

Wildfire Mitigation Plan Workshop

Bear Valley Electric Service

February 19, 2020

Paul Marconi, Director

Key Points to Take Away

- BVES developed an SB-901 and R18-10-007 compliant Wildfire Mitigation Plan (WMP) that:
  - Is tailored to our community;
  - Substantially mitigates the risk of wildfire;
  - Provides emergency response and restoration in wildfire events; and
  - Establishes an iterative process that builds on the 2019 WMP, promotes continuous improvement, and implements best practices.





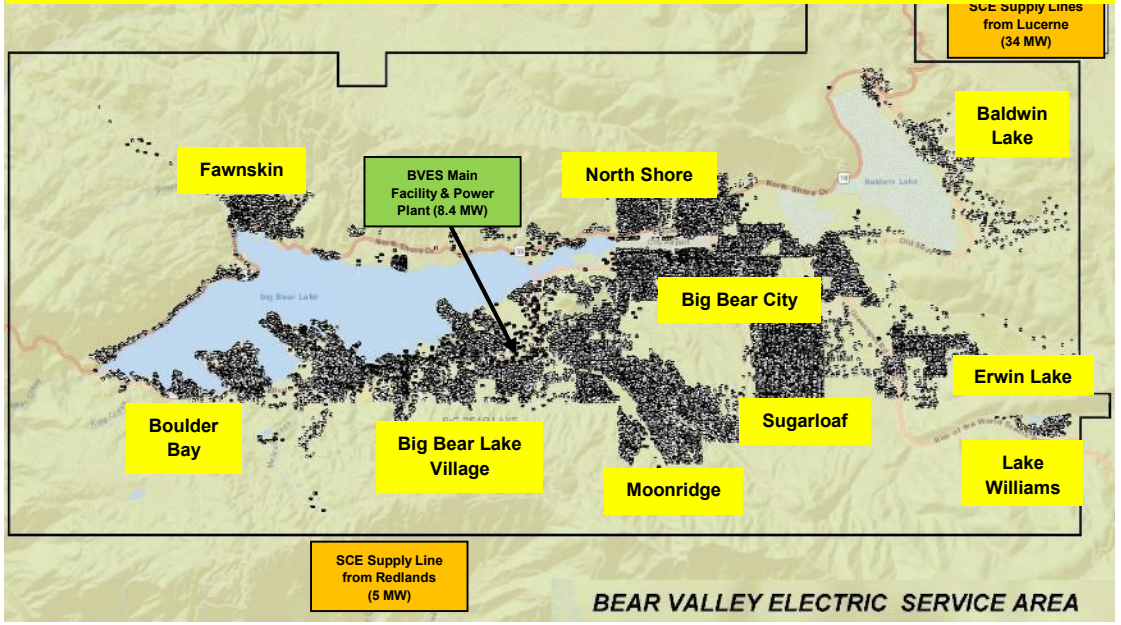


Service Area

Bear Valley Electric Service
A Division of Golden State Water Company

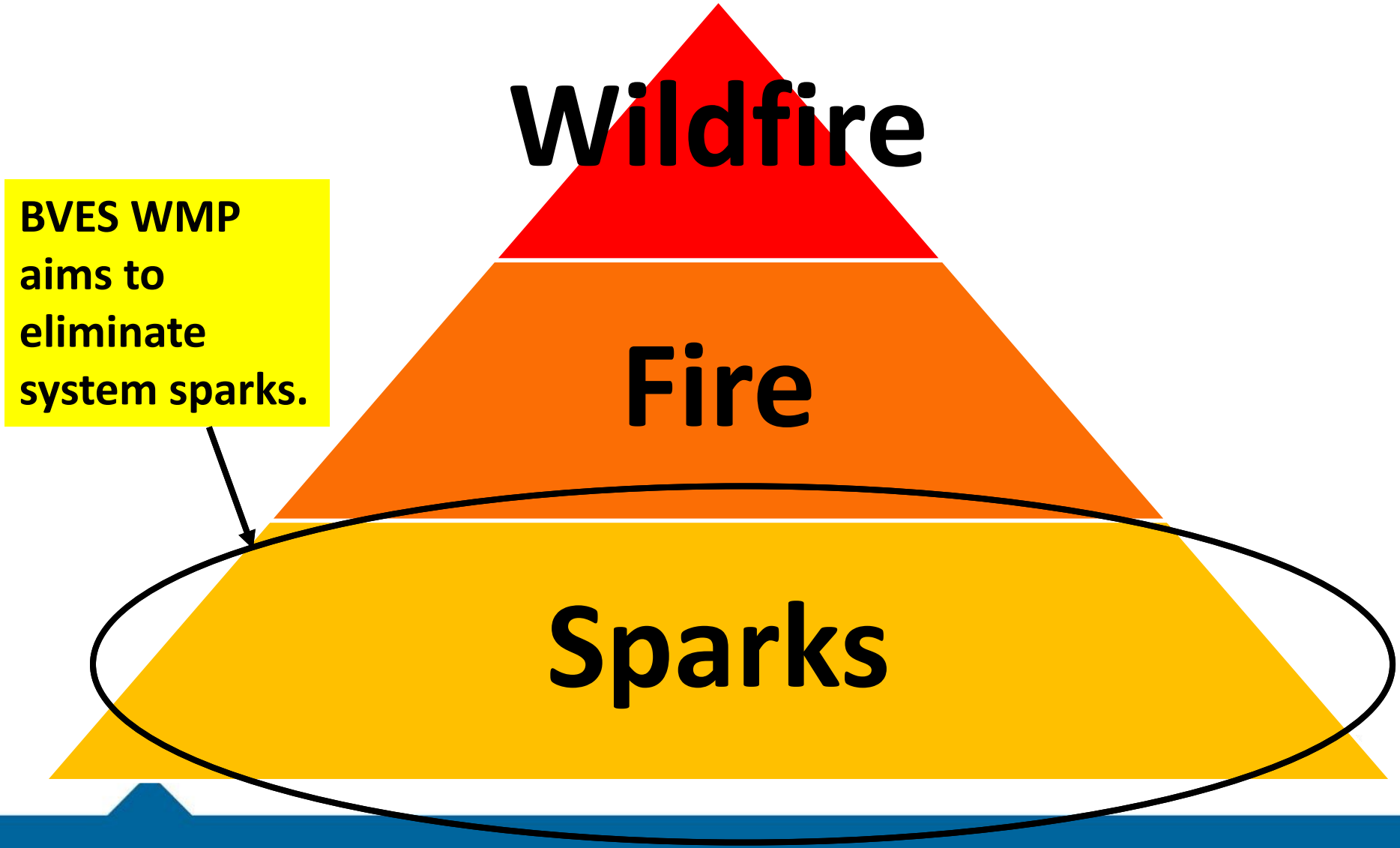
- **Location:** 32 square miles of rural and mountainous terrain at approximately 7,000 ft. in San Bernardino Mountains (80 miles East of Los Angeles).
  - Heavy tree and vegetation density
  - Mostly dry environment (80.5% of time "Very Dry" or "Dry" per NFDRS)
- **Key jurisdictions:** County of San Bernardino, City of Big Bear Lake, US Forest Service
- **Customers:** 24,427 total [22,917 residential (1,979 CARE) and 1,510 commercial]
- **Electrical System:**
  - Sub-transmission (34.5 kV)
    - 86.8 line miles overhead
    - 2.72 line miles underground
  - Distribution (4 kV)
    - 488.6 line miles overhead
    - 86.4 line miles underground
  - Substations: 13
  - Bear Valley Power Plant: 8.4 MW
  - Supply Lines: 39 MW total
  - Load is winter & evening peaking
    - Historical peak: 47 MW

Entire Service Area is in the High Fire-Threat District



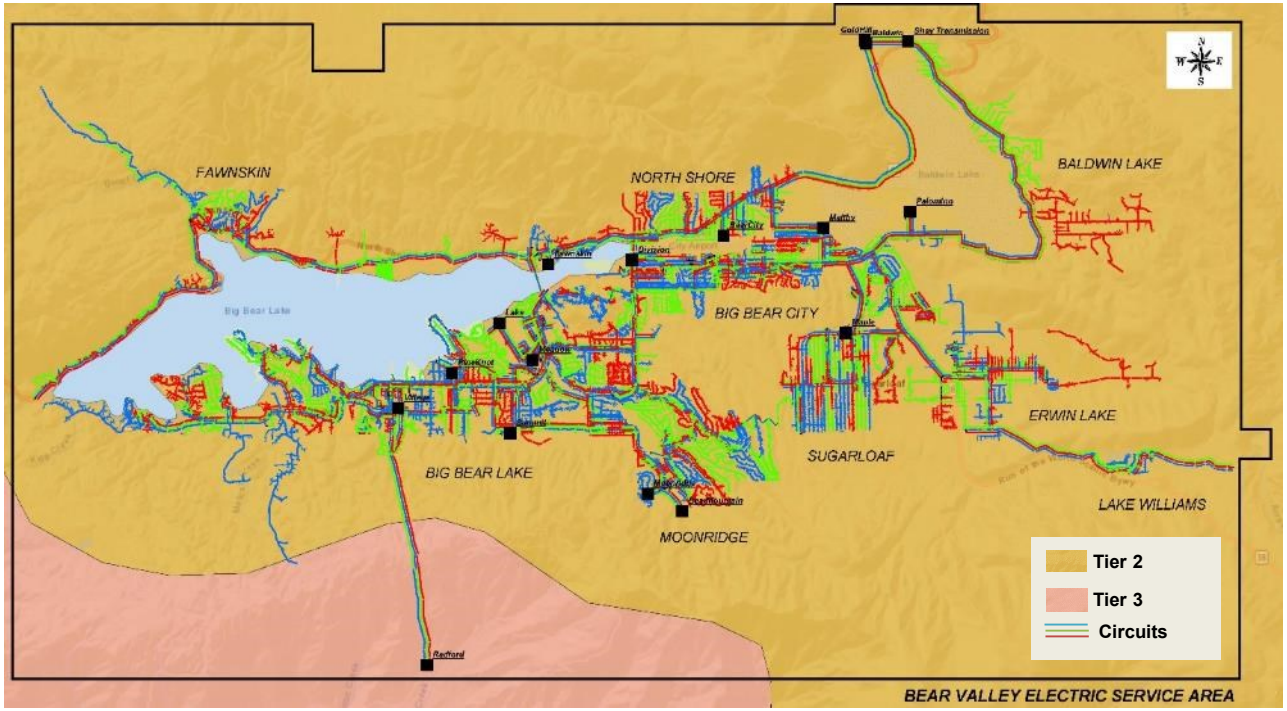
Where We Are Focused?

Bear Valley Electric Service
A Division of Golden State Water Company



Key Considerations for Wildfire Mitigation

Bear Valley Electric Service
A Division of Golden State Water Company



- Service Area entirely within the High Fire-Threat District
  - Mostly Tier 2
  - Some Tier 3
- WMP identifies:
  - Specific areas of higher risk for more surgical measures.
  - High risk circuits for systematic upgrades.

Elements considered in wildfire mitigation decision making:

- Electrical System Design & Assets (existing assets)
- Jurisdictional Structure (community)
- Local Load Profile (tourism and weather)
- Geographic Location and Features (elevation, vegetation, and access)

BVES Risk-Based Decision-Making Framework



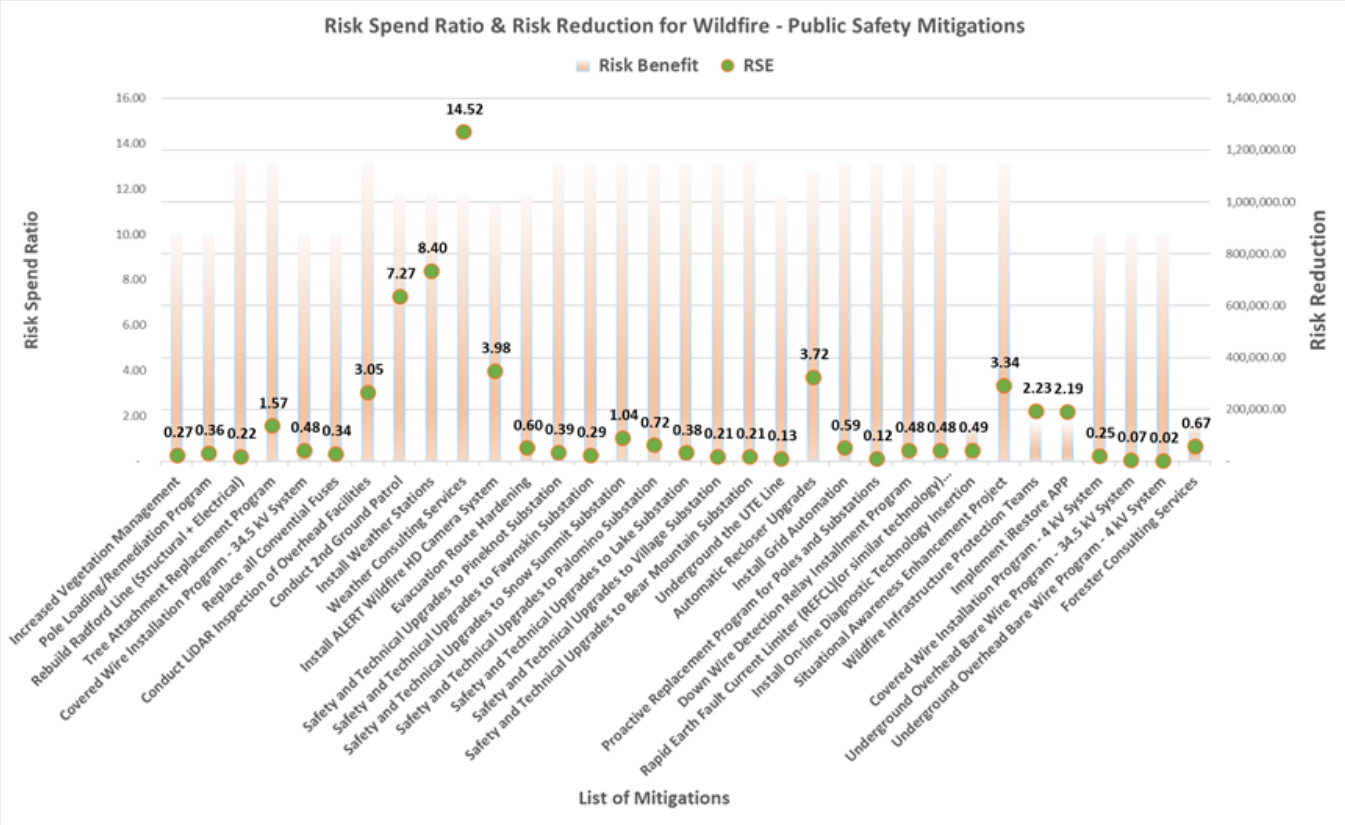
Analysis focused on ongoing and potential new projects to mitigate two primary risk events:

- Utility caused wildfire results in multiple public fatalities or firefighter fatalities
- Power supply lines from SCE are de-energized for PSPS for 48 hours (or more)

Some key specific fire risk drivers mitigated in the WMP:

Vegetation contact with bare wire	Live wire down	Conventional fuse blowing

Risk-Based Prioritization



Allows applying limited resources in the most cost-effective manner with the best value return on investment

Strategy & Program Overview

Bear Valley Electric Service
A Division of Golden State Water Company



Wildfire Prevention Programs

Bear Valley Electric Service
A Division of Golden State Water Company

New | In Development | Completed or Ongoing Program | On track | Off track

Mitigation Area	Programs	
Design & Construction	• Pineknot Substation Upgrades • Palomino Substation Upgrades • Ute Undergrounding • Energy Storage Facility • Critical Infrastructure PSPS Renewable Avoidance • Fuse Upgrades • Tree Attachment Removal	• Evacuation Route Hardening (pilot) • Pole Loading Assess & Remediation • Covered Conductor Pilot Program • Radford Line Covered Conductor Project • Covered Conductor Sub-transmission (All) • Covered Conductor Distribution (High Risk Areas) • Alternative Technologies (Down Wire Detection, REFCL, On-line Failure Detection, etc.)
Inspection & Maintenance	• GO-165 Annual On-Ground Patrol • Second On-Ground Patrol (3rd Party) • Electrical Equipment Preventative Maintenance	• Light Detection and Ranging (LIDAR) Inspection • GIS Data Collection & Sharing • Vegetation Management Plan • Implement Forester Program
Operational Practices	• Operational Considerations/Special Work Procedures • Automatic Recloser Upgrades	• Emergency Reporting & Procedures • Wildfire Infrastructure Protection Teams
Situational & Conditional Awareness	• Weather (Forecasting, Web-Based Resources, BVES-Owned Stations) • GIS-Based Applications (e.g. OMS) • Remote Monitoring (ALERTWildfire Cameras)	• SCADA/Grid Automation • Situation Awareness Enhancement (DMS Facility) • iRestore App
Response & Recovery	• PSPS Protocols • Post Incident Recovery, Restoration & Remediation • Emergency Response & Preparedness	

Operational Practices – Example

Bear Valley Electric Service
A Division of Golden State Water Company

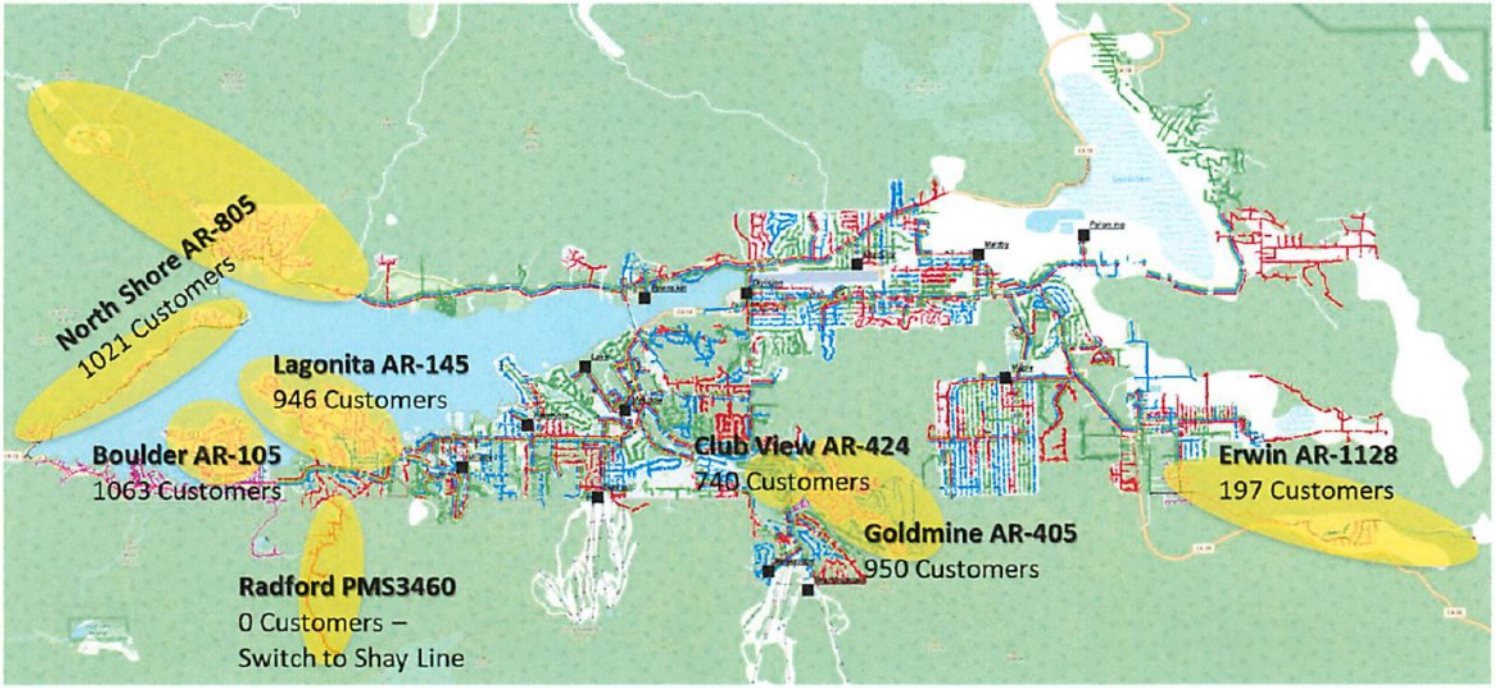
Daily National Fire Danger Rating System (NFDRS) forecast, combined with our local weather stations and our contracted meteorologist's assessments are used to set operational protocols to provide proper operational focus from reliability to fire prevention.

Operational Action	Green	Yellow	Brown	Orange	Red
Circuit Recloser Settings	Automatic Reclosing	Automatic Reclosing	Non-Automatic Reclosing	Non-Automatic Reclosing	Non-Automatic Reclosing
Patrol following circuit outage	No[1]	No[1]	Yes	Yes	Yes
TripSavers	Automatic	Automatic	Non-Automatic	Non-Automatic	Non-Automatic
PSPS	No	No	No	Yes – "at risk" lines when wind gusts greater than 55 mph	

[1]No patrol is required. Re-test allowed following check of fault indicators, SCADA, other system indicators, and reports from the field. If the re-test fails, a patrol is mandatory.

PSPS

Bear Valley Electric Service
A Division of Golden State Water Company



Conditional Based Actions & Notifications

- Forecasted Extreme Fire Weather
- Imminent Extreme Fire Weather
- Validated Extreme Fire Weather
- Weather Subsides to Safe Levels

We are vulnerable to SCE PSPS Actions

Circuit (AR To Be Opened)	Number of Customers
Radford 34kV	0[1]
North Shore 4kV (Open AR) 805)	1,021
Erwin 4 kV (Open AR 1128)	197
Boulder 4kV (Open AR 105)	1,063
Lagonita 4kV (Open AR 145)	946
Club View 4kV (Open AR 424)	740
Goldmine 4kV (Open AR 405)	950

[1]When this line is de-energized, the load is shifted to the Shay 34kV line.

Vegetation Management



- Program consists of:
  - Preventative Vegetation Management
  - Corrective Vegetation Clearance
  - Emergency Vegetation Clearance
- Unique local conditions, require BVES to go beyond regulated clearance standards (GO-95).
- Frequent Quality Control (QC) checks conducted by BVES managers and supervisors.

Bear Valley Electric Service
A Division of Golden State Water Company

Emergency Preparedness and Response

Bear Valley Electric Service
A Division of Golden State Water Company

Before Emergency

- Emergency preparations & training
- Community outreach & education
- Local government & agency meetings
- Mutual aid agreements in place

During Emergency

- EOC activation
- Emergency protocols
- Emergency communications plan & notifications
- Restoration strategies & resources

Post Emergency

- Customer service for emergencies
- Long-term emergency recovery strategy
- Regulatory reports
- CEMA if applicable

Performance Metrics

Bear Valley Electric Service
A Division of Golden State Water Company

2019 BVES Metrics

Metric Category	Metric	2019 Cycle Progress to Date / Lessons Learned
Overall WMP	Number of utility-caused fires	0 with 1 potential "Near Miss" event in 2019 / BVES evaluated the potential near miss and determined it was not a fire threat. BVES has not experienced a wildfire during the 2019 year and therefore has no direct lessons learned to apply to future practices.
Infrastructure	Number of bare line contact with vegetation	0 risks events identified in 2019.
	Number of live wire down events	0 risks events identified in 2019.
	Number of conventional blown fuse events	1 blown fuse event recorded in 2019.
	Number of Poles Tested & Assessed	2,512 out of 8,737 poles were tested and assessed to date in this 5-year project (2018-2022) / While this activity has experienced several logistics challenges, it has steadily progressed and remains on track.
	Number of Tree Attachments Removed	273 out 1,207 tree attachment were removed to date in this 5-year project (2018 - 2022) / This activity has presented to have additional challenges in access and resource availability. Throughout 2019, BVES predominately removed tree attachments over the summer months.
	Length of Bare Wire Covered (Circuit Miles)	BVES is ahead of its planned goal of replacing 3 circuit miles (three conductors over the span of one physical mile) by May 2020 / BVES also plans to press forward targeting to exceed its original goal by May. BVES understands that several utilities have experienced postponements with deploying covered conductor due to issues that range from procurement arrivals, resource adequacy, operating windows, access to rough terrain, and permitting delays. BVES is still keeping these voiced concerns in mind for future covered conductor projects.
	Number of conventional fuses replaced by current limiting fuses *or fused trip savers (vacuum style)*	BVES replaced 612 out of a target of 1,602 conventional fuses with current limiting fuses and fused trip savers.
Operations	Average Time for Clearance Permissions from Local Agencies	An averaged time was not determined over 2019, however, BVES understands that this process with permitting and permissions/siting can take up to 12 months prior to a project's construction phase. This metric will be better tracked for projected timelines to enable efficient forecasting of hurdles that may arise that are external to the utility's controls.
Customer Service	Number of Customer Service Calls about Tree Trimming	0
	SAIDI due to PSPS	0 / BVES has not had to initiate a PSPS event from June – December 2019.

2020 WMP Standardized Metrics

Outcome Metrics

Metric Type
1. Near Misses

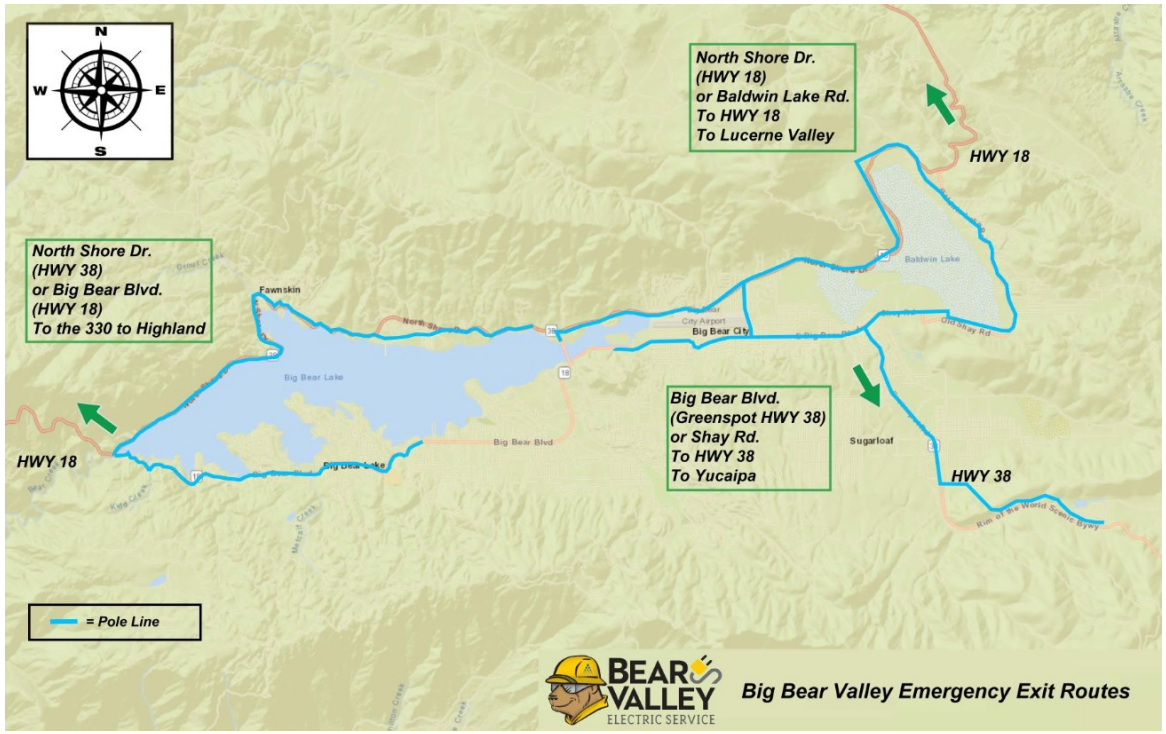
2020 BVES Program Targets

Metric Category	Me
Overall WMP	Number of utility-
Infrastructure	Number of bare li vegetation
	Number of live wir
	Number of conver fuse events
	Number of Poles Assessed
	Number of Tree A Removed
	Length of Bare Wi (Circuit Miles)
	Number of conver replaced by curre *or fused trip saver*
Operations	Average Time for Permissions from
Customer Service	Number of Custon about Tree Trimm
	SAIDI due to PSP

Progress Metrics

#	Progress metric name	Unit(s)	Sources	Collection frequency
1	Grid condition findings from inspection	Number of Level 1, 2, and 3 findings per mile of circuit in High Fire-Threat District (HFTD), and per total miles of circuit for each of the following inspection types: 1. Patrol inspections 2. Detailed inspections 3. Other inspection types	Utility reporting	Monthly
2	Vegetation clearance findings from inspection	Percentage of right-of-way with noncompliant clearance based on applicable rules and regulations at the time of inspection	Utility reporting	Monthly
3	Extreme weather prediction accuracy	Percentage of total PSPS predictions that are false positives or false negatives 2 days before a potential PSPS event	Utility reporting	Post-event
4	Extent of grid modularization	Number of sectionalizing devices per circuit mile and number of automated grid control equipment in: 1. HFTD 2. Non-HFTD	Utility reporting	Quarterly
5	Equipment operating load above nameplate capacity	Number of circuit hours operated above nameplate capacity in HFTD areas Average % above nameplate capacity when equipment operated above nameplate capacity in HFTD areas	Utility reporting	Quarterly
6	Risk-spend efficiency of resources deployed towards wildfire mitigation efforts	Dollars per incremental life saved Dollars invested per estimated dollars of rebuilt structures avoided Dollars per customer hour of PSPS avoided	Utility reporting	Quarterly
7	Extent of hardening across grid	Percent of all grid assets in HFTD areas using proven and demonstrated wildfire-resistant equipment	Utility reporting	Monthly

Evacuation Routes



Evacuation Route Hardening Pilot Program

- Fire-resistant Fiber/Composite, Ductile Iron, and Light-Duty Steel Poles
- Fiberglass cross-arms
- Cladding
- Relocate Infrastructure away from routes
- Underground

Considering the implications for evacuation routes has been part of BVES wildfire response planning.

There are only three paved routes in and out of Big Bear Lake.

Recent events in California have only further emphasized the importance of hardened and protected evacuation routes.

Recap of Key Points to Take Away

Bear Valley Electric Service
A Division of Golden State Water Company

- BVES developed an SB-901 and R18-10-007 compliant Wildfire Mitigation Plan (WMP) that:
- Is tailored to our community;
- Substantially mitigates the risk of wildfire;
- Provides emergency response and restoration in wildfire events; and
- Establishes an iterative process that builds on the 2019 WMP, promotes continuous improvement, and implements best practices.












Questions?

Bear Valley
Electric Service
A Division of Golden State Water Company