

2022 Wildfire Season Preparedness

April 27, 2022



**PUGET
SOUND
ENERGY**

Responding to Evolving Wildfire Risks

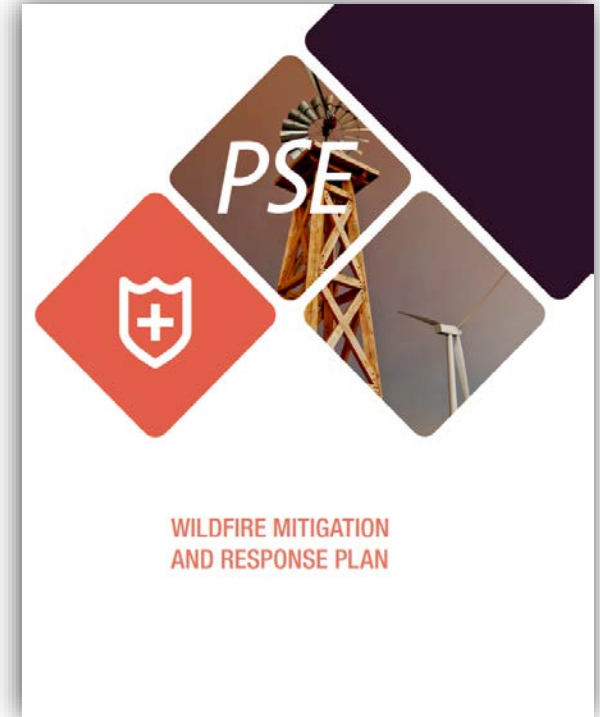
Situational Awareness

Fault Reduction

Fault Protection

Communication and Outreach

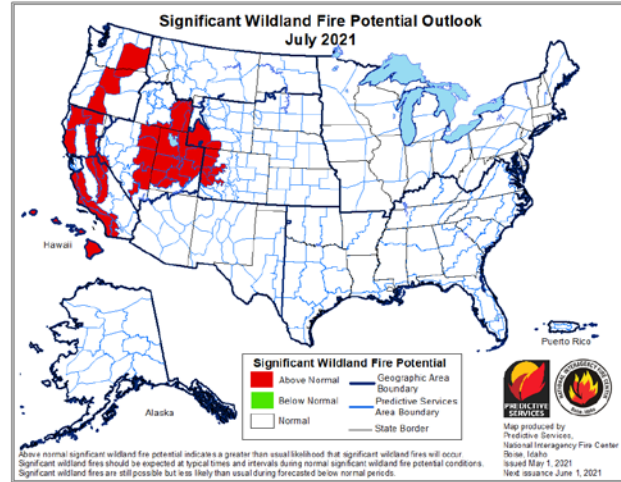
Operational Procedures & Emergency Response



2021 Wildfire Season Review

(Actual conditions largely followed predictions)

2021 Predicted Outlook



2021 NWCC Large Wildfire Events



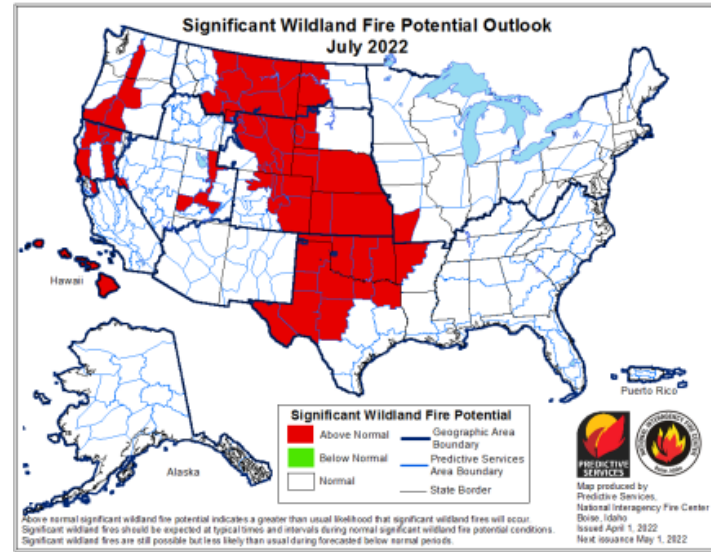
2021 Wildfire Season Review

Number of wildfires in PSE territory and whether they affected PSE infrastructure

Year	Number of wildfires within or near PSE's territory	Number of wildfires that affected PSE infrastructure
2017	3	0
2018	5	0
2019	0	0
2020	3	2
2021	5	0

* Sourced from NICC Annual Fire Reports

2022 Wildfire Season Outlook



- The outlook for significant wildfires prior to July 2022 is normal in PSE's service territory
- The outlook for significant wildfires in July of 2022 is above normal in portions of PSE's service territory
- PSE prepares for an active fire season regardless of forecasts

2022 Pre-Wildfire Season Actions



Incorporated 2022 risk modeling into Daily Risk Dashboard and Operational Procedures



Conducting pre-season inspections and remediation for vegetation



System hardening projects completed that reduce wildfire risks and improve reliability



Participating in hazards workshops hosted by county emergency management departments



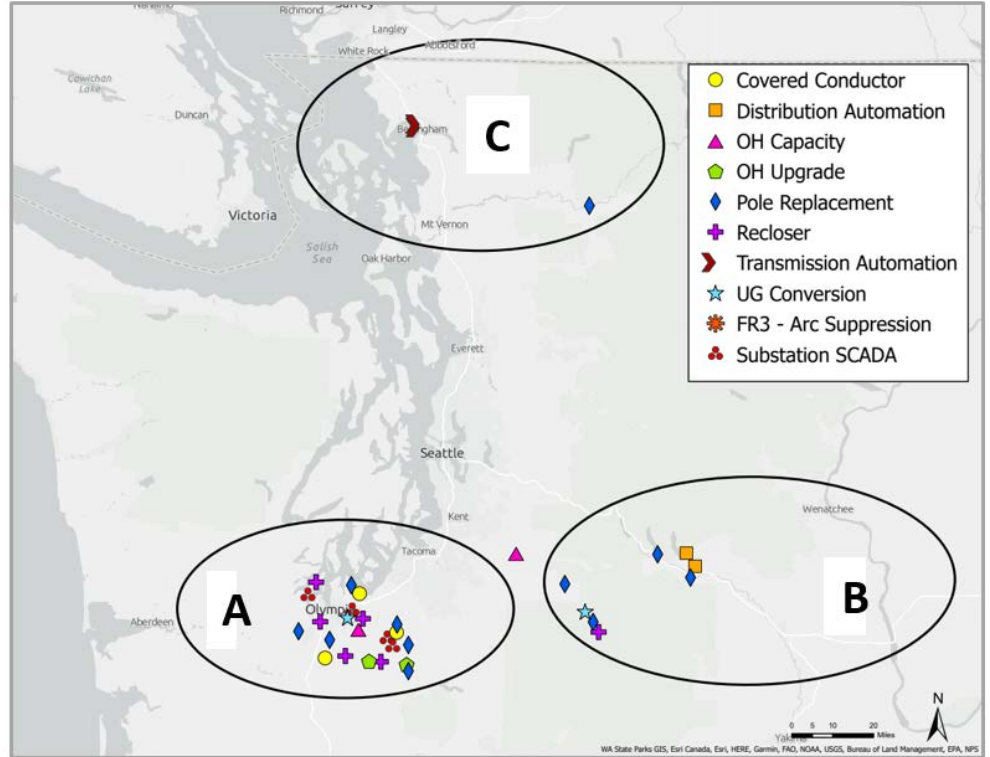
Hosting first community meeting



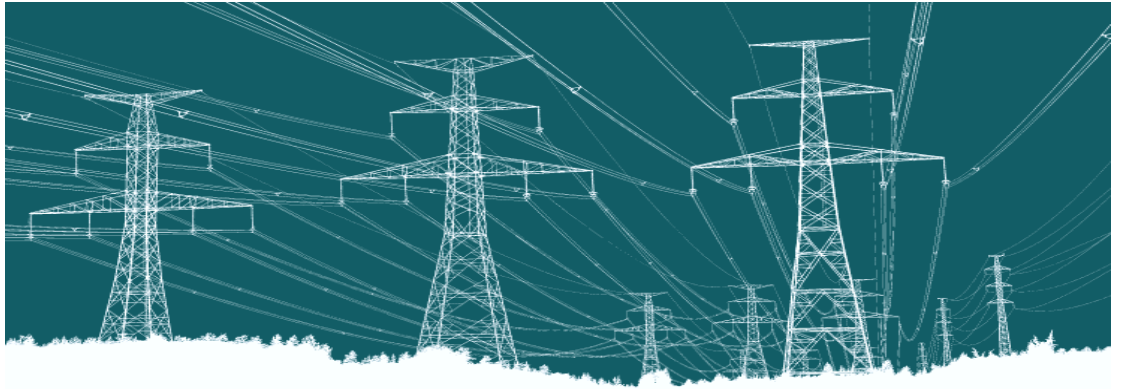
Formalizing and improving daily ignition/fire event logging practices

2022 Pre-Wildfire Season Actions

2020-2021 Fault Reduction and Protection Projects



2022 Plan Updates



- Progress in developing and implementing a public safety power shutoff (PSPS) plan
- Advancements in wildfire risk assessment model and incident capture capabilities
- Investment plan for fault reduction and protection through 2025 to execute our strategies
- Roadmap for the next planned improvements across each plan element
- Increased staffing dedicated to wildfire planning, administration, and mitigation efforts

Public Safety Power Shutoffs

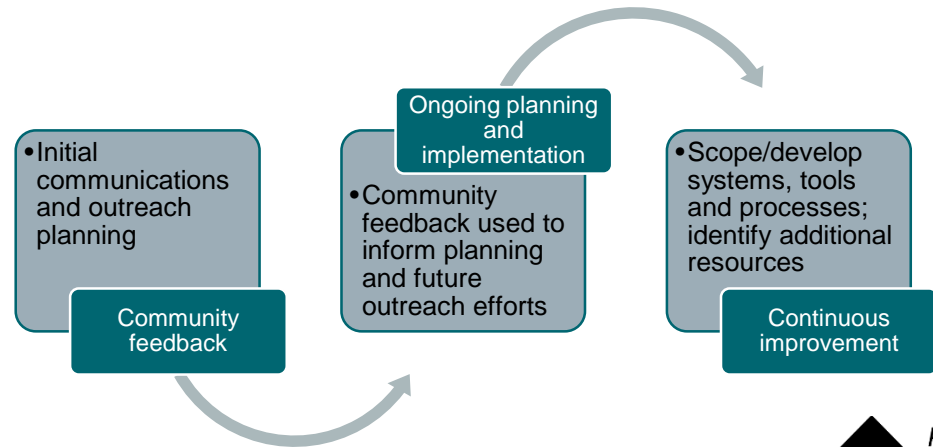


PSE's approach and objective is community specific and informed wildfire ignition risk reduction and safety plans that recognize the potential negative consequences of a power shut-off. Key elements in implementation include:

- Risk modeling
- Situational awareness to forecasted and real-time weather conditions
- Customer education and communication strategies
- Documented operations procedures

Community Engagement

- We will hold our first community engagement meeting in Cle Elum, WA on June 8, 2022
- To ensure broad and inclusive outreach, PSE will be using a variety of outreach methods to invite customers to attend
- Additional community meetings will follow this summer in other higher wildfire risk areas in our service territory



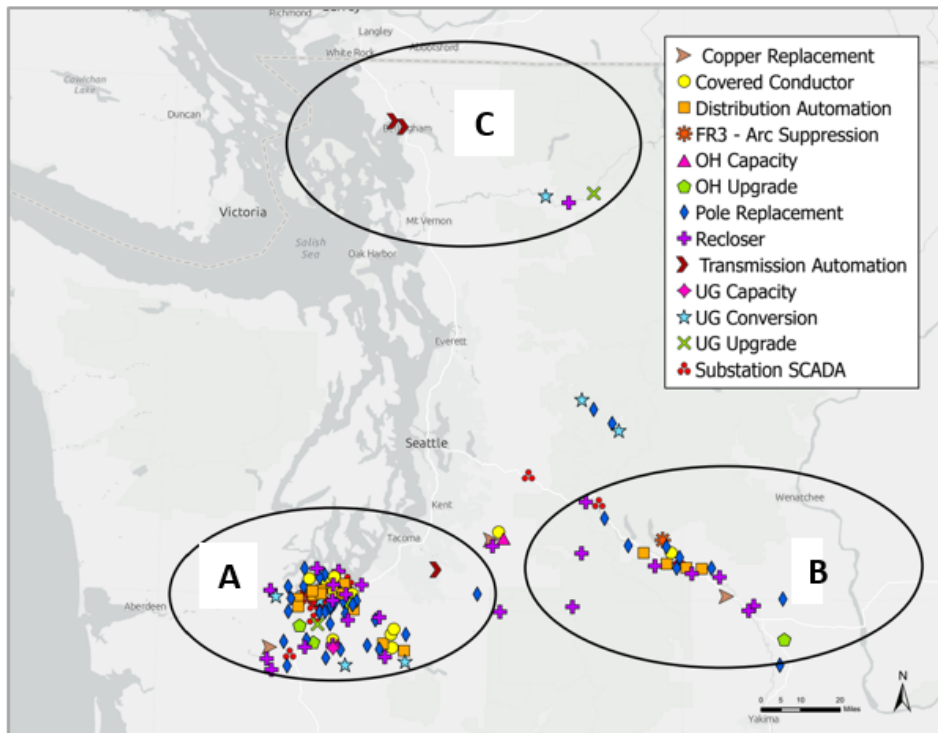
Continuous Improvement



- Advance specific grid modernization investments for a resilient community.
- Enhance decision criteria that prioritizes investments and actions that reduce wildfire risk.
- Deploy situational awareness technologies.
- Refresh operational procedures and performance metrics with wildfire risk in mind.
- Engage and collaborate with communities, customers, and emergency response personnel to inform our tools, actions, and plans.

2022-2025 System Hardening Projects

2022-2025 Fault Reduction and Protection Projects





Thank You

APPENDIX A-1: EXECUTION AND CONTINUOUS IMPROVEMENT

Definition and Objective	Plan years	On-going
Effective plan execution requires staff focused on identifying and incorporating best practices to ensure PSE's plan effectively and adaptively addresses evolving wildfire risks within PSE's territory.	Total Cost	Unknown at this time
	Wildfire Risk	H, M, and L
	Key Performance Metrics	Number of ignition events Number of arcing events Acres burned Industry practices deployed Number of RCAs performed

Plan Next Milestones		
Key Strategy	Process	Key Accomplishments 2021-2022
Engineering	Wildfire and Vegetation Engineer	New Engineer focused on: <ul style="list-style-type: none"> Holistic strategies and processes for reducing wildfire risk and improving reliability and resiliency. Developing and implementing asset management strategies for long-term system hardening in higher wildfire risk areas. Engaging with the industry and vendors to align with best practices and evaluate the potential for integrating new technologies or approaches to reduce wildfire risk. Working with standards to improve equipment specification and exploring new technologies.
Analysis	Data Scientist	Position to be hired in 2022
	Data Capture Capability	In 2022, develop and implement improved methods for capturing and logging fire ignition data
Program Management	Wildfire Program Manager	Starting April 18, 2022 This position is responsible for leading PSE's ongoing development and implementation of our corporate wildfire risk reduction strategies and assembling and leading multi-disciplinary teams to ensure mitigation implementation aligns with overall corporate objectives
Lessons Learned	Root Cause Analysis (RCA)	In 2022, evaluate use of existing reliability RCA processes for application in wildfire risk reduction
	2021 experience	Continued to develop risk model, including burn potential and fire propagation, likelihood, and consequence of ignitions; continued engagement with DNR advisory committee
	Industry sharing	Wildfire Season Recap Summit January 2022 WEI Wildfire Planning and Mitigation Conference April 2022 Ongoing meetings and discussions with peer utilities Avista bi-annual meetings focused on risk prevention Training and continuous improvement with transmission and distribution grid operators

DEVELOP DASHBOARD FOR KPIs

DEVELOP GRID OPERATOR TRAINING AND FEEDBACK LOOP

UTILIZE ENHANCED DATA CAPTURE

CONTINUE TO ENGAGE IN INDUSTRY WORKSHOPS AND COLLABORATING WITH PEER UTILITIES

APPENDIX A-2: SITUATIONAL AWARENESS

Definition and Objective	Plan years	2020-2025
Real-time situational awareness is enhanced through operator dashboards utilizing public risk and weather datasets. Real-time operations personnel can use these dashboards to trigger operational decisions such as non-reclose operation of distribution circuits, staging first-response personnel, and required visual inspection during restoration efforts. These actions will significantly reduce the risk of ignition.	Total Cost	\$13 million
	Wildfire Risk	H, M, and L
	Key Performance Metrics	Dashboard uptime Number of dashboard improvements Number of pre-season inspections performed on time Number of agency coordination events Miles of WUI (increasing over time)

Plan Next Milestones		
Key Strategy	Process	Key Accomplishments 2021-2022
Assess Risk	Risk Modeling	<p>New Engineer focused on:</p> <ul style="list-style-type: none"> Holistic strategies and processes for reducing wildfire risk and improving reliability and resiliency. Developing and implementing asset management strategies for long-term system hardening in higher wildfire risk areas. Engaging with the industry and vendors to align with best practices and evaluate the potential for integrating new technologies or approaches to reduce wildfire risk. Working with standards to improve equipment specification and exploring new technologies. <p>Position hired in 2022</p>
	Annual risk rating	In 2022, develop and implement improved methods for capturing and logging fire ignition data
Fire Weather Monitoring and Risk Mitigation	Daily Dashboard	Updated real-time dashboard with new risk classifications and additional real-time environmental data to monitor fire weather conditions.
	Ignitions and fire tracking	Enhanced data capture procedures to enable more granular tracking and ongoing trend analysis of ignition and wildfire events in logs as compared to other fire events; developing new tracking tool for field recording.
Inspection Technology	Aerial and thermal inspection devices	Initiated pilot for satellite imagery that will feed predictive modeling
Pre-Wildfire Season Inspections	Ground and helicopter inspections	Piloted OSMOSE overhead detailed inspection. Inspected and addressed tree and equipment issues on 4 transmission circuits and 19 distribution circuits.

INCORPORATE RISK MODEL REFINEMENTS TO ENABLE PRIORITIZATION OF PROJECTS

INVESTIGATE DEPLOYMENT OF CAMEVAS AND WEATHER STATIONS

TRACK TREE GROWTH IF SATELLITE PILOT IS SUCCESSFUL

INCORPORATE INFORMATION FROM SATELLITE MONITORING, LIDAR, REMOTE SENSING SYSTEMS; EXPAND DRONE PROGRAM

APPENDIX A-3: FAULT REDUCTION

Definition and Objective Reduce wildfire risk by preventing the interaction of utility infrastructure and the environment through incorporating a variety of fault reduction strategies tailored to the wildfire environment.	Plan years	2020-2025
	Total Cost	Capital - \$ 100.8 million for known projects – additional dollars will be allocated as additional projects are scoped O&M - \$ 17.7 million for pole replacement and pre-wildfire season vegetation management
	Wildfire Risk	H, M, and L
	Key Performance Metrics	Distribution grid hardening projects completed Miles of bare conductor upgraded Miles of conductor undergrounded Miles of covered conductor installed Number of poles replaced Number of PSPS deployed

Plan Next Milestones		
Key Strategy	Process	Key Accomplishments 2021-2022
Vegetation Management	Pre-wildfire season trimming	2021 trimmed 1,692 trees 2022 to be addressed with completed inspections
	Pre-wildfire season hazard Tree Removal	2021 removed 473 trees 2022 to be addressed with completed inspections
Public Safety Power Shutoffs	Operational planning	Defined circuit characteristics for impact including evaluating community and customer impacts to decide priority areas. Focusing on 2 circuits for initial planning
	Community Engagement and customer education	June 2022 first community and customer education meeting in Cle Elum Additional community and customer education meetings being planned
Deploy Covered Conductor and Strategic Undergrounding	Defined investments	2021 completed 1 installations of covered conductor 2021 completed 2 undergrounding projects 2022 planned 2 covered conductor projects 2022 planned 1 undergrounding project
Asset Management	Defined investments	2021 replaced poles at the end of their useful life on 11 circuits 2022 planned replacement of poles at the end of their useful life on 9 circuits. 2022 DER projects are being planned

2022: 15 PROJECTS BEING EVALUATED

2024: 27 PROJECTS PLANNED

2025: 17 PROJECTS PLANNED

APPENDIX A-4: FAULT PROTECTION

Definition and Objective	Plan years	2020-2025
Reducing the duration and extent of faults or the likelihood of an ignition. Several common fault protection tactics include altering automatic reclosing and protective device settings.	Total Cost	Capital - \$ 33.6 million for known projects – additional dollars will be allocated as additional projects are scoped
	Wildfire Risk	H, M, and L
	Key Performance Metrics	Number of reclosers SCADA upgrades to circuit breakers Distribution Automation schemes installed Overhead equipment failure tracking Number of fiberglass arms installed Arc-suppression fuses installed FR3 transformers installed

Plan Next Milestones		
Key Strategy	Process	Key Accomplishments 2021-2022
Reclose Blocking	SCADA enablement	2021 4 projects completed 2022 7 projects planned
	DA and TA	2021 2 Transmission Automation Projects completed 2022 2 Transmission Automation Projects planned
Arc Suppression fuses	New technology	New arc suppression fuse in trial
Other System Re-Design Equipment	FR3 filled transformers	2021 1 demonstration project completed 2022 Piloting arc suppression fuses and FR3 transformers
	Fiberglass cross arms	2022 – Piloting fiberglass cross arms
	Reclosers	2021 – 5 Recloser installation projects completed 2022 – 7 Recloser installation projects planned
	Bonding transmission insulators	Developing standards in 2022

2023: 52 PROJECTS PLANNED

2024: 18 PROJECTS PLANNED

2025: 16 PROJECTS PLANNED

APPENDIX A-5: OPERATIONAL PROCEDURES AND EMERGENCY RESPONSE

Definition and Objective PSE's operating procedures in higher wildfire risk areas and during wildland fire weather events require proactively monitoring our system and maintaining situational awareness as well as closely coordinating our emergency response activities with many other entities.	Plan years	2020-2023
	Total Cost	TBD
	Wildfire Risk	H, M, and L
	Key Performance Metrics	Number of overhead equipment failures Number of system operations actions taken from dashboard use Number of PSPS deployed

Plan Next Milestones		
Key Strategy	Process	Key Accomplishments 2021-2022
Emergency Management	Workshops	Attending Six county summer hazard workshops planned in 2022
	Wildland Fire Prevention Task Force	Attended meetings and participated in discussions with DNR
Operational Procedures	Situational Awareness	Updated operating procedures to reflect 2022 risk modeling Enhanced ignition event data capture and logging capabilities in 2022 Performed online training for operations leadership
	Activation thresholds	Established thresholds and protocols to guide evaluation of operational actions Proactively responded to 10 red flag warnings; modified procedures with field feedback; Kittitas real time coordination established
	Fire Command Interface	Proactively responded to 10 red flag warnings; modified procedures with field feedback; Kittitas real time coordination established 2021 collaborated with fire districts throughout Pierce County and with Tacoma Power to mutually understand operation and emergency communications procedures Established real-time communication with Kittitas fire during emergency events 2022 Expanding this effort to additional fire districts including the six emergency management workshops mentioned above Updated internal Safety Procedures

EXPAND ON COLLABORATION WITH DNR, FIRE DISTRICTS, AND OTHER UTILITIES IN THE AREA

ANALYZE DATA CAPTURED THROUGH SOFTWARE UPDATES FOR DAILY LOGGING

DETERMINE ADJUSTMENTS TO OPERATIONAL PROCEDURES BASED ON DATA ANALYSIS

APPENDIX A-6: COMMUNICATIONS AND OUTREACH

Definition and Objective	<p>Effective external and internal communication is essential for coordinated prevention and response to wildfire risks. PSE will host several community engagement sessions in higher wildfire risk areas to inform and develop unique community- and customer-centric actions and wildfire mitigation tools, such as an effective PSPS plan. In addition, PSE works with land management groups ahead of fire season and fire response personnel during wildfire events. Customer communication follows established protocols from storms and other emergencies.</p>
Plan years	2020-2022
Total Cost	<p>Estimated budget per town hall event: \$45,000-100,000</p> <p>Note: Budget for additional communication tools and resources that may need to be developed is unknown at this time.</p>
Wildfire Risk	H, M, and L
Key Performance Metrics	<ul style="list-style-type: none"> • Customer participation/feedback from community meeting(s) • Customer communication via multiple channels (social media, bill inserts, etc.) • Number of meetings with fire agencies • Number of meetings with forest land agencies

Plan Next Milestones		
Key Strategy	Process	Key Accomplishments 2021-2022
Communication tools and channels	Planning	<ul style="list-style-type: none"> • Developing a communications plan to gather public input from customers in higher risk wildfire areas, including a series of facilitated town hall meetings. The plan includes leveraging existing relationships within the community to ensure a thoughtful approach to inviting community members to the table • Developing communications materials, including maps, fact sheet, web content and slide deck to educate the public, customers and key stakeholders • Created wildfire.response@pse.com email inbox as a tool for communicating with customers and the public • Working to onboard an external facilitator to help collect feedback during town hall meetings, capture and summarize feedback to inform future town halls and wildfire planning efforts • Providing communications perspective, recommendations and tools/resources needed for public education and customer notification around potential future PSPS events • Identifying key media publications or community newsletters to target for proactive outreach ahead of fire season
Pre-Season	Communication activities	<ul style="list-style-type: none"> • Launched web landing page (pse.com/wildfireplan) with customer information about how PSE prepares and what they can do to prepare as well as communicating with customers through social media, bill inserts, community partnerships • Proactive outreach to media publications or community newsletters ahead of fire season, ahead of wildfire-related community engagement events, or to share program developments or milestones • Business Continuity team is connecting with County emergency management agencies to discuss wildfire and summer weather safety
During an event	Communications activities	<ul style="list-style-type: none"> • Use of existing storm/emergency channels to share information. Available channels include social media, web, media engagement, email/phone calls to customers, jurisdiction and key stakeholder engagement

