

# 2022 Wildfire Mitigation Plan Update



## Grid Design and System Hardening

Amy McCluskey, Managing Director of Wildfire Safety and Asset Management  
May 18, 2022



In 2021, as part of Wildfire Mitigation efforts, **Grid Hardening:**

- ✓ Completed installation of 20 miles of covered conductor in HFTD
- ✓ Completed installation of 32 reclosers and relays
- ✓ Initiated Generator Rebate and Free Portable Battery program (refer to PSPS discussion for more)

In 2022, **Grid Hardening** changes include:

- Increased initiative targets
- Updated contract management strategy
- Undergrounding scoped

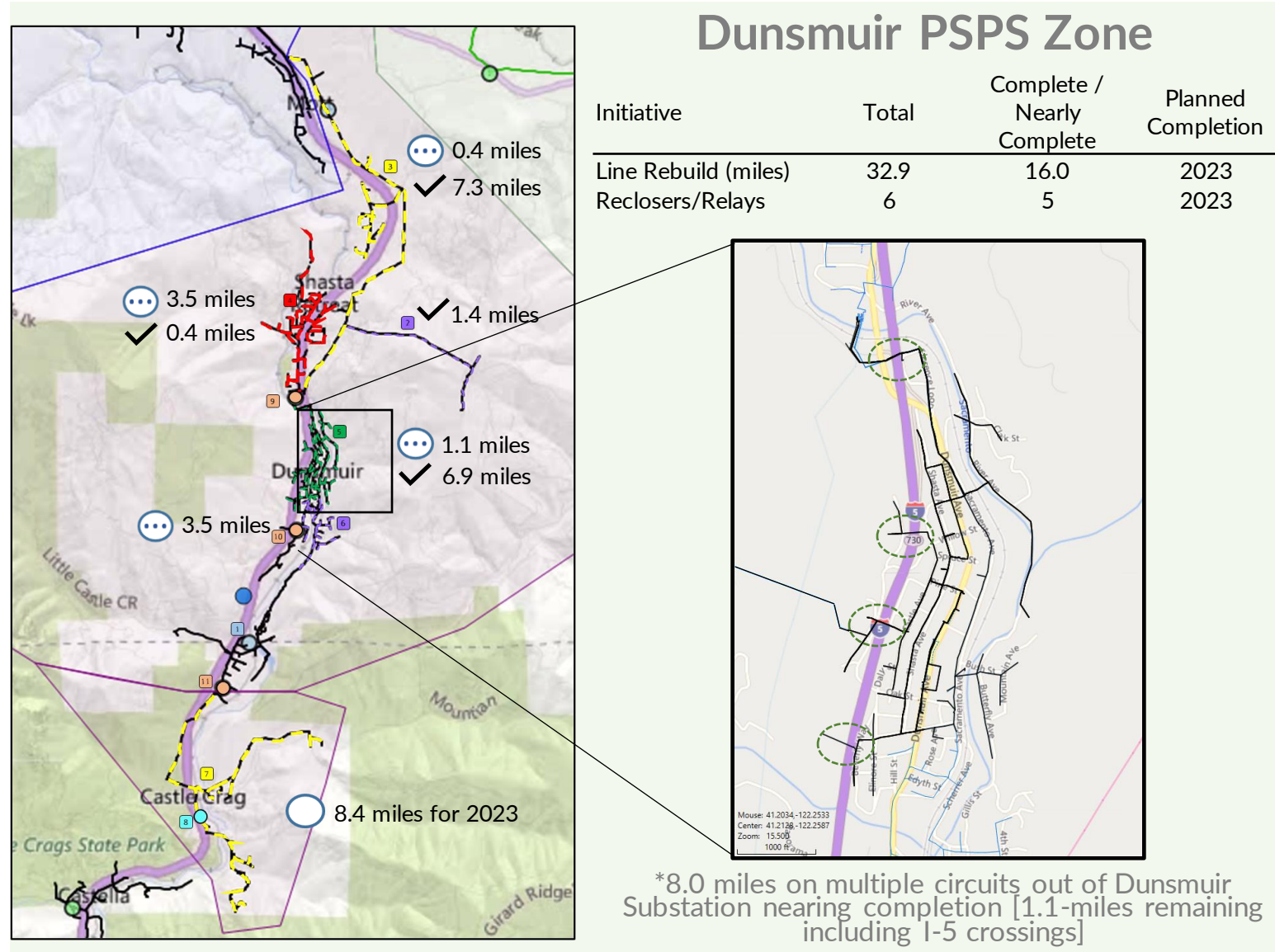
Future Plans

- 2023: Continue grid hardening
- 2025: Complete all grid hardening scope to mitigate existing PSPS zones.
- 2032: Risk-based deployment of grid hardening complete



# Grid Hardening for PSPS Mitigation

- ✓ Covered conductor, combined with other **grid hardening** is projected to **decrease PSPS impacts** and likelihood
- ✓ Covered conductor **physically prevents the initiation** of flash-over due to vegetation
- ✓ Mechanical properties of covered conductor reduce PSPS impacts by
  - ✓ (a) making PSPS substantially less likely and
  - ✓ (b) helping PacifiCorp methodically reduce the size and areas of impact.



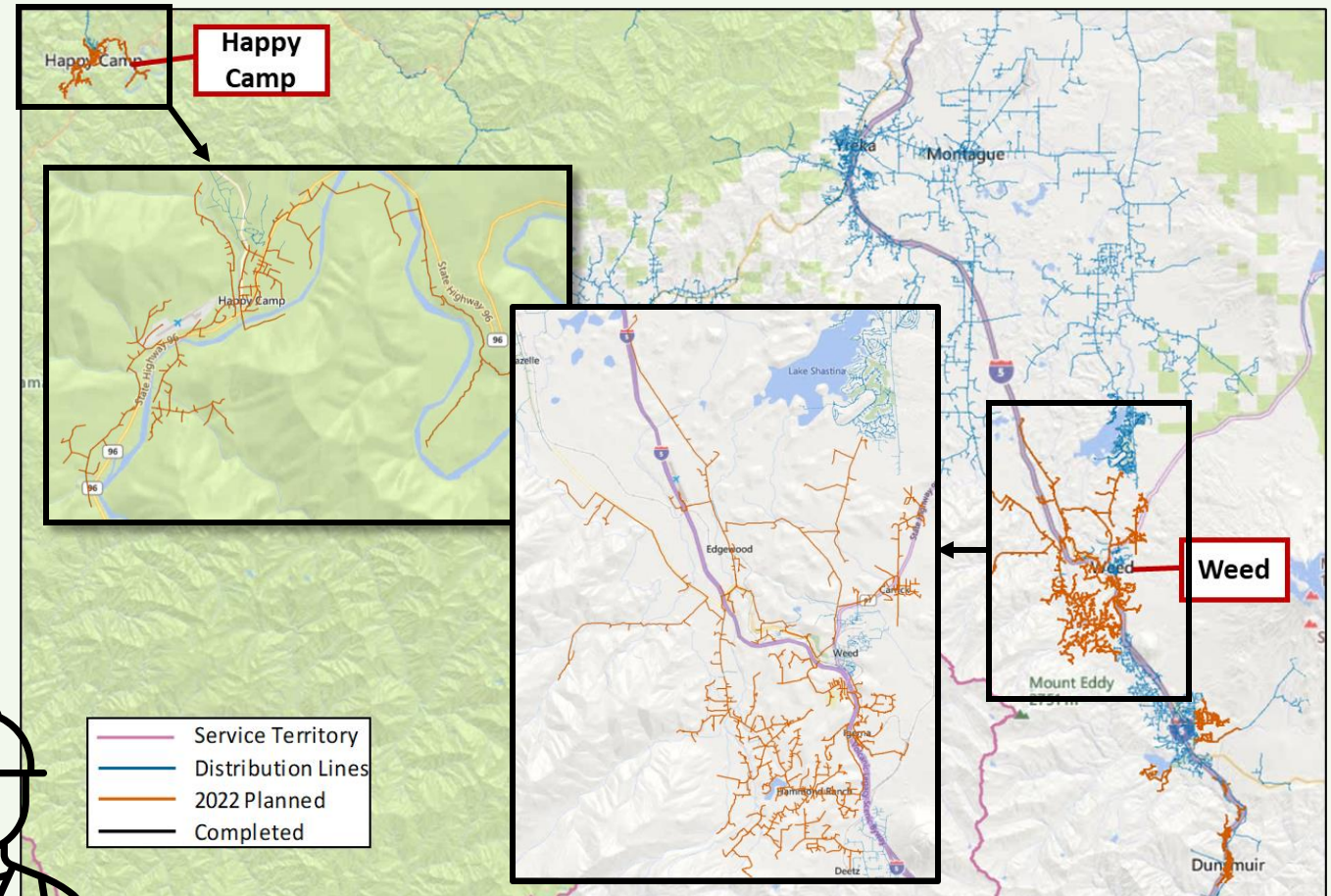


# Key Initiative Targets

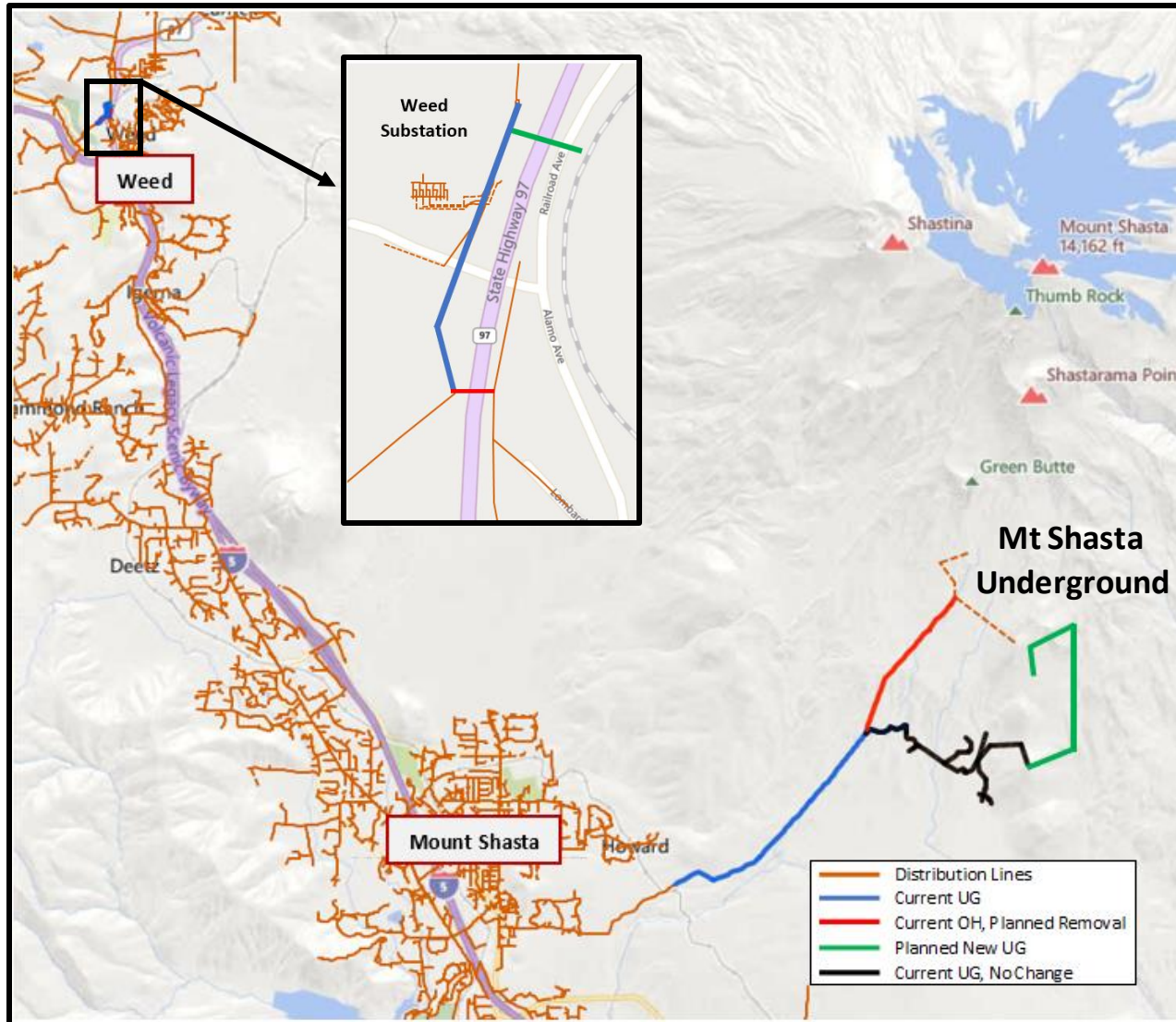
- ✓ Separate expulsion fuse replacement program: replacing 2,269 fuses
- ✓ Increased plan for recloser /relay installation: increased to from 36 to 51 units
- ✓ Continued ramp up of covered conductor installation: increased to 112 miles
- ✓ New Communicating Fault Circuit Indicators installation :500 operational in 2022



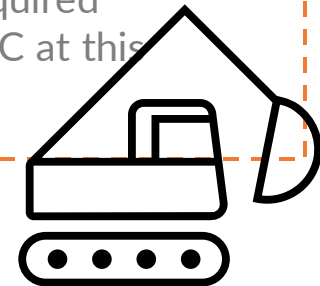
## 2022 Covered Conductor Plan



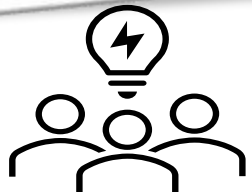
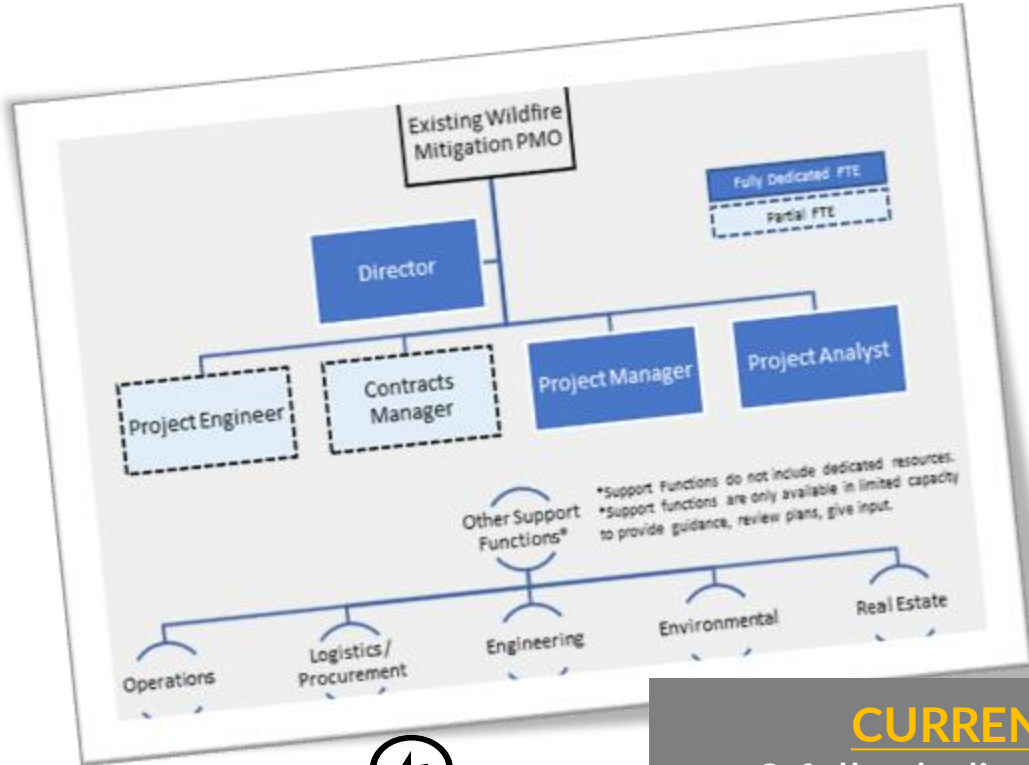
# Undergrounding Scoped



- ✓ Two projects identified for potential underground [Mt. Shasta and Outside Weed Substation]
- ✓ Collaboration with US Forest Service
- ✓ Underground Cost Benefit Evaluation:
  - ✓ Heavy tree canopy with limited access
  - ✓ High elevation and high loading require full pole replacement with more poles per line mile than lower elevations
  - ✓ No customer meter replacements required=Lower cost than CC at this location



# Updated Contract Management Strategy



**CURRENTLY**  
 3 fully dedicated FTEs  
 2 Partial FTEs  
 Support Functions are Shared



- Project Management
- Project Control
- Project Reporting
- Engineering
- Estimating
- Permitting
- Environmental Surveys
- Easements / Land Acquisition
- Public Engagement / Stakeholder Management
- Material Procurement
- Materials Management, Storage, & Logistics
- Construction
- Post Construction Inspections
- Equipment Commissioning & Inspection
- Maintenance Program Development

**2023**  
 Externally Contracted,  
 Fully Dedicated Teams of  
 Contractors



# 2022 Wildfire Mitigation Plan Update



## Risk Modelling and Assessment

Steve Vanderburg, Manager of Meteorology  
May 18, 2022



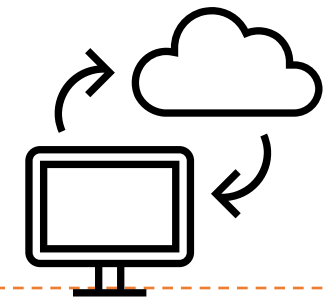
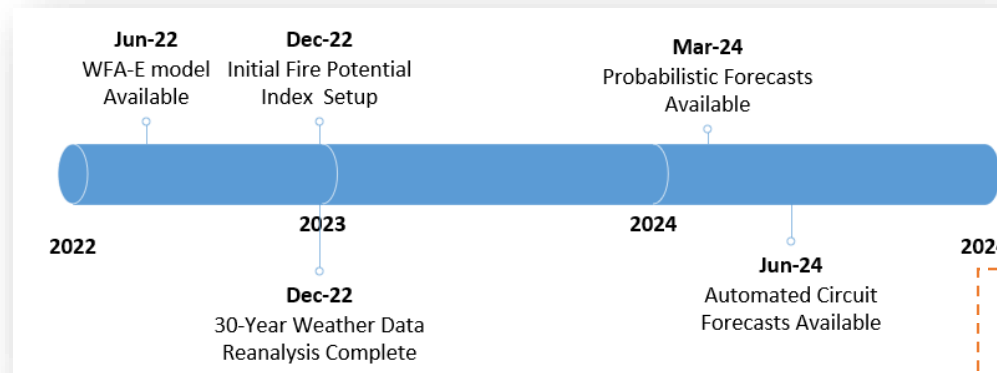
## In 2021, as part of Wildfire Mitigation efforts, **risk modelling**:

- ✓ Completed procurement of redundant hardware infrastructure to support operational risk modelling plans
- ✓ Completed procurement of Technosylva FireCast and Firesim to initiate dynamic risk modelling
- ✓ Completed setup of StormGeo Website tool

## In 2022, **risk modelling** is planned to continually improve efforts through:

- ❑ Completing procurement of WRF 30-year data
- ❑ Continuing to expand the weather station network
- ❑ Completing procurement of Technosylva WFA-E to include updated data inputs
- ❑ Forecasting by new meteorology team
- ❑ Installation of Communicating Fault Circuit Indicators

## Future Plans



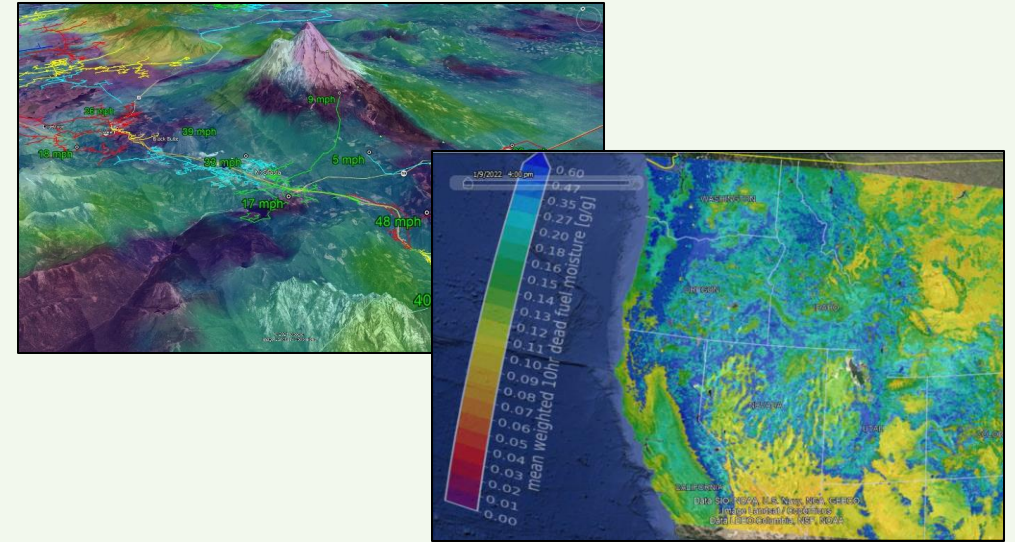
*Improved tools to reduce PSPS scope, scale and likelihood*



# Improved Situational Awareness Data

## Weather Research & Forecast (WRF)

- ✓ 2km, 96-hour weather and fuels forecasts
- ✓ Detailed 30-year weather reanalysis
- ✓ Foundation for risk-based forecast



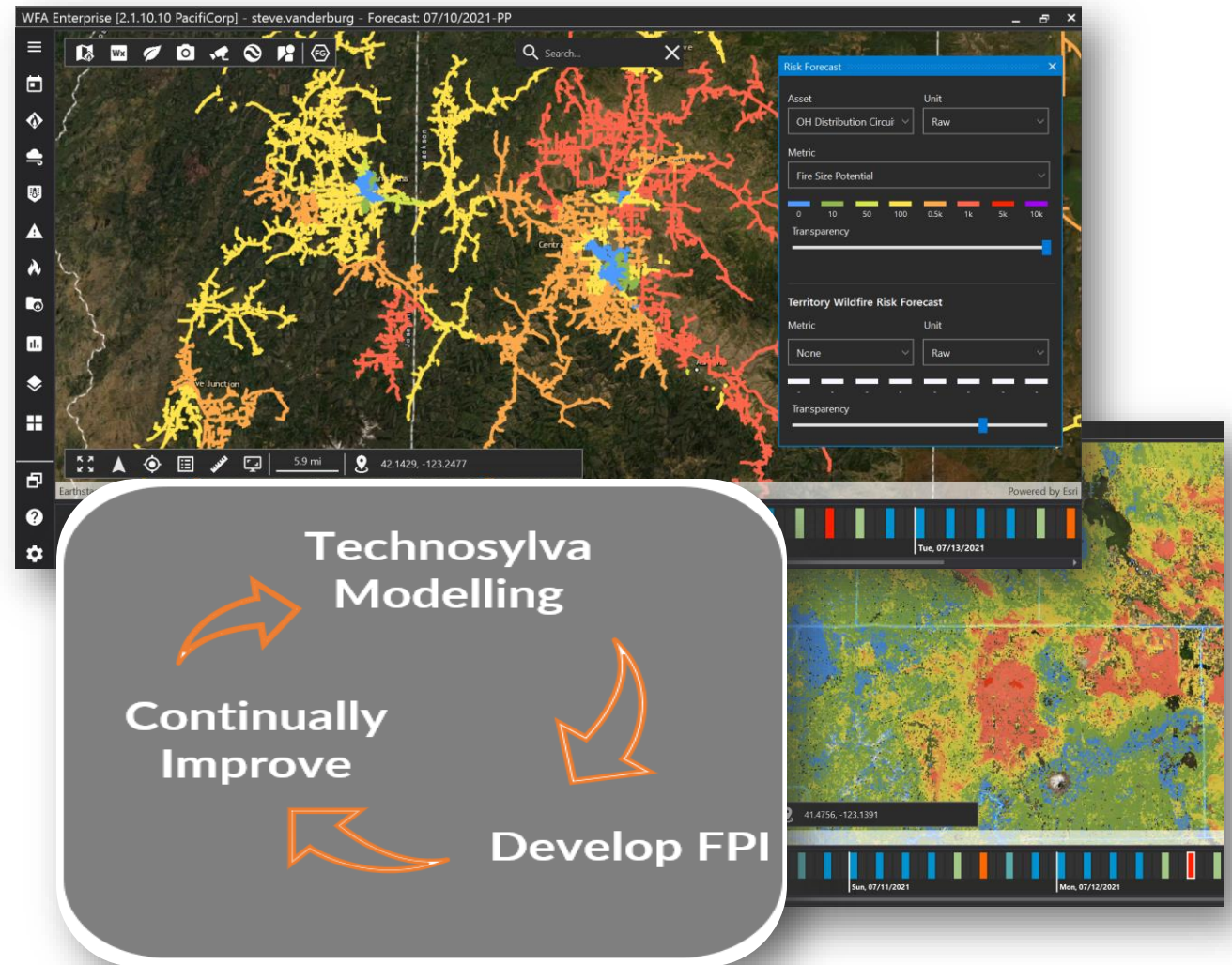
## Weather Station Expansion

- ✓ Expanding to 80 weather stations in California in 2022
- ✓ 10-minute observations to support real-time operations

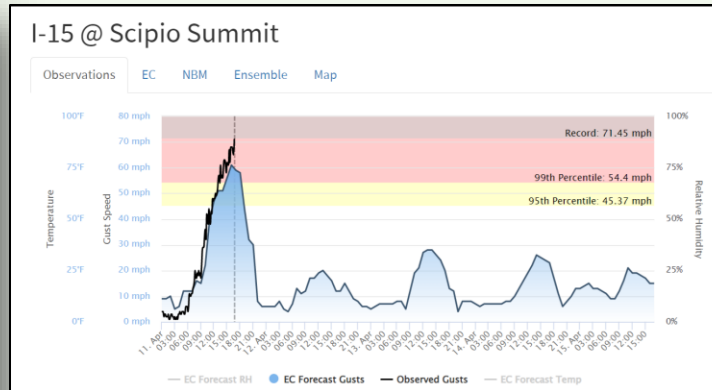
# Improved Risk Modelling

## Procurement of Advanced Wildfire Models

- ✓ Initial step to developing quantitative FPI
- ✓ Millions of territory-wide wildfire simulations performed daily
- ✓ Wildfire risk and consequence forecasts
- ✓ Used for real-time decision making and long-term planning of system hardening



# New Situational Awareness Initiatives



Station	Wind	Gust	Direction	Temp	Humidity
Quail Point Lookout	49 mph	58 mph	SSW	58°F	100%
Henry Lake	27 mph	38 mph	SSW	42°F	98%
Woodhouse	28 mph	38 mph	SSW	42°F	98%
Clear Mountain Lookout	40 mph	50 mph	SSW	50°F	100%
North Pine Ridge	43 mph	53 mph	S	50°F	98%
McEwen Lookout	49 mph	59 mph	WSW	49°F	98%
Clear Lake Lookout	29 mph	39 mph	SSW	22°F	72%
Clear Lake Lookout	32 mph	42 mph	S	47°F	100%
Black Hills	27 mph	37 mph	SSW	33°F	62%
Woods Summit	26 mph	36 mph	S	54°F	98%
Woodhouse	29 mph	39 mph	SSW	42°F	74%
Clear Lake Lookout	30 mph	40 mph	SSW	39°F	75%
Haystack	27 mph	37 mph	S	58°F	87%
Woods Summit	29 mph	39 mph	S	48°F	96%
Clear Lake Lookout	28 mph	38 mph	SSW	51°F	85%
Woods Summit	28 mph	38 mph	S	44°F	98%
Clear Lake Lookout	28 mph	38 mph	S	44°F	98%
Clear Lake Lookout	28 mph	38 mph	S	44°F	98%
Clear Lake Lookout	28 mph	38 mph	S	44°F	98%
Clear Lake Lookout	28 mph	38 mph	S	44°F	98%
Clear Lake Lookout	28 mph	38 mph	S	44°F	98%
Clear Lake Lookout	28 mph	38 mph	S	44°F	98%
Clear Lake Lookout	28 mph	38 mph	S	44°F	98%

Station	Status	Alert Speed mph	Gust mph	Gust-Alert Speed mph	Wind gust magnitude mph			Speed mph	Direction	Temp °F	Humidity %	
					≥95	≥99	≥Max					
North Mt Shasta City	Watching	35	18	-17	21	31	35	42	9	W	47	67
Lake Shastiyou	Watching	27	10	-17	12	22	27	36	4	NNE	52	59
West Weed	Watching	22	4	-18	37	47	57	67	2	ESE	46	73

## New Websites

- ✓ Real-time displays of weather station & forecast data at PacificPowerWeather.com
- ✓ Wind gusts are color coded by strength relative to the local climatology... or simply put, “noteworthiness”

## New Meteorology Team

- ✓ 5 full-time meteorologists provide 24/7/365 support
- ✓ Provides daily and event-driven forecasts
- ✓ Supports the company’s Emergency Coordination Center for all-hazards including fire weather & PSPS

## New Wildfire Detection

- ✓ Planned installation in 2023
- ✓ Exploring the implementation of cameras and smoke detectors



# 2022 Wildfire Mitigation Plan Update

## Vegetation Management

Brian King, Director of Environmental and Vegetation Management  
May 18, 2022







## In 2021, as part of Wildfire Mitigation efforts, vegetation management

- ✓ Completed routine vegetation management work as per Public Resources Code § 4292 and Public Resources Code § 4293
- ✓ Completed detailed and patrol vegetation management inspections on approximately 3,000 line miles
- ✓ Utilized QA/QC program on worked lines

## In 2022, PacifiCorp will continue vegetation management programs and improve through:


- Continued best practice vegetation management work
- Continued improvement of the field mobile software tool
- Enhanced overhang reduction pilot planning
- Re-instituting tree maintenance survey with customers
- Increasing QA/QC resources





**Tree Maintenance Survey**

Dear Pacific Power Customer:  
We would like your feedback on the quality of our recent tree work on your property. Please take a minute to complete and return this postage-paid survey. Your comments will help us improve our vegetation management services.

U.S. Version only 

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1. Our notification clearly explained the work we would be doing.  
Disagree 1 2 3 4 Agree 5 No opinion

2. The workers were friendly and courteous.  
Disagree 1 2 3 4 Agree 5 No opinion

3. The work was completed as you understood it would be.  
Disagree 1 2 3 4 Agree 5 No opinion

4. The property was left neat and orderly.  
Disagree 1 2 3 4 Agree 5 No opinion

5. Overall, I am satisfied with how the work was handled.  
Disagree 1 2 3 4 Agree 5 No opinion

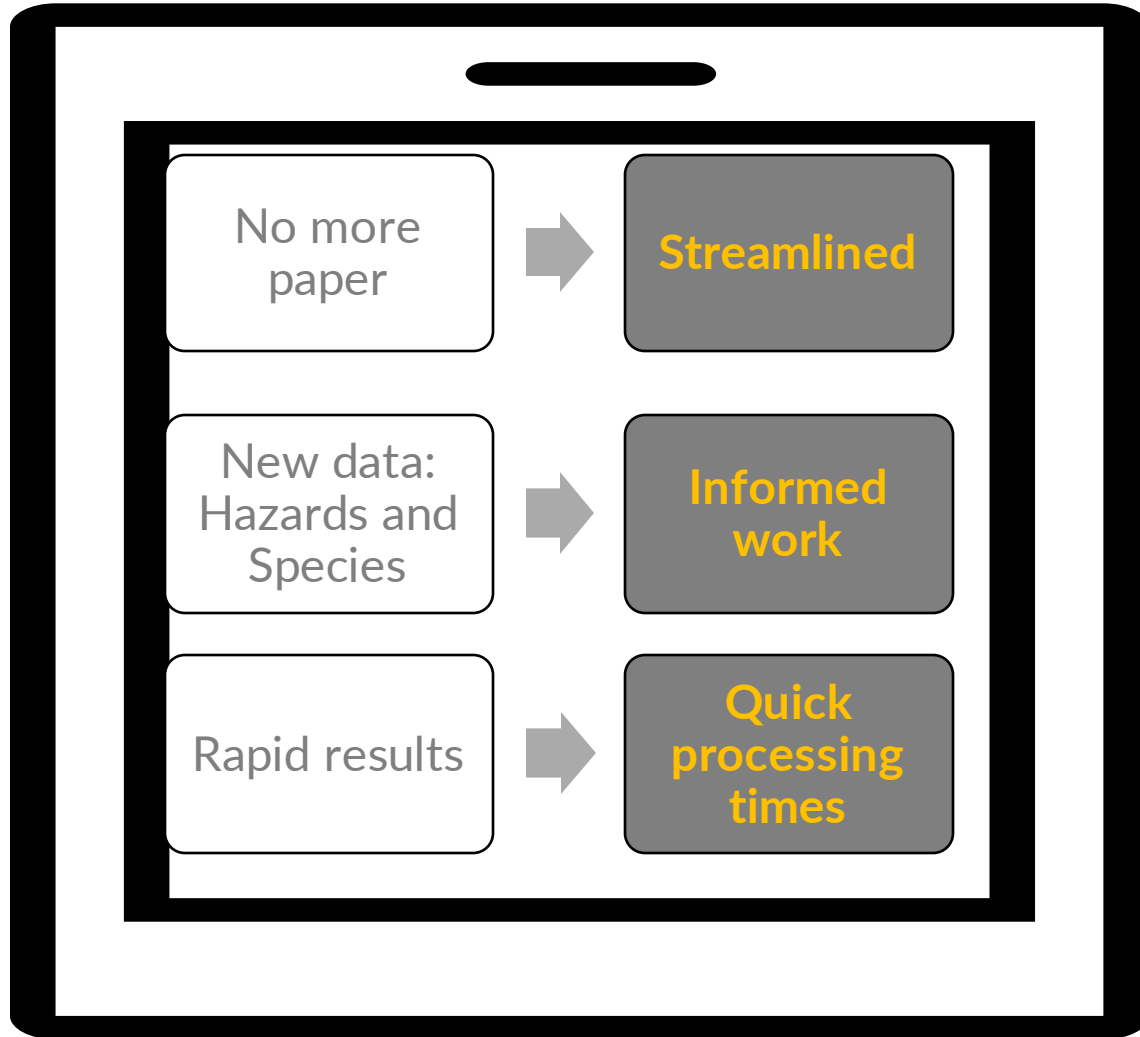
Please offer any other questions or concerns you may have:  
\_\_\_\_\_

How may we contact you? (optional)  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City, State, Zip: \_\_\_\_\_  
Phone (day): \_\_\_\_\_

(For office use only)  
Arborist: \_\_\_\_\_  
Contractor: \_\_\_\_\_  
Circuit/grid number: \_\_\_\_\_  
District: \_\_\_\_\_  
Crew Leader: \_\_\_\_\_



# Mobile Software Tool



aplFast - AgTerra Technologie x +  
https://mapitfast.agterra.com/Mapping/Main#

NM/ 5R103 - DST 2022

278701  
7230 Foley  
Inventory - Brian Archibald;

FIELD	VALUE
CREATION_DATE	3/24/2022
CREATION_TIME	3:31:40 PM
LAST_UPDATE_USER_ID	Altones
LAST_UPDATE_DATE	3/24/2022
LAST_UPDATE_TIME	3:31:40 PM
TD_search	
DeviceID	35
District_search	02993
County_search	2027
work_code_search	14915
Inspector	14915
contact_type	Door Card
Ownership	Private
State	OK
Area_type	Climb
TCID	No
work_location	
permitted_area	
Density	
brush_height	
recommended_year	
PERM	
AUTO_EMAIL_TO	3/24/2022

Table: PP\_INVENTORY\_V4\_6\_REPEAT\_1

31 owner permission card attached

Work Notes

- Remove
- Reliability Prune
- Reliability Remove

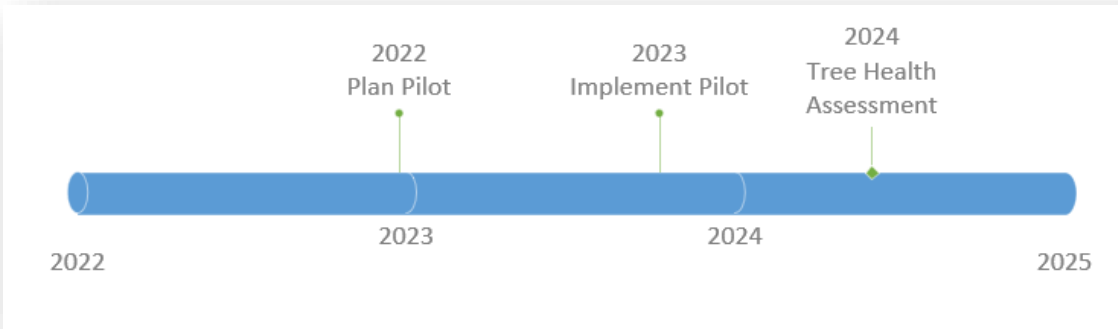
\*1C - Tree Quantity or Brush Sq Ft

Detailed Record

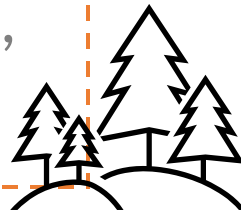
Detailed map with notes



# Enhanced Overhang Reduction

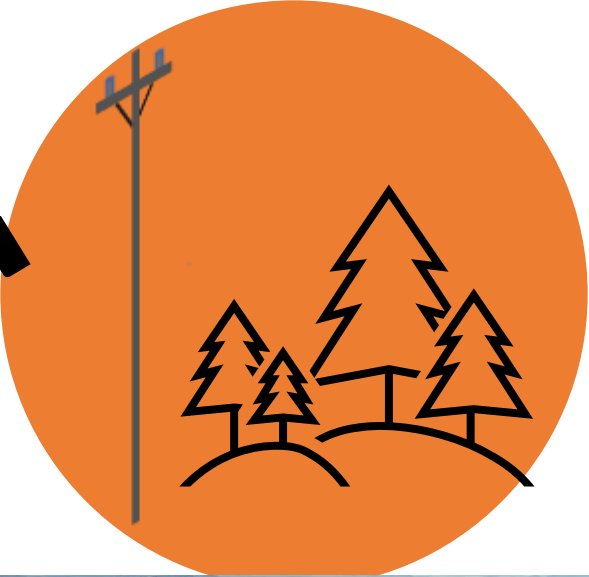


- ✓ Clear overhanging vegetation to sky
- ✓ Located in HFTD Tier 2 and/or Tier 3 where there is a variety of coniferous and hardwood species
- ✓ Collect data on tree species, location, date pruned, general tree health



# Collaborative Efforts

- ✓ For fuels reduction and safety projects:
  - ✓ CalFire
  - ✓ Local Logging Companies
  - ✓ Forest Service





# 2022 Wildfire Mitigation Plan Update

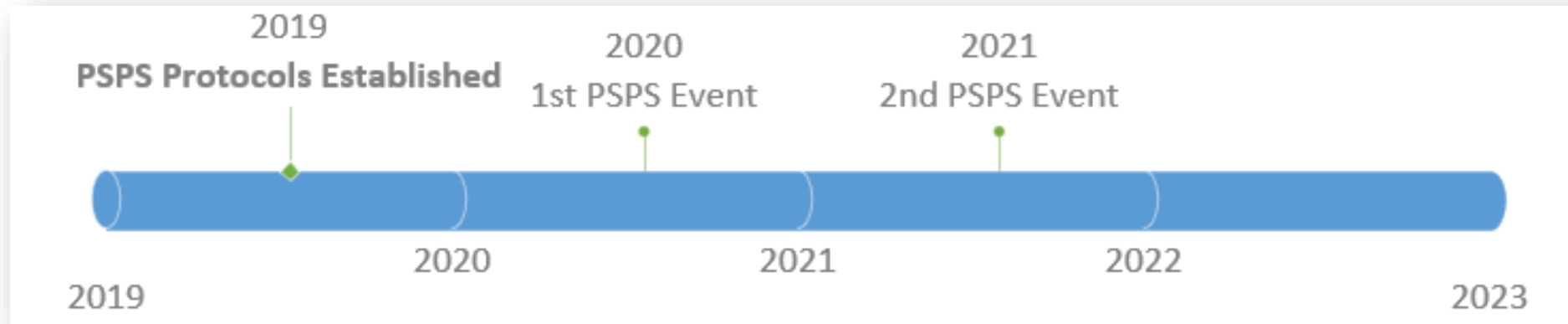
## Public Safety Power Shutoffs

Allen Berreth, Vice President of Transmission & Distribution Operations  
May 18, 2022





# History of PSPS



PSPS Watch & De-Energization Log							
State	Type	Area	Date & Time	Duration (hrs)	# Circuits	# Customers	Comment
CA	De-energization	Weed	9/13/20 10:01 AM	8	2	2,557	-
CA	External Watch	Weed	9/17/20 2:00 PM	4	2	(2,557)	-
CA	External Watch	Happy Camp	10/25/20 7:00 AM	11	4	(606)	PSPS watch initiated 10/23/20 at 5:30 PM.
CA	De-energization	Dunsmuir	8/17/21 3:41 PM	9.5	6	1,953	CRC deployed night-time restoration

# Public Safety Partner Portal

✓ Phase 1 available for PSPS training exercise



☐ Jun-2022: Phase 1 Solution In-Service

☐ Jun-2022: Phase 2 Project Kick-Off

☐ Interactive live map

☐ Dec-2022: Phase 2 Solution In-Service



	CriticalFacilities-CA-2022-03.gdb.zip	Geodatabase
	CriticalFacilities-CA-2022-03.kml	KML
	CriticalFacilities-CA-2022-03.shp.zip	Shapefile
	CriticalFacilities-CA-2022-03.xlsx	Excel

## Generator Rebate Program



Rebate offered on the purchase of a portable generator or portable power station to customers who:

- ✓ Reside in Tier 2 or Tier 3 area
- ✓ Additional rebate to Access and Functional Needs (AFN) customers

### 2022:

- ✓ Letters were delivered to the master meter owners (i.e., manufactured homes)
- ✓ Included in Public Safety Partner outreach, Wildfire Safety Advisory Board meetings, and Webinar

## Free Portable Battery program



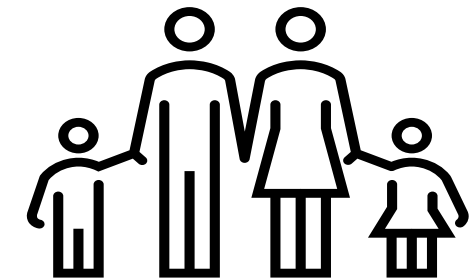
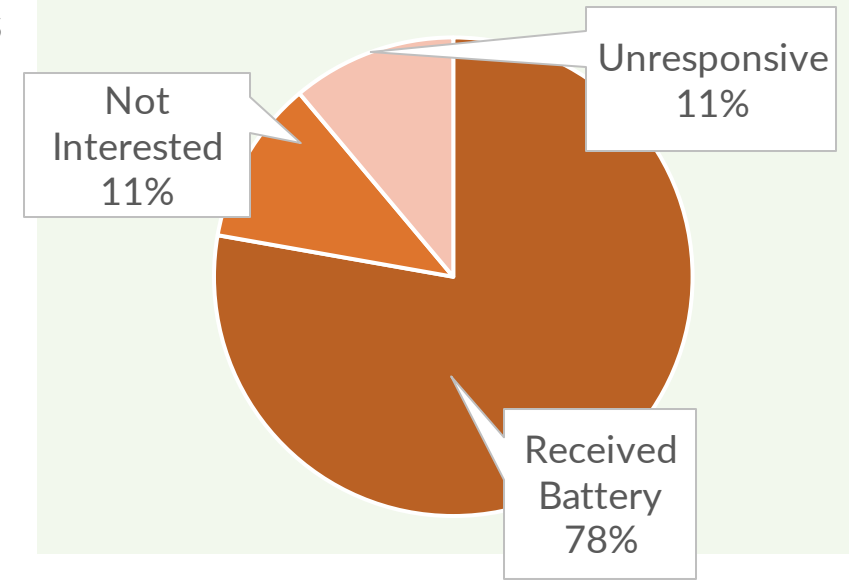
Implemented in 2021 to provide free back-up batteries. Calls were made to **100% of Medical Baseline Customers in HFTD** to offer program.

### 2022:

- ✓ Expanded to **all service territory**
- ✓ By 2022 : **55%** of medical baseline customers (107 total) will have **received** free portable batteries

## 2021 Free Battery Results

(All Qualified Medical Baseline Customers in HFTD)





# Community Outreach and Education

- ✓ Tabletop exercises with Public Safety Partners
  - ✓ Completed tabletop in **Siskiyou County** on April 28, 2022.
  - ✓ Functional exercise planned with **Siskiyou County** on May 26, 2022.
- ✓ Wildfire safety and preparedness campaign includes **social media, radio, bill inserts and other online media** (such as Spotify)
- ✓ Updated brochures, flyers and other collateral
- ✓ Updates to improve awareness of customer support programs
- ✓ **Spanish PSPS Website**
- ✓ **New 2022 Webinar**

**Public safety power shutoff forecasting**

This table shows the Public Safety Power Shutoff status.

NAME	TODAY	TOMORROW	2 DAYS OUT	3 DAYS OUT	4 DAYS OUT	5 DAYS OUT	6 DAYS OUT
Azalea / Glendale / Wolf Creek / Sunny Valley	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Cascade-Siskiyou NM	Normal	Normal					
Dunsmuir	Normal	Normal					
Happy Camp	Normal	Normal					
Hood River / Wasco Rural	Normal	Normal					

**PUBLIC SAFETY POWER SHUTOFF** PACIFIC POWER

**Understanding public safety power shutoffs**

We're taking proactive steps to keep the community safe. To prevent wildfire ignition in high fire risk areas, we may turn off power along specific circuits. This is called a Public Safety Power Shutoff.

**Why would a Public Safety Power Shutoff happen?**

Wildfire safety and preparedness campaign includes social media, radio, bill inserts and other online media (such as Spotify)

**WILDFIRE SAFETY** PACIFIC POWER

**Staying safe during wildfire season**

As wildfires become more frequent and intense throughout the West, our focus is on keeping you and your community safe. Protecting you from this increasing threat, while providing you with safe, reliable power, is our highest priority.

**Here's what we're doing, and what you can do to stay prepared.**

**What we're doing:**

**Reducing wildfire risks**

We're taking additional steps to reduce wildfire risk by increasing wildfire monitoring and removing vegetation around power lines. We're also upgrading the reliability of systems, making sure that we're working with local emergency services to ensure that we have the best information available to help us respond to any wildfire that occurs.

**Preparing to**

While it's important to have a plan, it's also important to have a higher level of awareness. We're working with local emergency services to ensure that we have the best information available to help us respond to any wildfire that occurs.

**Keeping you informed**

Communication is an essential part of any emergency response. We're working to ensure that you have the best information available to help you stay safe.

- Increase fire risk awareness
- Potential power shutoffs
- Updates on power restoration

**Wildfire Safety and Preparedness Webinar**

On May 3, we held an informative webinar for our customers in northern California to share progress on wildfire safety work including system hardening, vegetation management practices and more.

**Wildfire Safety & Preparedness Webinar Presentation**

Look for similar webinars coming soon for customers in Oregon and Washington communities.

**Investing in Resilience - Wildfire Safety**

Watch on YouTube

# 2022 Wildfire Mitigation Plan Update

## Asset Management and Data Governance

Amy McCluskey, Managing Director of Wildfire Safety and Asset Management  
May 18, 2022



# Service Territory Overview

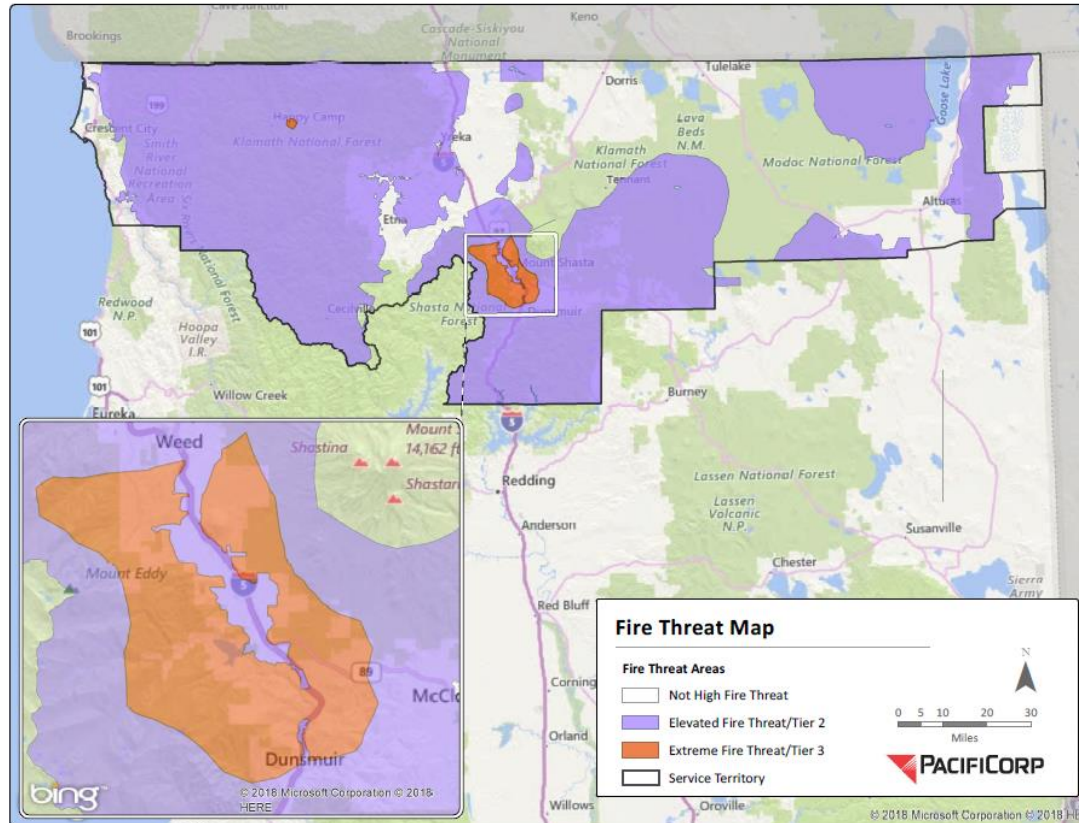
## General Stats

PacifiCorp provides electricity to approximately **45,000 California customers** via **62 substations**, **2,500 miles** of distribution lines, and about **780 miles** of transmission lines across nearly **11,000 square miles**

### System Wide Initiatives

- ✓ Weather Stations
- ✓ Situational Awareness
- ✓ Operational Protocols
- ✓ Community Education and Outreach

## California Service Territory



## HFTD

*Heightened Risk of Wildfire*

Approximately **1,200 miles** or **36%** of all **overhead lines** are located within the HFTD

**850 miles of overhead distribution** in the HFTD;

**350 miles of overhead transmission** in the HFTD

### Programmatic Shifts

- ✓ Increased Frequency of Asset Inspections
- ✓ Accelerated Condition Correction
- ✓ Enhanced Vegetation Management



## PSPS Zones

*Extreme Risk of Wildfire*

Approximately **250 miles** or **10%** of all **overhead distribution lines** are located within **5 individual PSPS Zones**

### Prioritized System Hardening

- ✓ Covered Conductor
- ✓ Advanced Protection and Control
- ✓ Expulsion Fuse Replacements



## In 2021, as part of Wildfire Mitigation efforts, asset management

- ✓ Completed **routine asset management** work as per **GO95** and **GO165**
- ✓ Completed **detailed and patrol** asset inspections on approximately **4,200 line miles**
- ✓ Identified, through inspections, **7,000 conditions** for correction
- ✓ Corrected **13,700 conditions** (found in all yrs)
- ✓ Completed enhanced IR inspections on **700 line miles**
- ✓ Identified, through enhanced inspections, **2 conditions** for correction

## In 2022, PacifiCorp will continue asset management programs and improve through:

- ❑ Continued best practice asset inspections and corrections
- ❑ Continued prioritization of **PSPS** and **HFTD** areas
- ❑ Continued development of the **Distribution Handheld IR pilot**



# Asset Inspections

- ✓ Increased frequency of inspections in the HFTD

Inspection Type	Cycle Change
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Detail	10 yr → 5 yr
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Patrol	2 yr → 1 yr
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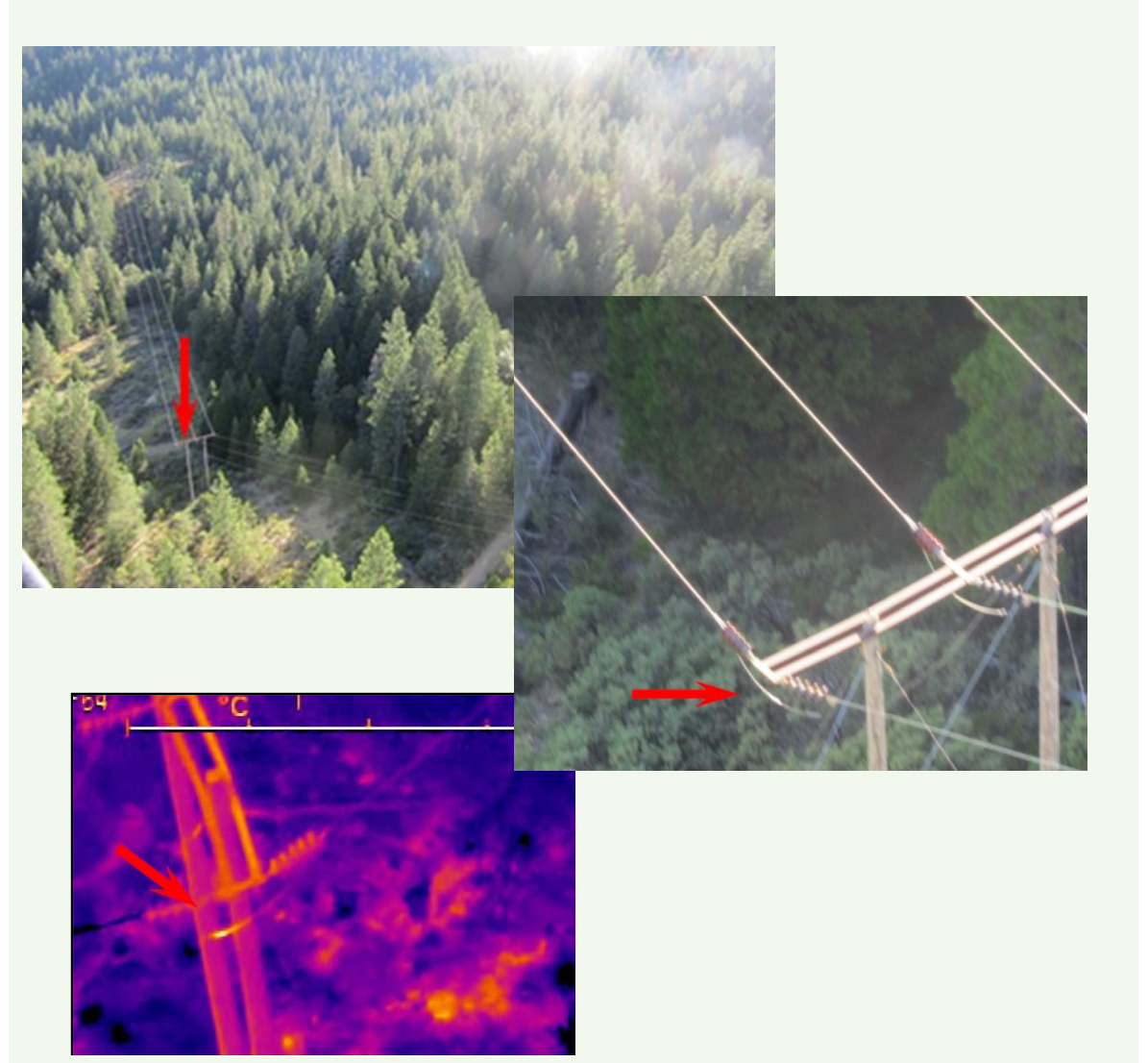
- ✓ Accelerated correction of Fire Threat Conditions
  - ✓ Corrected 205 Priority A Fire Threat Conditions
  - ✓ Corrected 1196 Priority B Fire Threat Conditions

Priority Type	Cycle Change
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Level 1 / A	30 days
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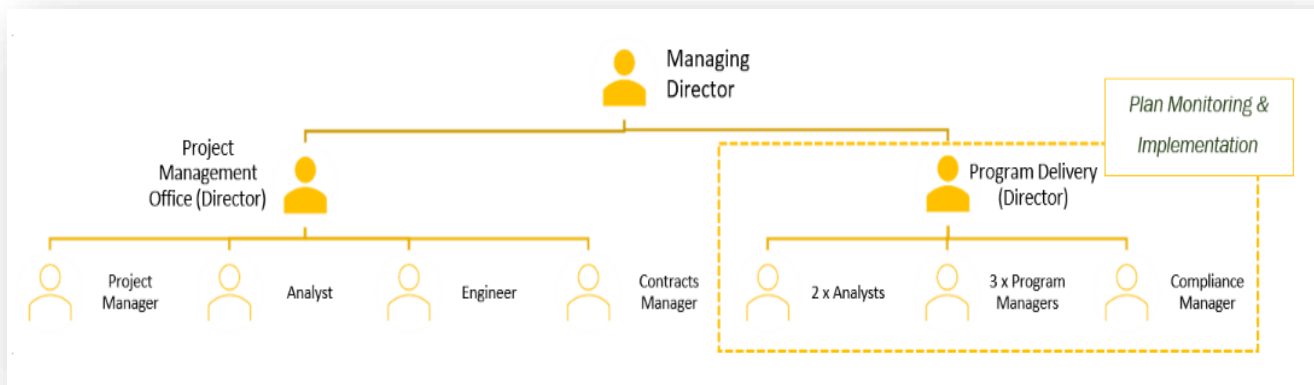
Level 2 / B	6 mo – 12 mo (Tier 3 – Tier 2)
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- ✓ Annual Infrared Inspection of Transmission Lines
  - ✓ 2 conditions found and corrected

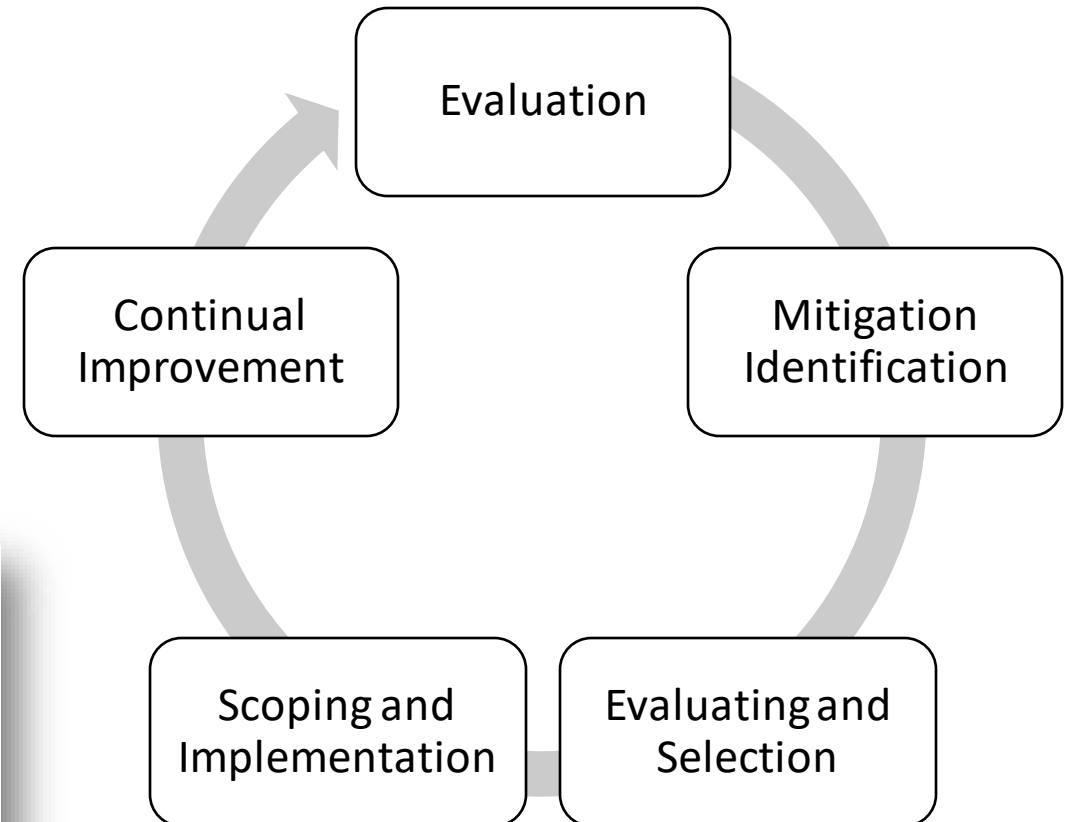


# Data Governance

- ✓ Additional FTE for GIS quarterly filings
- ✓ Improved QA/QC processes
  - ✓ Received data check
  - ✓ Final submitted cross document check
- ✓ Wildfire safety team established
  - ✓ Dedicated team to manage and monitor collective implementation of the plan
  - ✓ Coordinates between departments to reflect overall Wildfire Mitigation efforts



## Resource Allocation Methodology





THANK YOU

