the potential outage boundaries. The purpose of this call would be to inform these customers of the potential for a PSPS event as well as direct them to the outage map webpage as the source for more real-time updates. The second phase at which the call campaign would be used would be when the go/no-go decision for a PSPS event has been made (i.e., beginning of Phase 1.4). The purpose of this call would be to either inform previously-contacted customers that the PSPS event had been cancelled, or inform them that the outage would be occurring, provide them with critical information about the outage such as impacted areas and the timing of the outage, and direct them to the outage map webpage for more information. The final phase at which the call campaign would be utilized would be following the restoration of power (i.e., Phase 2.3). This call would be used to inform customers who were impacted by the PSPS outage that the power had been restored and to direct them to reporting resources if they find themselves to still be experiencing a power outage (i.e., a nested outage).

7.4.2 Public Website

NorthWestern Energy's public website, in addition to hosting the primary communication channel (the outage map webpage), also supports other crucial communication channels. First, at all times (including when there is no ongoing PSPS event) NorthWestern Energy's website will include a PSPS education page designed to educate customers about PSPS events, communication channels (including directing stakeholders to the outage map webpage as the primary source for real time info), recommended preparations, and other general PSPS information. The second way the public website is utilized is to display an informational banner at the top of every page. This banner is intended to be used at all phases of a PSPS event, beginning with Phase 1.2, until the power is restored or the PSPS event is cancelled. The banner would reference any ongoing PSPS events and provide a link to the outage map webpage. It is intended to be a highly visible method for catching the attention of website visitors who may be looking for information about a PSPS event and may be unaware that the outage map webpage is the primary channel for information.

7.4.3 Interactive Voice Response (IVR)

NorthWestern Energy also selected its Interactive Voice Response (IVR) as another channel focused on directing traffic to its outage map. Much like the website banner, the IVR is intended to be used during all phases of a PSPS event, beginning with Phase 1.2, until the power is restored or the PSPS event is cancelled. During these times the IVR would include a pre-recorded message informing callers, who may be calling to request information about a PSPS event, that the outage map webpage is the primary source of information about ongoing PSPS events. Not only does this direct and educate external parties, it also helps to reduce NorthWestern Energy call volumes – freeing up internal resources to manage other issues and reduce call wait times.

7.4.4 Customer Care

NorthWestern Energy also identified the value in supporting several manual/human-based communication channels during PSPS events. For instance, NorthWestern Energy's Customer Care group, which includes customer service representatives and customer associates, will almost certainly be a critical communication channel for many customers and other external parties alike. As such, NorthWestern Energy's PSPS communication strategy requires that one or more Customer Care leaders (e.g., managers, directors, etc.) be included in all PSPS Awareness Team and Incident Command Team meetings. The role of these leaders is to then ensure that all customer-facing Customer Care employees are provided with, and understand, the most up-to-date PSPS information. Generally speaking, the goal of the customer care communication channel is to ensure that Customer Care employees are properly equipped to navigate, escalate, or redirect as needed, any conversations with, or questions from, external parties. However, in addition to fielding incoming inquiries about PSPS events, Customer Care leaders may, in some cases, identify the need to proactively or reactively reach out to specific customers (e.g., energy-dependent customers, hard-to-reach customers, etc.) to provide them with PSPS information.

7.4.5 Community Connections

Another human-based channel identified in NorthWestern Energy's PSPS communication strategy involves its Community Connections group which includes key account managers and community relations managers. This group, much like Customer Care, is likely to receive incoming PSPS inquiries from a variety of external parties such as local governments, critical/energy-dependent customers, and large businesses among others. This group is also generally responsible for proactively and reactively keeping these external stakeholders apprised of situations that may directly or indirectly impact them – who in many cases may require more detailed or timely information than can be provided via other channels. As such, NorthWestern Energy recognized the value in leveraging the existing communication processes of the Community Connections group to support the broader PSPS communication strategy. In short, the approach to the community connections channel requires that one or more Community Connections leaders (e.g., managers, directors, local community relations managers, etc.) be included in all PSPS Awareness Team and Incident Command Team meetings. Much like the strategy for Customer Care, the Community Connections leaders are then responsible for disseminating the most up-to-date PSPS information to the appropriate Community Connections employees to enable them to properly navigate, escalate, or redirect any conversations with, or questions from, external parties. Similarly, and perhaps to a greater degree than Customer Care, Community Connections leaders may also identify the need to reach out directly to specific stakeholders to provide them with critical PSPS information.

7.4.6 Corporate Communications

The third human-based channel included in NorthWestern Energy's PSPS communication strategy involves its Corporate Communications group. This group is responsible for any corporate-level communications (website, social media, paid media, press releases, etc.). In general, because PSPS events are expected to be localized to relatively small areas of impact, it is not anticipated that large-scale, public, and corporate-level communications such as paid ads and press releases will be necessary. However, due to the inherent potential that PSPS communication needs may escalate beyond the designated strategies listed above and the fact that the external communication responsibilities of Corporate Communications, Customer Care, and Community Connections groups can often overlap, NorthWestern recognized the clear need to include Corporate Communications personnel in its PSPS communication strategy. As with Customer Care and Community Connections, the expectation is that one or more Corporate Communications leaders or designee(s) be included in all PSPS Awareness Team and Incident Command Team meetings. These Corporate Communications leaders would then be responsible for keeping their employees up to date with PSPS information. Additionally, it is expected that Corporate Communications personnel will support Customer Care and Community Connections in order to carry out the general PSPS Communication Strategy (website updates, IVR messaging, etc.). For example, Corporate Communications will be responsible for ultimately establishing the language and information provided by the abovementioned channels (e.g., defining the language to be contained on the outage map webpage, website banner, call campaign scripts, IVR, and website info page). This ensures that PSPS information is consistent across all channels. Additionally, if the need is identified, the Corporate Communications group may be requested on a case-by-case basis to provide supplemental PSPS communications through channels such as social media, television, newspapers, and/or radio.

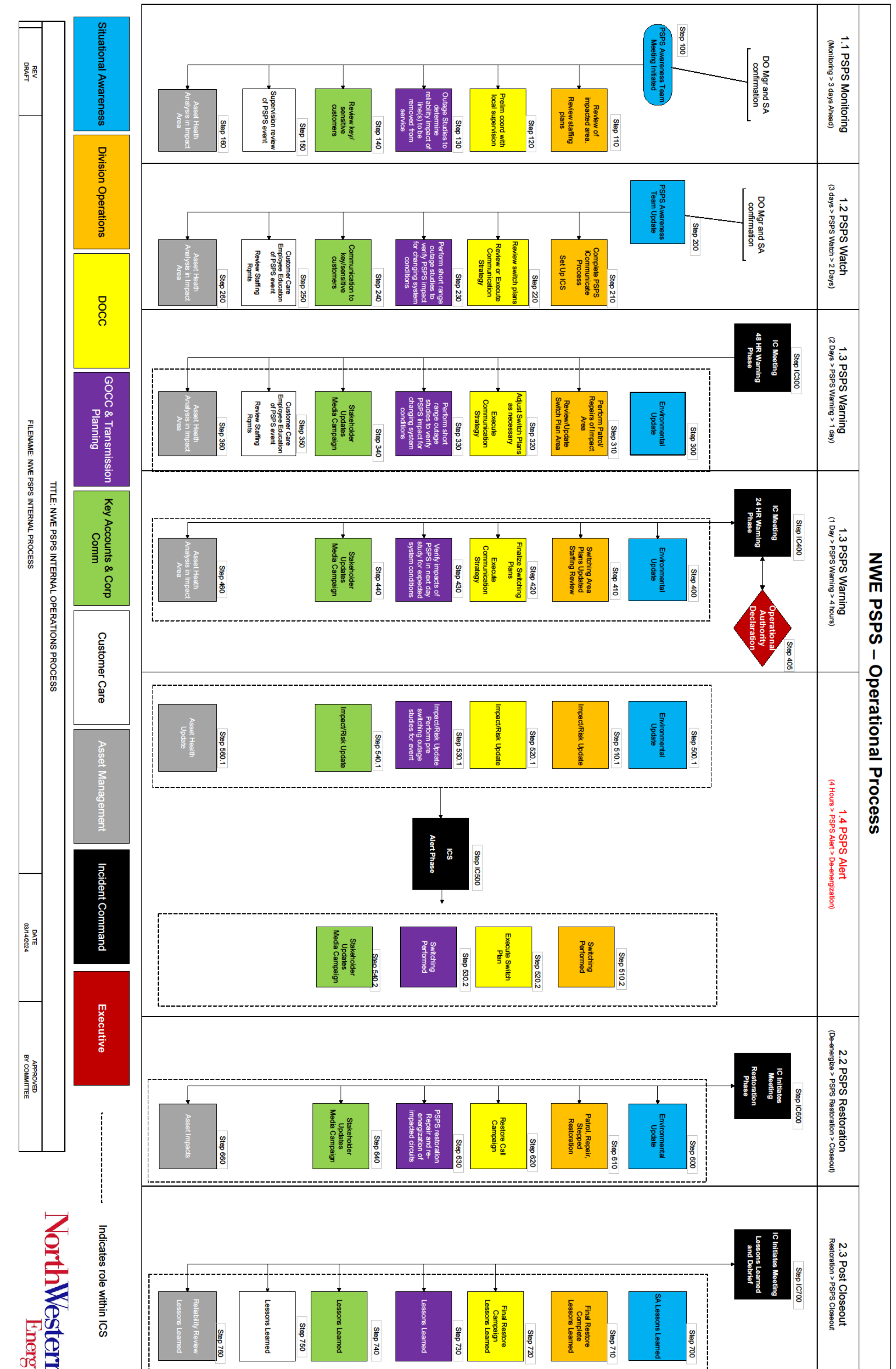
7.4.7 Grid Operations Outage Coordination

The final human-based channel included in NorthWestern Energy's PSPS communication strategy is managed by the Grid Operations Outage Coordination group. This group is responsible for all transmission system reliability-based communications with the regional Reliability Coordinator (RC) and external utilities. PSPS events on the NorthWestern Energy transmission system can impact grid reliability throughout the western interconnection and this group is expected to coordinate with external entities to prevent the PSPS event from causing undue risk to the interconnection. Beginning as early as Phase 1.1, and continuing throughout the PSPS event, the Grid Operations Outage Coordination group will use its iTOA and webOMS outage systems to notify the RC and external utilities of the status of the PSPS event including the equipment to be removed from service, the expected start and end times of the PSPS, system impacts, and any actions that are requested from that entity. This allows external entities to assess reliability impacts within their areas of responsibility and to adjust their operational process to support the PSPS event. Grid Operations Outage Coordination will also use the OASIS system to adjust available transmission capacity on the NorthWestern Energy and ensure external utilities can re-allocate energy schedules during the PSPS event. All outage notifications and OASIS postings will be updated as necessary to ensure all information is current. As such, it is essential that Grid Operations be included on all PSPS Awareness Team meetings and may be included in all Incident Command Team meetings if the event is expected to rise to the level of impacting transmission system elements, generation assets, electric co-operatives or large customer groups.

7.5 PSPS Communication Strategy Summary

Ultimately, the goal of NorthWestern Energy's PSPS communication strategy is to ensure that critical information about PSPS events is delivered, or made available, to all necessary external stakeholders via the designated channels and that internal parties have access to the most up-to-date information and have a clear understanding of their external communication responsibilities. To that end, NorthWestern's PSPS channel strategy (Appendix B – NorthWestern Energy PSPS Stakeholder Communication Channel Strategy) is provided as a summary of NorthWestern Energy's PSPS Communication Strategy.

Appendix A – NorthWestern Energy PSPS Operations Process



Appendix B – NorthWestern Energy PSPS Stakeholder Communication Channel Strategy

			Stage 1 PSPS Assessment				Stage 2 PSPS Execution		
		Stage 0				De-energization		Re-energization	
Communication Channel	**Purpose of Channel**	**0** Situational Monitoring	**1.1** PSPS Monitoring	**1.2** PSPS Watch	**1.3** PSPS Warning	**1.4** PSPS Alert	**2.1** PSPS In-Effect	**2.2** PSPS Restoration	**2.3** PSPS Closeout
Call Campaign	Inform impacted customers & direct traffic to website outage page								
Website Outage Page	PRIMARY COMMUNICATION CHANNEL Provides consistent info to all stakeholders								
Website Outage Map *(including text/email alerts)*									
Website Banner	Direct traffic to website outage page								
Website Info Page	General PSPS readiness info & direct traffic to website outage page								
IVR	Direct callers towards website outage page and away from call center								
Customer Care *(CSRs, CAs)*	Customer-facing employees are provided with latest info that can be relayed to customers								
Community Connections *(KAMs, CRMs, etc.)*	Key Account & Community Relations Managers provided with info for key stakeholders								
Corporate Communications *(Social Media, Radio, TV, etc.)*	Corporate Communications may use corporate-level communication channels as-needed								
Grid Operations *(OASIS, webOMS, iTOA, etc.)*	Grid Operations may use additional channels for transmission-level PSPS events								

SYMBOL LEGEND

ALL STAKEHOLDERS
Channel is intended for all stakeholders (i.e., any party seeking general information about a PSPS event)

IMPACTED CUSTOMERS
Channel is intended for customers whose electric service is, or is expected to be, impacted by a PSPS outage

TARGET/KEY STAKEHOLDERS
Channel is intended for specific stakeholders such as, government agencies, large customers, critical customers, service providers, public safety partners, etc.

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