# PacifiCorp's California Wildfire Mitigation Plan Update
# September 17, 2019
# California Public Utilities Commission







PACIFICORP
POWERING YOUR GREATNESS

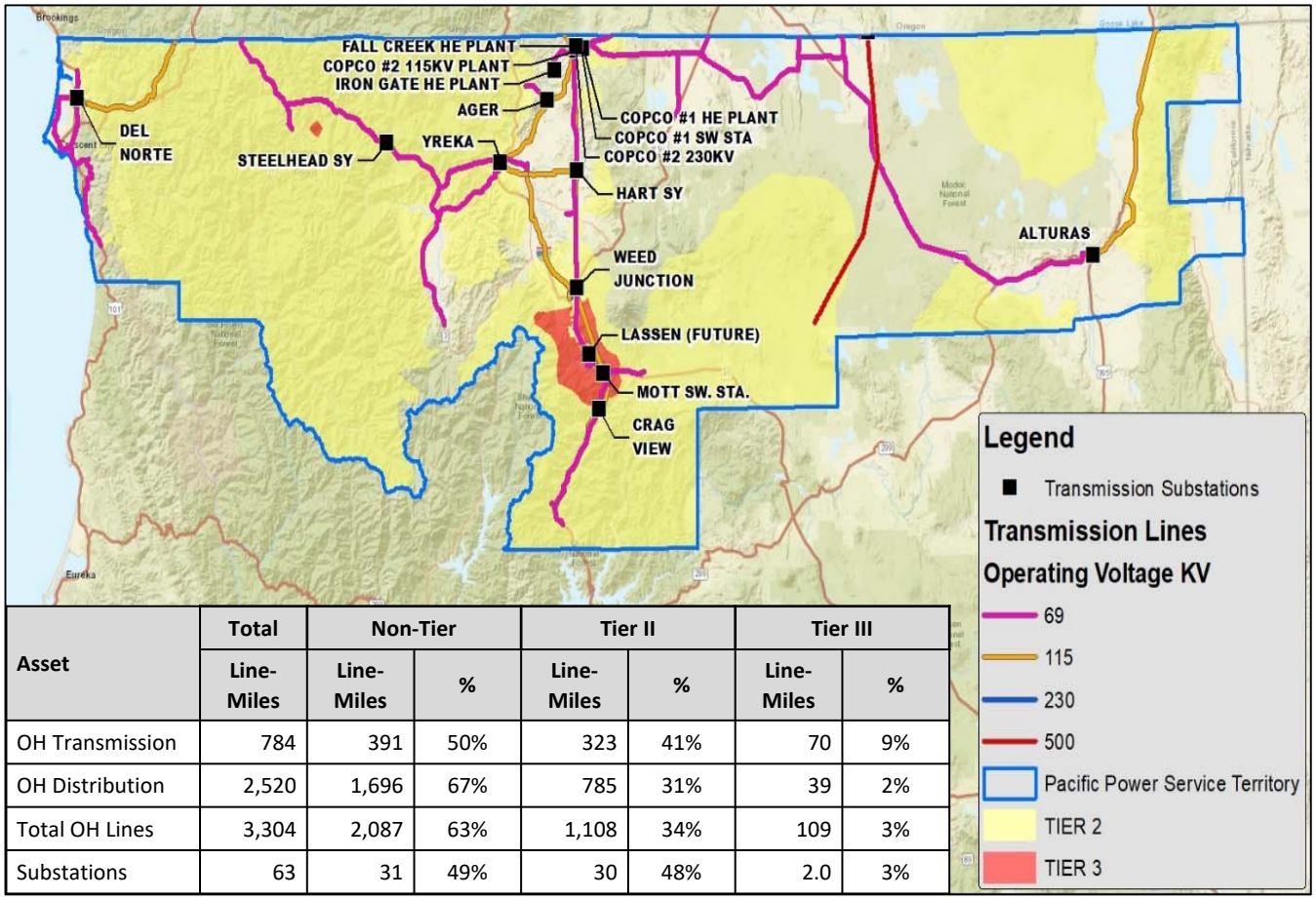
# Agenda

- PacifiCorp's Objectives
- Identified Risk
- Plan Progress
- Challenges & Successes

# Key Objectives of PacifiCorp's Plan

- More resilient systems with lower likelihood of fault events
- Better response when faults occur, including equipment and personnel plans to minimize scope and duration of the fault event
- Situational awareness and operational readiness designed to mitigate impacts to the system
- Maintenance of the plan, assessment of its effectiveness and review of impacts on stakeholders

# PacifiCorp's California Service Territory




| Asset | Total | Non-Tier | | Tier II | | Tier III | |
|---|---|---|---|---|---|---|---|
| | Line-Miles | Line-Miles | % | Line-Miles | % | Line-Miles | % |
| OH Transmission | 784 | 391 | 50% | 323 | 41% | 70 | 9% |
| OH Distribution | 2,520 | 1,696 | 67% | 785 | 31% | 39 | 2% |
| Total OH Lines | 3,304 | 2,087 | 63% | 1,108 | 34% | 109 | 3% |
| Substations | 63 | 31 | 49% | 30 | 48% | 2.0 | 3% |

PacifiCorp provides electricity to approximately **45,000 customers** via **63 substations** and **2,520 miles** of distribution lines and about **800 miles** of transmission lines across nearly **11,000 square miles**

# PacifiCorp's WMP Progress

| | Completed | Underway |
|---|---|---|
| Sit'l Aware | Weather stations installed (10) | Lightning data in final stages of procurement |
| | Extreme weather forecast method developed | |
| | Develop method to share weather data collected with local weather and fire teams | Developing method to share weather analysis with scientific community |
| Operating Practices | Staff additions | Staff additions |
| | -Line patrol | -Fire data scientist |
| | Fire risk tools; water trailers, pulaski, chain saw, shovels, 10 gal extinguishers, retrofitting portions of fleet with fire shielding on undercarriage | -Risk data scientist |
| | Fire prevention training as well as reclosing practices during fire risk periods, also modified work hours during periods of elevated fire risk | Developing probabilistic fuse coordination software |
| Inspect / Maintai | Two enhanced transmission inspection using IR/corona completed; one pre-fire season, second during summer heavy loading conditions; one California condition found and corrected as of week of August 12, 2019 | Evaluating radio frequency (RF) and LiDAR imaging for improving inspection and vegetation programs |
| | Begin additional detail device inspections, including downloading operational data | Enhance outage-initiated inspection within Tier 3 |
| Asset Hardening | Pole replacement prioritization criteria developed | LiDAR pilot for strength modeling underway |
| | Hstorically butt clad and treat with fire proofing spray in targeted Tier 3 areas | 10.8 miles of aerial cable is in design and will be constructed in advance of next fire season |
| | Detailed relay/recloser replacement plan and key delivery dates (largely completed fall/winter 2019 & spring/summer 2020) | 25 modern reclosers with alternate settings being installed beginning this month |
| | Standard for composite and steel poles in place and able to be utilized as dictated by prioritization process | 10 modern substation relays designed; construction beginning next month |
| | Standard for non-expulsion fusing installation developed & being used on all new construction | 13 transmission line relays on 8 transmission lines designed; construction starting next month |
| | | Fiber reinforced polymer (FRP) emergency stock quantities and combinations have been developed for use during pole replacements and post fires |
| Veg Mgmt | Tier 2 clearance deadline (6/30/2019) met (Tier 3 completed 9/1/2018) | Incorporating additional overhang removal into work plans during vegetation cycle work |
| | Conduct pre-fire season patrol evaluating for proper vegetation and conductor clearances | |
| | Fuel removal completed in limited areas | Began implementation of annual vegetation inspection for off-cycle facilities within HFTD |
| | Develop criteria for targeting higher risk tree removal during vegetation cycle work | Began implementation of additional risk tree removal in HFTD |
| Alt Tech | | Leveraging asset health framework which includes HFTD, in addition to a variety of other factors, to prioritize asset replacement |
| | | Piloting technologies including RF, LiDAR, drones and (in Oregon) use of HD cameras in collaboration with response personnel |

# Situational Awareness: Weather

**SHORT TERM FORECAST**

| TODAY | KBDI | 6HrMax FFWI6 | Wind Spd | Wind Gust | Wind Dir | Max Temp | Min RH |
|---|---|---|---|---|---|---|---|
| Happy Camp | 749 | 10 | 5 | 12 | W | 75 | 27% |
| Weed | 642 | 15 | 9 | 18 | NW | 69 | 29% |
| Mt. Shasta | 679 | 15 | 9 | 18 | SE-SW | 68 | 31% |
| Dunsmuir | 717 | 12 | 6 | 15 | SW | 73 | 27% |
| Snowbrush | 635 | 10 | 5 | 12 | S-SE | 65 | 30% |

**Synopsis:** A large trough across the West Coast will bring below average temperatures but only a slight chance of afternoon showers. Winds will be breezy at times for exposed areas around Weed & Mt Shasta City.

| TONIGHT | | | Wind Spd | Wind Gust | Wind Dir | Min Temp | Min RH |
|---|---|---|---|---|---|---|---|
| Happy Camp | -- | -- | 1 | 4 | Var | 47-53 | 55% |
| Mt. Shasta Area | -- | -- | 2 | 5 | NE-N | 45-51 | 50% |

**Synopsis:** Cool with light winds.

| Tuesday | KBDI | FFWI6 | Wind Spd | Wind Gust | Wind Dir | Max Temp | Min RH |
|---|---|---|---|---|---|---|---|
| Happy Camp | 750 | 9 | 6 | 14 | W-NW | 74 | 30% |
| Weed | 644 | 16 | 10 | 20 | NW | 68 | 30% |
| Mt. Shasta | 681 | 15 | 10 | 20 | NW-SW | 67 | 32% |
| Dunsmuir | 718 | 10 | 6 | 14 | SW | 72 | 28% |
| Snowbrush | 637 | 9 | 6 | 14 | SW-SE | 63 | 34% |

**Synopsis:** The trough will migrate more to the east Tuesday but keep cool temperatures around and the risk of some showers.

| Tuesday Night | | | Wind Spd | Wind Gust | Wind Dir | Min Temp | Min RH |
|---|---|---|---|---|---|---|---|
| Happy Camp | -- | -- | 1 | 4 | Var | 47-53 | 55% |
| Mt. Shasta Area | -- | -- | 2 | 5 | N | 45-51 | 50% |

**Synopsis:** Cool & dry with light winds

| Wednesday | KBDI | FFWI6 | Wind Spd | Wind Gust | Wind Dir | Max Temp | Min RH |
|---|---|---|---|---|---|---|---|
| Happy Camp | 750 | 11 | 5 | 12 | W-NW | 79 | 18% |
| Weed | 644 | 18 | 9 | 18 | NW-SW | 74 | 21% |
| Mt. Shasta | 681 | 15 | 9 | 18 | W-NW | 73 | 23% |
| Dunsmuir | 718 | 12 | 5 | 12 | SW | 77 | 20% |
| Snowbrush | 637 | 10 | 5 | 12 | W-NW | 68 | 25% |

| 7 Day | Happy Camp | | Weed | | Mt. Shasta | |
|---|---|---|---|---|---|---|
| | KBDI | FFWI6 | KBDI | FFWI6 | KBDI | FFWI6 |
| TODAY | 749 | 10 | 642 | 15 | 679 | 15 |
| Tuesday | 750 | 9 | 644 | 16 | 681 | 15 |
| Wednesday | 750 | 11 | 644 | 15 | 681 | 15 |
| Thursday | 751 | 11 | 646 | | | |
| Friday | 752 | 11 | 647 | | | |
| Saturday | 753 | 15 | 648 | | | |
| Sunday | 754 | 13 | 647 | | | |
| | | | AVG KBDI | | | |



## PacifiCorp Weather Station Network
### Daily Meteorological Summary
**Sunday, September 8, 2019**

| | Temperature | | | | Rain | | RH | Dew Pt | Fire Indices | | WIND | | | Fuels | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Max °F | Time occur | Min °F | Time occur | Today in | Seasonal in | Min % | Avg °F | 6HrMax FFWI | KBDI | Avg mph | Gust mph | Gust Dir | Max Temp | Avg Moisture |
| Dunsmuir | 76.3 | 15:01 | 55.3 | 06:47 | 0.00 | 0.00 | 30 | 44.8 | 4 | 750 | 1.8 | 17.8 | N | 102.1 | 6.8 |
| Lake Siskiyou | 73.0 | 15:36 | 51.1 | 07:10 | 0.00 | 0.00 | 35 | 44.2 | 3 | 649 | 1.5 | 13.7 | W | - | - |
| Snowbrush | 67.7 | 15:36 | 43.0 | 07:18 | 0.00 | 0.00 | 33 | 41.4 | 4 | 633 | 1.9 | 14.4 | WSW | 94.4 | 8.6 |
| Pollard Flat | | | | | | | | | | | | | | | |
| North Mt Shasta City | 70.4 | 15:12 | 51.0 | 07:00 | 0.00 | 0.01 | 35 | 42.5 | 8 | 679 | 7.0 | 24.0 | NW | - | - |
| SW Weed | 72.7 | 15:26 | 46.3 | 00:55 | 0.00 | 0.05 | 34 | 43.7 | 3 | 641 | 1.5 | 10.9 | NW | 105.8 | 6.1 |
| West Weed | 71.0 | 17:06 | 49.2 | 00:58 | 0.00 | 0.16 | 33 | 44.8 | 3 | 641 | 1.0 | 8.8 | N | - | - |
| North Weed | 72.5 | 16:09 | 50.3 | 00:54 | 0.00 | 0.07 | 31 | 43.2 | 14 | 641 | 4.5 | 18.0 | N | - | - |
| Seiad | 78.8 | 15:18 | 57.6 | 01:02 | 0.00 | 0.00 | 30 | 49.5 | 3 | 749 | 0.9 | 11.1 | S | 103.5 | 6.7 |
| Happy Camp | 78.1 | 14:55 | 56.2 | 01:01 | 0.00 | 0.01 | 29 | 49.4 | 12 | 749 | 3.7 | 19.5 | SW | - | - |

# Inspect & Maintain: IR/Corona on Transmission Lines

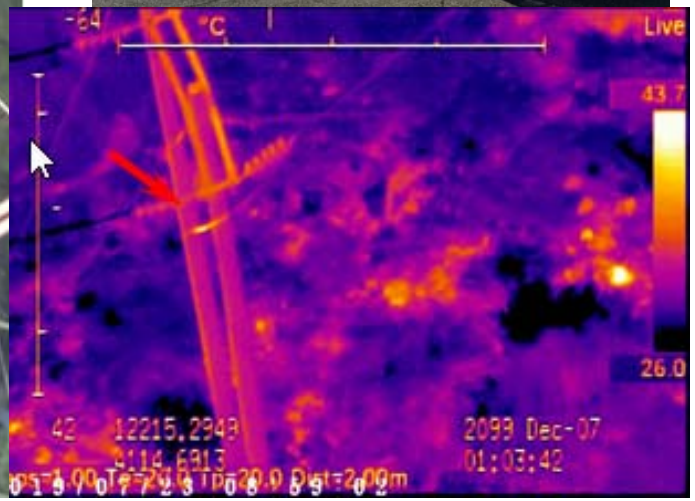
- Completed two infrared/corona aerial inspections on transmission lines
- One hot spot detected at a jumper sleeve connection with broken pole top on adjacent H structure; corrected week of August 12, 2019





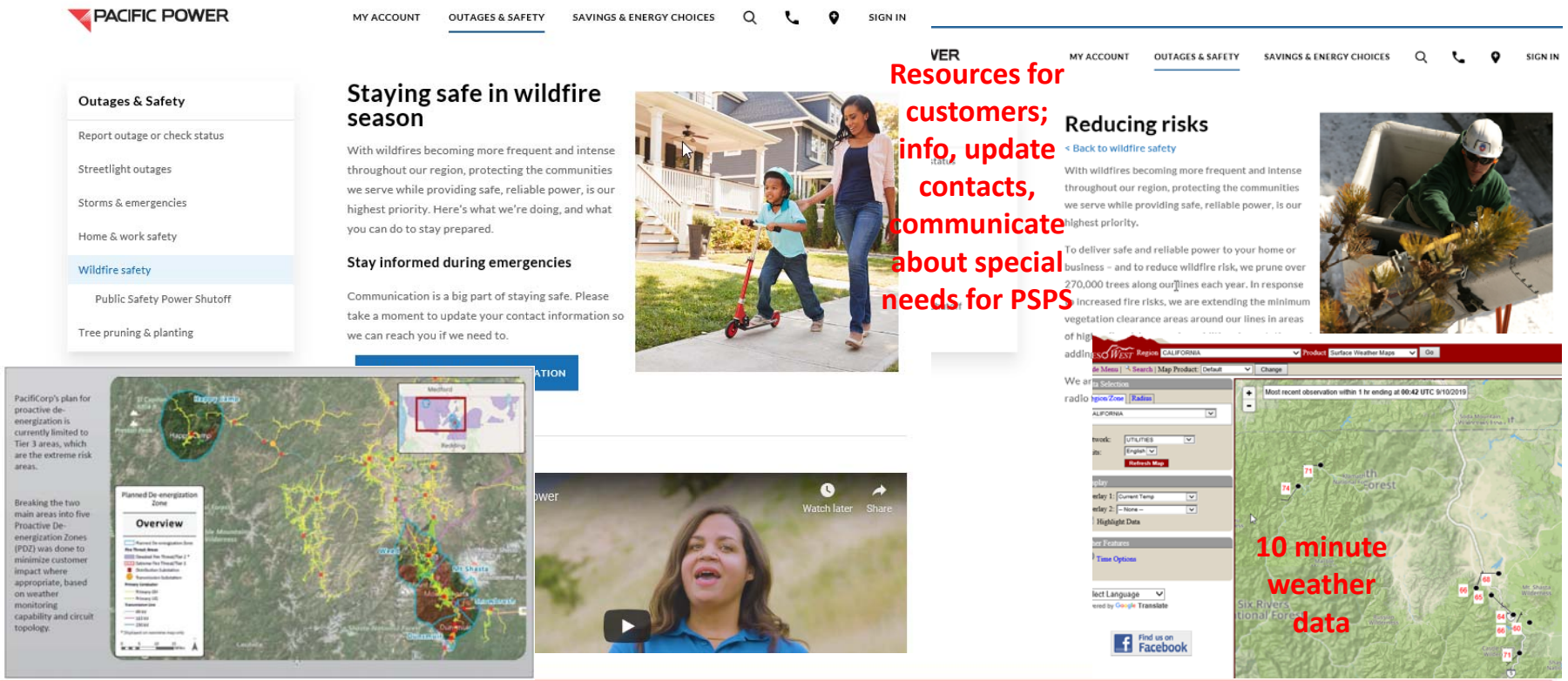


Gimbal mounted on helicopter



# Community/Public Safety Partner Outreach

- Held public meetings with emergency response and customer groups to review WMP and its various elements; targeted up-to-date contact information and soliciting input
- Developed wildfire webpage at [https://www.pacificpower.net/outages-safety/wildfire-safety.html](https://www.pacificpower.net/outages-safety/wildfire-safety.html)
- Posted updates to regulators, resources for customers, coordinated websites with public safety partners, sharing weather information broadly




PSPS Candidate Areas Available to Customers

# Successes and Challenges

- Successes
  - Substantial planning, engineering and construction has begun and has provided benefits during this fire season and is expected to provide benefits in the future
  - Field teams continue to strengthen in their operational responses to wildfire mitigation
- Challenges
  - Resources are heavily leveraged
    - Supply chains for resources and materials have tightened, resulting in constraints and impacting the cost of WMP implementation
    - Internal teams, engineering and construction resources and materials are being maximized
    - Other organizations are challenged by our timeframes

# Summary

- PacifiCorp appreciates the focus and guidance provided by legislators, regulators and other policy setters to address this important issue
- PacifiCorp recognizes it's at the beginning of a long journey but believes substantial progress has already been achieved
- PacifiCorp believes efforts it and others have made to make wildfire mitigation a top priority are making a difference for the better