

Wildfire Mitigation Plan

DATE: December 12, 2019

PROJECT: TR19-001

REVISION: V0



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Chapter1: Introduction

The state of California has experienced some of the most devastating and catastrophic wildfires in the nation's history. Due to the fatalities and damages resulting from the catastrophic wildfires, the state of California signed Senate Bill (SB) No. 901 into law on September 21, 2018, which amended Public Utilities Code (PUC) section 8387, requiring every local publicly owned electricity utility to prepare a *Wildfire Mitigation Plan* (WMP). To safeguard their electrical systems, utilities are now required to implement a WMP to comply with the state's Public Utility Code Division 4.1, Chapter 6, Section 8387¹ by January 1, 2019. Section 8387 requires every publicly own electrical utility (POU) to construct, maintain and operate its electrical facilities and equipment in ways that minimize the risk of wildfire posed by those facilities and equipment to be adopted by January 1, 2020, and annually thereafter.

¹ Amended by Stats. 2018, Ch. 626, Sec 42. (SB 901) Effective January 1, 2019

Fire mitigation has been an integral part of Trinity Public Utilities District's (TPUD) operational practices for years, and TPUD has several existing policies, programs and procedures in place that directly or indirectly manage or reduce this risk. Over time, TPUD has adopted additional fire mitigation programs to adjust to changes in fire-related conditions as well as technological advances and improved operational practices. TPUD continues to evaluate and implement new technologies and operating practices to further mitigate the potential for ignitions and to better respond to high wildfire risk conditions.

The strategies, programs and activities included in this WMP, with associated goals and metrics are an effective approach to reduce fire-related risk for TPUD's customers in the near term and will allow for refinement and improvement over time. As new information is obtained, and experience is gained by implementing these mitigation programs in this WMP, the District will assess, evaluate, and enhance its wildfire risk mitigation strategies. This plan will also describe vegetation management, asset inspection and maintenance, recloser setting protocols, communication plans as well as the restoration of service process. Plan ownership, performance metrics and deficiency identification are included, as well as the plan audit and approval process.

1.1 Mission

TPUD's Board of Directors has established the following mission and vision statement: "TPUD's purpose is to exceed our customer expectations in terms of cost, reliability, safety, customer convenience, and satisfaction". To this end, TPUD employs construction, maintenance and operational practices that minimizes any risks of catastrophic wildfire posed by its electrical system.

1.2 Purpose of the Plan

This Plan describes TPUD's strategies and programs to mitigate the threat of power-line ignited wildfires. It addresses the unique features of TPUD's service area such as topography, weather, infrastructure, grid configuration and potential wildfire risks. This plan is subject to direct supervision by TPUD's Board of Directors and primary responsibility for its implementation resides with the General Manager (GM). This plan meets or exceeds the requirements of PUC section 8387 for publicly owned electric utilities to prepare a WMP by January 1, 2020, and to evaluate and update annually thereafter. Table 1 (page 3) outlines the WMP's code compliance with 8387 and the corresponding sections within the plan.

Table 1 Plan Compliance with PUC Division 4.1, Ch. 6 [8387]

PUC § 8387(b)	DESCRIPTION	PLAN SECTION NUMBER
(2) (A)	An accounting of the responsibilities of persons responsible for executing the plan.	8.1, 8.1.1
(2) (B)	The objectives of the wildfire mitigation plan.	1.2, 1.3
(2) (C)	A description of the preventative strategies and programs to be adopted by the local publicly owned electric utility or electrical cooperative to minimize the risk of its electrical lines and equipment causing catastrophic wildfires, including consideration of dynamic climate change risks.	3
(2) (D)	A description of the metrics the local publicly owned electric utility or electrical cooperative plans to use to evaluate the wildfire mitigation plan's performance and the assumptions that underlie the use of those metrics.	8.2
(2) (E)	A discussion of how the application of previously identified metrics to previous wildfire mitigation plan performances has informed the wildfire mitigation plan.	8.2.1
(2) (F)	Protocols for disabling reclosers and deenergizing portions of the electrical distribution system that consider the associated impacts on public safety, as well as protocols related to mitigating the public safety impacts of those protocols, including impacts on critical first responders and on health and communication infrastructure.	6.1.1, 6.1.2
(2) (G)	Appropriate and feasible procedures for notifying a customer who may be impacted by the deenergizing of electrical lines. The procedures shall consider the need to notify, as a priority, critical first responders, health care facilities and operators of telecommunications infrastructure.	7.1, 7.2
(2) (H)	Plans for vegetation management.	6.3
(2) (I)	Plans for inspections of the local publicly owned electric utility's or electrical cooperative's electrical infrastructure.	6.2

(2) (J)	List that identifies, describes, and prioritizes all wildfire risks, and drivers for those risks, throughout the local publicly owned electric utility's or electrical cooperative's service territory. The list shall include, but not be limited to both of the following:	4
(2) (J) (i)	Risks and risk drivers associated with design, construction, operation and maintenance of the local publicly owned electric utility's or electrical cooperative's equipment and facilities.	4.5.1
(2) (J) (ii)	Particular risks and risk drivers associated with topographic and climatological risk factors throughout the different parts of the local publicly owned electric utility's or electrical cooperative's service territory.	4.5.2,4.5.3
(2) (K)	Identification of any geographic area in the local publicly owned electric utility's or electrical cooperative's service territory that is a higher wildfire threat than is identified in a commission fire threat map, and identification of where the commission should expand a high fire threat district based on new information or changes to the environment.	5.1
(2) (L)	A methodology for identifying and presenting enterprise-wide safety risk and wildfire-related risk.	4.1
(2) (M)	A statement of how the local publicly owned electric utility or electrical cooperative will restore service after a wildfire.	7.4
(2) (N)	A description of the processes and procedures the local publicly owned electric utility or electrical cooperative shall use to do all of the following:	8.3
(2) (N) (i)	Monitor and audit the implementation of the wildfire mitigation plan.	8.3.3
(2) (N) (ii)	Identify any deficiencies in the wildfire mitigation plan or its implementation and correct those deficiencies.	8.3.2
(2) (N) (iii)	Monitor and audit the effectiveness of electrical line and equipment inspections, including inspections performed by contractors that are carried out under the plan, other applicable statutes or commission rules.	8.3.3

(3)	The local or publicly owned electric utility or electrical cooperative shall present each wildfire mitigation plan in an appropriately noticed public meeting. The local or publicly owned electric utility or electrical cooperative shall accept comments on its wildfire mitigation plan from the public, other local and state agencies and interested parties, and shall verify that the WMP complies with all applicable rules, regulations, and standards as appropriate.	9.1.2
(3) (C)	The local publicly owned electric utility or electrical cooperative shall contract with a qualified independent evaluator with experience in assessing the safe operation of electrical infrastructure to review and assess the comprehensiveness of its wildfire mitigation plan. The independent evaluator shall issue a report that shall be made available on the internet web site of the local publicly owned electric utility or electrical cooperative and shall present the report at a public meeting of the local publicly owned electric utility's or electrical cooperative's governing board.	9.1.1

1.3 Objectives of the WMP

The main objective of the WMP is to implement an actionable plan that will create increased reliability and safety while minimizing the probability that TPUD assets may be the origin or contributing factor in the ignition of a wildfire. The plan embraces safety, prevention, mitigation and recovery programs that are consistent with State of California Law.

As part of the development of the Plan, TPUD assessed new industry practices and technologies that will reduce the likelihood of an interruption in service and reduce the duration of an outage.

The plan also addresses policies related to customer outreach and assistance programs, communications with local agencies and service restoration after a disaster event.

The secondary objective is to measure, through the annual evaluation of the matrix, the effectiveness of the specific wildfire mitigation strategies as they apply to Trinity PUD. Where a particular action, program component, or protocol is determined to be unnecessary or ineffective, TPUD will assess whether modification or replacement is suitable.

Included within this Plan are the various programs, practices and procedures that TPUD utilizes to comply with PUC section 8387, which requires publicly owned electric utilities to prepare a Wildfire Mitigation Plan by January 1, 2020. After January 1, 2020, a local publicly owned utility shall submit the plan to the California Wildfire Safety Advisory Board on or before July 1, 2020 of that year. Each local publicly owned electric utility and electrical cooperative shall update its plan annually and submit the update to the California Wildfire Safety Advisory Board² by July 1 of each year. At least once every three years, the submission shall be a comprehensive revision of the plan³.

PUC section 8387(c) requires TPUD to contract with a qualified independent evaluator with experience in assessing the safe operation of electrical infrastructure to review and assess the comprehensiveness of this WMP.

TPUD shall accept comments on its WMP and the third-party assessment from the public, other local and state agencies, and interested parties, in an appropriately noticed public meeting and shall verify that the WMP complies with all applicable rules, regulations and standards as appropriate.

² PUC DIVISION 1, part 1, ch. 2, Section 326.2

³ PUC DIVISION 4.1. Ch 6, 8387, (b)(1) (Amended by Stats. 2019, Ch. 79, Sec. 20. (AB 1054) Effective July 12, 2019.)

Chapter 2: TPUD Background and Mission Statement

2.1 TPUD Profile and History

CP National, a small private utility, had been supplying retail electric service to the residents of Weaverville since the 1930s. At that time, their electric rates were the highest in the state. To reduce the relatively high cost of electricity, TPUD was formed in 1981. In 1982, the newly formed Trinity Public Utilities District purchased CP National facilities. Since the creation of TPUD, area customers have gone from paying the highest rates in the state, to paying the lowest.

TPUD operates out of offices located in Trinity County, in the county seat of Weaverville, California. TPUD transmits and distributes electricity within an 1,800 square-mile territory that includes the principal parts of Trinity County. As a public utility, TPUD is governed by a five-member popularly elected Board of Directors that determines policy and appoints the General Manager who is responsible for TPUD's overall management and operations. TPUD owns, operates and has ownership interests that are critical to maintaining the flow of power from generating facilities through the transmission lines to TPUD's service area.

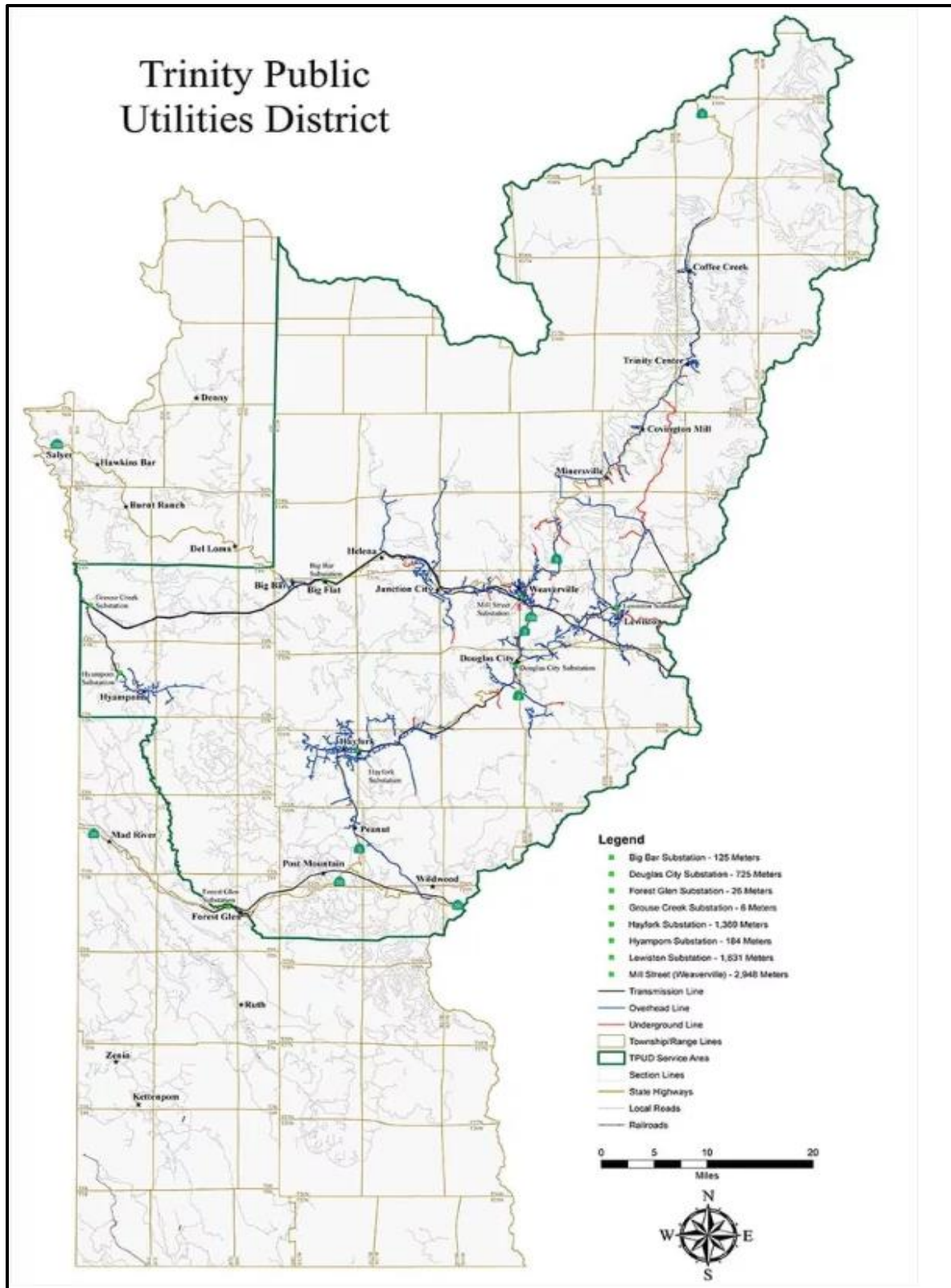
2.2 The Service Area

Located in the lower reaches of the Cascade Range in Northern California, TPUD is the primary distributor of electric power within an area of approximately 2,200 square miles, which is about 95% of Trinity County's habitable area. Located midway between Redding in Shasta County and the Northern Redwood Coast, the service area is the fourth least populous county in the state.

TPUD's electric system supplies power to a population of approximately 13,000 with a total annual retail load of approximately 108 million kilowatt hours (kWh) for the year ending December 31, 2018. TPUD's annual peak load has averaged 25 Megawatts (MW) over the last three years.

Timber harvesting, government employment and recreational tourism serve as the major sectors of employment and industry in the area.

Figure 1. TPUD Operating Area



2.3 The Electric System

TPUD owns and operates an electric system that includes transmission and distribution facilities. TPUD has been providing 100% renewable hydroelectricity to its customers since 1982. The Western Area Power Administration (WAPA) supplies power to TPUD bulk power substations through a 60 kilovolt (kV) transmission system. This system receives power from the 140 kW US Bureau of Reclamation generation plant at the Trinity Dam and is wheeled by WAPA transmission lines. Power is distributed throughout Trinity County via a 21 kV, 12.47 kV, 12 kV and 7.2 kV sub-transmission system. The distribution system serving TPUD's service territory is comprised of 60 kV and 115 kV substations with overhead and underground distribution circuits.

2.4 Goals and Objectives

For more than thirty-eight years, TPUD has provided safe, reliable and affordable electricity, excellent customer service, community value, innovation and environmental leadership to its customers.

The Board has adopted a set of Strategic Directions (SDs) with related metrics, which it considers essential in the continued success of the organization and its service to its customers. These include safety, reliability, competitive rates, enterprise risk management (ERM), customer relations, environmental leadership and resource planning. The Strategic Directions are used as a guide in the decisions made about TPUD's policies and operations. The Board continually reviews and refines these guidelines to make sure it meets its customer's energy needs both now and in the future.

Some of the general elements in TPUD's business strategy are:

- **Work with WAPA:** Minimize its average cost of power while encouraging electrification to fully utilize TPUD's carbon-free federal power allocation while reducing distribution losses to 6%.
- **Improve operational efficiencies and reliability:** Sustained analysis of methods and policies to achieve maximum customer satisfaction. Continue assertive vegetation line clearing practices.
- **Safe and reliable energy and environmental protection:** Convert District customer thermal energy use to Trinity River renewable. Developing and maintaining a sustainable and reliable power supply to meet peak demand

growth consistent with state mandates for renewable energy and reduced carbon emissions.

- **Customer and community services:** Working closely with customers to provide the information, tools and incentives to assist them to more efficiently manage energy use, which will contribute to meeting greenhouse gas (GHG) emission targets and managing peak demand requirements.
- **Long term financial stability:** Managing price, volumetric and credit risks associated with energy procurement and TPUD's finances to meet funding needs and maintain fair and reasonable energy rates.
- **Operational independence and local control:** Retaining local decision-making authority and operational independence.
- **Protect and improve the Districts position in Federal and State regulations:** Maintain and protect First Preference Rights. Support alternative Control Areas and oppose mandatory Regional Transmission Organization's (RTO) Defend against Power Marketing Administration (PMA) transfers or sales at "market rates". Defend the continuation of the Balancing Authority of Northern California (BANC). Defend against Deregulation legislation or regulations that increase costs. Support a return to cost-based services.
- **Community and Collaboration:** Promote Economic Development and new jobs in Trinity County., Development of District land and development of economic small Hydroelectric projects.
- **Long-term infrastructure investment:** Maintain and improve TPUD's infrastructure in a cost-effective manner to ensure sustainable delivery of reliable energy and address economic and environmental concerns.
- **Risk management:** Maintain an Enterprise Risk Management (ERM) program designed to act as an early warning system to monitor changes in, and the emergence of, risks that could impact TPUD's business objectives.
- **Distribute Benefits from the 1955 Trinity River Division Act to the balance of the county:** Assist in Community Choice Aggregation District information when requested by Trinity County citizens served by Pacific Gas & Electric.

Chapter 3: Overview of TPUD's Fire Prevention Strategies

The proposed wildfire preventative strategies can be categorized into five main mechanisms that align with Trinity PUD's best practices. Together, the five components create a comprehensive wildfire preparedness and response plan with a principal focus on stringent construction standards, fire prevention through system design, proactive operations and maintenance programs, and specialized operating procedures and staff training.

- **Design & Construction:** TPUD's design and construction consist of system, equipment, infrastructure design and technical upgrades. These practices aim to improve system hardening to prevent contact between infrastructure and fuel sources.
- **Inspection & Maintenance:** TPUD's inspection and maintenance strategies consist of diagnostic activities as well as various ways of maintaining and ensuring all equipment and infrastructure is in working condition. This includes adopting section PRC⁴ 4292: 1254 Minimum Clearance Provisions (Appendix D)
- **Operational Practices:** This includes day-to-day actions taken to mitigate wildfire risks to ensure preparedness in high-risk situations, such as dry and windy climatological conditions. For example, when the National Weather Service issues the first Red Flag Warning (RFW) of the fire season, reclosers are switched to "one shot" mode.
- **Situational & Conditional Awareness:** This component consists of methods to improve system visualization and awareness of environmental conditions. The practices in this category aim to provide tools to improve the other components of the plan. For example, TPUD monitors local weather station and camera installations to enhance situational awareness. The District employs a full-time drone pilot to closely observe and monitor conditions in the field.
- **Response & Recovery:** This consists of TPUD's procedures to react to wildfire and de-energization. This component aims to formalize protocols for these situations for adequate communications, emergency response and recovery.

Table 2 on page 12 provides a summary of TPUD's programs and activities that support wildfire prevention and mitigation, along with a timeframe for implementation.

⁴ Public Resources Code 4292 is administered by the California Dept. of Forestry and Fire Protections (CAL FIRE)

3.1 Timeframes of Preventative Strategies and Programs

The components described above have several strategies and programs, most of which have already been implemented. Some are situational and are not limited to any particular timeframe. For example, TPUD's PSPS protocols are only triggered when conditions pose a significant threat to the public and will possibly never be implemented. Some programs are scheduled to be completed over several years, while others are in the evaluation or proposal stages. Targets, scheduled timeframes and programmatic metrics can be found in Chapter 8. The strategies and programs below fall into one or more of the five implementation timeframes:

- A: Currently implemented
- B: Implemented before the upcoming fire season
- C: Completed annually or on schedule per relevant code
- D: In evaluation stage
- E: Implemented on as-needed basis/protocols in place

Table 2 Mitigation Programs/Activities

DESIGN AND CONSTRUCTION	TIMEFRAME
Underground distribution lines	A*
Non-expulsion equipment on all radial tap lines and transformers	A*
Install overhead wire inter-phase spacers to reduce wire to wire contact	A
INSPECTION AND MAINTENANCE	
T&D line aerial patrols and infrared inspections (drone)	C
Transmission line ground patrols	C
T&D wood pole intrusive inspections	C
T&D vegetation right-of-way maintenance	C
T&D pole clearing program	C
Distribution system line patrols and detailed inspections	C
Infrared inspections of electrical equipment	C

OPERATIONAL PRACTICES	
Disabling automatic reclosing during fire season	A
T&D system vegetation management program	C
Work procedures and training for persons working in locations with elevated fire risk conditions	A
Safety and physical security protection teams	A
Increased staff for line and vegetation management crews in preparation of wildfire	B
Existing relationship with local government and fire safety councils	A
Supervisory Control and Data Acquisition (SCADA) (Investigatory phase)	D
Increased community outreach/wildfire safety awareness	B
SITUATIONAL/CONDITONAL AWARENESS	
Coordinate and collaborate with Fire Safe Councils and County Office of Emergency Services to prepare for Red Flag Warnings (RFW) and high fire risk events	B
Contractor/staff safety training and orientation for T&D vegetation management work	A
Weather monitoring	A
RESPONSE AND RECOVERY	
Public safety power protocols	E
Critical event communications process and procedures	A
Line patrols prior to re-energization	A
Customer assistance after a disaster	A

* Ongoing program with no defined completion date

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Chapter 4: Risk Analysis and Risk Drivers

In order to establish a baseline understanding of the risks and risk drivers involved, TPUD looked at all aspects of the Districts exposure to fire related hazards. Although there are inherent risks in the operation of an electric utility, it is possible to put in place strategies and processes to better plan and manage them. Enterprise Risk Management (ERM) is one tool to assist in anticipating and managing risks, as well as considering how multiple risks can present even greater challenges. The overall goal is to determine the residual risk level after all mitigation factors have been applied to the initial inherent risk.

4.1 Enterprise Risk Assessment (ERM)

The ERM is not a periodic “Risk Assessment” but an ongoing and forward-looking management discipline that allows TPUD to analyze risks to the District as a whole on a continual basis and adapt to changing conditions. The most key or critical risks affect the entire community and are interrelated, and thus, are managed holistically and with a structured approach. Figure 3, on the following page describes the objective of each step.

Figure 2. TPUD Enterprise Risk Management Process

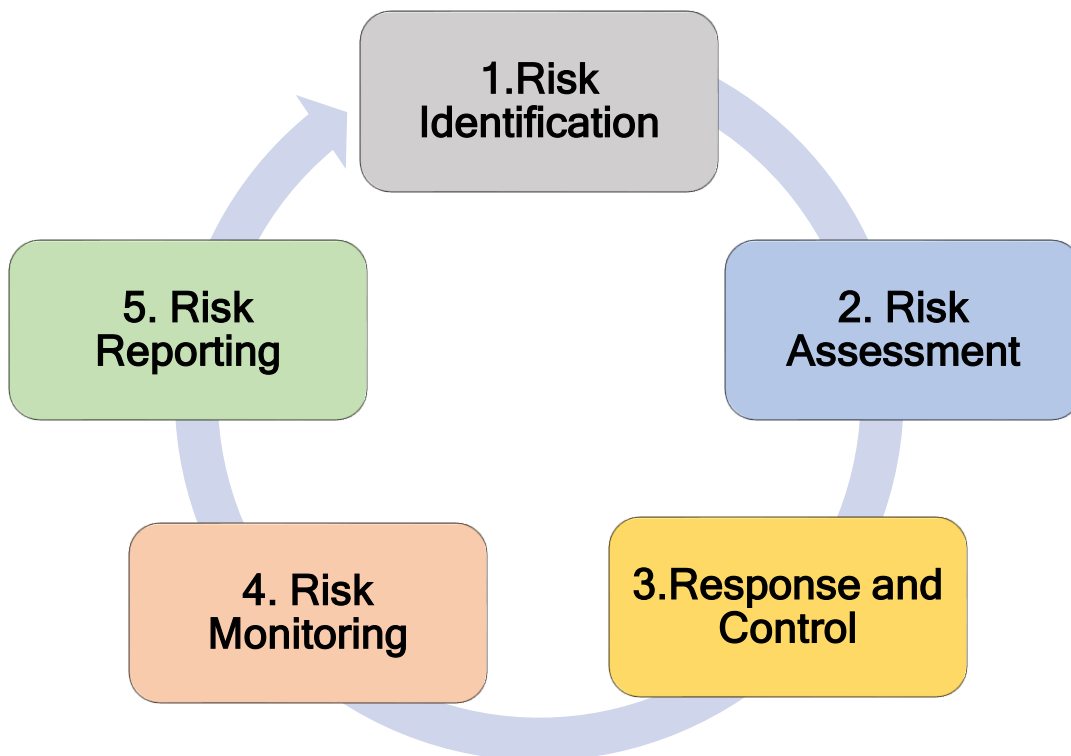
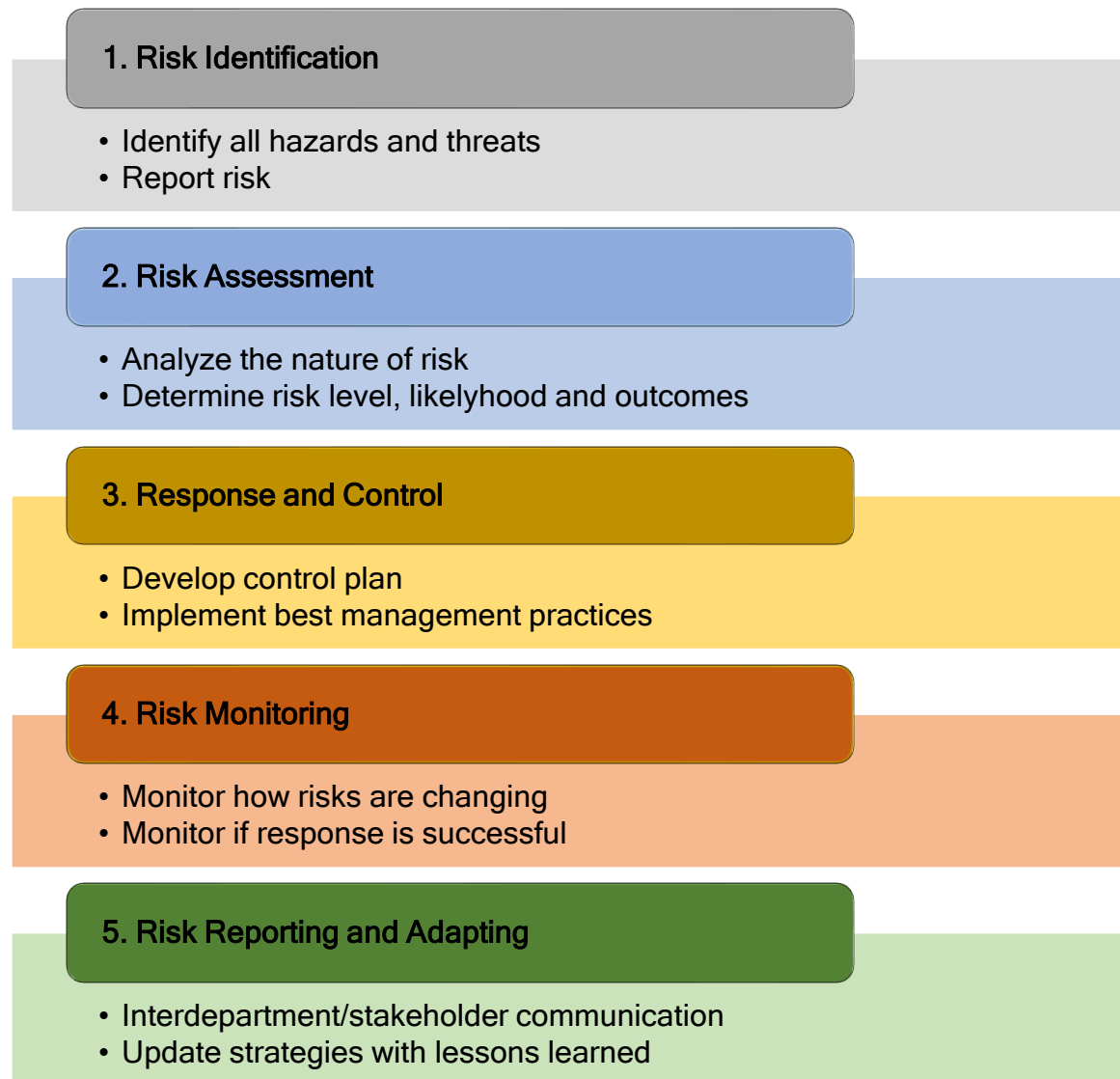


Figure 3. TPUD 5-Step Process



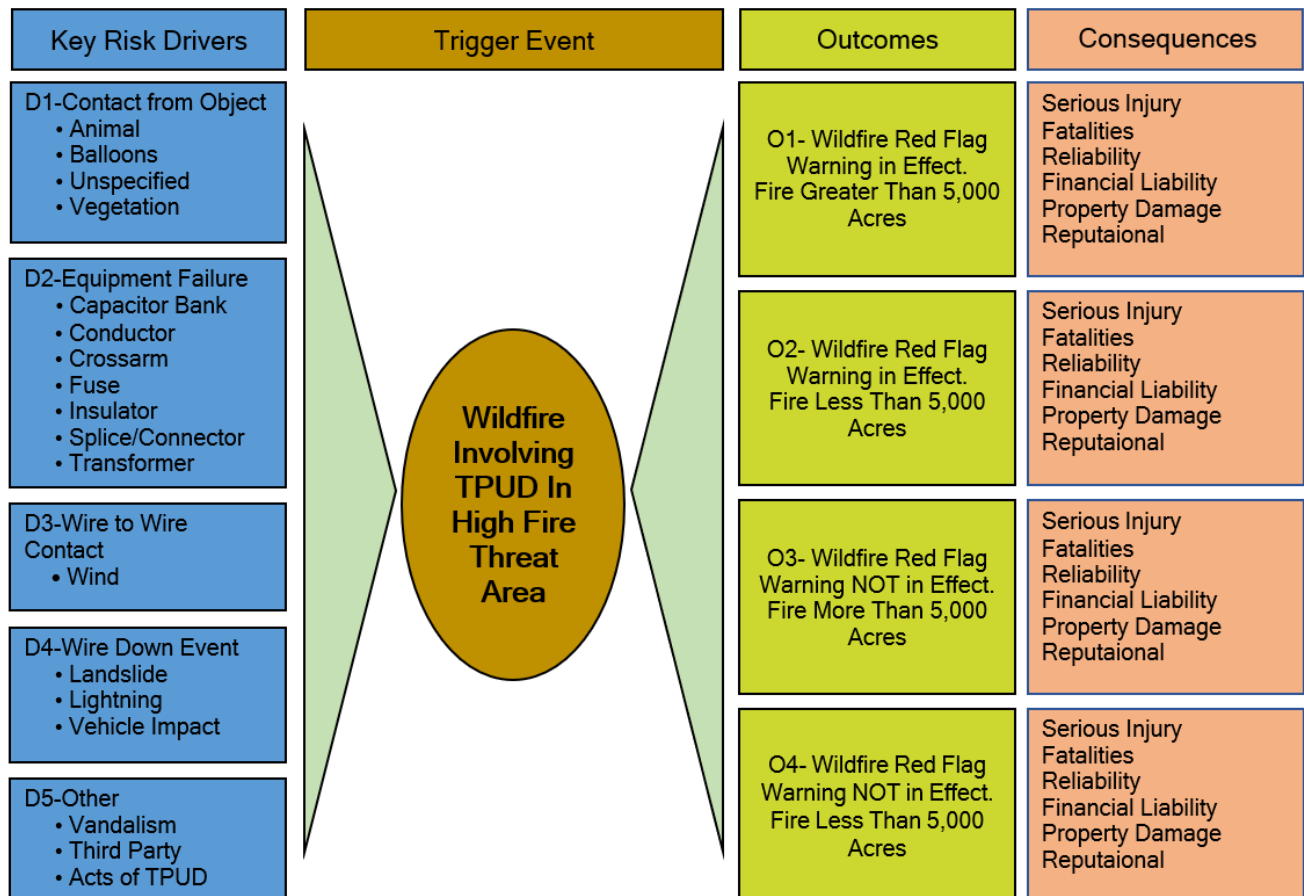
The Risk Assessment process begins with the General Manager (GM), Electric Superintendent (ES), key staff and stakeholders working together to collect information on all potential and perceived risks. Relevant local plans, such as the Trinity County Community Wildfire Protection Plan and the Trinity County Hazard Mitigation Plan were reviewed for additional data. The risks, risk drivers, key risk impacts, mitigations, District policies, controls and procedures were analyzed and potential outcomes identified. A root cause analysis was conducted using a commonly used risk assessment tool known as the bow-tie method framework. This method provides a visual representation of the causal relationships between the key risk drivers, trigger

event, outcomes and impacts to TPUD and the community at large. The bow-tie framework takes into consideration the key impacts to TPUD's reputation, public and employee safety, financial liability, operations, reputation and property damage.

4.2 Enterprise Safety and Wildfire Risk

TPUD does not have a history of starting wildfires where TPUD owned equipment was involved. The following list included in the bowtie diagram below focuses on hypothetical causes of powerline sparks that could potentially start a fire. The bowtie analysis below aims to identify the key root cause/risk drivers and exposure to impacts from a wildfire and identify the possible consequences. Figure 4.6 displays the risk bowtie, which summarizes the assessment process.

Figure 4. Wildfire Risk Bow Tie Analysis



4.3 Climate Change

The fourth *California Climate Change Assessment* has concluded that climate change will make forests more susceptible to extreme wildfires. One study has found that the frequency of fires over 25,000 acres would increase by nearly 50 percent and that the average area burned would increase by 77 percent by the end of the century if greenhouse gas levels continue to rise. Increasing temperatures and rising sea-levels will have direct impacts on public health and infrastructure. Drought, coastal and inland flooding and wildfire will continue to affect people's livelihoods and local economies⁵.

In TPUD's service territory climate cycles range from very dry years to above average wet years and droughts can last for several years in a row. The most recent California drought lasting from December of 2011 to March of 2017. Although the dry spell ended in 2017, after many consecutive dry years several species of trees seem to now have root fungus, adding to the overall tree mortality rate. Additionally, these drought stressed trees are more susceptible to bark beetle infestations.

For decades, TPUD has designed its electrical system with the primary goal of providing safe, reliable and affordable power. These designs stem from many decades of engineering experience and the adoption of emerging technologies. TPUD's design practices continue to advance with the addition of newer safety and reliability-related technologies. As part of this advancement, it is important to understand and adapt to the new normal and the challenges climate change brings. The greater intensity and year-round frequency of fire danger is driving the need for further evolution, hardening and strengthening of the grid-particularly as portrayed in the High Fire-Threat District (HFTD) Map of TPUD's service territory.

The State of California-Public Utilities Commission (CPUC) has designated most of TPUD's service territory as Tier 2, with a small area designated Tier 3 and a small fraction Tier 1. The "In town" areas of Hyampom, Hayfork, Lewiston and Weaverville are located outside of the High Fire Threat Districts as shown in Figure 6 (page 28).

⁵ California's 4th Climate Change Assessment

4.4 Fire Risk Drivers

TPUD staff evaluated other utilities' fire causes and applied its own field experience to determine the potential risk drivers. Five categories were identified as potential for causing powerline sparks and ignitions:

- Red Flag Warning Conditions
- Foreign Contact
- Equipment/Facility Failure
- Wire to Wire Contact/Contamination
- Other

TPUD staff identified the following drivers associated with each category. These are discussed below but may not be limited to the following.

4.4.1 Red Flag Warning Conditions

The National Weather Service issue Red Flag Warnings (RFW) & Fire Weather Watches to alert fire departments of the onset, or possible onset of critical weather and dry conditions that could lead to rapid or dramatic increases in wildfire activity⁶. An RFW is issued for weather events which may result in extreme fire behavior that will occur within 24 hours. A Fire Weather Watch is issued when weather conditions could exist in the next 12-72 hours. An RFW is the highest alert. While an RFW is in effect, TPUD crews working in remote sites limit hot-work such as welding, grinding and cutting. Vegetation Management (VM) and line crews have on-site fire suppression equipment, including water backpacks, shovels and fire rakes. Work crews conduct tail-gate meetings to confirm the location and readiness of the fire suppression equipment. Designated staff assigned as a fire-watch remain on site for 30 minutes or longer to ensure a fire doesn't start after work crews leave a remote or high-risk area.

4.4.2 Foreign Contact

As is the case for most electrical utilities, the majority of overhead powerlines are installed with bare wire conductor on insulated structures. The benefits of this type of conductor is that it is much lighter and easier to work with, as well as a much more cost-effective method of delivering energy compared to insulated/covered wire. The downside to bare wire is its susceptibility to contact from foreign objects such as wildlife, vegetation and third-party

⁶ <https://www.fire.ca.gov/programs/communications/red-flag-warnings-fire-weather-watches/>

equipment. Protection equipment is utilized to isolate faults, but there are time delays associated with circuit breakers, reclosers and fuses. These time delays are not fast enough, in many cases, to prevent all sparks prior to tripping. Ejected molten metal, sparks or burnt foreign objects can potentially ignite any fuels in the vicinity of the fault. Vehicles leaving the roadway and making contact with a pole is a common source of faults. Such an impact with poles or guy wires can break poles and/or crossarms, creating enough stress on the conductors to break them. The results can be ground contact, potentially emitting sparks.

4.4.3 Equipment Failure

There are a many reasons equipment failure can occur during its service life. Most equipment requires regular maintenance for optimal performance. Even though TPUD's qualified personnel perform regularly scheduled inspection and maintenance on all system equipment, internal defects that are not visible or predictable, can be the cause of destructive equipment failure resulting in ejection of sparks and/or molten metal. The failure of components such as hot line clamps, connectors and insulators can result in wire failure and wire to ground contact. Transformers and capacitor banks can have internal shorts potentially resulting in the ejection materials which could be a fire source.

4.4.4 Wire to Wire Contact/Contamination

High wind events and storms are potential causes of wire-to-wire contact referred to as contamination. Conductors can sway under these conditions, and if extreme, wire-to-wire contact can occur. When two or more energized conductors come into contact with each other they will generally emit sparks or cause breakers to trip, emitting sparks and ejecting material. A vehicle impacting a pole, livestock rubbing on guy wires are also potential causes for contamination. Certain processes of re-energization of conductors can cause a "galloping" condition which may result in contamination.

4.4.5 Other Potential Risk Factors

Construction projects by non-TPUD crews are another possible cause of ignition. Boom trucks working near power lines can contact conductors causing a fault. Digging without first locating power lines are another hazard, as the District has many miles of underground distribution lines in its service area. These situations would most likely not be the source of

an uncontrolled wildfire, as this type of event would be observed and responsive actions immediately taken.

TPUD employs a properly trained and well-informed workforce. Switching, construction and maintenance activities are performed daily. The tools and vehicles can be sources of sparks or ignition as well. For example, driving a vehicle over dry grass/brush can cause the dry grass/brush to ignite when contacting hot surfaces. For these reasons, TPUD vehicles are equipped with fire suppression equipment and District staff are trained to respond to fires and in the proper use of fire suppression equipment. Tailgate meetings are held before work to discuss the potential for fire and to confirm the location and condition of on-board fire suppression equipment.

4.5 Key Risk Impacts

The aforementioned risks have many possible outcomes. The list below outlines some of the worst-case scenarios and consequences:

- Personal injuries or fatalities to the public, employees and contractors
- Damage to public and/or private property
- Damage and loss of TPUD owned infrastructures and assets
- Impacts to reliability and operations
- Damage claims and litigation costs, as well as fines from governing bodies
- Damage to TPUD's reputation and loss of public confidence
- Environmental and ecological damage
- Customer and community impacts
- Financial liability

4.5.1 Design, Construction, Operation and Maintenance

Some of the risks and risk drivers associated with design, construction, operation and maintenance of TPUD's equipment and facilities is the age of infrastructure. The use of expulsion type fuses as well as mineral oil used in transformers are other examples. TPUD is in the on-going process of replacing all expulsion type fuses with non-expulsion fuses. The demand for this equipment is very high, due the widespread use in many electric utilities with operations in high fire threat areas. The District has replaced approximately 25% of their fuses with the CAL-FIRE exempt fuses and will continue the replacement program moving forward.

4.5.2 Associated with Topographic and Climatological Risk Factors

Within Trinity PUD's service territory and the surrounding areas, the following are the primary risk drivers for wildfire:

- Severe drought
- Vegetation type
- High winds
- Tree mortality
- Lightning
- Traffic
- High heat during summer months

Trinity County has a steep and rugged terrain with thick vegetation and a high tree mortality rate. These factors, along with ongoing drought conditions, makes it more vulnerable to wildfire than areas with less extreme topography. Fire-fighting activities in this type of terrain are also much more challenging. Access to remote sections of some distribution lines are very difficult and time consuming.

4.5.3 Geographical Risk Factors

The lack of reliable cell phone coverage in the service area could contribute to a delay in reporting wildfires or other immediate hazards by the general public.

Chapter 5: TPUD's Asset Overview

Power is provided to TPUD customers by way of bulk substations, overhead transmission line, overhead and underground distribution line assets. The utility has its headquarters office and an equipment storage facility located in Weaverville, CA. Table 3 on the following page depicts a high-level description of TPUD's T&D assets.



Table 3 Asset Description

ASSET CLASSIFICATION	ASSET DESCRIPTION
Transmission Line Assets	Approximately 56 miles of conductor, transmission structures and switches at 60 kilovolt (kV).
Distribution Line Assets	Approximately 510 miles of overhead (OH) and underground (UG) conductor, underground cabling, transformers, voltage regulators, capacitors, switches, lined protective devices and street lighting operating at or below 24 kV.
Substation Assets	Major equipment such as power transformers, voltage regulators, capacitors, reactors, protective devices, relays, open-air structures, switchgear and control houses in eight substation facilities.

5.1 Fire Threat Assessment in TPUD Service territory

TPUD provided input in the development of the CPUC's Fire-Threat Map⁷, which the Commission adopted on January 19, 2019. This map identifies Statewide High Fire Threat Districts (HFTD). The HFTD map has been incorporated into the construction inspection, maintenance, repair and clearance practices, where applicable.

Based on TPUD's knowledge of historic wildfire events, the existing environment and current information, TPUD believes that the HFTD map approximately identifies the level of wildfire risks within TPUD's service territory. TPUD will continue to evaluate factors that may indicate the CPUC should modify the HFTDs. The CPUC Fire-Threat map identifies Tier 3 (extreme fire risk), Tier 2 (elevated fire risk) and areas outside of the HFTD. The majority of TPUD service area falls within the Tier 2 areas. Portions of the District's assets located in the more densely populated and developed areas fall outside the HFTD areas. These areas include portions of Lewiston, Weaverville, Hayfork and Hyampom. Table 4, on page 26, provides a breakdown, by tier group, the various asset types within the TPUD service area.

Figure 5, on page 27, depicts the CPUC Fire-Threat Map and TPUD's service area within the map. As shown, TPUD's service area is not comprised of Trinity County in its entirety.

⁷ Adopted by CPUC Decision 1-24-024

Figure 6, (page 28) is a high level diagram of TPUD assets in relation to the threat level tiers. As illustrated, most of TPUD's T&D lines and substations are located in "Tier 2 - Elevated" fire threat areas. There are portions of the distribution system located outside of the High Fire Threat Districts, as well as 3 substations. The non-tiered area are shown in Figures 7 through 10 (pages 29-31). A very small portion of TPUD's service area is designated Tier 1-High Hazard Zone as shown on Figures 7 (Hayfork) and Figure10 (Weaverville).

Figure 11 (page 32) shows the recent (2018) history of major wildfires in the Trinity County and Shasta county areas.

Figure 12 (page 33) shows the State Responsibility Areas⁸ (SRA). SRAs are recognized by the Board of Forestry and Fire Protection as areas where Cal Fire is the primary emergency response agency responsible for fire suppression and prevention. All of Trinity County falls within the SRA.



⁸ <https://bofdata.fire.ca.gov/projects-and-programs/state-responsibility-area-viewer/>

Table 4 Overview of TPUD's T&D Assets in CPUC Tiers

Assets	Total	Outside HFTD		Tier 2		Tier 3	
	Line-miles	Line-miles	%	Line-miles	%	Line-miles	%
60 kV OH Transmission	56.4	0	0%	56.4	100%	0	0%
21 kV OH Distribution	62.2	0	0%	62.2	100%	0	0%
12.47 kV OH Distribution	26.9	13.32	49.5%	13.6	50.5%	0	0%
12 kV OH Distribution	250.7	19.62	7.8%	231.1	92.2%	0	0%
7.2 kV OH Distribution	82.0	0	0%	82.0	100%	0	0%
21 kV UG Distribution	26.9	0	0%	26.9	100%	0	0%
12.47 kV UG Distribution	6.4	6.01	94.9%	.3	5.1%	0	0%
12 kV UG Distribution	28.3	1.70	6.0%	26.6	94.0%	0	0%
7.2 kV UG Distribution	26.2	0	0%	26.2	100%	0	0%
Total OH Transmission	56.4	0	0%	56.4	100%	0	0%
Total OH Distribution	421	32.9	7.8%	388.9	92.2%	0	0%
Total UG Distribution	87.8	7.8	8.9%	80.0	91.1%	0	0%
Total Substations	8	3	37.5%	5	62.5%	0	0%

As shown in Table 4 above, TPUD's OH and UG Distribution assets are located primarily within Tier 2 HFTD areas, deemed "elevated threat". There are a total of 445.3 overhead T&D line-miles located within the HFTDs, with 32.9 line-miles located outside the HFTD. None of the T&D lines are located within Tier 3, deemed "Extreme Fire Threat."

Figure 5. Territory Within CPUC Fire-Tier Threat Map

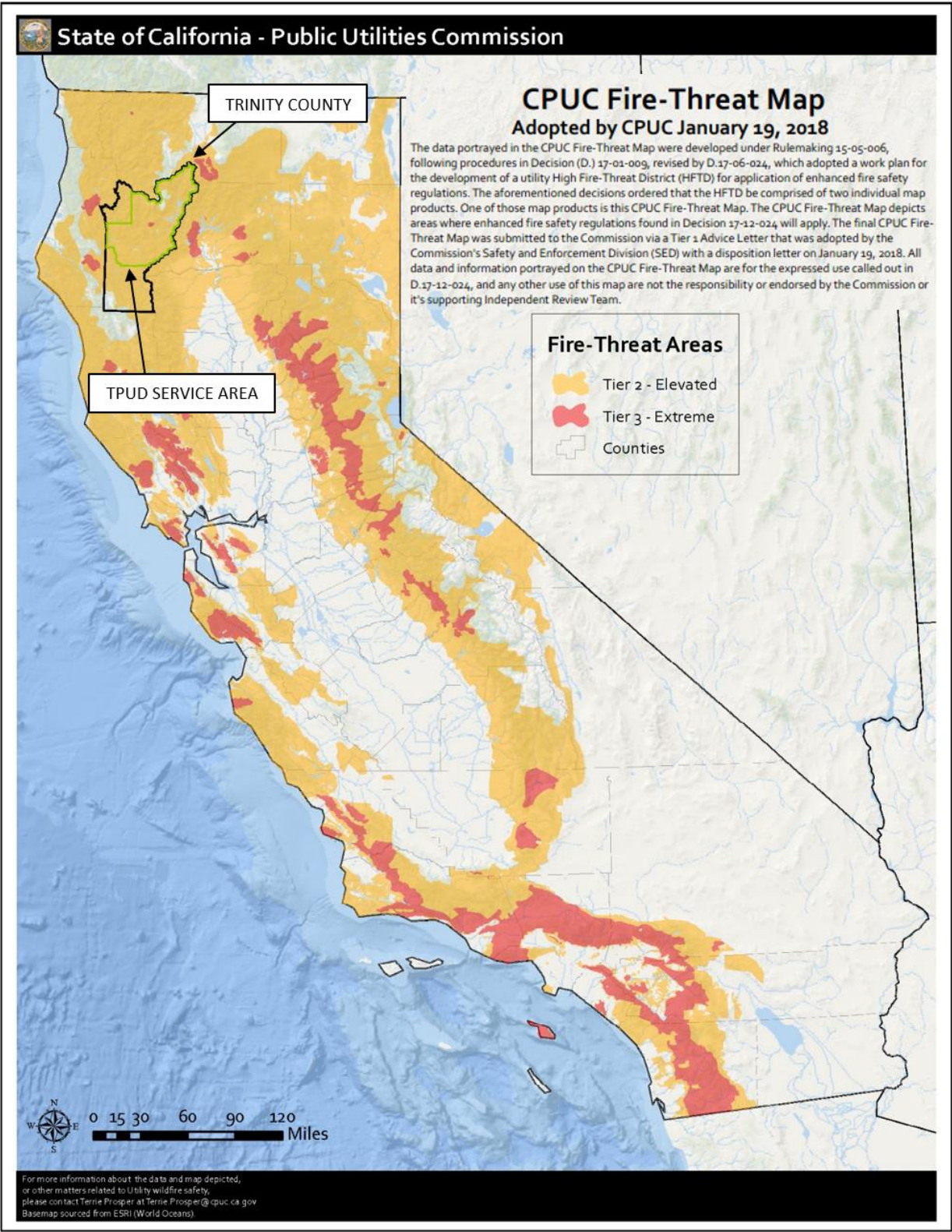


Figure 6. High Level Map of TPUD Assets by HTFD Tier

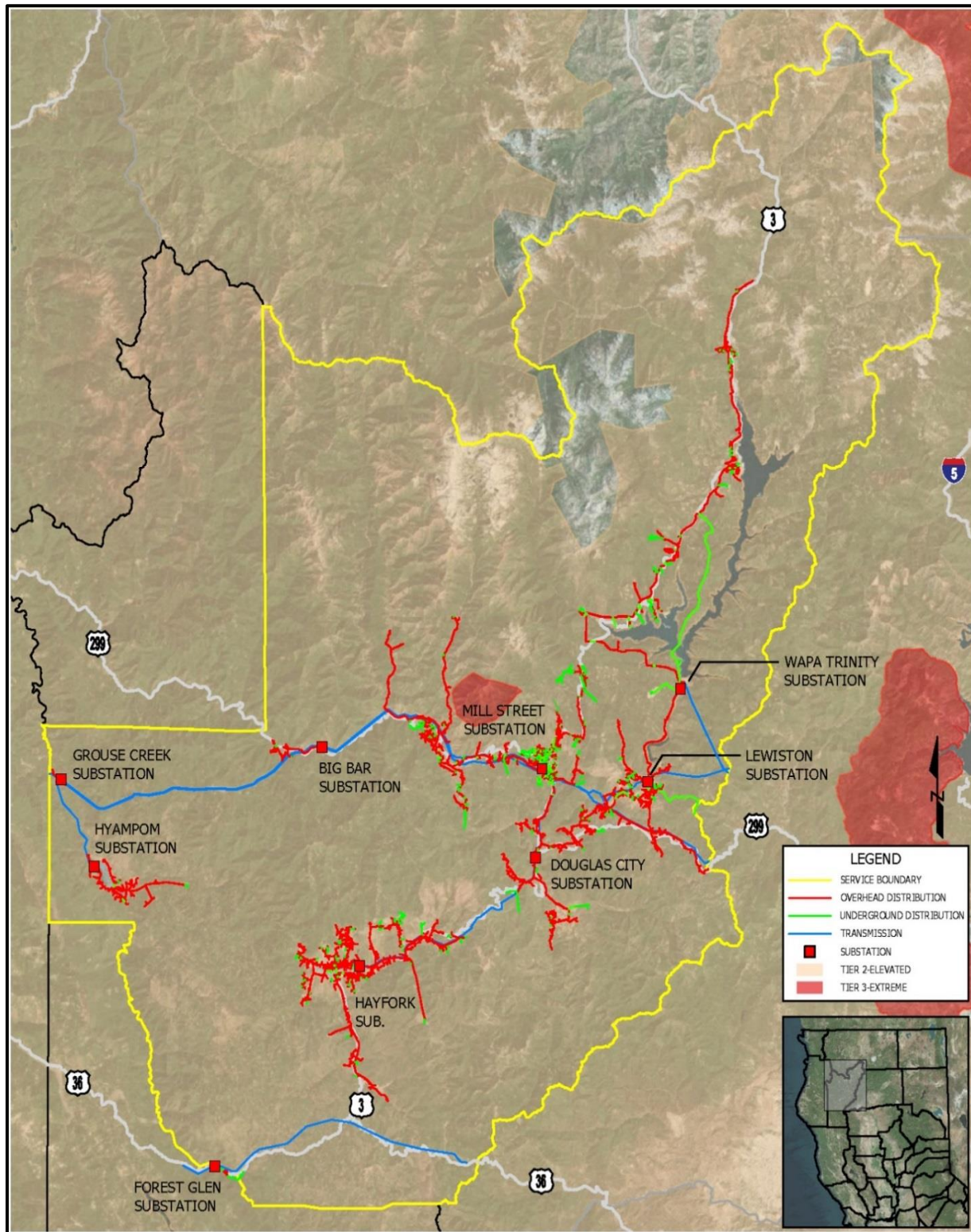


Figure 7. Hayfork HTFD Detail Map

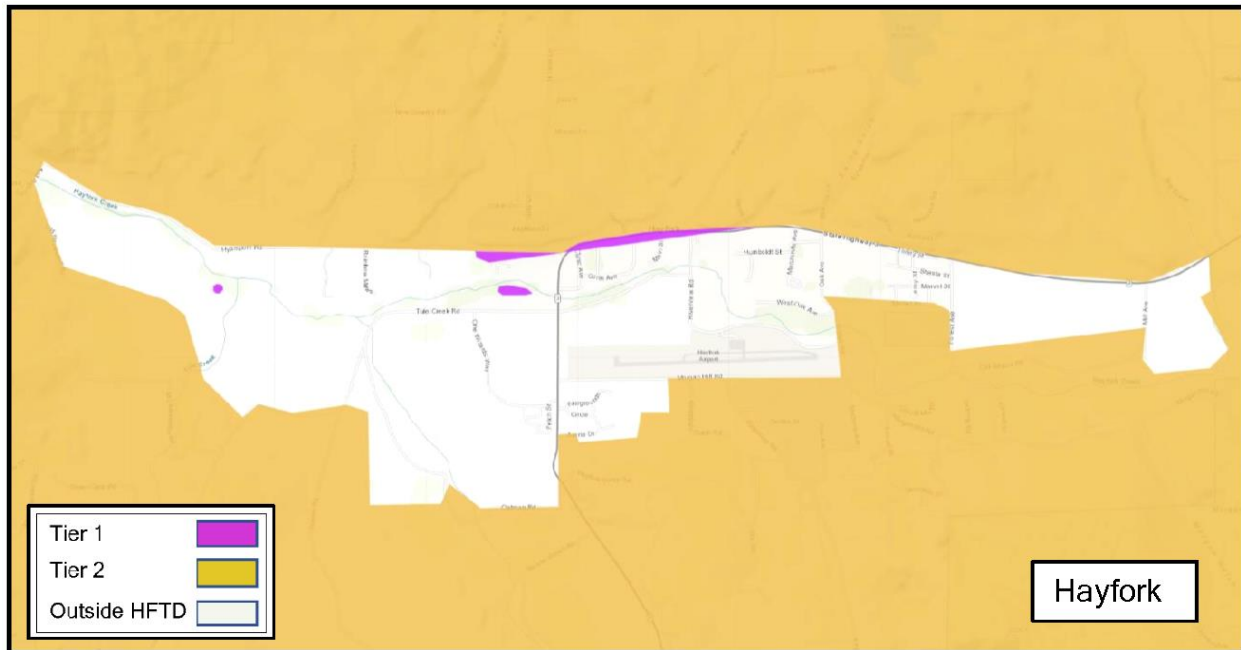


Figure 8. Lewiston HTFD Detail Map

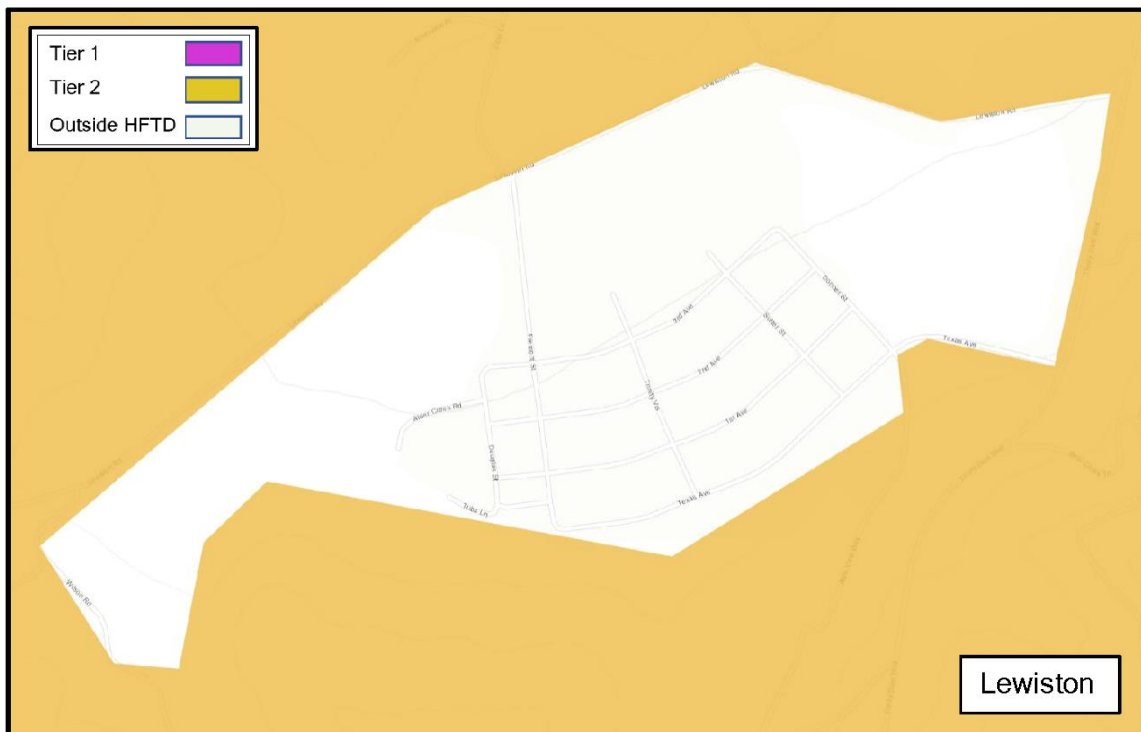


Figure 9. Hyampom HTFD Detail Map

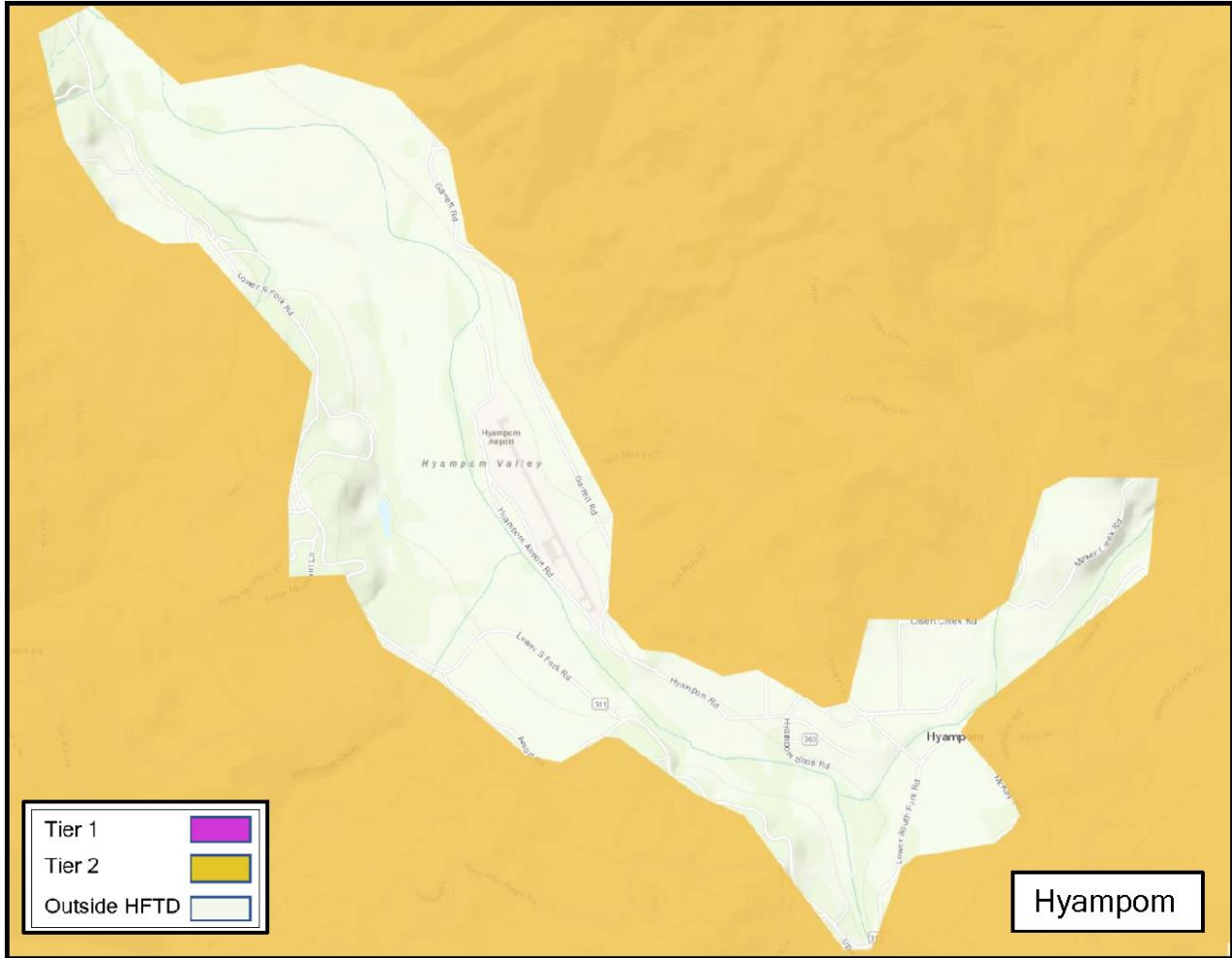


Figure 10. Weaverville HTFD Detail Map

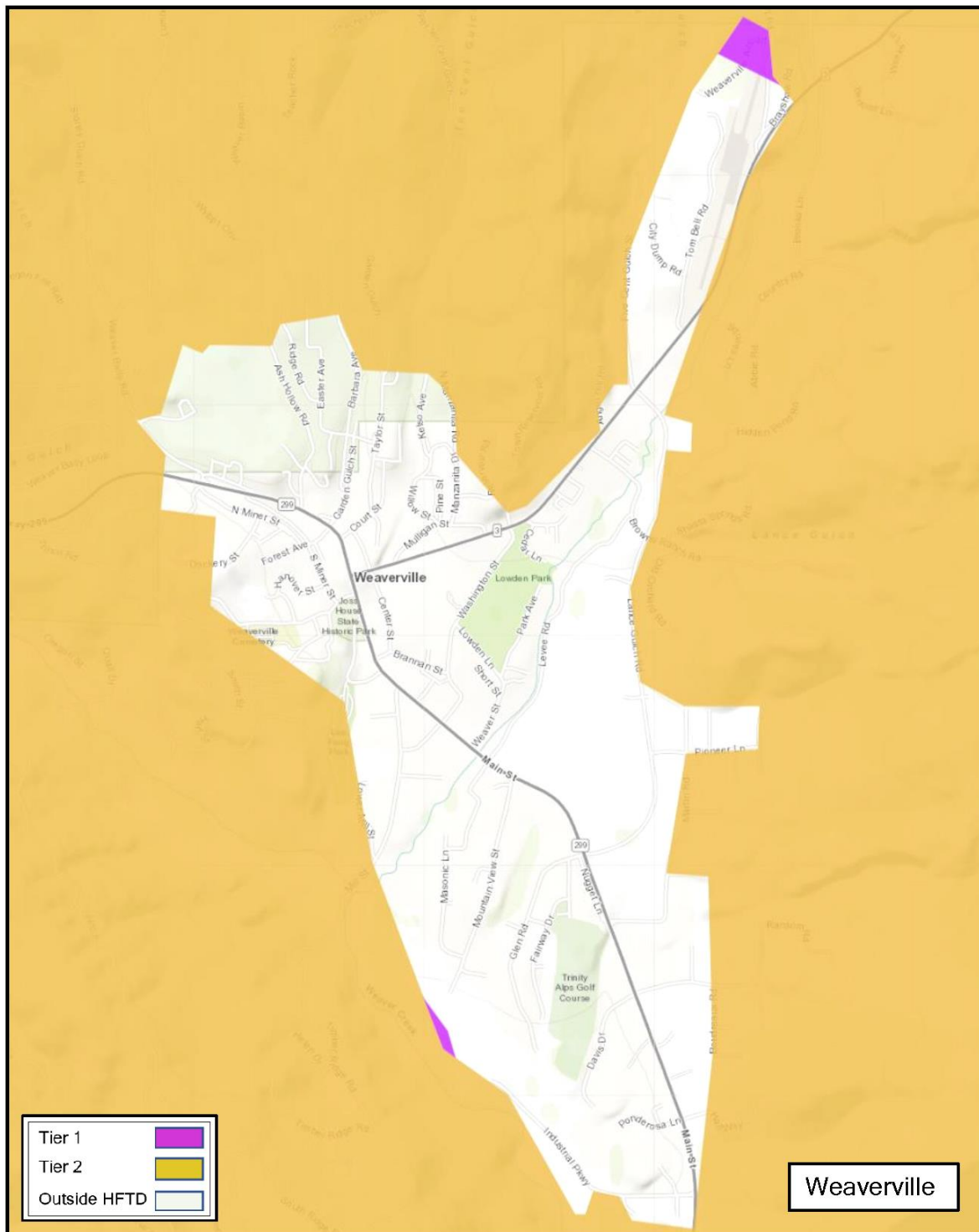
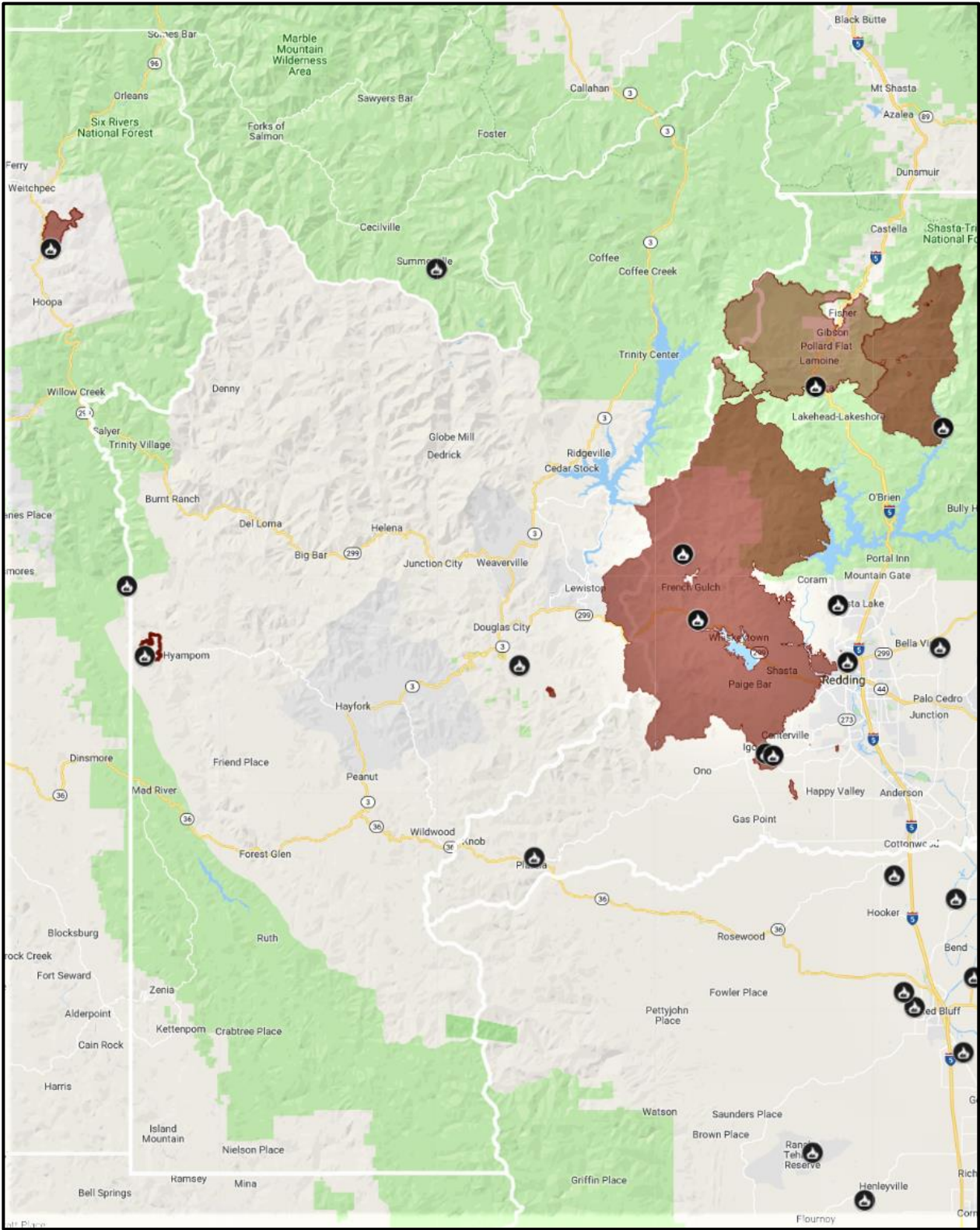


Figure 11. Trinity Area 2018 Incident Map



TRINITY COUNTY

FIRE HAZARD SEVERITY ZONES IN SRA

Adopted by CAL FIRE on November 7, 2007

FIRE HAZARD SEVERITY ZONES in State Responsibility Area (SRA)

- Moderate
- High
- Very High

FIRE PROTECTION RESPONSIBILITY

- Federal Responsibility Area (FRA)
- Local Responsibility Area (LRA) - Unincorporated
- Local Responsibility Area (LRA) - Incorporated

Legend:

- FIRE HAZARD SEVERITY ZONES in State Responsibility Area (SRA)
- Moderate
- High
- Very High
- FIRE PROTECTION RESPONSIBILITY
- Federal Responsibility Area (FRA)
- Local Responsibility Area (LRA) - Unincorporated
- Local Responsibility Area (LRA) - Incorporated

Map Information:

- Projection: Albers, NAD 1927
- Scale: 1:150,000
- At 32° 40'
- November 06, 2007

Map of California:

Map of California showing the location of Trinity County.

Map Sources:

- CAL FIRE Fire Hazard Severity Zones (FH2508_3)
- CAL FIRE State Responsibility Areas (SRAC05_3)
- CAL FIRE Incorporated Cities (Incorp07_3)
- PLSS (1:100,000 USGS, Land Grants with CAL FIRE gis)

Disclaimer:

The State of California and the Department of Forestry and Fire Protection make no representations or warranties regarding the accuracy of data or maps. Neither the State nor the Department shall be liable under any circumstances for any direct, special, incidental, or consequential damages with respect to any claim by any user or third party on account of, or arising from, the use of data or maps.

Obtain FRAP maps, data, metadata and publications on the Internet at <http://trp.off.ca.gov>

For more information, contact CAL FIRE FRAP, PO Box 944245, Sacramento, CA 94244-2450, (916) 327-3939.

Arnold Schwarzenegger, Governor,
State of California
Mike Christman, Secretary for Resources,
The Resources Agency
Robert Grignani, Director
Department of Forestry and Fire Protection

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Chapter 6: Wildfire Prevention Strategy and Programs

This WMP was built upon a sound foundation, as TPUD has been proactive in implementing measures to address potential wildfire risks for many years. The Plan outlines existing fire mitigation efforts and identifies new processes the District will employ moving forward.

In general, this WMP describes certain programs that TPUD will attempt to complete on an accelerated basis in order to mitigate wildfire risks as quickly as possible. However, many of the programs are multi-year and programmatic in nature, i.e., there is a startup period with limited initial implementation followed by full implementation that expands as processes and methods mature. We also have robust inspection and maintenance programs that include aerial patrols with a TPUD owned drone employing infrared (IR) technology, along with high resolution photography. Regular ground inspections of all facilities, including core testing of the wood poles are another part of the preventive maintenance program.

The District has already begun the process of replacing standard fuses with non-expulsion type fuses throughout its service area. There are protocols in place for disabling automatic reclosers and for de-energizing lines to protect public safety. Some of the conditions that factor into these protocols may include: RFWs, forecasted temperatures above 100, winds exceeding design standards and low humidity.

TPUD is researching the implementation of radio communications with its reclosers and other equipment to enable immediate setting adjustments to react to quickly changing conditions on the ground.

Several of TPUD's strategies and programs in use now are not limited to any timeframe, and are instead situational, and based on certain real-world events, such as Red Flag Warnings (RFW) and other high fire-risk conditions. For example, TPUD's Public Safety Power Shutoff (PSPS) protocols are only triggered when conditions pose a significant threat to the public. These conditions are predominantly weather and vegetative fuel-related and not associated with time periods (e.g., in 2019, or within 5 years). Similarly, TPUD's emergency preparedness and response plans, post-incident recovery, restoration, and remediation activities and programs to support customers impacted by a wildfire are event-driven and are not timeframe-dependent. TPUD's operational practices are also not time-dependent, and certain practices are triggered by RFW and other high fire risk conditions. Additionally, these practices are updated as TPUD gains new information and adopts improved practices. Furthermore, all administrative-related programs such as risk analyses, performance metrics and monitoring of this WMP will be performed at regular or annual intervals.

TPUD regularly coordinates with our local fire safe councils and other first response agencies. TPUD also participates with emergency operations activities in our system areas. TPUD has robust VM programs with accelerated VM Trimming Cycles.

The Outage Communications Plan includes methods to address potential de-energization events with targeted messaging for affected areas.

The following table shows activities that will address key wildfire risk factors.

Table 5 Activities That Address Wildfire Risk Factors

RISK FACTOR	ACTIVITY
Fuel Source	• Vegetation Management/Pole Clearing • Fuels Reduction • Drone enabled inspection
Wire to Wire Contact	• Weather station monitoring • NWS monitoring • Inter-phase line spacing
Contact from Objects	• Animal/bird guards • Raptor nest relocation/drone inspection • Increased vegetation clearances
Equipment Failure	• Routine maintenance • Infrared inspections • Focused design and construction standards to reduce ignition sources • Transmission and distribution line detailed inspections and annual patrol • Recloser resetting during fire season • Non-expulsion fuses and arrestors • Intrusive pole testing • De-energizing of lines during certain conditions
Other	• TPUD worker/contractor education on fire ignition sources from normal work activities • Fire watch 30 after work completion in high risk areas • Tailgate meeting

6.1 T&D Operational Practices

6.1.1 De-energization

The District, in consultation with the local Public Safety Providers, has evaluated the efficacy of a Public Safety Power Shutdown (PSPS). Major considerations include what the District considers the potential negative impacts to fire response, water supply, public safety, and emergency communications should a fire occur while a portion or all of the TPUD system is

deenergized. The weather conditions contribute to red-flag warnings typically in late Summer/Fall. Red flag warnings are weather generated and do not consider fuel source factors.

During red flag warnings, however, the winds that accompany these events are typically the reason fires reach an uncontrollable state. During red flag warnings, the most likely cause of wildfire ignition is lightning strikes, transportation, illegal fireworks or recreation.

While the District is willing to take whatever steps are necessary to protect our community and the public that we serve, the risks and potential consequences of initiating a PSPS are significant and extremely complex. Foremost concerns include:

- Potential loss of water supply to fight wildfires due to loss of production wells and pumping facilities.
- Negative impacts to emergency response and public safety due to disruptions in internet and mobile phone service during periods of extended power outages.
- Loss of key community infrastructure and operational efficiency that occurs during power outages.
- Medical emergencies for members of the community requiring powered medical equipment or refrigerated medication. Additionally, lack of air conditioning can negatively impact medically vulnerable populations.
- Traffic congestion resulting from the public evacuation de-energized areas can lengthen response times for emergency responders.
- Negative economic impacts from local businesses forced to close during outage.
- Inability to open garage doors during a wildfire event can lead to injuries and fatalities.

Based on the above considerations, the risks of implementing a PSPS outweigh the chances that the District's electric overhead distribution system would cause a catastrophic wildfire. The District, on a case-by-case basis, has historically and will continue to consider de-energizing a portion of its system in response to a known public safety issue or in response to a request from an outside emergency management/response agency. Any de-energizing will be performed in coordination with key local partner agencies. The District will also monitor the evolution of PSPS implementation by other California electric utilities to continue to refine its evaluation of this important topic.

If conditions on the ground indicate that a wildfire threat is imminent, TPUD's Electric Superintendent has the authority to de-energize select distribution circuits. A de-

energization decision will be based on multiple triggers as well as the unique understanding of the TPUD system, including any enterprise risks involved. No single element is determinative. TPUD relies on weather data from various sources, including the National Weather Service, Cal Fire and PG&E weather station data.

Risk triggers for de-energization of circuits:

- Imminent fire danger
- Critically dry vegetation that could serve as fuel for a wildfire
- Low humidity levels
- An RFW declaration by the NWS
- Temperatures over 100°F
- Winds projected beyond 12 kV design criteria (56 mph)
- Mandatory fire orders in effect (as directed by any Agency Incident Commander)
- On-the-ground observations from TPUD or other agency field staff

TPUD utilizes various operational and situational awareness tools to determine when de-energization is appropriate. The tools are listed below:

- Weather data such as wind speed, wind direction, air temperature, barometric pressure, relative humidity
- US Forest Service - Wildland Fire Assessment System, <https://www.wfas.net/>
- CAL FIRE California Statewide Fire Map, [http:// www.fire.ca.gov/general/firemaps](http://www.fire.ca.gov/general/firemaps)
- National Weather Service, <https://www.weather.gov/>
- GIS based tools

6.1.2 Recloser Operational Practices

For the purposes of this document, fire season is defined as:

- August 1 to October 31, or
- RFW in effect for areas in Tier 3 and Tier 2, or as directed by the CAL FIRE or
- TPUD's incident commander

There are 22 reclosers on various distribution lines in TPUD's system and two on the transmission lines. During Extreme Weather Events at the start of the fire season, or as low fuel moisture conditions dictate, the District may disable automatic reclosing functions at District Substations and in the field. In some cases, the reclosers are completely bypassed if automatic reclosing cannot be disabled. To disable, District personnel will physically go to each recloser

and place the unit on the alternate setting blocking the reclosing function. After the first substantial rain in the fall, the reclosers are reset to the normal operating mode.

The District is currently investigating the feasibility and cost of using radio communication to change recloser settings remotely. This will allow TPUD personnel to react quickly to changing conditions on the ground, as well as reserve manpower for other critical operations.



6.2 Infrastructure Inspections and Maintenance

TPUD performs multiple time-based inspections on its T&D facilities. Inspection plays an important role in wildfire prevention. Recognizing the hazards of equipment that operate high voltage lines, TPUD maintains a formal inspection and maintenance program for distribution, transmission and substation equipment. TPUD currently patrols its system regularly and is increasing the frequency of inspections. The following sections outline practices for inspections of TPUD assets.

6.2.1 Transmission Line Inspections

TPUD's Transmission Lines are grouped into two inspection areas: The Weaverville 60 kV tap, and the Hayfork 60 kV tap. The overhead transmission system (>60 kV) will be visually inspected twice annually to report any conditions that may have potential for circuit interruptions.

6.2.1.1 Infrared Inspections

Currently, TPUD uses infrared (IR) technology to identify problem areas with spans and equipment. TPUD plans to evaluate more on the effectiveness of an Infrared Inspection Program. An infrared inspection uses a device that determines the relative temperature of equipment on the electrical system. The infrared inspection can detect, using temperature readings, equipment that may fail in service. Abnormal temperatures indicate a possible internal malfunction, or loose connection, leading to a failure of the equipment. Inspection data is recorded including, GPS location, pole numbers, date and time stamps and images. Reports are generated and further investigation and/or repairs are scheduled and prioritized base on the hazard level.

IR inspections are performed on an ongoing basis on all lines, or as needed for diagnostic purposes. Approximately 25% of all lines are IR inspected per year.

6.2.1.2 Ground Patrols and Inspection

TPUD has a detailed system patrol process complying with GO 165 requirements, which includes annual patrols for most system infrastructure. Manual inspections include both system and vegetation patrols. TPUD monitors vegetation during its system patrols and also directs a contractor to conduct additional inspections and vegetation management.

6.2.1.3 Aerial patrols (Drone)

TPUD has acquired drone technology and employs a full-time drone Coordinator/Pilot. The drone is utilized for quickly identifying lines that are down, while providing situational awareness during emergency situations. The drone is equipped with a high-resolution camera, allowing for detailed inspections of cross arms, hardware and equipment not visible from the ground. The drone is also equipped with infrared technology, which is used to identify problem areas with spans and equipment.

6.2.1.4 Wood Pole Intrusive Inspections

For wood poles over 15 years in age, an intrusive inspection is conducted.

Intrusive inspections require sample material be taken for analysis. Wood poles are subjected to an intrusive inspection to determine and identify problems such as rot and decay. Wood poles over fifteen years old, which have not been subject to intrusive inspections are intrusively inspected and tested within a maximum interval of 10 years. Wood poles that pass the intrusive inspections are retested within a maximum interval of 20 years.

6.2.2. Transmission and Distribution Line Inspections

Inspections of the overhead 60 kV transmission, and overhead and underground electric distribution system with primary operating voltages of 12.4 ,12 kV, 7.2 kV and secondary voltages of 480/277, 208/120 and 240/120 are performed on a cycle to ensure that all equipment is inspected on a regular schedule. Inspections and maintenance is performed employing measures which are intended to protect the worker, general public and the reliability of the system. The inspection cycles are designed to ensure safety and reliability and are based on standards found in CPUC General Order (GO) 95, GO 128 and GO165.

All inspections are performed by qualified personnel. System equipment that is found in need of maintenance or repair is categorized depending on the severity of the condition. Repairs are done in order of rating. Items rated Priority #1 receive immediate attention to prevent failure or service interruption. Items rated Priority #2 are scheduled for maintenance to be performed within thirty days. A record of the inspections and maintenance performed will be submitted to the Electric Superintendent and maintained by the appropriate office personnel.

- Poles supporting electrical facilities that have been in service for 15 years and longer will be given an intrusive inspection (Drill test below ground level).
- Overhead line apparatus will have a detailed inspection every five years.
- Underground line apparatus will have a detailed inspection every three years.

6.2.2.1 Detailed Line Inspections

Detailed Line Inspections (DLI) consist of walking, driving and drone inspections of all TPUD poles. Much of the system is in rugged terrain with difficult access due to the direct alignments the distribution lines were built on. Binoculars are used to detect and evaluate damage to above ground components. Poles are given a “sound” test to detect decaying or rotten wood. Inspectors are looking for:

- Mechanical damage
- Loose hardware

- Guy wire and anchor condition
- Disconnects and fuse holder condition
- Insulators and conductor condition
- Condition of transformers and reclosers
- Ground conductors and moldings
- Pole ID signs and other minor hardware
- Raptor nests

DLIs are performed on a five-year schedule on all overhead distribution equipment and pad mounted equipment, and every three years on underground equipment.

6.2.2.2 Line Patrols

Inspection progress is tracked using computer tablets loaded with GIS enabled visualization tools and software. The use of these tools ensures that all assets within TPUD's service territory are patrolled. Patrolmen look for obvious signs of defects, structural damages, broken hardware, sagging lines and vegetation clearance issues. Line inspectors may climb towers identified with severe corrosion or deformation to determine the corrective action required. Any anomalies found are addressed based on severity of the defect. Line patrols are performed annually on all distribution lines and equipment.

6.2.2.3 Wood Pole Intrusive Inspections

Distribution wood pole intrusive inspections follow the same criteria as Transmission wood poles. See section 6.2.1.4.

6.2.2.4 Instruction to Inspectors

The Preventive Maintenance Plan is designed to provide safe reliable service. The plan is based on sound industry principles and practices. Maintenance work shall be prioritized considering the most urgent need due to compromised safety and reliability.

The inspector will document the condition of the overhead and underground systems, recording defects, deterioration, violations, safety concerns or any other conditions that require attention on the inspection tags. Focus of the inspection shall be on any hazards that could affect the integrity of the system or the safety of line workers and the general public.

Inspection tags (overhead & underground) will be prioritized and issued as follows:

Priority # 1 - Immediate hazard:

Conditions that may affect the integrity of the system or present a hazard to workers or the general public. All Priority #1 tags will be responded to **immediately**, and appropriate action taken until the hazardous condition is remedied.

Priority # 2 - Non-emergency repair condition:

Conditions that require maintenance that can be scheduled to maintain the integrity of the system. Priority #2 tags will be prioritized by urgency and will be scheduled to have appropriate repairs made to correct the condition within 30 days where practicable.

Priority # 3 - Non-emergency repair condition:

Conditions that do not present a situation that could jeopardize the safety of the system, line workers and the general public. Priority #3 tags will be submitted by the inspector with the time interval recommended. In the judgment of the inspector, work will be scheduled to be completed within six months.

6.2.2.5 Satisfactory Conditions

Facilities that are found to be within standards and do not require maintenance will be checked off on the patrol sheets and filed for future reference. Completed Maintenance tags will be kept in a file for five years, tags not completed will be placed in a follow-up file to be reviewed until maintenance is performed.

6.2.2.6 Standards for Record-Keeping and Reporting

General Instructions: Inspections of the electrical systems will be documented in the GIS mapping system. If the condition of the system being inspected is satisfactory no further documentation is needed. Conditions other than satisfactory are imported and a list of poles with deficiencies is generated for the Senior Estimator who will generate a work order.

The Tablet collects the following information at the time of inspection:

- Item inspected
- Name of inspector
- Date of inspection
- Location of asset
- Feeder/circuit name
- Facility ID (Pole #)
- Damaged (yes/no)
- Work order priority

- Notes regarding damage (if applicable)
- Pole clearing required (yes/no)
- Vegetation notes (if applicable)
- Height of pole
- Joint owner facility

A photograph can be uploaded and attached to the feature in the map for use by the Senior Estimator.

6.2.3 Substation Inspections

The Preventive Maintenance plan provides for regular inspections of substations. Qualified personnel will use prudent care while performing inspections following all required safety rules to protect themselves, other workers, the general public and the reliability of the system. TPUD performs various inspections on substations to ensure safety and reliability. TPUD inspections meet or exceed standards in CPUC GO 174. A “Detailed” inspection shall be defined as one where individual pieces of equipment and structures are carefully examined visually and through use of routine diagnostic test, as appropriate. If practical and useful information can be gathered, equipment opened and the condition of each piece of equipment rated and recorded.

- Substations shall be visually inspected once a month and a detailed inspection performed four times a year.
- All overhead line equipment shall be visually inspected once a month and a detailed inspection performed every six months.

6.2.3.1 Visual Inspection

Substation inspectors visit each TPUD substation to visually inspect the facility and all equipment within. A visual inspection is a simple quick look at the system to assure that there are no obvious structural problems, hazards or tree trimming requirements.

The inspectors look for:

- Broken or loose hardware
- Vandalism or damage to any equipment
- Oil or gas leaks
- Perimeter fence security
- Condition of the buss
- Insulators and other hardware

- Condition of the control house
- Conditions of the poles/structures and lines exiting the substation
- Condition of the disconnects and fuses for signs of damage and connectivity

Visual inspections are performed 12 times per year.

6.2.3.2 Detailed inspection

A detailed inspection of substation assets includes all items listed in section 6.2.3.1, as well as mechanical damage to any component including:

- Condition of insulators and conductors
- Condition of risers and conduits
- Condition of transformers
- Reclosers and cap banks

Similar inspections are performed on pad-mounted equipment and equipment installed below grade in vaults or building basements. Underground system vaults, transformers and switch cabinets etc, will be opened and closely inspected. All substations receive infrared inspections annually. Detailed Inspections are performed quarterly.





6.3 Vegetation Management

TPUD's Vegetation Manager is responsible for the patrol, work plans and quality control (QC) audits of the actual tree work in TPUD's service territory. Circuits are patrolled and maintained on an ongoing basis, enabling the District to cover all lines on a rotating three-year cycle. Contracts are awarded to outside vegetation management contractors to conduct this work. These processes are in compliance with Federal FAC 003-4 and State regulations, including Public Resources Codes section 4292 and 4293; they also meet or exceed the standards in CPUC GO 95 Rule 35. TPUD utilizes the 2008 "Power Line Fire Prevention Field Guide" in establishing its pole clearing practices. Contracts for vegetation management signed for one

year, with up to 3, one-year extensions. TPUD has approximately 12,000 poles in its service area, making the tree trimming budget the largest expense for the District. The photo on page 47 illustrates the successful results of TPUDs adherence to proper pole clearing methods.

6.3.1 Annual Pole Clearing Program

The pole clearing program is an annual requirement to clear vegetation around poles that have certain CAL FIRE non-exempt equipment on them. This program is in compliance with California Public Resource Code 4292. The code calls for clearing vegetation within a 10-foot radius of a pole or tower on which non-exempt equipment is attached, unless such pole or tower meets certain criteria that makes it exempt from the clearance requirements. TPUD contracts this activity out for completion prior to May 15th of each year.

6.3.2 Vegetation Inspection and Maintenance

When conducting routine maintenance that involves preventative inspection, TPUD responds to high-risk fuel sources with efforts to remove identified vegetation, as needed. This maintenance work occurs once every three years per circuit. Pursuant to GO 95, Rule 35 and Public Resources Code (PRC) 4293 Clearance Exempt Trees, TPUD will maintain a record of exempt trees with recommendations or corrective actions. TPUD also performs inspections of vegetation concerns when either service calls are made, or utility employees or vegetation management contractors identify at-risk vegetation while performing day-to-day operations. Future considerations are being evaluated to enhance inspection procedures.

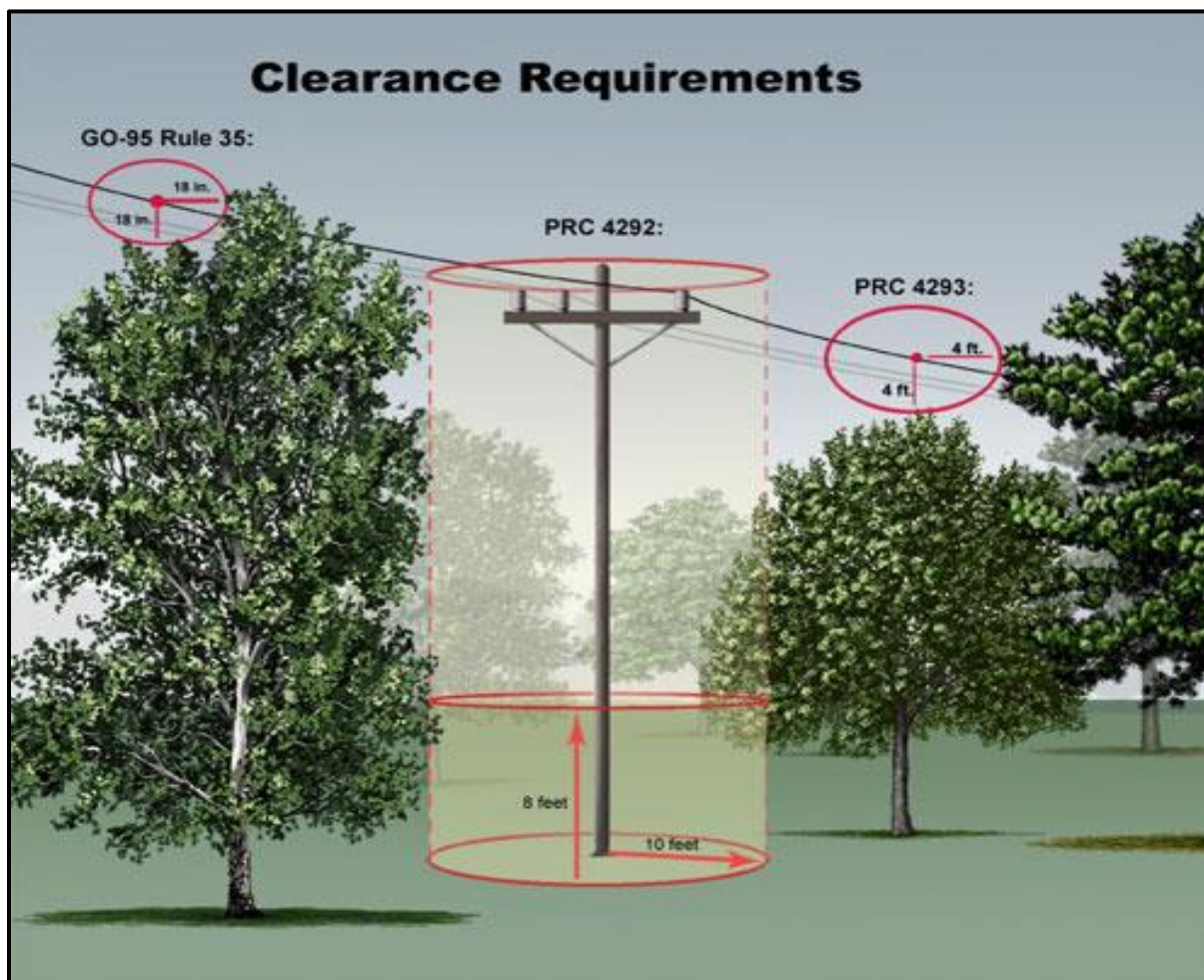
6.3.3 TPUD Tree Trimming and Removal Guidelines

Circuits are patrolled for vegetation work on a three-year cycle and are maintained to PRC 4292 and PRC 4293 standards.

- Any tree or portion of tree that will be within four feet of energized conductors within three years will be trimmed or removed to achieve maximum clearance possible while taking into consideration the tree's health, documented rights and proper arboricultural practices.
- Any tree with a diameter at breast height (DBH) of 10 inches or less and that is located in or out of the rights-of-way (ROW) can be removed if it is in conflict with the conductors. No notification or permission is required on this class of tree.
- Any tree that's located in the ROW may be removed if it is or in the future will conflict with conductors.

- Any tree that is located outside of the ROW and is deemed a hazard tree will be removed or topped to make safe for conductors. Location, DBH, and height of all such trees will be provided to property owners within three days of inspection. The property owners have 15 days to respond for comment, otherwise work will proceed as scheduled. Hazard trees are considered any tree or portion of tree that is dead, rotten, decayed, or diseased and which may fall into or onto the overhead lines or trees leaning toward the lines.
- Poles subject to section 4292 of the California Public Resource Code will have all vegetation cleared to a ten-foot radius of the pole as illustrated in Figure 13.
- Best management practices (BMP) will be used on ROW maintenance.

Figure 13. Pole Clearing Requirements



A Hazard Tree is defined as any tree or portion of a tree that is dead, rotten, decayed or diseased and which may fall in to or onto the overhead lines or trees leaning toward the lines. Herbicide use is used for weed abatement inside TPUD locked substations and potentially in

certain 60 kV ROW corridors. Due to US Forest Service policies, the use of herbicide is not permitted on public lands in the TPUD service area.

6.3.4 Ground Level Vegetation Clearance and Removal

TPUD maintains firebreaks around bases of certain power poles throughout the OH distribution system. The projected work product consists of providing a firebreak by removing all vegetation at ground level around and adjacent to specific poles or structures as identified by location and pole number. See Figure 6 Poles Requiring Ground Level Vegetation Clearing

Ground level Vegetation Clearance and Removal is performed to provide the required firebreaks. Work begins after plants and grasses have matured to minimize new spring growth. Work is completed as soon as is practicable by the beginning of the fire season if possible. It is anticipated the work cycle will occur between June 15 and August 31 of each year.

There are currently 854 listed poles identified as part of the annual ground-clearance work cycle. The District anticipates up thirty additional poles (areas yet to be identified) requiring vegetation ground level clearing will be added to the cycle for the 2020 work period.

Number of poles to be cleared listed by designated area: Total of all areas = 854.

Table 6 Poles Requiring Ground Level Vegetation Clearing

AREA	NUMBER OF POLES
Area 1:	
Hayfork	222
Hyampom	53
Forest Glen	7
Grouse Creek	5
Total: Area 1	287
Area 2:	
Weaverville	218
Total: Area 2	218
Area 3:	
Lewiston	117
Lewiston/Trinity Center	148
Douglas City	71
Big Bar	13
Total: Area 3	349
Total for all areas	854

6.3.5 T&D System Vegetation Management Standards

TPUD VM crews perform ground-based inspections of tree and conductor clearances and hazard tree identification. Patrols are scheduled to ensure all lines are inspected for vegetation hazards on a three-year timeline. The results of the patrols are targeted areas for vegetation pruning or removal. Annual ground-based field patrols ensure compliance with state and federal regulatory requirements (Public Resource Code 4293) and alignment with standards in CPUC GO 95 Rule 35 and FAC 003-4. During tree work, contractors aim to achieve up to 12 feet of clearance, unless otherwise directed by TPUD VM staff. The contractor also clears vegetation from TPUD's secondary voltage, service drops and pole climbing space on an as needed basis. TPUD's contractors follow American National Standards Institute (ANSI) A300 concepts and utility directional pruning, which supports proper pruning/tree health while achieving and maximizing the pruning cycle.

6.4 Fire Mitigation Construction

6.4.1 Ester-Based Insulating Fluid

For many years, mineral oil has been the standard in electrical transformers due to its cooling and electrical performance. There are shortcomings, however, which are being acknowledged in terms of its flammability, poor environmental performance, low moisture tolerance and corrosive Sulphur⁹. Ester fluid is a natural ester derived from renewable vegetable oils - providing improved fire safety, transformer life/load-ability and environmental benefits that are superior to mineral oil. TPUD is looking at the feasibility of transitioning to FR3 fluid in the future. The District currently has one transformer in the Lewiston Substation using ester oil instead of mineral oil.

6.4.2 Non-Expulsion Current Limiting Fuses

The District has undertaken a project to replace traditional expulsion fuses on its overhead distribution system with CAL-Fire exempt, non-expulsion type fuses. Typical utility industry practice is to install expulsion fuses on transformer and tap-lines as a means of protecting and isolating parts of the system that have experienced a faulted condition. Expulsion fuses utilize a tin or silver-link element in an arc-tube that vents gas and potentially molten metal to atmosphere as a means of extinguishing an arc created by a faulted condition. The molten metal, however, can be a source of ignition for fire.

⁹ <https://www.midel.com/blog/about-esters/>

In contrast, non-expulsion current-limiting fuses are a non-venting fuse encapsulated within a tube to contain the arc and gases, which minimizes the potential for molten metals to be expelled. It is the District's goal to install non-expulsion fuses throughout the system, where benefits from this design can be achieved. A significant reduction in vegetation management costs can be achieved, since the use of CAL-Fire exempt fuses eliminates the need to maintain the required radius of mowed grasses beneath every distribution pole¹⁰.

6.4.3 Tree Attachments (Legacy Attachments)

The District has legacy attachments to trees that consist of service drop(s); secondary conductor(s); or, security lighting. Although these installations were permitted pursuant to 14 California Code of Regulation (CCR) §1 257, the District does not engage in this practice for new installations.

District staff is in the process of developing a recommendation and operational practices to address these legacy attachments. The inclusive recommendation will consider the following:

- Pursuant to 14 CCR § 1257, the District will inspect these installations on periodic basis.
- Limbing of a tree used as an attachment point(s) will be consistent with 14 CCR §1257.

The District may audit tree attachments on a periodic basis.

Remote locations where there are miles of line for 1-2 service locations will be evaluated for continued service. High risk of wildfire, especially when there are tree attachments, may preclude the District from continuing to serve such locations.

6.4.4 Defensible Space Requirements

In January 2005 a new state law became effective that extended the defensible space clearance around homes and structures from 30 feet to 100 feet. Proper clearance to 100 feet dramatically increases the chance of a structure surviving a wildfire. Public Resources Code 4291¹¹ covers requirements for property owners in mountainous, forest, brush and grass covered lands to maintain a defensible space around structures. In February 2006, the State Board of Forestry (BOF) adopted additional guidelines which can be found in the document titled "General guidelines for Creating Defensible Space". As part of TPUD's overall approach to wildfire mitigation, the District supports and promotes the public awareness and adherence

¹⁰ § 1255. Exemptions to Minimum Clearance Provisions -PRC 4292.

¹¹ http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PRC§ionNum=4291.

of these safety requirements. A PRC 4291 code compliance checklist with diagrams can be found in Appendix E.

6.5 Pilot Projects

Pilot projects are initiated to explore technologies and practices that are new to TPUD. These projects are intended for TPUD staff to evaluate the effectiveness and benefits of the technologies or practices. Based on the results of the pilots, TPUD may elect to integrate the technologies or practices into its various ongoing maintenance programs. These such projects are described in sections 6.5.1 through 6.5.4.

6.5.1 LiDAR Aerial Inspections

LiDAR and remote sensing can supplement or enhance traditional “boots on the ground” vegetation patrols. Both LiDAR and Hyperspectral Imagery is obtained from rotary and fixed wing aircraft. The technology measures vegetation clearance distances from the conductor in both “as flown” and modeled conditions. The Hyperspectral and Ortho Imagery is used to pinpoint tree speciation and supports detecting tree health or condition that may not yet be visible to the naked eye. The District is looking at combining this technology with its drone inspection program as it becomes feasible. Currently the associated equipment is too heavy to be utilized with the TPUD drone. The size and weight of this equipment continues to drop and will be employed as soon as possible.

6.5.2 Outage Management System

The District is in the process of implementing an automated customer contact system developed by the National Information Systems Cooperative (NISC). The Outage Management System (OMS) is tied to the TPUD GIS mapping system, which is continually improved. When the full benefits of the system are realized, specifically affected customers, who have opted in, will be notified via text and/or e-mail of outages. The OMS will be used in the event of a PSPS as well as planned or unplanned outages.

6.5.3 Supervisory Control and Data Acquisition (SCADA)

SCADA is a control and monitoring system of gathering data and sending control commands remotely to field connected devices. An important part of most SCADA implementations is alarm handling. The system monitors whether certain alarm conditions are satisfied, to determine when an alarm event has occurred. SCADA system have traditionally used combinations of radio and direct wired connections. The District is currently looking to integrate this technology

into its recloser setting program using radio communications systems. This will allow the Utility to react quickly changing conditions, conserve manpower and increase customer, as well as TPUD employee safety.

6.5.4 Advanced Radio Communications and Automated Vehicle Location (AVL)

Because cellular service is less than optimal in the TPUD service area, the District is looking at implementing a radio communications system that will assist in automatically tracking vehicle locations. Traditional cellular GPS tracking does not provide consistent and reliable information due the terrain and “cellular dead zones”.



6.6 Workforce Training

The District has developed rules and complementary training programs for its workforce to reduce the likelihood of an ignition. All field staff will be:

- Trained on the content of the WMP
- Trained in proper use and storage of fire extinguishers

- Required, during pre-job briefings, to discuss the potential(s) for ignition, environmental conditions (current and forecasted weather that coincides with the duration of work for the day)
- Required to identify the closest fire extinguisher and other fire abatement tools
- Required to report all ignition events to management for follow-up
- Encouraged to identify deficiencies in the WMP and bring such information to management

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Chapter 7: Emergency Response

7.1 Preparedness and Response Planning

TPUD strives to minimize the impacts of any disruptive event regardless of the size or scope, while consistently focusing attention on the community's most critical systems and infrastructure.

TPUD's emergency preparedness and response planning has resulted in emergency action plans that facilitate an effective utility-wide response to incidents of varying sizes and emergency disruptions, including wildfire response operations. Emergency preparedness and response plans are periodically reviewed, evaluated and updated to maintain continued effectiveness in protecting public and employee health and safety and minimizing damage to public and private property as well as TPUD infrastructure.

TPUD's emergency preparedness and response plans consider hazards that have been identified as potentially impacting TPUD's service territory. This plan was developed to streamline TPUD

response efforts, inform critical actions and decision-making, determine roles and responsibilities of TPUD first responders, and maximize TPUD's ability to respond and recover following any type of disruptive incident. By undertaking comprehensive planning efforts, TPUD aims to minimize the impacts of wildfire incidents on customers and communities. TPUD's emergency preparedness and response plans make available critical information for incident response and recovery team members to implement an efficient, effective and safe response to any type of incident, disruption or disaster.

7.1.1 Community Outreach

Community involvement can play an important role in wildfire mitigation. As part of the District's holistic approach, TPUD encourages its customers to take proactive measures to safeguard their homes from wildfire danger. To help create an awareness of fire danger in the service area, TPUD provides information on prevention and mitigation on The District's web site.

Customers will find links to useful information regarding Defensible Space requirements, National Weather Service alerts and fire season preparation. Links to CAL FIRE and the Trinity County Fire Safe Council websites, which contain excellent information on how residents can mitigate fire hazards, are also provided.

7.1.2 Standardized Emergency Management System (SEMS)

TPUD is designated a Special District and is considered a local government agency. As such, TPUD has planning, communication and coordination obligations pursuant to the California Office of Emergency Services' (OES) Standardized Emergency Management System (SEMS) Regulations¹². The standard organizational model is based on an approach called the Incident Command System (ICS) which was developed by fire departments to give them a common language when requesting personnel and equipment from other agencies and to give them common tactics when responding to emergencies¹³. CCR, Title §2403 specifies five levels of the SEMS organization, which are activated as necessary. The five levels are outlined briefly below:

- **Field Response:** Local Emergency response personnel and resources, under the command of an appropriate authority, carry out tactical decisions and activities in direct response to an incident or threat.
- **Local Government:** Local governments manage and coordinate the overall emergency response and recovery activities within their jurisdiction. CCR, Title 19, §2407 states

¹² Ch 7 of Div. 2 of §8607

¹³ SEMS Guidance for Special Districts

that SEMS shall be utilized when the local government Emergency Operation Center (EOC) is activated, and when a local emergency is declared or proclaimed.

- **Operational Area:** OA means an intermediate level of the state's emergency services organization which encompasses the county and all political subdivisions within the county including special districts.
- **Regional:** The state has been divided into six mutual aid regions to provide for more effective application and coordination of mutual aid and other emergency related activities.
- **State:** This level manages state resources in response to the emergency needs of the other levels and coordinates mutual aid among the mutual aid regions and between the regional level and state level. It serves as the coordination and communication link between the state and the federal disaster response system.

TPUD coordinates with its local emergency response agencies as well as other relevant local and state agencies, as a peer partner. In response to all emergency events, TPUD collaborates with the local OES and provide an agency representative to the county and/or city Emergency Operations Centers (EOC) to ensure effective communication and coordination. TPUD's two primary coordination points are Trinity County OES and Trinity County Sheriff's Office OES.

During emergency events, TPUD Emergency Response staff contact the local OES and establish themselves as the duty officer for coordination. Local OES are invited to send agency representatives into TPUD's EOC. These representatives may include: City of Weaverville Fire Chief, local cities, Trinity County Office of Emergency Services and other local critical infrastructure agencies, ensuring coordination for our service territory.

7.2 Public and Agency Communications for A Potential Wildfire

TPUD understands the importance of proactive planning and coordinating closely with local governments, agencies and customers. There are several stakeholders that are involved in emergency preparedness and response. The key stakeholders include local governmental agencies as well as location-specific organizations, including critical facilities, resorts, customers and business groups.

7.2.1 Stakeholder Assets

Below are specific locations of some of the stakeholder assets in Trinity County.

- **Local radio repeaters and cell towers** - Located at Oregon Mountain, Hoadley Peak and Hayfork Bally (Velocity, Verizon Wireless, Frontier)
- **Trinity Hospital** - Located in Weaverville, this is the only hospital in Trinity County. The hospital does have a back-up generator but would be a top priority during a wildfire event.
- **Cal Fire Stations** - Located in Weaverville, Lewiston Area and Hayfork.
- **USFS Fire Stations** - Located in Coffee Creek, Trinity Lake Area (Mule Creek Station), Junction City, Weaverville and Hayfork.
- **Water Districts** - Located in Lewiston, Weaverville, Trinity Center and Hayfork.
- **Local Volunteer Fire Departments** - Located in Downriver, Junction City, Weaverville, Lewiston, Hayfork, Douglas City and Trinity Center.

Other customers that could affect public safety during a significant outage include the Sheriff's Department in Weaverville, the Emergency Operations Center (determined by the Office of Emergency Service (OES)) - any established shelters (which are typically schools in each community).



Table 7 TPUD Emergency Preparedness and Response Stakeholder List

STAKEHOLDER GROUP	DESCRIPTION
Critical Agencies	• Primary Care Hospitals • Schools • Water Districts • Public Safety Dispatch Centers • Local Emergency Planning Committees • California Department of Transportation • CPUC Safety and Enforcement Division
Communications	• Local radio station • Telecommunications companies • Local news stations
First Responders	• Law enforcement/holding facilities • Fire operations facilities • CAL FIRE stations • USFS (U.S Forest Service-Pacific Northwest)
Local Government	• Cities/Towns (Weaverville, Douglas City, Junction City, Lewiston, Hayfork) • Trinity County
Safety Councils	• Trinity County Fire Safety Council
Customers	• Any person, organization, or critical facility receiving electricity from TPUD

7.2.2 Emergency Level Definitions

In 2018, Cal OES, the State Sheriff's Association and statewide fire agencies adopted new terminology regarding wildfire evacuation incidents.

The following is a list of evacuation terminology that Trinity county's OES currently uses:

- **Evacuation Warning:** Potential Threat to life and/or property. Those who require additional time to evacuate, and those with pets and livestock should leave now.
- **Evacuation Order:** Immediate threat to life. This is a lawful order to leave now. The area is lawfully closed to public access.
- **Shelter in Place:** Stay indoors. Shut and lock doors and windows. Prepare to self-sustain until further notice and/or until being contacted by emergency personnel with additional direction.

7.2.3 CodeRED and IPAWS Alerts

The Trinity County Office of Emergency Services, in conjunction with the Trinity County Sheriff's office, strongly encourage all Trinity county residents to sign up for a CodeRED account and to load CodeRED phone numbers into their phones to receive Trinity County Emergency Notifications. The Trinity County Sheriff's Office conduct County-Wide testing of the CodeRED and Integrated Public Alert Warning System (IPAWS) to confirm customers that have opted in to CodeRED receive emergency notifications. IPAWS notifications will be sent to alert all cell phones in the county with cell service in the event of a catastrophic wildfire. While this system can quickly alert a substantial number of residents, poor cell phone coverage in many areas will prevent complete notification with this system. A link to the CodeRED sign-up can be found on the TPUD and Trinity County websites.

7.2.4 Public Safety Power Shutdown (PSPS)

While initiation of a public safety power shutdown is regarded as a last resort, there may be situations where it may be the safest approach if the risk of a wildfire starting and spreading is severe. In the event of a PG&E initiated PSPS for their transmission lines, the Big Flat, Forest Glen and Hyampom substations could be affected.

TPUD would proactively communicate to customers and key stakeholders through multiple channels about preparing for potential curtailments, and the power restoration process. TPUD recognizes that many entities and individuals are particularly vulnerable during extended power outages and makes every effort to provide up to date information to these populations prior to, during and after an event.

This proactive communication is utilized for:

1. A wildfire threat to localized circuits within the TPUD service territory that results in localized de-energization.
2. A wildfire threat to TPUD's transmission system that results in a de-energization event causing a capacity/energy shortage (rotating outages).
3. A de-energization by PG&E of its transmission circuits.

TPUD's Operations Center will provide ongoing and available resources for communication with the overall customer base. TPUD's General Manager will provide ongoing mass media communication via traditional news media channels to provide

customers and the community with information about an emergency or potential emergency.

Trinity County OES utilizes the CodeRED App and the IPAWS systems to notify citizens of emergency information. The information can be targeted based on geography. TPUD's GM or his designee will reach out to the elected officials and executive staff of local governments, TPUD's state delegation, federal representatives and appropriate agency staff to provide initial contact and ongoing communications by email and phone with messages for their constituents.

Customers can visit the Trinitypud.com website for information where they'll be able to find:

- Information on generator safety
- Links to the National Weather Service
- Links to additional resources
- Fire safety and preparedness
- CodeRED emergency alert system
- Trinity County website
- Caltrans

In the time leading up to potential or imminent safety shutoffs, TPUD does its best to establish or maintain contact with customers it believes may be impacted (via the various channels mentioned above) and keep the media, local agencies and the public aware of the number of customers affected and TPUD's activities and restoration efforts.

The GM or his designee is responsible for contacting key stakeholders, federal, state and local elected officials, City and County executive staff, critical customers and first responders via a variety of channels. Critical customers include water, telecommunications utilities and medical facilities potentially affected by a shutoff.

The following customer categories are considered essential and/or critical service providers:

- Jurisdictions and functional agencies providing essential fire, police and prison services
- Government agencies essential to national defense
- Hospitals and skilled nursing facilities
- Communication utilities, as they relate to public health, welfare and security, including telephone utilities

- Radio and television broadcasting stations used for broadcasting emergency messages, instruction, and other public information related to the electric curtailment emergency
- Water and sewage treatment utilities identified as necessary for services such as firefighting

7.2.5 Public Agency and Customer Communications

TPUD has a comprehensive plan for communicating with its customers during emergencies, especially during outages. TPUD's current process includes sharing information with the local newspaper for posting on their Facebook page for unplanned outages. For planned maintenance outages there are several methods, depending on the number of customers affected and the amount of time there is prior to the outage happening. Customers who will be affected either receive a bill stuffer, a postcard in the mail, a telephone call advising of the outage or a hang tag at their residence. Information is also posted on the TPUD web site.

For scheduled maintenance outages, TPUD provides as much notice as possible. TPUD also shares some power poles with other agencies (PG&E and WAPA). These organizations may sometimes require TPUD to de-energize shared power poles for planned-maintenance work. This work is schedule at least 30 days in advance.

TPUD e-mails the local communications companies (phone and internet providers), county government officials and Office of Emergency Services prior to planned outages. Businesses are called in all cases. Table 7 TPUD Emergency Preparedness and Response Stakeholder list displays all the critical local government/ agencies that are contacted in case of a catastrophic wildfire event.

Examples of TPUD's communication and engagement with elected officials, government agencies and commercial customers include:

- Regular in-person briefings with federal, state and local elected officials and key staff on wildfire risk mitigation and other utility-related issues with comprehensive "leave-behind" materials
- Meetings with regional and local government staff and elected officials focused on individual districts, communities and neighborhoods and mitigation opportunities
- Regular in-person and/or digital communication with critical facilities and key customers through TPUD Strategic Account Advisors

- Interagency projects, collaborative staff training efforts and regular communication with first responders and essential service providers
- Ongoing communication, collaboration and support for local Fire Safe Councils and other fire prevention agencies and nonprofits

7.3 Actions Taken to Support Customers During and After A Wildfire

TPUD takes specific actions to support customers during and after wildfires, including:

- Facilitating billing adjustments
- Extending payment plans
- Suspending disconnection and non-payment fees
- Waiving of extension fees

These activities are described in further detail the following sections.

7.3.1 Facilitating Billing Adjustments

For customers who have experience catastrophic losses to homes or businesses due to natural disaster, TPUD will discontinue billing and close the service account from the date of a disaster event included in a *Governor's State of Emergency Proclamation*. In support of the rebuilding efforts, customer account information and history will be maintained and transferred to the new residence or business, along with a re-establishing their credit history.

TPUD suspends bill estimation for customers impacted by disasters, including those customers who were away from their residences or businesses when evacuations were ordered. TPUD works with the appropriate city and county agencies to identify and verify homes and small businesses in TPUD's service territory that were destroyed or damaged by wildfires and follows up with field verifications. Upon contact from customers who receive bills based on estimated usage for the times they were evacuated, TPUD conducts an account review and makes appropriate billing adjustments. If a customer is billed during the evacuation period based on actual electricity usage, TPUD considers adjusting customer bills under specific circumstances, even if the customer's residence or business was not destroyed in the disaster. In addition, TPUD adjusts minimum charges for evacuated customers, as appropriate.

7.3.2 Extending Payment Plans

TPUD relies on its customers to contact the District and self-certify their disaster-related financial situation. TPUD works with impacted customers who contact TPUD to establish reasonable

payment arrangements based on individual customer need. TPUD customers are eligible to pay off their arrearages at any time (sooner), if they prefer.

7.3.3 Suspending Disconnection and Nonrepayment Fees

As part of its regular business practice, TPUD does not assess or charge disconnection fees for destroyed homes or small businesses. Upon identification of impacted customers, TPUD immediately confirms that customer accounts are flagged, suspends disconnection for non-payment, waives late fees and deposit requirements and delays late payment reports to credit reporting agencies. TPUD assists customers whose homes or small businesses were damaged by disaster in their re-building efforts within reason.

7.3.4 Waiving of Extension Fees

TPUD will only waive all line extension fees if the customer requests the electric service be built exactly as it was prior to the disaster. If a customer chooses to change the service in any way (i.e., overhead to underground, different panel size, different path) the customer must pay the entire cost for the new line extension.

7.4 Restoration of Service

Although the District does not have a PSPS operational practice, if an outside emergency management/emergency response agency requests a power shutdown, or if the District elects to de-energize segments of its system due to extreme weather, District staff will patrol the affected portions of the system before the system can be re-energized. Suspect equipment or distribution lines that cannot immediately be patrolled will remain de-energized. Poles and structures damaged in a wildfire must be assessed and rebuilt as needed prior to re-energization. Periodic customer and media updates of restoration status prior to full restoration will be made.

7.4.1 Service Restoration Process

TPUD work crews will take the following steps prior to restoring electrical service after a de-energization event. These measures are intended to protect the worker, general public and the reliability of the system.

- **Patrol:** If the de-energization was a PSPS, lines are patrolled to ensure no hazards have affected the system during the outage. If an outage is due to wildfire, as soon as it is deemed safe by fire officials, lines and equipment are inspected for obvious damage or

foreign objects. Much of the lines are located in remote and rugged terrain with limited access, making this process potentially lengthy. VM crews are called on to assist in clearing downed trees and limbs as needed.

- **Repair:** After the initial assessment, TPUD supervisors, managers and engineers meet to plan the needed work. Re-building will commence as soon as affected areas become safe. Repair plans prioritize circuits that serve the most critical infrastructure needs. While the goal is to reenergize all areas as soon as possible, emergency services, medical facilities and utilities are given first consideration when resources are limited.
- **Test:** After repairs are completed and the equipment is safe to operate, line segments are energized and tested.
- **Restore:** After successful line testing, power is restored to homes and businesses as quickly as possible. Customers, local news and other agencies are then notified of the restoration of electric service. After initial power restoration, further demolition and rebuilding will likely take place.

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Chapter 8: Performance Metrics and Monitoring

In addition to a robust mitigation strategy, TPUD developed performance metrics to monitor their efforts over time. The goal of these metrics is to provide a data-driven evaluation of performance to help TPUD determine the effectiveness of the Plan and to identify areas for improvement. This section identifies TPUD's management responsibilities for overseeing this WMP and includes the operating departments and teams responsible for carrying out the various activities described in the previous chapters. This section also identifies the controllable metrics which are used to demonstrate compliance with this WMP.

8.1 Plan Accountability

The Board of Directors makes policy decisions relative to the District - they will be responsible for approving and adopting the Wildfire Mitigation plan. The GM directs management staff responsible for operations, customer service and finance. The Electric Superintendent supervises the Vegetation Manager, Senior Estimator and Supervising Foreman. The Office Administrator supervises customer service, the meter department and provides human resources support and administrative assistance to the Electric Superintendent, GM, Board of Directors and Chief Financial Officer. The Chief Financial Officer is responsible for District finances. The Administrative Assistant provides GIS support and administrative assistance to the GM and other staff as needed.

The GM is responsible for executing the WMP. Staff will be directed as to their roles and responsibilities. The GM is responsible for communicating with public safety, media outlets, public agencies, first responders, local Office of Emergency Services and health agencies during an emergency or planned maintenance outages. The GM determines when and how to notify outside agencies in cases of wildfire emergency events.

8.1.1 Operating Unit Responsibility

Table 7, on the following page, identifies the Departments responsible for tracking and implementing the various components of the WMP.

Table 8 Accountability of Plan Implementation

MITIGATION ACTIVITIES	RESPONSIBLE DEPARTMENT AND WORKGROUP
Risk Analysis	General Manager
Fire threat assessment in service territory	Distribution System Operations & Maintenance Planning
Wildfire Prevention Strategy Programs	
• Disable reclosers • Weather station monitoring • Planned de-energization	Grid Strategy & Operation: Grid Operations T&D System Operations, Distribution System Operations
• T&D line patrols • Aerial patrols • 60 kV & transmission line infrared inspections • Wood pole intrusive inspection • Detailed line inspections	Grid Assets: Line Assets, Distribution System Operations, Vegetation Management
• Substation visual and detailed inspections • Substation infrared inspections	Grid Assets: T&D Substation Maintenance
• Vegetation management • Pole clearing program • Line Patrols	Grid Assets: Vegetation Management
Fire Mitigation Construction	
• Ester Based Cooling Fluid • Non-expulsion equipment • Legacy Tree Attachment • SCADA	Distribution System Operations Maintenance: Design & Standards
System Enhancement Capital Projects	
• Install non-expulsion equipment in high risk areas	Distribution System Operations & Maintenance: T&D Maintenance Planning, Grid Assets: Line Assets
Pilot Projects	
• Aerial LiDAR inspections	Grid Assets: Vegetation Management
• SCADA	Distribution System Operations & Maintenance: T&D Maintenance Planning, Grid Strategy & Operations
• Radio communications	Grid Strategy & Operation: Grid Operations

Emergency Preparedness	
TPUD Emergency Operations Center	Workforce and Enterprise Services: Facilities Operations
Public and agency communications for wildfires	Customer & Community Services: Revenue Operations, Communications Marketing & Community Relations

8.2 Performance Metrics

Metrics to gauge the success or shortcomings of the WMP and outlined programs are covered in this section. As with other aspects of the Plan, these metrics will likely evolve in the future iterations of the WMP.

8.2.1 Metrics and Assumptions for Measuring WMP Performance

TPUD will use the follow metrics to measure the performance and efficacy of the Plan.

Table 9 Proposed Metrics

METRIC	RATIONAL	INDICATOR	MEASURE OF EFFECTIVENESS
Number of Utility Caused Fires	Demonstrates effectiveness of overall plan	Count of events	No material increase
Ignitions on Circuits in HFTD	Demonstrates effectiveness of overall plan	Sum of acres Affected	No Material Increase
Events Recorded with Fire Reference	Demonstrates effectiveness of overall plan	Count of events	Reduction in general trend of events
Service Interruption Events with Fire Reference	Assess system hardening efforts	Count of events	Reduction in general trend of events
Non-Expulsion Type Fuse Trip Event with Fire Reference	Measure success of fuse replacement program	Count of events	Reduction in general trend of events

Traditional Fuse Trip Event with Fire Reference	Measure success of fuse replacement program	Count of events	Reduction in general trend of events
Bare Line Contact with Vegetation	Assess Vegetation Management Program	Number of contacts recorded	Reduction of vegetation contacts
Number of Customer Service Calls Re: At Risk Vegetation	Assess if VM Program has reduced customer concerns and risk events	Number of calls received	Reduction in general trend of events
Power Line Down Event in HFRA	Assigns risk to root cause	Count of events	Reduction in general trend of events

As this Plan is in the initial stage of implementation, relatively limited data is on hand. However, as results of the programs become evident and additional data is collected, TPUD will identify areas of its operations that will require a different approach, as well as methods that are working towards the goal of completely eliminating TPUD asset sourced ignitions. As the metrics are analyzed in the following years, refinements will be made to the WMP annually.

PUC section 8387 subsection b(2)(E) requires a discussion of how the application of previously identified metrics to previous Mitigation Plan performance has informed the WMP. TPUD will include this discussion in the next annual revision.

8.2.2 Programmatic Metrics

The District outlines and schedules required work on an annual basis. Any work that is incomplete or behind schedule is flagged for review or field verification. TPUD's goal is to complete 100% of the work within the initially scheduled time frame, however, emergencies or other unforeseen contingencies can occur that may require material and labor resources to be otherwise assigned. In this instance, delayed work will be prioritized in following time periods. All work is completed within time periods to allow for the safe and reliable operation of the electric system in accordance with applicable requirements and industry standards.

Table 10 Programmatic Metrics

PROGRAM	TARGET	METRIC DESCRIPTION
Distribution Line Inspections	95-100%	Perform all detailed line inspections within the compliance period set in General Order (GO) 95/165 by the end of the year. The inspections must be completed within the specified time intervals set for each inspection type. (Chapter 6)
Distribution Wood Pole Intrusive Tests	95-100%	Perform all wood pole intrusive tests scheduled for the year. TPUD's goal is to perform wood pole tests within 15 years of installation and 10 years thereafter. (Chapter 6)
Distribution Annual Line Patrol	95-100%	Perform all annual distribution line patrols within the compliance period set in GO 95/165. See Chapter 6 for a detailed description of the program.
Annual Pole Clearing Program	95-100%	Complete all vegetation clearing activities) prior to the beginning of fire season of each year. (Chapter 6)
Transmission Structure Patrols	95-100%	There are three inspection regions for transmission structure patrols. The goal is to perform all scheduled patrols prior to the end of the year.
Transmission Aerial Patrols (Drone)	95-100%	Aerial patrols are performed on an ongoing basis. The goal is to perform all scheduled patrols prior to the end of the year. (Chapter 6)
Transmission IR Patrols (Drone)	95-100%	Infrared (IR) patrols are performed once a year. The goal is to perform all scheduled patrols prior to the end of the year. (Chapter 6)
60 kV IR Drone Patrols	95-100%	IR patrols on the 60 kV in the are ongoing. The goal is to perform all scheduled patrols prior to the end of the year.
Distribution Vegetation Pruning/Clearing	95-100%	Complete scheduled respective tree work to ensure compliance with PRC 4293 to prevent ignition and propagation of fire caused by TPUD electric overhead assets.
Transmission Vegetation Pruning/Clearing	95-100%	Complete scheduled respective tree work to ensure compliance with PRC 4293 and NERC FAC-003-4 to prevent ignition and propagation of fire caused by TPUD electric overhead assets.

8.3 Monitoring and Auditing of the WMP

The WMP will be included as a discussion item on the agenda of regularly scheduled management meetings. TPUD will monitor efforts of the WMP quarterly and report on its effectiveness to the Board of Directors on an annual basis. Quarterly reports of the Plan's current progress and risk reduction impact will be developed and circulated to appropriate utility staff to engender collaborative discussion to make changes to approved strategies. The GM, or their designee, will update leadership with recommendations or proposed action in enhancing the Plan's objectives overtime.

The WMP annual review will align with TPUD's existing business planning process. This review will include an assessment of the WMP programs and performance.

Annually, the District will engage a CPUC approved evaluator to review and assess TPUD's compliance with WMP requirements.

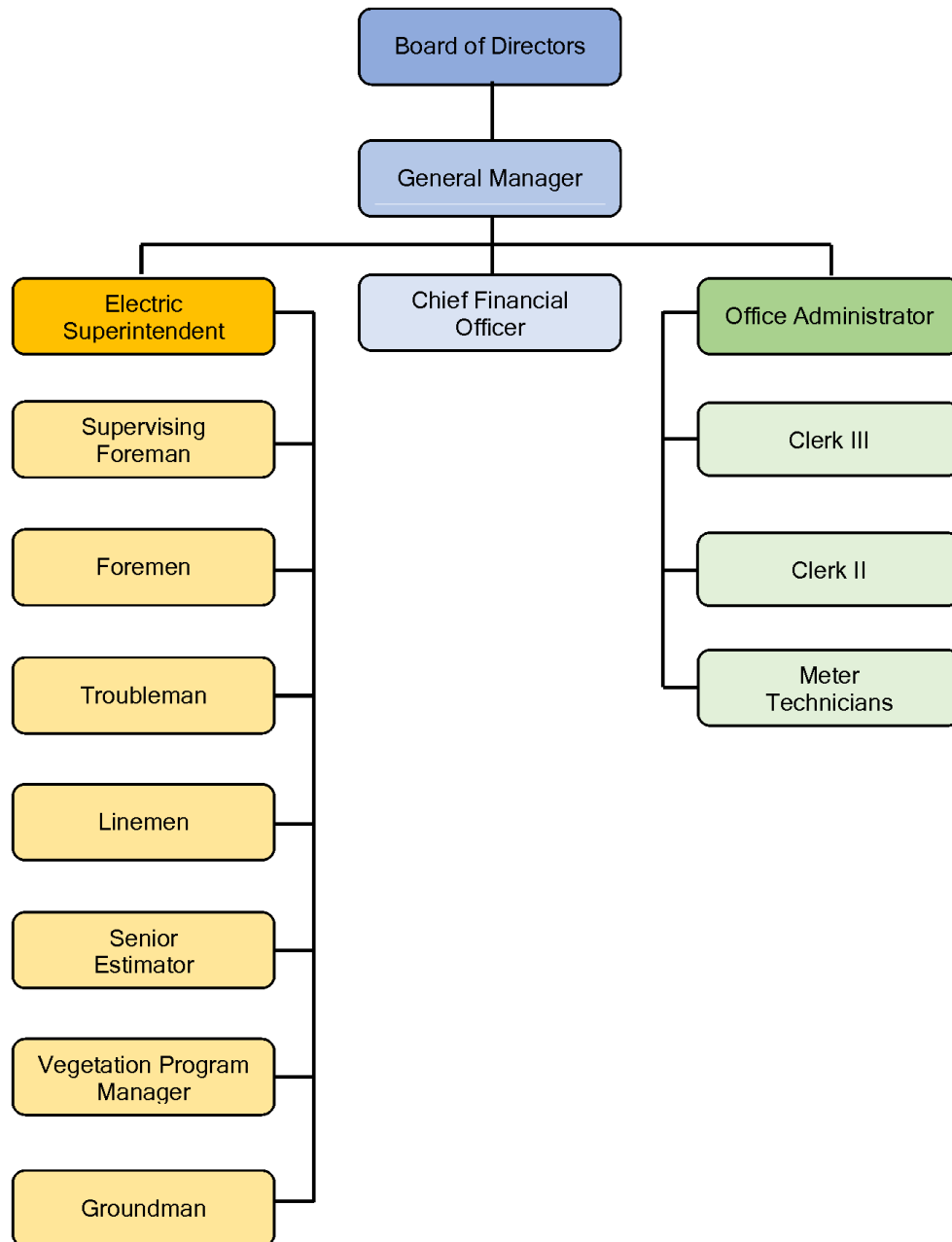
TPUD's business planning process includes budgeting and strategic planning for a 3-5-year planning horizon.

8.3.1 Accountability

TPUD's General Manager and Electric Superintendent will be responsible for monitoring and auditing the targets specified in the WMP to confirm that the objectives of the WMP are met.

TPUD's management structure is shown in Figure 14 on the following page.

Figure 14. TPUD Management Structure



8.3.2 Identify Deficiencies in the WMP

The GM will be responsible for ensuring that this WMP meets all the State of California guidelines to mitigate the risk of its assets becoming the source or contributing factor of a wildfire. Staff responsible for assigned mitigation areas have the role of vetting current procedures and recommending changes or enhancements to build upon the strategies in the WMP. Either due to unforeseen circumstances, regulatory changes, emerging technologies or other rationales, deficiencies within the WMP will be sought out and reported to the Board of Directors in the form of an updated WMP on an annual basis. The GM, or their designee, will be responsible for spearheading discussions on addressing deficiencies, and collaborating on solutions when updating the WMP for its annual filing. At any point in time when deficiencies are identified, the Supervisors or their delegates are responsible for correcting the deficiencies. TPUD staff and qualified stakeholders are encouraged to bring any potential deficiencies to the attention of the GM. The GM, along with the appropriate staff, will evaluate each reported deficiency, and if determined to be valid, shall record the deficiency for further action.

8.3.3 Monitor and Audit the Effectiveness of Inspections

TPUD's compliance with Commission regulations ensures that facilities are inspected and repaired in accordance with GO 165 program standards. Any issues found impacting safety and reliability are addressed as outlined in that program. In addition to this maintenance program, TPUD is constantly evaluating its facilities while performing other activities such as outage patrols, new business planning, replacements and related field work.

Monitoring the effectiveness of inspection practices will occur through ongoing tracking and annual review of findings resulting from internal processes. The Electric Superintendent or their designee supervises the Vegetation Manager and will review concerns found during routine field work and equipment and line inspections. TPUD will use this information as a method to assess the effectiveness of inspection procedures. The review process will take place annually where inspection records will be reviewed, deficiencies identified and corrective actions determined. An internal report will be provided to the utility's leadership in deliberation of future strategies. Related strategies that mitigate wildfire risk will then be identified and proposed within the next iteration of the Plan. Aggregating this data will guide future decision-making on the direction of wildfire mitigation strategy with the intention that incidents will become less frequent or hazardous system wide.

TPUD has quality control processes embedded in its existing general practices. However, for certain programs, there is a formal quality control process. The following depicts a few of these programs.

8.3.4 Written Processes and Procedures

The District documents its operational procedures and processes to maintain consistent and thorough implementation at all levels. Processes are reviewed and updated as needed to maintain the most efficient, effective, beneficial and safety driven methods and protocols.

8.4. Programmatic QA/QC processes

8.4.1 Distribution System Inspections

The Electrical Superintendent (ES) manages T&D line and substation assets and develops the comprehensive inspection and maintenance programs. These programs are driven by the need to ensure the safe operation of T&D line and substation facilities.

Key imperatives are to:

- Reduce the risk of power-related wildfire.
- Meet federal and state regulatory requirements.
- Achieve reliability performance within mandated limits and to optimize capital and O&M investments.

In addition, the ES or designated managers regularly monitor inspection and corrective maintenance records, as well as diagnostic test results to adjust maintenance plans and develop new programs. Best industry practices are used in development of the maintenance programs.

TPUD's Grid Assets group is responsible for performing the inspections and corrective maintenance. When deficiencies are found, work orders are created by the Senior Estimator. The priority for corrective maintenance is to remove safety hazards immediately and repair minor deficiencies according to the type of defect, severity and HFTD tiers. Work orders are monitored throughout the year to ensure timely completion via regular internal reports.

8.4.2 Vegetation Management (VM)

TPUD's vegetation management work is performed by contractors. This VM work is QC audited by TPUD's Vegetation Manager. Approximately 10% of the distribution system related clearing and pruning is field audited. QA efforts are tracked to monitor program effectiveness and overall tree work performance. TPUD VM staff perform a QC audit of 100% of the transmission system related work performed by the contractor. For both T&D QA efforts, all deficiencies are recorded, and work reissued to the contractor for corrective action. Distribution QC is only on TPUD contractors and consists of approximately 10% sample of tree work.



Chapter 9: Independent Evaluation, Public Comment and Board Presentation

9.1 Plan Approval Process

TPUD made all efforts to consider stakeholder input in the preparation of its Wildfire Mitigation Plan. Local fire safe councils, OES and healthcare organizations as well as federal, state and local agencies were consulted. The initial draft of the WMP will be posted on TPUD's website and made available for public comment for thirty days. Interested parties are invited to comment on the plan at the time it is presented to TPUD's Board of Directors in a properly noticed public meeting. Annually reviewed and revised WMPs will follow these same protocols.

9.1.1 Independent Evaluation

PUC section 8387(c) requires Trinity PUD to contract with a qualified independent evaluator with experience in assessing the safe operation of electrical infrastructure to review and assess the comprehensiveness of this WMP. TPUD will issue a public request for qualification, consistent with TPUD's current procurement practice, to select an independent evaluator. The independent evaluator will provide a report that will be posted to Trinity PUD's website and made available for review at the TPUD office. The *Independent Assessment* and WMP will be available for public review and comment prior to plan adoption at a properly noticed TPUD Board of Directors meeting.

The independent evaluator's report will be posted to TPUD's website and presented to TPUD's Board of Directors at a properly noticed public meeting. The Independent Evaluation Report will be included in Appendix G when concluded.

9.1.2 Public Comment

A draft copy of the WMP is being made available to the public for comment for a minimum period of 30 days.

- The draft WMP is available on TPUD's website (TrinityPUD.com). Public comments will be addressed in the final WMP.
- TPUD will also provide an opportunity for public comments on the draft WMP at a regularly scheduled Board Meeting.

- TPUD Board Committee meetings are open and accessible to the public. Meeting notices and agendas are posted, at a minimum, 72 hours in advance at the TPUD office and on TPUD's website.

The public comments received prior to adoption will be included in Appendix G.

9.1.3 Board Presentation

Information and meeting minutes will be added as an addendum to this section after TPUD's board presentation in the Fall of 2019.

Appendix A: Definitions

Cal Fire: California Department of Forestry and Fire Protection serves and safeguards the people and protects the property and resources of California.

Fire Hazard¹⁴: “Hazard” is based on the physical conditions that give a likelihood that an area will burn over a 30 to 50-year period without considering modifications such as fuel reduction efforts.

Fire Risk: “Risk” is the potential damage a fire can do to the area under existing conditions, including any modifications such as defensible space, irrigation and sprinklers and ignition resistant building construction which can reduce fire risk. Risk considers the susceptibility of what is being protected.

Hardening: Modifications to electric infrastructure to reduce the likelihood of ignition and improve the survivability of electrical assets.

High Fire Threat District (HFTD)¹⁵: The HFTD identifies areas of elevated and extreme fire risk related to electric utility facilities. These areas are reflected in a map adopted by the CPUC after an extensive public process. It is a composite of two maps:

1. **Tier 1 High Hazard Zones (HHZs) on the U.S. Forest Service** - CAL FIRE joint map of Tree Mortality HHZs (“Tree Mortality HHZ Map”). Tier 1 HHZs are zones in direct proximity to communities, roads, and utility lines and are a direct threat to public safety.
2. **Tier 2 and Tier 3 fire-threat areas on the CPUC Fire-Threat Map.** Tier 2 fire-threat areas depict areas where there is an elevated risk (including likelihood and potential impacts on people and property) from utility associated wildfires. Tier 3 fire-threat areas depict areas where there is an extreme risk (including likelihood and potential impacts on people and property) from utility associated wildfires.

Red Flag Warning (RFW)¹⁶: A term used by fire- weather forecasters to call attention to limited weather conditions of particular importance that may result in extreme burning conditions. It is issued when it is an on-going event, or the fire weather forecaster has a high degree of confidence that Red Flag criteria will occur within 24 hours of issuance. Red Flag criteria

¹⁴ Source: http://www.fire.ca.gov/fire_protection/downloads/siege/2007/Overview_Glossary.pdf

¹⁵ Source: <http://www.cpuc.ca.gov/FireThreatMaps/>

¹⁶ Source: <https://w1.weather.gov/glossary/index.php?word=Red%20Flag%20Warning>

occurs whenever a geographical area has been in a dry spell for a week or two, or for a shorter period, if before spring green-up or after fall color, and the National Fire Danger Rating System (NFDRS) is high to extreme and the following forecast weather parameters are forecasted to be met:

- A sustained wind average 15 mph or greater
- Relative humidity less than or equal to 25 percent and
- A temperature of greater than 75 degrees F
- In some states, dry lightning and unstable air are criteria. A Fire Weather Watch may be issued prior to the RFW.

Pole Clearing: The process of establishing a firebreak clearance as required by PRC 4292 are applicable within an imaginary cylindrical space surrounding each pole or tower on which a switch, fuse, transformer or lightning arrester is attached and surrounding each dead end or corner pole unless such pole or tower is exempt from minimum clearance requirements by provisions of 14 CCR 1255 or PRC 4296.

State Responsibility Area (SRA)¹⁷: “The California Board of Forestry and Fire Protection classify areas in which the primary financial responsibility for preventing and suppressing fires is that of the state. California Department of Forestry (CDF) has SRA responsibility for the protection of over 31 million acres of California’s privately-owned wildlands.”

Substation: Part of the electrical generation, transmission, and distribution system, substations transform voltage from high to low, or the reverse, or perform any of several other important functions. Between the generating station and consumer, electric power may flow through several substations at different voltage levels. A substation may include transformers to change voltage levels between high transmission voltages and lower distribution voltages, or at the interconnection of two different transmission voltages.

Transmission and Distribution (T&D): At TPUD, for line maintenance purposes, the transmission system includes 60 kV lines tied to generation facilities. The distribution system includes 21 kV, 12.47 kV, 12 kV, and 7.2 kV lines not tied to generation facilities.

Wildfire¹⁷: “Also called wildland fire, uncontrolled fire in a forest, grassland, brushland or land sown to crops.” “Fire danger in a wildland setting varies with weather conditions: drought, heat

¹⁷ Source: <https://www.britannica.com/science/wildfire>

and wind participate in drying out the timber or other fuel, making it easier to ignite. Once a fire is burning, drought, heat and wind all increase its intensity. Topography also affects wildfire, which spreads quickly uphill and slowly downhill. Dried grass, leaves and light branches are considered flash fuels; they ignite readily, and fire spreads quickly in them, often generating enough heat to ignite heavier fuels such as tree stumps, heavy limbs and the organic matter of the forest floor. Such fuels, ordinarily slow to kindle, are difficult to extinguish. Green fuels—growing vegetation—are not considered flammable, but an intense fire can dry out leaves and needles quickly enough to allow ready ignition. Green fuels sometimes carry a special danger: evergreens, such as pine, cedar, fir and spruce, contain flammable oils that burst into flames when heated sufficiently by the searing drafts of a forest fire.”

Wildfire Mitigation Plan (WMP): As amended by SB 901, section 8387 of the Public Utilities Code (PUC) more specifically requires every publicly owned utility to prepare and present a wildfire mitigation plan to its governing body by January 1, 2020, and annually thereafter.

Wildfire Safety Advisory Board: Under section 326.2 “The California Wildfire Safety Advisory Board shall do all of the following:

- (a) Develop and make recommendations to the Wildfire Safety Division related to wildfire safety and mitigation performance metrics.
- (b) Develop and make recommendations related to the contents of wildfire mitigation plans pursuant to Chapter 6 (commencing with Section 8385) of Division 4.1.
- (c) Review and provide comments and advisory opinions to each local publicly owned electric utility and electrical cooperative regarding the content and sufficiency of its wildfire mitigation plan and recommendations on how to mitigate wildfire risk.
- (d) Provide other advice and recommendations related to wildfire safety as requested by the Wildfire Safety Division.”

(Added by Stats. 2019, Ch. 79, Sec. 5. (AB 1054) Effective July 12, 2019.)

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Appendix B: Reference for Definitions

- CPUC Fire Threat Map, <https://ia.cpuc.ca.gov/firemap/>
- Public Utilities Code, Chapter 6. Wildfire Mitigation [8387], http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PUC§ionNum=8387
- General Order 95, contains rules for the design, construction, maintenance, inspection, repair and replacement of overhead utility lines. <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M209/K464/209464026.pdf>
- General Order 165, Inspection Requirements for Electric Distribution and Transmission Facilities. <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M209/K552/209552704.pdf>
- General Order 166, Standards for Operation, Reliability and Safety During Emergencies and Disasters <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M209/K451/209451792.pdf>
- General Order 174, Rules for Electric Utility Substations <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M031/K879/31879476.PDF>
- Power Line Fire Prevention Field Guide, <http://cdfdata.fire.ca.gov/pub/fireplan/fpupload/fppguidepdf126.pdf>

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Appendix C: Administrative Procedure Emergency Plan

Trinity Public Utilities District Administrative Procedure EMERGENCY ACTION PLAN

OFFICE

When an emergency arises other than fire follow these directions:

1. Know the location of all exits in the building.
2. Use the closest safe exit.
3. If danger or emergency is not immediately acute shut down equipment and lock safe, then evacuate immediately.
4. Assemble in driveway in front of the building and perform a head count.
5. Standby to render first aid and other needed medical assistance.
6. Report emergency or fire to 911 as soon as possible.
7. Flammables shall be stored in outside storage area. No smoking signs shall be observed in and around flammable storage areas.

In the event of fire in the General Office or Yard Area, call 911 and report the fire.

- A. Use fire extinguishers if safe to do so.
- B. Use Halon extinguishers on electronic equipment.
- C. The Electric Superintendent shall be the person responsible to maintain fire equipment.

Regular housecleaning procedures will be followed to prevent accumulation of flammable substances.

Employees shall receive safety training on use and storage of flammables.

8. Coordinator for emergency action plan will be the General Manager and all TPUD staffs.

DISTRIBUTION AND YARD AREA

When an emergency arises other than fire follow these directions:

1. Know the location of all exits in the building.
2. Use the closest safe exit.
3. If danger or emergency is not immediately acute shut equipment, then evacuate immediately.
4. Assemble in driveway in front of the building and perform a head count.
5. Standby to render first aid and other needed medical assistance.
6. Report emergency or fire to 911 as soon as possible.
7. Flammables shall be stored in outside storage area. No smoking signs shall be observed in and around flammable storage areas.

In the event of fire, call 911 and report the fire.

- A. Use fire extinguishers if safe to do so.
- B. Use Halon extinguishers on electronic equipment.
- C. The Electric Superintendent shall be the person responsible to maintain fire equipment.

8. Regular housecleaning procedures will be followed to prevent accumulation of flammable substances.
9. Employees shall receive safety training on use and storage of flammables.

10. Coordination for emergency action plan will be the Electric Superintendent.

FIRE PREVENTION PLAN

1. Flammables shall be stored in outside storage area. No smoking signs shall be observed in and around flammable storage areas.
2. In the event of fire, call 911 and report the fire.
3. The Electric Superintendent shall be the person responsible to maintain fire equipment.
4. Regular housecleaning procedures will be followed to prevent accumulation of flammable substances.
5. Employees shall receive safety training on use and storage of flammables.

CODE OF SAFE PRACTICES

General Office Work - Safe Workplace Conditions

1. Adjustable chairs
2. Good lighting
3. Clean environment
4. Means of egress kept clean and unblocked
5. No excessive storage of paper or office supplies in workplace
6. Aisles and hallways always kept clear

General Office Work - Safe Work Practices

1. Keep workplace free of floor storage and extension cords
2. Maintain adequate aisle space
3. Use caution when moving about in office
4. File cabinet drawers shall be opened one at a time and closed when work is finished
5. Care should be used when closing file or any drawer to avoid pinching fingers
6. Use care when carrying loads to avoid stain
7. Use rest periods to relax eyes and body.
8. Employees should use care when opening and closing office machines to avoid hand injuries

Meter Reader & Collection

1. Use only approved ladder or other safe support when necessary to climb to an elevated position.
2. Upon entering an opening, gate, stairway, etc., provided with a closing device be sure it operates easily and closes
3. Use provided walkways and gates
4. If unfriendly animals are encountered record the information the meter log or book and when necessary make arrangements to have them contained
5. Park off the street and use a cone as an aid to safe parking
6. Use proper clothing, shoes and hat to avoid exposure to heat/sun or cold
7. Try to avoid parking where it is necessary to backup.
8. If backing a vehicle is necessary use caution and watch carefully.
9. When not sure about a dog keep facing it as you walk to the meter and back to the truck. Try not to let the dog get behind you.

10. Talk to dogs - it helps to relax them.

Distribution and Yard - Safe Working Condition

1. Keep area policed and clear of debris
2. Keep poles, wire, transformers and supplies stored in a safe fashion to avoid spills, movement, etc.
3. Keep building and yard office clean and floor areas clear of debris
4. Maintain floor free of slippery substances and hazards
6. Maintain vehicles in accordance with manufacture specks through periodic inspections and file inspection records
7. Keep all flammables stored in designated area
8. Maintain yard area and driveways free of chuckholes

Distribution and Yard - Safe Work Practices

Know your Safety and Construction Standards

1. No horseplay
2. Be in physical and mental condition to do the job
3. Use of intoxicants is prohibited during working hours
4. Observe "No Smoking" signs
5. Know your emergency first aid procedures
6. Use eye protection when required
7. Know your firefighting equipment
8. Use protective barriers, cones, signs, etc., when working where people or vehicular traffic may occur
9. Use safety devices provided and proper for each job
10. Use only approved safety belts, liners, etc.
11. Use only approved ladders and secure properly
12. Make sure your tools are in good repair
13. When lifting be sure to use proper position to avoid strain
14. When moving from one job to another, ride in designated areas only
15. Have proper license for the vehicle you are driving
16. Know uniform hand signals
17. Only qualified personnel shall engage in electric transmission and distribution work
18. Maintain proper working distances when working on energized lines
19. Electrical apparatus and lines are presumed energized, be sure and test what condition exists
20. Examine equipment to be sure it is properly tested
21. Be careful of and handle rubber goods carefully so as not to damage them
22. Check climbing equipment
23. Observe poles for structural quality
24. Check portable power tools for damage to cords, switches, etc., use only approved tools
25. Maintain a warm dry storage for all line tools
26. Hold a tail gate session before each job is started
27. Observe lockout tagout rules

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Appendix D: Minimum Clearance Provisions - PRC 4292

14 CA ADC § 1254 BARCLAYS OFFICIAL CALIFORNIA CODE OF REGULATIONS

Barclays Official California Code of Regulation Currentness

Title 14. Natural Resources

Division 1.5 Department of Forestry and Fire Protection

Chapter 7. Fire Protections [FNA2]

Article 4. Fire Prevention Standards for Electric Utilities

14 CCR § 1254

§ 1254. Minimum Clearance Provisions - PRC 4292.

The firebreak clearances required by PRC 4292 are applicable within an imaginary cylindrical space surrounding each pole or tower on which a switch, fuse, transformer or lightning arrester is attached and surrounding each dead end or corner pole unless such pole or tower is exempt from minimum clearance requirements by provisions of 14 CCR 1255 or PRC 4296. The radius of the cylindroid is 3.1 m (10 feet) measured horizontally from the outer circumference of the specified pole or tower with height equal to the distance from the intersection of the imaginary vertical exterior surface of the cylindroid with the ground to an intersection with a horizontal plane passing through the highest point at which a conductor is attached to such pole or tower. (See Figure 2 this Article.) Flammable vegetation and materials located wholly or partially within the firebreak space shall be treated as follows:

- (a) At ground level -remove flammable materials, including but not limited to, ground litter, duff and dead or desiccated vegetation that will allow fire to spread.
- (b) From 0-2.4 m (0-8 feet) above ground level -remove flammable trash, debris or other materials, grass, herbaceous and brush vegetation. All limbs and foliage of living trees shall be removed up to a height of 2.4 m (8 feet).
- (c) From 2.4 m (8 feet) to horizontal plane of highest point of conductor attachment -remove dead, diseased or dying limbs and foliage from living sound trees and any dead, diseased or dying trees in their entirety.

Note: Authority cited: Section 4292, Public Resources Code. Reference: Section 4292, Public Resources Code

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Appendix E: Defensible Space Requirements - PRC 4291

Zone 1: Within 30 feet of all structures or to the property line

- A. Remove all branches within 10 feet of any chimney or stovepipe outlet, pursuant to PRC § 4291(a)(4) and 14 CCR § 1299.03(a)(2).
- B. Remove leaves, needles or other vegetation on roofs, gutters, decks, porches, stairways, etc. pursuant to PRC § 4291 (a)(6) and 14 CCR § 1299.03(a)(1).
- C. Remove all dead and dying trees, branches and shrubs or other plants adjacent to or overhanging buildings, pursuant to PRC § 4291 (a)(5) and 14 CCR § 1299.03(a)(2).
- D. Remove all dead and dying grass, plants, shrubs, trees, branches, leaves, weeds and needles, pursuant to 14 CCR § 1299.03(a)(1).
- E. Remove or separate live flammable ground cover and shrubs, pursuant to PRC § 4291(a)(1) and BOF General Guidelines item 1.
- F. Remove flammable vegetation and items that could catch fire which are adjacent to or below combustible decks, balconies, and stairs, pursuant to 14 CCR § 1299.03(a)(4).
- G. Relocate exposed wood piles outside of Zone 1 unless completely covered in a fire resistive material, pursuant to 14 CCR § 1299.03(a)(3).

Zone 2: Within 30-100 feet of all structures or to the property line

- H. Cut annual grasses and forbs to a maximum of 4 inches in height, pursuant to 14 CCR § 1299.03(b)(2)(B).
- I. Remove fuels in accordance with the Fuel Separation or Continuous Tree Canopy guidelines (see back), pursuant to BOF General Guidelines item 4.
- J. All exposed woodpiles must have a minimum of ten feet (10 feet) clearance, down to bare mineral soil, in all directions, pursuant to 14 CCR § 1299.03(b)(2)(C).
- K. Dead and dying woody surface fuels and aerial fuels shall be removed. Loose surface litter, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches, shall be permitted to a maximum depth of three inches (3 in.), pursuant to 14 CCR § 1299.03(b)(2)(A).

Defensible and reduced fuel zone/within 100 feet of all structures or to the property line

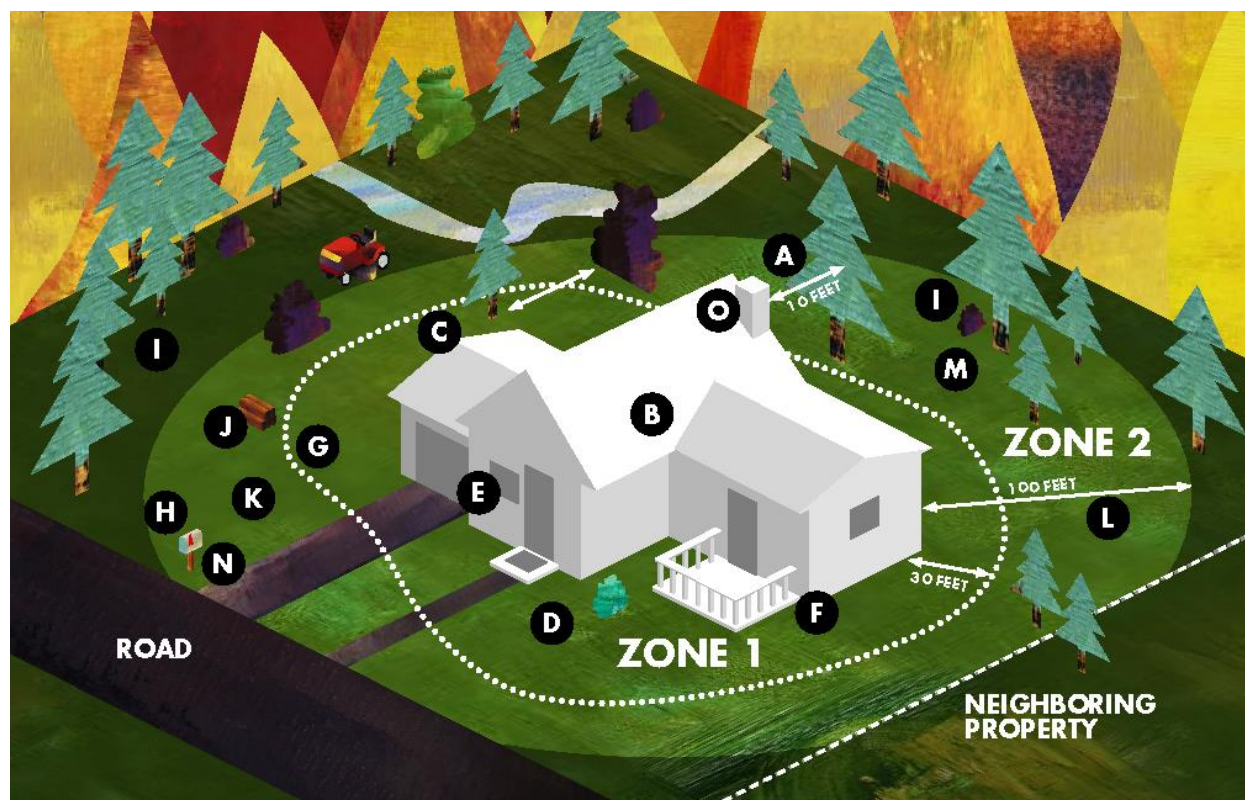
- L. Logs or stumps embedded in the soil must be removed or isolated from other vegetation, pursuant to BOF General Guidelines item 3¹⁸

Other requirements:

¹⁸ State Board of Forestry and Fire Protection (BOF) General Guidelines for Creating Defensible Space 1 February 8, 2006

- M. Outbuildings and Liquid Propane Gas (LPG) storage tanks shall have ten feet (10 ft.) of clearance to bare mineral soil and no flammable vegetation for an additional ten feet (10 ft.) around their exterior, pursuant to 14 CCR § 1299.03(c)(1).
- N. Address numbers shall be displayed in contrasting colors (4" min. size) and readable from the street or access road, pursuant to 2013 CFC § 505.1.
- O. Equip chimney or stovepipe openings with a metal screen having openings between 3/8" and 1/2", pursuant to 2013 CBC § 2113.9.2.

CAL FIRE Defensible Space Requirements Illustration



CAL FIRE Vegetation Spacing Guidelines

VERTICAL SPACING

Eliminate opportunities for a vertical "fire ladder" by:

- Remove branches beneath large trees for a 6 foot minimum clearance.
- Create proper vertical spacing between shrubs and the lowest branches of trees by using the formula shown.



HORIZONTAL SPACING

The spacing between grass, shrubs, and trees is crucial to reduce the spread of wildfire. The spacing needed is determined by the type and size of the shrubs and trees, as well as the slope of the land. For example, a property on a steep slope with larger plant life will require greater spacing between trees and shrubs than a level property that has small, sparse vegetation.

Fire-safe landscaping

Fire-safe landscaping isn't necessarily the same thing as a well-maintained yard. Fire-safe landscaping uses fire-resistant plants that are strategically planted to resist the spread of fire to your home.



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Appendix F: Acronym Glossary

ANSI	American National Standards Institute
AQS	Audit and Quality Services
ACR	Automatic Circuit Reclosers
AVL	Automatic Vehicle Location
BANC	Balancing Authority of Northern California
BOF	Board of Forestry
CCR	California Code of Regulation
CPUC	California Public Utilities Commission
DBH	Diameter at Breast Height
DLI	Detailed Line Inspections
DSO	Distribution System Operations
EAM	Enterprise Asset Management
ERM	Enterprise Risk Management
EROC	Enterprise Risk Oversight Committee
ES	Electrical Superintendent
ESRI	Environmental Systems Research Institute
FAC	Facilities Design, Connections and Maintenance
GHG	Greenhouse gas
GM	General Manager
GO	General Order
HFTD	High Fire Threat Districts
IR	Infrared
IVM	Integrated Vegetation Management
KV	Kilovolt
KWH	Kilowatt Hours
LIDAR	Light Detection and Ranging
LRA	Local Responsible Area
MW	Mega Watts
NASA	National Aeronautics and Space Administration
NWCG	National Wildfire Coordinating Group

NFDRS	National Fire Danger Rating System
OH	Overhead
O&M	Operations & Maintenance
OEC	Emergency Operations Centers
OES	Office of Emergency Services'
PCA	Pole Clearing Area
PG&E	Pacific Gas & Electric
PMA	Power Marketing Administration
PRC	Public Resources Code
PSO	Power System Operations
PSPS	Public Safety Power Shutoff
PUC	Public Utilities Code
QA	Quality Assurance
QC	Quality Control
RFW	Red Flag Warning
ROW	Right of Way
RTO	Regional Transmission Organization
SB	Senate Bill
SD	Strategic Direction
SEMS	Standardized Emergency Management System
SME	Subject Matter Expert
SRA	State Responsibility Areas
T&D	Transmission and Distribution
TPUD	Trinity Public Utility District
UG	Underground
USFS	U.S Forest Service-Pacific Southwest
VM	Vegetation Management
WAPA	Western Area Power Administration
WMP	Wildfire Mitigation Plan
WUI	Wildland-Urban Interface

Appendix G: Independent Evaluation

**Wildfire Mitigation Plan
Independent Evaluation
TRINITY PUBLIC UTILITIES DISTRICT**

December 2019



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Executive Summary

The Trinity Public Utilities District (TPUD) Wildfire Mitigation Plan (WMP) was prepared by Brown & Kysar, Inc. for publication in December 2019. In accordance with California Public Utilities Code Section 8387(c), this plan was reviewed and assessed by an independent evaluator to establish its comprehensiveness as legally defined. Chloeta Fire, LLC is providing the independent evaluation of this WMP prior to publication. Chloeta Fire, LLC is completely independent of both the TPUD and Brown & Kysar, Inc.

Analysis

This WMP was reviewed for compliance with California Public Utilities Code Section 8387, which establishes the guidelines for the comprehensiveness of a utility's wildfire mitigation plan. Section 8387 delineates multiple criteria for establishing comprehensiveness. This independent evaluation will review each criteria established in Section 8387 and determine if they are met by the WMP provided by Brown & Kysar.

A. Responsibilities of Persons Responsible for Executing Plan

Section 8387 Requirement: *An accounting of the responsibilities of persons responsible for executing the plan.*

Plan Section Number: 8.1, 8.1.1

The WMP identifies TPUD's management responsibilities regarding the implementation of the activities discussed in the WMP. Table 8 on page 70 identifies action items outlined in the WMP and the responsible department and workgroup in TPUD responsible for implementation.

B. Objectives of FMP

Section 8387 Requirement: *The objectives of the wildfire mitigation plan.*

Plan Section Number: 1.2, 1.3

The WMP establishes an overarching purpose in Section 1.2 and clearly states primary and secondary objectives in Section 1.3.

C. Preventative Strategies and Programs

Section 8387 Requirement: *A description of the preventive strategies and programs to be adopted by the local publicly owned electric utility or electrical cooperative to minimize the risk of its electrical lines and equipment*

causing catastrophic wildfires, including consideration of dynamic climate change risks.

Plan Section Number: 3

Section 3 of the WMP lists mitigation programs and activities that TPUD will undertake to minimize wildfire risk. Impacts of climate change are discussed in Section 4.3.

The WMP does not provide estimated timelines or costs on implementation of the preventative strategies and programs.

D. Metrics

Section 8387 Requirement: *A description of the metrics the local publicly owned electric utility or electrical cooperative plans to use to evaluate the wildfire mitigation plan's performance and the assumptions that underlie the use of those metrics.*

Plan Section Number: 8.2

Metrics and assumptions for measuring WMP performance are summarized in Table 9 and include the rationale, indicator, and measure of effectiveness. Programmatic metrics are discussed in Table 10 and include target goals. Goals outlined in the WMP will be monitored by the GM and Electric Superintendent.

E. Application of Previously Identified Metrics

Section 8387 Requirement: *A discussion of how the application of previously identified metrics to previous wildfire mitigation plan performances has informed the wildfire mitigation plan.*

Plan Section Number: 8.2.1

As noted in Section 8.2.1 the WMP is in its initial implementation and existing data is limited. The WMP establishes that as metrics are analyzed in subsequent years the WMP will be updated based on data collected.

F. Public Safety Protocols

Section 8387 Requirement: *Protocols for disabling reclosers and deenergizing portions of the electrical distribution system that consider the associated impacts on public safety, as well as protocols related to mitigating the public safety impacts of those protocols, including impacts on critical first responders and on health and communication infrastructure.*

Plan Section Number: 6.1.1, 6.1.2

Protocols for de-energization and disabling reclosers are described in Sections 6.1.1 and 6.1.2, respectively. Public safety impacts discussed include loss of water infrastructure, disruption in communications, and loss of community infrastructure and operational efficiency due to a power shut down. We recommend the following additional public safety impacts also be discussed:

- Loss of power can lead to medical emergencies for members of the community requiring powered medical equipment or refrigerated medication. Additionally, lack of air conditioning can negatively impact medically vulnerable populations.
- Traffic congestion resulting from the public evacuating de-energized areas can lengthen response times for emergency responders.
- Negative economic impacts from local businesses forced to close during the shut down.
- Inability to open garage doors during a wildfire event can lead to injuries and fatalities.

G. Notification of Customers

Section 8387 Requirement: *Appropriate and feasible procedures for notifying a customer who may be impacted by the deenergizing of electrical lines. The procedures shall consider the need to notify, as a priority, critical first responders, health care facilities, and operators of telecommunications infrastructure.*

Plan Section Number: 7.1, 7.2

Key first responder infrastructure, health care facilities, and operators of telecommunications infrastructure are identified in the WMP. TPUD will follow California OES SEMS regulations for the planning, communication, and coordination of power shut down incidents. TPUD will use multiple channels for communicating PSPS events to customers, including through traditional media, the CodeRED app, the IPAWS system, and Facebook, among others. TPUD has specific personnel assigned for contacting elected officials and agencies and critical customers, however these personnel are not delineated in the WMP.

H. Vegetation Management

Section 8387 Requirement: *Plans for vegetation management.*

Plan Section Number: 6.3

The WMP establishes vegetation management goals and procedures to reduce wildfire risk. A metric of 95-100% compliance annually is established in Table 10.

I. Inspection Plan

Section 8387 Requirement: *Plans for inspections of the local publicly owned electric utility's or electrical cooperative's electrical infrastructure.*

Plan Section Number: 6.2

The WMP includes a dedicated section on infrastructure inspections and maintenance (Section 6.2). Inspection protocols for transmission lines, transmission and distribution lines, and substations are delineated.

J. Identification of Risks

Section 8387 Requirement: *A list that identifies, describes, and prioritizes all wildfire risks, and drivers for those risks, throughout the local publicly owned electric utility's or electrical cooperative's service territory. The list shall include, but not be limited to, both of the following:*

(i) Risks and risk drivers associated with design, construction, operation, and maintenance of the local publicly owned electric utility's or electrical cooperative's equipment and facilities.

(ii) Particular risks and risk drivers associated with topographic and climatological risk factors throughout the different parts of the local publicly owned electric utility's or electrical cooperative's service territory.

Plan Section Number: 4, 4.5.1, 4.5.2, 4.5.3

Risks faced by TPUD are discussed in depth in Chapter 4 of the WMP. An Enterprise Risk Management strategy is implemented to identify, assess, respond and control, monitor, and report risk.

Particular risks and risk drivers associated with topographical and climatological risk factors are described in Sections 4.4 and 4.5.2.

K. Identification of Higher Threat Areas

Section 8387 Requirement: *Identification of any geographic area in the local publicly owned electric utility's or electrical cooperative's service territory that is a higher wildfire threat than is identified in a commission fire threat map, and identification of where the commission should expand a high fire-threat district based on new information or changes to the environment.*

Plan Section Number: 5.1

TPUD is primarily in a Tier 2 HFTD and includes no T&D lines in the extreme fire threat area. Maps within the WMP detail TPUD infrastructure across the service area with inset maps in populated areas.

L. Wildfire Risk Methodology

Section 8387 Requirement: *A methodology for identifying and presenting enterprisewide safety risk and wildfire-related risk.*

Plan Section Number: 4.1

TPUD uses an Enterprise Risk Management process for assessing risk. The methodology includes review of the Trinity County Community Wildfire Protection Plan and the Trinity County Hazard Mitigation Plan. A bow tie analysis links key wildfire risk drivers with outcomes and consequences. Consequences from all wildfire outcomes are the same, but this is not unreasonable as similar consequences follow both large and small wildfires, with the difference being the degree of severity.

M. Restoration of Service

Section 8387 Requirement: *A statement of how the local publicly owned electric utility or electrical cooperative will restore service after a wildfire.*

Plan Section Number: 7.4

The service restoration process following a wildfire is detailed in Section 7.4.1. Critical infrastructure facilities are prioritized during this process. Customer and media notification is done once electric service is restored. Periodic updates of restoration status prior to full restoration is recommended.

N. Processes and Procedures

Section 8387 Requirement: *A description of the processes and procedures the local publicly owned electric utility or electrical cooperative shall use to do all of the following:*

- (i) Monitor and audit the implementation of the wildfire mitigation plan.*
- (ii) Identify any deficiencies in the wildfire mitigation plan or its implementation, and correct those deficiencies.*
- (iii) Monitor and audit the effectiveness of electrical line and equipment inspections, including inspections performed by*

contractors, that are carried out under the plan, other applicable statutes, or commission rules.

Plan Section Number: 8.3, 8.3.3, 8.3.2, 8.2.3

WMP efforts will be monitored quarterly and reported to the Board of Directors annually. Budgeting and strategic planning of WMP initiatives will coincide with TPUD's existing practice of planning on a 3-5 year out cycle. A CPUC approved evaluator will annually review and assess TPUD's compliance with the WMP.

The TPUD GM will ensure that the WMP is reviewed annually and that any deficiencies identified are corrected.

Guidelines for monitoring and auditing the effectiveness of inspections are established in Section 8.3.3.

Section 8.2.3 is identified in Table 1 as corresponding with PUC Section 8387(b)(2)(N)(iii), but this section does not appear in the text and should instead be Section 8.3.3.

Conclusion

The TPUD WMP prepared by Brown & Kysar, Inc., is comprehensive and meets all requirements set forth by California Public Utilities Code Section 8387. Following review of the WMP we recommend the following concerns be implemented in future WMP updates:

- Preventative measures discussed in Section 3 do not have projected timelines or costs listed. These should be added at minimum following TPUD's normal business planning process.
- Additional public safety impacts of PSPS events should be considered.
- Specific personnel responsible for customer notification should be identified.
- Updates on power restoration status should be provided prior to full power restoration.

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Appendix H: Public Comments

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