

**NIST Technical Note 2135**

# **A Case Study of the Camp Fire – Fire Progression Timeline**

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**NIST**  
**National Institute of  
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National Institute of Standards and Technology

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## **Abstract**

The Camp Fire ignited on November 8, 2018 in the foothills of the Sierra Nevada in Butte County, California. The first 24 hours were characterized by a fast-moving fire with initial spread driven by high winds up to 22 m/s (50 mi/h) and long-range spotting up to 6.3 km (3.9 mi) into the community. The fire quickly impacted the communities of Concow, Paradise, and Magalia. The Camp Fire became the most destructive and deadly fire in California history, with over 18 000 destroyed structures, 700 damaged structures, and 85 fatalities. After a preliminary reconnaissance, it was determined that abundant data was available to support an in-depth case study of this devastating wildland-urban interface (WUI) fire to increase our understanding of WUI fire spread, fire behavior, evacuation, and structure response. The methodology guiding the case study and a detailed timeline reconstruction of the fire progression and fire behavior are presented. Over 2200 observations about fire spread and behavior were collected during the case study. Subsequent reports will detail additional aspects of the incident including emergency response and evacuation, and defensive actions and structure response. This study has identified that Butte County and the Town of Paradise were well prepared to respond to a WUI fire, that the Camp Fire grew and spread rapidly and that multiple factors contributed to the rapid growth and spread of the Camp Fire. Additionally, this study identified the importance of the wildland fire ignition location relative to the community, that multiple parcel-level fire spread pathways caused structure ignitions, and that WUI fire spread impacted the affected communities in multiple ways beyond the destruction of residential and commercial properties.

## **Key words**

burnover; community hazard reduction; disaster resilience; entrapment; field data collection; large outdoor fires; wildfire; wildland-urban interface; WUI; WUI data collection methodology; WUI fire spread

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Maps are large format (864 mm × 1118 mm, 34 in × 44 in) and are provided as a separate map book or electronically as additional PDF files.

## **Glossary**

### ***Agencies/Organizations***

BCSO	Butte County Sheriff's Office
CAL FIRE	California Department of Forestry and Fire Protection
Cal OES	California Governor's Office of Emergency Services
CHP	California Highway Patrol
FEMA	Federal Emergency Management Agency
FSC	Fire Safe Council
GACC	Geographic Area Coordination Center
ICC	International Code Council
NASA	National Aeronautics and Space Administration
NFPA	National Fire Protection Association
NIFC	National Interagency Fire Center
NIST	National Institute of Standards and Technology
NOPS	CAL FIRE Northern Region Operations
NWS	National Weather Service
PID	Paradise Irrigation District
PPD	Paradise Police Department
PPW	Paradise Public Works Department
USFS	United States Forest Service
USGS	United States Geological Survey

### ***CAL FIRE***

BFC	Butte Fire Center
BTU	CAL FIRE Butte Unit
LNU	CAL FIRE Sonoma-Lake-Napa Unit
NEU	CAL FIRE Nevada-Yuba-Placer Unit
SHU	CAL FIRE Shasta-Trinity Unit
TGU	CAL FIRE Tehama-Glenn Unit
Unit	operational unit (CA is divided into 21 geographical operational units)

### ***USFS***

ENF	Eldorado National Forest
MNF	Mendocino National Forest
PNF	Plumas National Forest
TNF	Tahoe National Forest

### ***Incident Command***

Branch	ICS organization level
Division	ICS organization level, below Branch
DINS	Damage Inspection / Damage Inspection Specialist
ECC	Emergency Command Center
IC	Incident Command(er)
ICP	Incident Command Post
ICS	Incident Command System
IMET	Incident Meteorologist
ST	Strike Team, group of resources of same kind and type

### ***Apparatus Type***

AA	Air Attack
B	Battalion Chief
D	Division Chief
DZ	Dozer
E	Engine
P	Fire Prevention Officer
T	Training Officer
TD	Dozer Transport
WT	Water Tender



**Other**

ANSI E-size	American National Standards Institute drawing size, 1118 mm × 864 mm (44 in × 34 in)
AVL	automatic vehicle locator
BO	burnover
CWPP	Community Wildfire Protection Plan
ERC	Energy Release Component, a measure of fuel energy availability
FDS	Fire Dynamics Simulator
FF	fire fighter
FR	first responder
FRH	Feather River Hospital
GIS	geographic information system
LANDFIRE	U.S. Government program providing landscape scale geospatial products describing vegetation and wildland fuel across the U.S.
LE	law enforcement
NFDRS	National Fire Danger Rating System
RAWS	Remote Automated Weather Station
ROS	rate of spread
SIG	special interest group
SSD	structure separation distance
TD	technical discussion
TRA	temporary refuge area
VHFHSZ	Very High Fire Hazard Severity Zone
VTD	“virtual” technical discussion
WUI	wildland-urban interface

## Executive Summary

The wildland-urban interface (WUI) is defined as the location where structures and communities meet or intermingle with undeveloped wildland. In the United States, over 44 million homes, housing 32 % of the US population, were in the WUI in 2010. WUI areas that experience wildland fires are vulnerable to significant fire exposures, causing significant loss of life and property. In the early 2000s, over one thousand structures per year on average were lost to WUI fires in California alone. The WUI fire problem is growing nationally each year; in the 2010s, multiple single fire events have caused losses in the thousands of structures. In 2018, the Camp Fire became the deadliest and most destructive fire in California history.

The Camp Fire started near Camp Creek Road and Pulga Road in Butte County, California, in the Feather River Canyon north of Jarbo Gap, at approximately 06:20 on the morning of November 8, 2018. The agencies responsible for unified command of the incident included the California Department of Forestry and Fire Protection (CAL FIRE), Butte County Sheriff's Office, Paradise Police Department, and the U.S. Forest Service. At peak daily staffing, total personnel involved in firefighting exceeded 5600, including 900 pieces of apparatus (620 engines, 101 hand crews, 102 dozers, and 77 water tenders).

The Camp Fire consumed 153 336 acres and destroyed 18 804 structures in the towns of Paradise, Magalia, and Concow—equivalent to three times the losses of the 2017 Tubbs Fire (5636 structures) or six times the losses of the 1991 Oakland Hills Fire (2900 structures). Eighty-five percent of the structures in the Town of Paradise were destroyed. In addition to the destroyed structures, the Camp Fire damaged a total of 754 structures. The fire resulted in 5 documented major firefighter injuries and 85 civilian fatalities. Afterwards, 3266 missing persons were located. The fire was declared 100 % contained on November 25, 2018, after burning for 18 days. Initial estimates suggested the Camp Fire would be the most destructive fire in California history at a cost of \$11 billion to \$13 billion in losses and \$3 billion for debris clean up. A more recent assessment determined that the Camp Fire was the costliest natural disaster worldwide in 2018, with overall losses of \$16.6 billion.

The catastrophic losses from the Camp Fire have led to the identification of multiple research questions to help understand this WUI fire and provide lessons learned that may be used to reduce losses in other WUI communities in the future. The five overarching research questions are:

- a. *How can a fire event of the scale of the Camp Fire be documented to facilitate the extraction of information for reducing future losses?*
- b. *How did the fire spread to and within Paradise?*
- c. *What were the primary causes of the extensive devastation?*
- d. *What fire spread pathways caused structural ignitions?*
- e. *How unique is Paradise as a community at risk of WUI fires?*

Additional research questions related to topics of emergency notification, evacuation, Temporary Refuge Areas, emergency response, defensive actions, and damaged structures will be addressed in subsequent reports.

**a. *How can a fire event of the scale of the Camp Fire be documented to facilitate the extraction of information for reducing future losses?***

Post-fire data includes fire observations, structural losses, emergency notification and evacuation details, and response particulars. Collection and dissemination of this information along with relevant pre-fire data can be used to develop lessons learned, with the goal of reducing losses in future WUI fires and improving community resilience. To address this question, a WUI data collection, analysis, and documentation framework was developed and utilized to document the Camp Fire. The methodology is based on the lessons learned from previous National Institute of Standards and Technology (NIST) WUI fire case studies. The methodology includes a field data collection process and a procedure for reconstructing the Camp Fire using the fire timeline as the baseline.

**b. *How did fire spread to and within Paradise?***

The NIST-developed post-fire data collection methodology is based on the observations and knowledge of first responders, local officials, and utilities personnel. During the data collection phase of this case study 157 individuals participated in technical discussions where they provided their unique first-hand perspective of the incident. Over 2200 data points related to fire observations were recorded from these discussions and other data sources, including photos, videos, 911 calls, and radio transcripts. The integration of these data points in space and time resulted in the reconstruction of the fire timeline presented here, focusing on the first 24 hours of the event when the majority of destruction occurred. Thousands of additional data points regarding evacuation, rescues, traffic, and defensive actions were also recorded and will be detailed in subsequent reports.

*Fire Spread Summary*

*November 8, 06:25 to 10:00*

The Camp Fire was first reported via calls to 911 beginning at 06:25. The caller indicated that the fire was burning on the west side of the Feather River near Poe Dam on Highway 70. The fire quickly became well-established in the steep canyon terrain, spreading from the origin toward Pulga. Shortly after 07:00, the fire was cresting the ridge and pushing towards Concow. By 07:25 the first structures started burning in Concow, 5 km (3 mi) from the origin.

The fire continued growing in Concow, moving westward and spotting over Concow Reservoir and Sawmill Peak. The first spot fires from the Camp Fire arrived in Paradise at 07:44, 12 km (7.5 mi) from the origin. The main fire front reached Pentz Road around 08:30, resulting in a significant number of distinct spot fires within Paradise. A total of 30 spot fires before 08:30 were identified during the data analysis, with spots reaching as far as 3.4 km (2.1 mi) into the town. Most of these spots (18) were within the first 1 km (0.6 mi) from the wildlands. The fire front reached Pentz Road between Apple View Way and Lowry Lane. Spot fires in and across town before 08:30 were most likely from the wildland fire front and a limited number of structure ignitions in Concow. By 08:45 there were two separate spot fires that had started in the vegetation far ahead of the main fire

front. One was burning in the drainage east of Clark Road near American Way, 3 km (1.9 mi) southwest from the Lowry Lane, spotted near Feather River Hospital. The second spot ignited in Honey Run Canyon, located on the west side of Paradise, 6.3 km (3.9 mi) from Lowry Lane.

Between 09:00 and 10:00 in Concow, the head of the fire was hung up on the east side of Concow Reservoir, burning to the north of Ishi Trail. Spot fires were igniting in pine and leaf litter 1.6 km (1 mi) ahead of the fire front. During that same time in Paradise, the fire intensified along both sides of Pentz Road. Initial spot fires deep within town were well established, and the fire was starting to spread to the west impacting Wagstaff, Bille, and Pearson Roads. By 10:00, fire was impacting Pentz, Bille, and Pearson Roads, where civilians were stuck in traffic and trapped in their vehicles. The fire continued to get deep-seated along both sides of Pentz while the earlier spots in town also grew.

#### November 8, 10:00 to 12:00

Between 10:00 and 11:00 on Pentz Road, peak vegetation fire activity had subsided, but significant fire remained. Most structures and heavy fuels were still burning on both sides of the road. The road was passable with variable visibility. The intersection of Pentz Road and Pearson Road remained fully involved, continuing to impact evacuations.

By 10:00, fire was impacting Clark Road in multiple locations, preventing passage while people were attempting to evacuate. The fire overtook vehicles evacuating on Clark Road at Buschmann Road with wind blowing flames “like a blow torch,” and fire jumped to the west side of Clark Road. Clark Road became barely passable again near the town limits for a brief time. However, another flare-up between 11:00 and 11:30 closed the roadway again as 15 m (50 ft) flames crossed Clark Road near Round Valley Ranch Road, and fire again crossed the roadway near American Way. Further down Clark Road at Airport Road, fire also burned over the roadway, delaying access of arriving strike teams as they waited for conditions to abate. The fire continued with high intensity south of the airport into the afternoon, where it paused and hung up for a period of time between about 13:00 and 15:00, before again advancing down into the flats south of Circle J Road.

Between 10:00 and 11:00, the spot fire in Honey Run Canyon, between Russell Drive and Redbud Drive, grew and became well established. Fire ran south up out of the canyon and burned over Skyway. Significant ember showers and fire activity on both sides of Skyway impacted evacuating vehicles.

By noon, intense fire was burning on the ridge and in the canyons near Jordan Hill Road. Flame lengths of 30 m to 45 m (100 ft to 150 ft) were observed. Engines looking for civilians had to drive through fire to escape back to Concow Road. At the same time, the northern flank of the fire was hung up between Coutolenc Road and Pentz Road. In Paradise, the main fire was pushing south down Berkshire Avenue, spreading to structures. Fire spread from structure to structure through Skyway Villa Mobile Home Park. The main fire activity along Pentz Road had passed; structures were burned down, vegetation had burned through, and Pentz Road was passable. Fire was well-established on the west side of northern Pentz Road, burning heavy brush, trees, and structures.

Structures began igniting on Sweetbriar Lane, and the fire spread west from structure to structure. Before noon, fire was approaching the Walgreens store and the intersection of Bille Road and Skyway from multiple directions. Structures were burning south and east of Skyway in the area of Almond Street and Fir Street. At the same time, fire activity at the Skyway split was still active on both sides of the roadway, but Skyway was passable. Fire was encroaching on Neal Road and Roe Road from the north, as a large area of fire burned over Skyway.

November 8, 12:00 to 17:00

Between noon and 15:00 in Concow, the southern extent of the fire continued to burn in the Concow Creek canyon northwest of Nelson Bar Road and north of Comfort Lane on both sides of Concow Road. In Paradise, the fire was well established through most of the town and began impacting the downtown area. By 13:00, 10 to 15 structures were burning at the south end of Andover Drive and on Adrian Drive. On the northern end of Paradise, fire was coming toward the Clark Road and Skyway intersection from the canyon to the west. Structures on the east side of Skyway were burning intensely, and fire was coming from the north through residential structures, threatening commercial structures where trapped civilians were taking temporary refuge. Many homes were on fire near Clark Road and Cabernet Lane. To the southwest, fire in Honey Run Canyon was moving down the canyon toward Centerville Road with a moderate rate of spread. On the ridgetops, flames were shooting out of the canyon with 30 m to 60 m (100 ft to 200 ft) flame lengths. In the canyon, flames were 2 m to 3 m (6 ft to 10 ft) long. Ember showers and flames were threatening multiple structures.

Between 14:00 and 17:00, fire was embedded in the structures in the area on the southern end of South Park Drive and Adrian Drive. Fire was burning in Little Butte Creek Canyon, wrapping around to the west, and burning in ravines uphill into the prevailing wind, toward West Park Drive.

By 15:00, heavy fire was burning everything on the west side of Skyway between Black Olive Drive and Jewell Road, including a burning woodpile that was threatening Town Hall. Torching shrubs and junipers were threatening additional nearby structures. Skyway between Pearson Road and Neal Road was being encroached upon from both east and west; fire was spreading uphill and upwind in Honey Run Canyon into structures on the west side of Skyway, and the main fire front was pushing west from Pearson Road. Structures were burning along Pearson Road, Almond Street, and Black Olive Drive, approaching Skyway.

Between 15:00 and 17:00 the fire approached Nelson Bar Road. To the north, the fire remained burning to the south of Magalia. In downtown Paradise, fire was well-established in multiple commercial structures at Skyway on Fir Street, and fire continued to burn structures in the area of Fire Station 81.

November 8, 17:00 to 24:00

Around sunset (16:56) in Concow, an intense fire front with 15 m to 30 m (50 ft to 100 ft) flames burned through the forest into the grasslands, impacting structures along the west

side of Nelson Bar Road. Numerous short-range spot fires were observed ahead of the fire front. At the same time in Magalia, fire was backing up out of the canyon, impinging on structures on Andover Drive with creeping fire behind homes. In Paradise, structures continued to burn. Large trees and power poles continued burning and threatened or blocked roadways. Also, around sunset, fire activity at Neal Road and Wayland Road increased, pushing into the area from the northeast. The fire then ran down into the foothills toward Highway 99.

Between 18:00 and midnight, the evening was a period of generally reduced fire behavior in the upper part of Little Butte Creek Canyon near Magalia. Different portions of Andover Drive were threatened throughout the evening period. By 22:00, fire had moved up out of Stilson Canyon and was coming up over Humboldt Road approaching Highway 32. Fire had also burned through the Cory Creek area, destroying multiple structures. Residual fire continued to threaten communities along Durham-Pentz Road.

#### November 9, 00:00 to 08:00

Between midnight and 02:00 on November 9, the fire flared up out of the West Branch Feather River Canyon with 30 m (100 ft) flames pushed by strong winds, estimated at 22 m/s (50 mi/h). Softball-sized embers blew across Coutolenc Road and Skyway into Magalia and Old Magalia. Several spot fires were established on the west side of Magalia Reservoir, and fire was spreading uphill toward Lakeridge Circle. Intense fire blocked Skyway south of the dam.

Between 02:00 and sunrise, at 06:44, the fire became well established in Magalia and consumed hundreds of structures. During the night in Concow fire was between Nelson Bar Road and Highway 70. Fire intensity was low to moderate, making local runs and overtaking dozer lines towards Lake Oroville.

The fire activity intensified dramatically at several locations at sunrise. In Concow, fire was burning across Pinkston Canyon Road towards Concow Road. Firefighters were worried about getting hemmed in by fire on both sides on Concow Road. Butte County Fire Station 37 on Concow Road was hit hard by the fire. At the same time in Magalia, a rapid increase in fire activity on the west end of Ponderosa Way impacted the south and west. Firefighters had to drive through fire to reach the safety zone of the parking lot at Pine Ridge School, where fire also approached from the east.

#### General

The fire timeline reconstruction has identified over a dozen entrapment/burnover events, life-threatening situations when fire traps or overtakes people or equipment and compromises escape routes. These events affected civilian and/or first responder evacuation and movement. The presence of primarily wildland vegetation along evacuation routes and some secondary roadways, likely amplified by local topography and wind, resulted in entrapments/burnovers in different locations and at different times.

Many of the entrapments/burnovers significantly impacted evacuation and required the formation of Temporary Refuge Areas (TRAs) to maintain life safety for residents and

firefighters. In at least two cases fire shelters were deployed by first responders to reduce radiative exposures to civilians and first responders. Several entrapments/burnovers resulted in civilian or first responder injuries and civilian fatalities. The relationships among entrapments/burnovers, evacuation of residents, and TRAs will be documented and analyzed in NIST Camp Fire Report #4.

**c. *What were the primary causes of the extensive devastation?***

There are many factors that may impact individual structure survivability and the effectiveness of defensive actions at a parcel level. When viewing the Camp Fire in its entirety, four factors were identified that most significantly influenced overall fire losses:

- i. *Fuel ignition potential,*
- ii. *Density of vegetative and structural fuels,*
- iii. *Wind and terrain, and*
- iv. *Extent/size of fire front reaching the communities.*

*Fuel Ignition Potential*

Fuel receptivity to embers and ignition potential was a result of over 200 days with almost no precipitation. Fuel moisture contents were at or near record low for the time of year. The presence of fine fuels, including but not limited to pine needles and ornamental vegetation stressed by limited precipitation, enabled a number of spot ignitions by embers traveling well ahead of the fire front. Fuel receptivity and ignition from embers was clearly conveyed in multiple first responder statements reporting “100 % ember ignitions.” It was this fuel receptiveness that caused the large number of ignitions within the communities. In Paradise, these ignitions started approximately 30 min to 40 min before the arrival of the fire front and rapidly grew in number when the front reached the community.

*Density of Vegetative and Structural Fuels*

All three communities, Concow, Paradise, and Magalia, are intermix communities that have developed over decades among the local wildland vegetation. Concow can be considered low population density intermix with 10 people/km<sup>2</sup> (26 p/mi<sup>2</sup>), while Paradise and Magalia can be classified as high-density intermix communities with 552 p/km<sup>2</sup> and 312 p/km<sup>2</sup> (1433 p/mi<sup>2</sup> and 808 p/mi<sup>2</sup>) respectively.

The absence of fire within most of Paradise and Magalia for many decades had resulted in significant vegetative fuel accumulation. The vegetative fuel loading was further increased by diseased vegetation (specifically pines). Seasonal needle dropping, combined with diseased trees and further enhanced by high winds, resulted in extensive needle accumulation before and during the fire. The historic growth of Paradise and surrounding communities, going back over a century, resulted in many structures placed on smaller lots. The short structure separation distances, together with the vegetative fuel loading, enabled rapid structure-to-structure fire spread.

Concow had been experiencing wildfires about every ten years; these fires have resulted in a modification of the local wildland fuels from timber to brush and grass. After the 1996–98 and 2008 fires, fuel loading around Concow was estimated at 2.24 kg/m<sup>2</sup> to

3.36 kg/m<sup>2</sup> (10 ton/ac to 15 ton/ac), which allowed the fire to maintain a high intensity and move rapidly through the community.

Fuel treatments have been used extensively to compartmentalize the landscape in the area around Paradise, Magalia, and Concow. The intent was to provide access for firefighting operations and reduce the total impact of wildfires by reducing the total acreage burned. Fuel treatments were used not only to influence wildland fire behavior but also to protect critical infrastructure such as the primary pumping station and treatment plant of the Paradise Irrigation District. Together with defensive actions, these specific fuel treatments met their objectives during the Camp Fire, and the critical infrastructure was undamaged. This specific fuel treatment example is included here to highlight the value of pre-fire preparation and vegetative fuel reduction in protecting critical infrastructure. The systematic analysis of the effectiveness of fuel treatments and their impact on fire behavior are beyond the scope of this report.

#### *Wind and Terrain*

The terrain of eastern Butte County is defined by the Sierra Nevada foothills and numerous deep river canyons and ravines.

The Feather River Canyon and Jarbo Gap, near the fire's origin, are known for their particularly high winds. Ridgetop gusts over 22 m/s (50 mi/h) are not uncommon, and the downslope north winds bring dry air through the foothills and the Town of Paradise.

The north wind event that occurred in the early morning on November 8 combined with receptive fuels, and the restricted access associated with topography contributed to the rapid growth of the fire, exceeding the ability for initial containment.

#### *Extent/Size of Fire Front Reaching the Communities*

All three communities were impacted by large fire fronts. The fire front that reached Concow was estimated to be between 0.8 km and 1.6 km (0.5 mi and 1 mi) long. This front impacted most of the community and, in combination with the three factors discussed above, caused very dangerous conditions that rapidly impacted life safety and evacuation.

The fire front that reached Paradise at 08:30 reached from Apple View Way to Merrill Road, a distance of 1 km (0.6 mi). Shortly after, the southern end of the approaching front progressed south and impacted the area between Merrill Road and Feather River Hospital. In a little over 40 min after the onset of spot fires, Paradise experienced a direct hit by a fire front with a length of 2.8 km (1.9 mi). The extent and severity of the initial fire exposure required civilian evacuations and life safety to become the top priorities of the early first responder resources on the scene. Rescues and life safety operations, including emergency notification, will be discussed in NIST Camp Fire Report #4.

The rapid increase in fire intensity around 24:00 on November 8 also resulted in a fire front over 1.6 km (1 mi) long that impacted the Magalia community. The extent of the front, coupled with the extensive ember cast and very strong winds estimated at 22 m/s



(50 mi/h), challenged the large number of available resources on the scene. The intensity of the fire exposure together with the receptivity of the fuels to embers resulted in an uncontrollable situation that eventually resulted in most of the structural losses in Magalia.

It is the confluence of these four factors (fuel ignition potential, high fuel density, wind and terrain, and extent of the fire front reaching the communities) that caused the aggressive fire behavior resulting in dangerous conditions for residents and first responders and in extensive damage and destruction.

**d. *What fire spread pathways caused structural ignitions?***

Documenting structure ignition vulnerabilities and structure ignition pathways is critical to improving building codes, standards, and best practices. Post-fire field data collection by NIST, together with CAL FIRE, USFS, and the Federal Emergency Management Agency (FEMA), captured structure damage and ignition vulnerabilities from 132 damaged structures. During the timeline reconstruction, first responder observations indicated that fuels on residential parcels, such as fences, vehicles, and furniture, could act as wicks to bring fire to the residential structures. Parcel-level exposures that resulted in damage of the 132 documented structures will be analyzed in NIST Camp Fire Report #5. The findings from this subsequent report will be used to guide future WUI fire research, building codes and standards, and best practices for WUI hazard reduction.

**e. *How unique is Paradise as a community at risk of WUI fires?***

This question was frequently asked by first responders, as well as state and federal officials, during the data collection and analysis phases of the Camp Fire case study. Currently there is no single standard way to capture a community's overall pre-WUI fire hazard that includes particulars of fuel and terrain, in addition to preparedness issues such as emergency notification and evacuation. Similarly, no standard framework yet exists that provides a clear and concise overview of fire response-related parameters for use by incident commanders and first responders during an event. While some of these data may be available from various sources including Community Wildfire Protection Plans (CWPP) and evacuation plans, summarizing the information in an easy-to-interpret format would help the community at hand, inform state and federal officials, and enhance the impact of state and federal hazard mitigation funds. A preliminary Community WUI Fire Hazard Framework is presented in this report as a first step towards highlighting community characteristics that should be considered when evaluating communities at risk of WUI fire.

**Fuels and Terrain**

The extensive vegetative fuels in Paradise, Magalia, and Concow may be representative of an older intermix community. A lifestyle of "living in the forest" may have attracted many residents to the community and may be a quality present in many communities across the WUI. The limited fire history of the Paradise area further contributed to the pre-fire vegetative loading. Vegetation fires along roadways and downed powerlines and power poles were the two primary factors that impacted evacuation. These factors will be further discussed in a subsequent report (Camp Fire Report #4) detailing emergency

notification and evacuation. Seasonal and multiyear drought conditions are common to many areas of the western United States. Extremely low fuel moisture conditions similar to those during the Camp Fire may also be representative of many WUI communities.

The topography of Paradise is characterized by numerous deep canyons and ravines which lead down slope to the Sacramento Valley. Similar terrain can be found throughout the western states. In addition to the direct influence of terrain on fire spread, many foothill and mountain communities may have similar topography-induced challenges to Paradise, including difficult-to-access areas, increased travel time due to indirect routes and mountain roads, and gusty ridgetop and down-canyon winds. Numerous regions across the west experience similar downslope wind events that characterize the Camp Fire and numerous other destructive wildland and WUI fires.

### Preparedness

The risk of WUI fire in the communities affected by the Camp Fire had been recognized by local officials for many years. Butte County and the Town of Paradise put into place several programs to reduce WUI fire hazard within and around Paradise, Magalia and Concow. These programs and the actions they promoted helped these communities prepare for a fire event by reducing fuels within and around the communities, enhancing communications, and ensuring an operating water supply and distribution system.

The Butte County CWPP addressed vegetation and structure ignitability and included a vegetation management component that incorporated fuels modifications and specifically highlighted topography, weather, and fire history. Paradise also had a town ordinance enabling residents to remove vegetation up to 23 cm (9 in) in diameter without any permit requirement. Infrastructure protection was specifically addressed in pre-fire preparation. Examples included fuel treatments around Pine Ridge School in Magalia and around Paradise Irrigation District (PID) critical infrastructure.

At the time of the fire, additional preparedness efforts related to emergency notification and evacuation were also in place. The Town of Paradise addressed emergency notification through a detailed evacuation plan and an opt-in Reverse 911 call system. Residents were encouraged to participate in the notification system through the local Fire Safe Council, and notices/reminders about the evacuation plan had been recently mailed to households. To facilitate evacuation, traffic lights at major intersections were equipped with battery backups to allow the signals to continue operating in the event of power loss.

The Paradise Public Works Department (PPW) was well prepared to respond to WUI fires. Measures were taken to prepare the town for the forecasted high wind event, including street sweeping and installation of battery backups. Equipment to facilitate evacuation, such as signage and traffic cones, was also prepared. PPW personnel also had selective fire training, including how to respond to burnovers.

Pre-fire firefighting preparedness and the emergency response to the Camp Fire, including fire department staffing in Paradise and Butte County, as well as preparations and coordination with the Geographic Area Coordination Center (GACC) will be

discussed in Camp Fire Report #5. Regional fire activity and US Forest Service (USFS) staffing will also be discussed in the same report.

### **Summary of Findings**

The data collection, analysis and quality control methodology used in this case study have made the spatiotemporal timeline reconstruction of the first 24 hours of the Camp Fire possible. This fire spread information enables an in-depth understanding of overall fire progression, including examples of local fire behavior and characterization of numerous entrapment/burnover events. The fire progression timeline forms the baseline for additional studies on community evacuation and life safety issues as well as the effectiveness of defensive actions and the impact of fire on structures and infrastructure. Future NIST reports will rely on this fire timeline to address those topics.

There are 23 findings distributed among seven categories related to the fire progression of the Camp Fire:

#### ***1. Butte County and Paradise Were Well Prepared to Respond to a WUI Fire***

- F1. Communities did have multiple programs in place to increase awareness of and reduce fire hazards associated with WUI fires.
- F2. The Town of Paradise did have an emergency notification and evacuation plan.
- F3. Paradise Public Works staff had received training in how to respond to a WUI fire.
- F4. Infrastructure was specifically addressed in pre-fire preparations.

#### ***2. Multiple Factors Contributed to the Rapid Growth and Spread of the Camp Fire***

- F5. Dry winds, with recorded gusts at Jarbo Gap exceeding 22 m/s (50 mi/h) from the northeast, increased fire spread in vegetative and structural fuels.
- F6. Steep topographical features including river canyons and creek drainages channeled north winds and accelerated fire spread through vegetative fuels.
- F7. Extremely dry vegetative fuels, associated with over 200 days without any significant precipitation, increased the fuel ignition potential around and within Concow, Paradise, and Magalia.
- F8. Fire spread toward Paradise from Concow was fueled by heavy conifer forests with brush understory. At lower elevations oak woodlands and savannah grass were primary fuels.

#### ***3. The Camp Fire Grew and Spread Rapidly***

- F9. Fire ignited near Pulga and Concow, was pushed by gusty wind across steep terrain toward Paradise, swept through Paradise, and then spread into Magalia.
- F10. Extensive intermediate- and long-range firebrand spotting caused multiple ignitions ahead of the main fire line and resulted in different exposures to fire conditions.

- F11. The fire travelled and/or spotted more than 11 km (7 mi) downwind of the origin to reach Paradise in less than 1.5 hours after ignition.
- F12. Fire consumed a significant fraction of the Town of Paradise over a period of 6 hours, between 08:30 and 14:30.
- F13. Fire spread down slope through the foothills at an average 1 m/s (2.2 mi/h, 180 ch/h (chain per hour<sup>1</sup>)) through grassy wildland fuels south and west of Paradise.
- F14. Fire spread rates for Paradise and Magalia could not be readily computed due to extensive spotting fire behavior.

The first spot fires from the Camp Fire arrived in Paradise at 07:50. The main fire front reached Pentz Road 40 min later, around 08:30. A total of 30 spot fires before 08:30 were identified, with spots reaching as far as 3.4 km (2.1 mi) into the town. The combination of numerous spot fires and a 1.5 km (1 mi) long fire front resulted in the fire rapidly becoming well-established throughout Paradise.

#### 4. *Burnovers Impacted Civilian Evacuations and First Responder Operations*

- F15. Multiple burnovers occurred during the Camp Fire.
- F16. Burnovers adversely affected pre-planned evacuation routes and led to use of Temporary Refuge Areas.
- F17. Intense vegetation and structure fires occurred along roadways and resulted in multiple road closures which adversely impacted response and evacuation activities.
- F18. Fire resulted in downed utility poles along roadways and throughout the communities. The downed poles, along with the associated electrical and utility lines, blocked multiple streets and impaired access for response and evacuation.

Burnovers were identified and documented in nineteen different locations and occurred throughout the first 24 hours of the incident. The first two burnovers occurred at approximately 07:50 on November 8 on Hoffman Road and Concow Road in Concow, and the last two recorded burnovers occurred at 07:15 on November 9 on Ponderosa Way in Magalia and on Concow Road in Concow. Multiple roadways were burned over before 10:00 on November 8, impacting evacuation and life safety of residents and first responders. Most burnover events lasted between 1 hour and 2 hours in duration.

#### 5. *The Location of Wildland Fire Ignition Relative to the Community is Important*

- F19. The ignition of the fire in wildland fuels over 11 km (7 mi) from Paradise allowed the fire to grow in intensity and size before reaching the affected communities.

Fire suppression capacity can be rapidly exceeded by large fire front lengths and/or extensive spotting throughout the community. The intense and long fire front and numerous spot fires that reached Paradise also impacted large-scale evacuations. This

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<sup>1</sup> The chain is a unit of length commonly used in wildland firefighting (1 ch = 66 ft ≈ 20.1 m).

points to the threat posed by a potentially dangerous region located upwind and some distance away from the communities. Ignitions in the dangerous region that cannot be rapidly suppressed (due to terrain and or wind) may quickly cause dangerous conditions for communities many kilometers (miles) downwind. Far-away ignitions can develop into large fire fronts that can threaten entire communities. In adverse conditions, such as dry conditions and/or locations with high vegetative fuel loads, spot fires developing near or within communities kilometers (miles) ahead of the fire front can impact local conditions and potentially affect evacuation routes.

#### **6. *Multiple Parcel-Level Fire Spread Pathways Caused Structure Ignitions***

- F20. Post-fire field data collection and first responder observations identified structure ignition vulnerabilities including structure-to-structure ignition pathways.
- F21. Fire spread through Paradise, and subsequently Magalia, was fueled by vegetative fuels, including ornamental shrubs, bushes, and trees; structural fuels, including homes, garages, detached auxiliary buildings, commercial occupancies; and cars, trucks, and campers.
- F22. Separation distances between fuel packages within a parcel as well as between parcels did not prevent rapid fire spread.

#### **7. *WUI Fire Spread Impacts Communities in Multiple Ways During Fire Events***

- F23. A standardized community wildland-urban interface hazard evaluation framework would improve assessment of fire risk for communities.

The documentation and quantification of the effects of the Camp Fire on Paradise, Magalia, and Concow highlight the issue that WUI fire spread has significant impact on communities well beyond the loss of structures, including community evacuation and incident response. The data begins to demonstrate the relationship between community preparedness and how a WUI fire event unfolds. Pre-fire planning and hazard mitigation impact how the fire develops, how the life safety of residents and first responders is impacted during evacuations, and the extent of structural and infrastructure losses.

The rapid spread of the Camp Fire through Concow, Paradise, and Magalia suggests that WUI community preparedness may benefit from a holistic approach to hazard assessment. The successful pre-fire planning by Butte County and Paradise suggests that a community's hazard assessment and preparedness for WUI fires can benefit from the inclusion of information on the fire history of the community and surroundings, vegetative and structural fuel loading information, as well as evacuation and response plans.

### **Recommendations**

There are nine recommendations made in this report. The recommendations are aimed at improving resident and first responder life safety (R1) and reducing structural losses during WUI fires (R2–R9).

- R1. Characterize fire behavior that leads to burnovers and quantify burnover severity. This information will inform fuel setback guidance for primary egress arteries and provide technical input to evacuation plans. *(F15, F16, F17, F18)*
- R2. Develop technical guidance to quantify parcel level exposures. *(F20, F21, F22)*
- R3. Quantify fire spread within parcels with focus on fire exposures. *(F20, F21, F22)*
- R4. Quantify exposures from adjacent parcels, specifically from neighboring structures, and develop design guidance for structure separation distances. *(F20, F21, F22)*
- R5. Develop methodology to connect field-collected ember data, such as ember flux and size distribution, to laboratory scales and develop worst case ember exposure criteria. *(F7, F10, F11)*
- R6. Develop spacing/hardening cost benefit relationships for high energy release sources (fences, wood piles, sheds, vehicles, RVs, and residences) and target structures (residential and commercial). *(F20, F21, F22)*
- R7. Characterize the relationships among fire history, fuel treatments, and fire behavior. *(F5, F6, F7, F8, F9, F10, F11, F12, F13, F17, F19, F21, F22)*
- R8. Develop a standardized methodology for assessing the exposures from ornamental vegetation. *(F20, F21, F22)*
- R9. Develop a plant list for vegetation with unacceptably high fire hazard for northern California and other locations with WUI fire risks. *(F20, F21, F22)*

## 1. NIST Wildland-Urban Interface Fire Research Background

Recent years have repeatedly shown that wildland-urban interface (WUI) fires pose a significant threat to life safety and property in the United States. In just the last five years, the State of California, in particular, has seen some of the largest, most destructive, and deadliest fires in its history. Five of those fires are among the top 25 largest fire losses (of any fire type) on a list compiled by the National Fire Protection Association (NFPA) [1]. Twelve of the 25 are WUI fires. Eight of the top 20 most destructive California fires [2] occurred during the 2017 and 2018 fire seasons, causing a combined 138 fatalities.

Defined as the location where structures and communities meet or intermingle with undeveloped wildland, the WUI is prevalent in the United States. Analysis of the 2010 U.S. Census data determined that over 44 million homes, housing 32 % of the US population, were located in the WUI [3]. Since 2010, development into wildlands has not slowed, and neither has the number of WUI fires.

In the early 2000s over one thousand structures per year on average were lost to WUI fires in California alone. In the 2010s, seven individual WUI fire events each caused losses of more than one thousand structures. In 2017, the Tubbs Fire destroyed and damaged 5636 structures—double the losses from the 1991 Tunnel Fire (Oakland Hills Fire), which at 2900 structures was the most destructive California fire to date [2]. One year later, the Camp Fire tripled the mark, destroying 18 804 structures [2, 4]. Eighty-five people perished [5-7].

An improved understanding of WUI fire dynamics and structure ignition mechanisms is critical to improving structure and community resistance to WUI fires (the “WUI fire problem”). The National Institute of Standards and Technology (NIST) WUI Fire Hazard Mitigation research effort comprises laboratory and field research projects to address this national fire problem. Additionally, the NIST Disaster and Failure Studies Program provides a platform for research on building and infrastructure performance and emergency response and evacuation procedures.

The NIST Wildland-Urban Interface (WUI) Fire Data Collection on Parcel Vulnerabilities Project is focused on understanding how WUI fire behavior is driven by the interactions among fuel, weather, and topography and the roles played by heat flux, embers, and direct flame impingement. The WUI Hazard Exposure Scale [8] characterizes these interactions and provides a framework that allows improved understanding of how communities are exposed to fire and embers during a WUI fire. Building and community vulnerabilities identified through post-fire analysis [9-13] are further investigated through laboratory experiments. Post-fire analysis also shows how fire behavior is modified by active and passive defensive actions. Additionally, field-scale experiments provide data for development and validation of the NIST-developed Fire Dynamic Simulator (FDS) computer fire model [14].

NIST WUI research is conducted in partnership with other federal agencies, including the US Forest Service (USFS), Federal Emergency Management Agency (FEMA), US Department of Homeland Security (DHS), and US Fire Administration (USFA); state agencies, including California Department of Forestry and Fire Protection (CAL FIRE) and Texas Forest Service; fire service organizations including Western Fire Chiefs Association, International

Association of Fire Fighters (IAFF), and International Association of Fire Chiefs (IAFC); building codes and standards organizations, such as National Fire Protection Association (NFPA) and International Code Council (ICC); and many academic institutions. Research findings are used directly to guide the development of new standards and to provide the scientific basis for new performance-based requirements, with the intent to make structures and communities more resistant to fire and ember exposures.



## 2. Camp Fire Introduction

The Camp Fire started near Camp Creek Road and Pulga Road in Butte County, California, in the Feather River Canyon north of Jarbo Gap, at approximately 06:20 on November 8, 2018. The first report was called in to 911 at 06:25, and the initial response was immediately dispatched to the vegetation fire. The fire quickly became well-established in steep canyon terrain, spreading from the origin toward the small community of Pulga. Shortly after 07:00, the fire crested the ridge west of Pulga and pushed towards Concow. Strong east winds drove the fire 12 km (7.5 mi) from the origin to the Town of Paradise. Within the next five hours, most of the town was destroyed. Fire continued to spread, impacting the foothills south of Paradise to Highway 99 and the outskirts of Chico, destroying a large portion of Magalia, and burning communities in Yankee Hill and Cherokee. Section 9.1, Fire Progression, describes the first 24 hours of fire progression in detail.

The fire burned for 18 days before being declared 100 % contained on November 25. The daily progression for the duration of the fire is documented in Appendix A, which was produced by the incident management team near the end of the incident. The agencies responsible for the unified command of the incident included CAL FIRE, Butte County Sheriff's Office, Paradise Police Department, and the U.S. Forest Service. At peak daily staffing, total personnel involved in firefighting exceeded 5600, including 900 pieces of apparatus (620 engines, 101 hand crews, 102 dozers, and 77 water tenders) [15].

The Camp Fire consumed 62 053 ha (153 336 acres) and destroyed 18 804 structures, including 13 696 single-family residences [4]. The fire resulted in 85 civilian fatalities [5-7, 16] and 5 reported major firefighter injuries [17]. After the fire, 3266 missing persons were located [18].

The extent of the damage was surveyed by the CAL FIRE damage inspection team [4] and is categorized by structure type and level of damage in **Table 1**. Initial estimates suggested the Camp Fire would be the most destructive fire in California history at a cost between \$11 billion and \$13 billion in losses [19] and \$3 billion for debris clean up [20]. A more recent assessment determined that the Camp Fire was the costliest natural disaster worldwide in 2018, with overall losses of \$16.6 billion [21].

NIST deployed a team to conduct a preliminary reconnaissance of the Camp Fire [22]. The primary objective of the reconnaissance was to determine if the Camp Fire offered unique data that, if collected and analyzed, could provide new technical insight into the US WUI fire problem. After the preliminary reconnaissance, it was determined this larger case study was warranted.

**Table 1.** Camp Fire Damage Assessment Summary.

<b>Category of Damage<sup>a</sup></b>	<b>Affected (1 % to 9 %)</b>	<b>Minor (10 % to 25 %)</b>	<b>Major (26 % to 50 %)</b>	<b>Destroyed (&gt;50 %)</b>	<b>Total</b>
Single Residence	439	47	3	13 696	<b>14 185</b>
Multiple Residence	21	3	1	276	<b>301</b>
Mixed Commercial/Residential	1	1	0	11	<b>13</b>
Non-residential Commercial	76	18	8	528	<b>630</b>
“Other” Minor Structures <sup>b</sup>	87	32	13	4286	<b>4418</b>
Infrastructure <sup>c</sup>	2	0	2	7	<b>11</b>
<b>Total</b>	<b>626</b>	<b>101</b>	<b>27</b>	<b>18 804</b>	<b>19 558</b>

<sup>a</sup>Damage categories are adopted from Federal Emergency Management Agency preliminary damage assessment guidelines [23].

<sup>b</sup>“Other” includes uninhabitable structures such as detached garages and sheds > 11 m<sup>2</sup> (120 ft<sup>2</sup>).

<sup>c</sup>Infrastructure includes communications towers, water supply equipment, and bridges.

### 3. Technical Overview

The catastrophic losses from the Camp Fire have led to the identification of multiple research questions to help understand this WUI fire and provide lessons learned that may be used to reduce losses in other WUI communities in the future. A detailed case study of the Camp Fire is presented through a series of five reports. Two reports have been published. *Report #1* [22] describes preliminary reconnaissance deployments to the Camp Fire while *Report #2* [24] contains preliminary data collected during those deployments. The remaining three reports categorize the research questions into three groups:

- Report #3 (this report):* fire progression and fire behavior,
- Report #4:* emergency notification, evacuation, and Temporary Refuge Areas,
- Report #5:* emergency response, defensive actions, and damaged structures.

The research questions addressed in this report are:

- a. *How can a fire event of the scale of the Camp Fire be documented to facilitate the extraction of information for reducing future losses?*
  - b. *How did the fire spread to and within Paradise?*
  - c. *What were the primary causes of the extensive devastation?*
  - d. *What fire spread pathways caused structural ignitions?*
  - e. *How unique is Paradise as a community at risk of WUI fires?*
- a. ***How can a fire event of the scale of the Camp Fire be documented to facilitate the extraction of information for reducing future losses?***

Post-fire data includes fire observations, structural losses, emergency notification and evacuation details, and response particulars. Collection and dissemination of this information along with relevant pre-fire data can be used to develop lessons learned, with the goal of reducing losses in future WUI fires and improving community resilience. To address this question, a WUI data collection, analysis, and documentation framework, described in Section 7, was developed and utilized to document the Camp Fire. This methodology was based on the lessons learned from previous NIST WUI fire case studies. The methodology includes a field data collection process and a procedure for reconstructing the Camp Fire using the fire timeline as the baseline. Subsequent analysis of evacuation and response will be linked to and interpreted in relation to fire progression in Reports #4 and #5.

- b. ***How did the fire spread to and within Paradise?***

The NIST-developed post-fire data collection methodology is based on the observations and knowledge of first responders, local officials, and utilities personnel. Their input was collected, compared, and integrated to reconstruct and capture fire activity in space and time, focusing on the first 24 hours of the event when the majority of the damage occurred. The fire timeline was developed using the available data; fire observations were directly linked to the locations and density of observers. Technical discussions with first responders, together with Automatic Vehicle Location (AVL), photographic images, videos, 911 calls, and radio transcripts were some of the tools used to develop the fire progression timeline. To facilitate the comprehension of the data, fire progression during

the first 24 hours after ignition was divided into 15 distinct geographic areas in this report. A summarized version for each of the 15 areas is presented in Section 9.1, Fire Progression. This section is further summarized in Section 16.3, in the Summarized Technical Findings. The fire timeline reconstruction has identified over a dozen entrapment/burnover events, life-threatening situations when fire traps or overtakes people or equipment and compromises escape routes, possibly resulting in injuries and/or fatalities [25-27]. Due to the similarities and uncertainties in the distinction between entrapments and burnovers, these events are all referred to as burnovers in this report. These events are summarized in spatiotemporal detail in Section 9.3, Burnovers, and further documented in Appendix B.

**c. *What were the primary causes of the extensive devastation?***

There are many factors that may impact individual structure survivability and the effectiveness of defensive actions at a parcel level. When viewing the Camp Fire in its entirety, four factors were identified that most significantly influenced overall fire losses:

- i. *Fuel ignition potential,*
- ii. *Density of vegetative and structural fuels,*
- iii. *Wind and terrain, and*
- iv. *Extent/size of fire front reaching the communities.*

It was the confluence of these four factors that caused the aggressive fire behavior resulting in dangerous conditions for residents and first responders and in extensive damage and destruction. The primary causes responsible for the extensive devastation are discussed in Section 13.

**d. *What fire spread pathways caused structural ignitions?***

Documenting structure ignition vulnerabilities and structure ignition pathways is critical to improving building codes, standards, and best practices. Post-fire field data collection by NIST, together with CAL FIRE, USFS, and the Federal Emergency Management Agency (FEMA), captured structure damage and ignition vulnerabilities from 132 damaged structures. First responder observations presented in Section 11 indicate that fuels on residential parcels, such as fences, vehicles, and furniture, can act as wicks to bring fire to residential structures.

Parcel-level exposures and structure damage will be further analyzed in NIST Camp Fire Report #5. This information, together with that collected from first responders during the timeline reconstruction effort, will connect fire and ember exposures to specific damage vulnerabilities to inform future WUI fire research, building codes and standards, and best practices for WUI hazard reduction.

**e. *How unique is Paradise as a community at risk of WUI fires?***

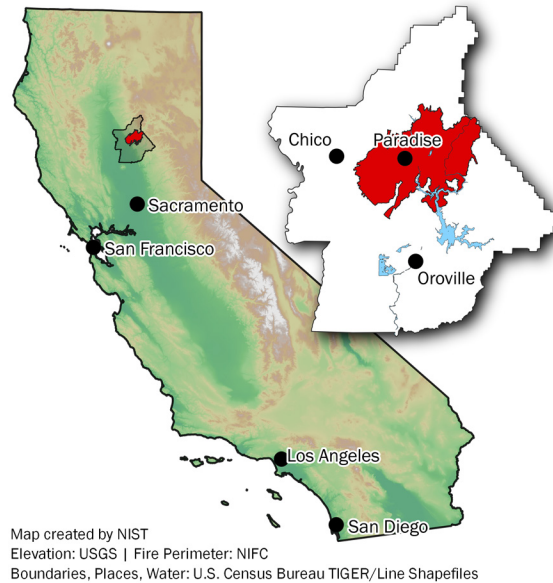
This question was frequently asked by first responders, as well as state and federal officials, during the data collection and analysis phases of the Camp Fire case study. Currently there is no single standard way to capture a community's overall pre-WUI fire hazard that includes particulars of fuel and terrain, in addition to preparedness issues such as emergency notification and evacuation. Similarly, no document yet exists that provides

a clear and concise overview of fire response-related parameters for use by incident commanders and first responders during an event. While some of these data may be available from various sources, including the community's Community Wildfire Protection Plan (CWPP) and evacuation plans, summarizing the information in an easy-to-interpret format can help the community at hand, inform state and federal officials, and enhance the impact of state and federal hazard mitigation funds. A preliminary Community WUI Fire Hazard Evaluation framework is presented in Section 15, and further explained in Appendix C, as a first step towards highlighting community characteristics that should be considered when evaluating communities at risk of WUI fire.

#### 4. WUI Characteristics of Paradise, Magalia, and Concow, CA

Butte County, approximately 130 km (80 mi) north of Sacramento, is located in the northern part of California, stretching from the northeastern Sacramento Valley into the Sierra Nevada mountains. **Figure 1** shows the location of Butte County and the Camp Fire perimeter (in red) in relation to the state.

The Town of Paradise is located in the foothills of the Sierra Nevada at an elevation of 542 m (1778 ft). Magalia, further up the ridge just north of Paradise, is at an elevation of 711 m (2333 ft). To the east, Concow lies in a topographic bowl at an elevation of 611 m (2005 ft). Before the Camp Fire, Paradise was the second-largest population center in Butte County, with a 2014-2018 American Community Survey (ACS) 5-year population estimate [28] of 26 543 people. Magalia and Concow were smaller unincorporated communities with populations of 12 671 in Magalia, and 743 in Concow.



**Figure 1.** Location of Butte County, California and the Camp Fire.

WUI is defined in two primary categories, interface and intermix, depending on population or structure density and the extent of wildland vegetation. This classification of WUI does not directly translate to the level of hazard, although it may suggest potential differences in fire behavior and/or community mitigation and preparedness capabilities (e.g., details related to evacuation or structure-to-structure ignition potential).

The Town of Paradise had a population density of 559 persons/km<sup>2</sup> (p/km<sup>2</sup>) (1450 p/mi<sup>2</sup>). Using the definitions provided by the U.S. Department of Agriculture and the Department of the Interior in their 2001 *Federal Register* notice [29], the town exceeded the 97 p/km<sup>2</sup> (250 p/mi<sup>2</sup>) minimum threshold and qualified as an interface community based on population density. Magalia similarly met the population density threshold of an interface community.

The CAL FIRE Damage Inspection (DINS) efforts documented all destroyed, damaged, and undamaged structures (over 22 000 structures) in Paradise, Magalia, and Concow (a combination of residential, commercial, and other auxiliary structures greater than 11 m<sup>2</sup> (120 ft<sup>2</sup>)) [30]. The distribution of these structures within the boundaries of the three communities is tabulated in **Table 2**. Using the 16 520 assessed structures within the Paradise town limits and the 74.5 km<sup>2</sup> area, the town-wide nominal structure density was estimated to be 3.5 structures/hectare (s/ha) (1.8 s/ac). This is below the 7.4 s/ha (3 s/ac) structure density aspect of the definition for interface listed in the *Federal Register* [29]. However, an effective structure density of 6.4 s/ha (2.6 s/ac) within the central area of Paradise approached the interface threshold of 7.4 s/ha (3 s/ac). Examples of this structure density include the residential areas west of Skyway in the vicinity of Bille and Wagstaff Roads and around Lancaster Drive. Structure density reached 17 s/ha (7 s/ac) locally, including several mobile home parks, some of which abutted directly to wildlands. **Table 3** lists examples of effective structure densities in selected sections throughout Paradise to illustrate the variability. Effective structure density in Magalia was higher than Paradise at 8.2 s/ha (3.3 s/ac) and was considered interface.

**Table 2.** Population and structure density statistics.

Location	Pop.	Area km <sup>2</sup> (mi <sup>2</sup> )	Pop. Density p/km <sup>2</sup> (p/mi <sup>2</sup> )	DINS Struct. Count	Nominal Struct. Density s/ha (s/ac)	Effective Struct. Density s/ha (s/ac)
Paradise	26 543	47.5 (18.3)	559 (1450)	16 520	3.5 (1.4)	6.4 (2.6)
Magalia	12 671	36.3 (14.0)	349 (905)	3466 <sup>a</sup>	6.4 <sup>a</sup> (2.6)	8.2 (3.3)
Concow	743	72.0 (27.8)	10 (27)	684	0.1 (0.04)	0.6 (0.25)

<sup>a</sup> Only the fire-impacted southern portion of Magalia was included in structure damage inspection data; the entire structure count is unavailable. Area was truncated at the extent of available data.

Concow, with a population of 743, had a population density of 10 p/km<sup>2</sup> (27 p/mi<sup>2</sup>) and by the Federal definition was an intermix area. Housing density in Concow was estimated at 0.1 s/ha (0.04 s/ac), or one structure every 10 ha (25 ac). This is above the lower threshold for intermix which is defined as one house every 16 ha (40 ac). Note that this nominal structure density includes significant areas of relatively undeveloped wildland. An effective structure density for the developed area clustered around the Camelot Lane and Concow Road intersection was much higher at 0.6 s/ha (0.25 s/ac), or 1.6 ha (4 ac) for each structure.

To more accurately identify WUI areas [3], some additional vegetative constraints have been combined with the *Federal Register* definitions of WUI. Stewart *et al.* [31] defines intermix as “the area where houses exist at more than 1 housing unit per 40 ac and wildland vegetation covers more than 50% of the land area” and interface as “wildland vegetation covers less

than 50 % of the land area, but a large area (over 1235 ac) [500 ha] covered with more than 75 % wildland vegetation is within 1.5 mi [2.4 km].”

The definitions provided by Stewart *et al.* include the wildland vegetative component, which provides important context related to wildland fire. An important factor that is not considered in either definition (Federal Register or USFS) is a characterization of vegetative fuel loading on the residential parcels. The Town of Paradise was a community built in the forest, and the distinction between wildland vegetation and residential vegetation can be ambiguous. A distribution of pine trees on a residential parcel that results in extensive needle cast can have significant impact on fire behavior, independent of housing density or population density. This important vegetative component is not directly captured by either set of definitions and highlights the challenge of trying to address the WUI fire hazard problem across multiple physical scales from community to residential parcel.

**Figure 2** shows four different areas in Paradise, also listed in **Table 3**, that had very different housing and vegetative densities, further highlighting the complexities of defining and quantifying the WUI fire hazard problem. Housing densities in the pictured areas vary by an order of magnitude, ranging from 17 s/ha (7 s/ac) down to 0.7 s/ha (0.3 s/ac). Additionally, differences in vegetation density are apparent, with limited vegetation seen in **Figure 2a** and predominately vegetation seen in **Figure 2d**. Green lawns and extensive non-combustible areas (e.g., driveways and pools) are common in **Figure 2c**.

**Table 3.** Variation of structure density in Paradise.

Selected Location [Cross Street or Bounding Streets]	DINS Struct. Count	Selected Area ha (ac)	Effective Struct. Density s/ha (s/ac)
Ridgewood Mobile Home Park [Pentz Rd]	98	5.6 (14)	17 (7)
Apple Tree Village Mobile Home Park [Clark Rd]	168	9.7 (24)	17 (7)
Lancaster Dr [Country Oak/Himmel/Bille/Sawmill]	130	18 (45)	7 (2.9)
Bille Rd [Wagstaff/Graham/Bille/Lucky John Rd]	206	32 (80)	6 (2.6)
Nunneley Rd [Elliott/Clark/Pearson/Sawmill Rd]	872	142 (350)	6 (2.5)
Valley View Dr [Valley View Dr et al. west of Oliver Rd]	608	172 (425)	3.5 (1.4)
Round Valley Ranch Rd [Clark Rd]	87	137 (338)	0.7 (0.3)



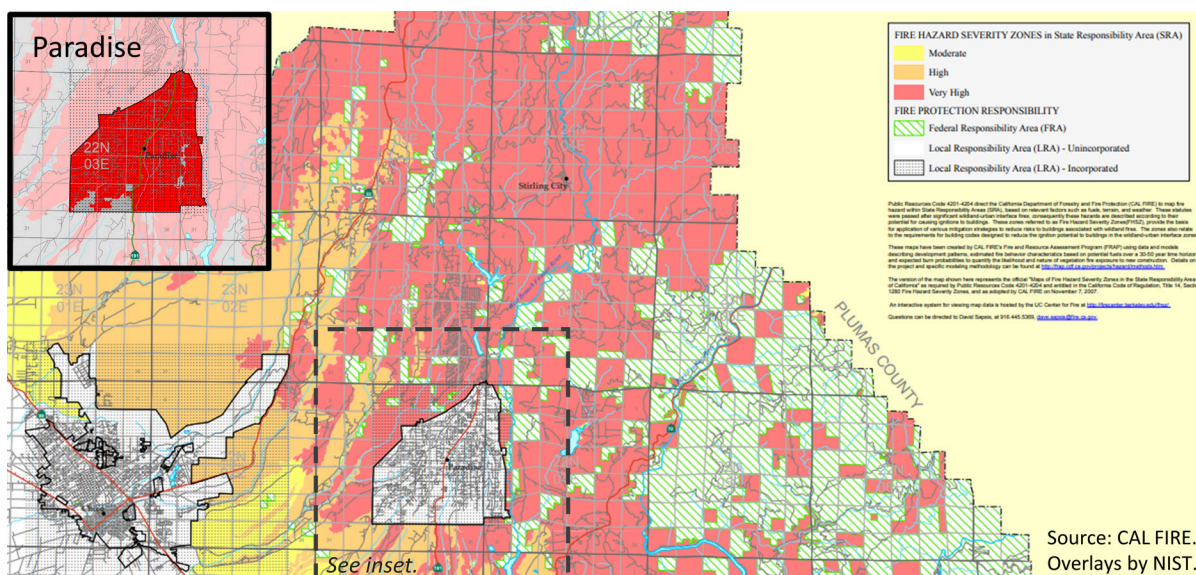


**Figure 2.** Homes within Paradise display a wide range of structure-to-structure separation. Representative images show progressive reductions in structure density from locations; a) Apple Tree Village Mobile Home Park, b) Lancaster Dr, c) Valley Ridge Dr, and d) Round Valley Ranch Rd. Also note the variability in vegetative fuel density.

## 5. Pre-Fire Hazard

The California Department of Forestry and Fire Protection's Fire and Resource Assessment Program (FRAP) assesses the amount and extent of California's forests and rangelands, analyzes their conditions, and identifies alternative management and policy guidelines. The FRAP program assesses the wildland fire hazard throughout the state and, in conjunction with the Office of the State Fire Marshal, establishes Fire Hazard Severity Zones (FHSZ). In addition to classifying the fire hazard, these FHSZs drive the building codes and mitigation strategies in WUI areas. **Figure 3** shows an excerpt of the Butte County Fire Hazard Severity Zone map [32, 33], last updated in 2007. Magalia, Concow, and Paradise<sup>2</sup> are all identified as Very High Fire Hazard Severity Zones (VHFHSZ).

Fire hazard is determined by a number of factors, including fuels, topography, weather, and fire history. These factors are discussed in the following sections as they relate to the Camp Fire.



**Figure 3.** Excerpt of the FRAP fire hazard severity zone map [32] of northern Butte County indicating, in red, *Very High Fire Hazard Severity Zone* (VHFHSZ) on the Paradise ridge and surrounding areas. Paradise is a “Local Responsibility Area” and is recommended by the state as VHFHSZ, shown in the inset [33].

### 5.1. Topography

The terrain around the Camp Fire is characterized by the rising foothills of the Sierra Nevada and numerous steep river canyons and creek drainages. The Feather River Canyon, where the fire originated, the canyon of the West Branch Feather River along the east side of Paradise, and the Butte Creek Canyons to the west, define the region. **Map 1** shows a shaded relief

<sup>2</sup> The FHSZ are applicable on lands where the state is responsible for wildland fire protection (State Responsibility Area). FHSZ are recommended for Local Responsibility Areas, including Paradise and Chico. The recommended FHSZ for Paradise is Very High, as seen in the inset of **Figure 3**. Federal lands are not classified by FRAP.

topographic map of Paradise and Concow, along with several labels of topographic features and locations frequently referenced in this report.

The fire started in the Feather River Canyon at an elevation of 550 m (1800 ft) and climbed the west wall of the canyon and the deep Flea Valley up to Rim Road, along the ridge to the west at 975 m (3200 ft). Concow sits in a bowl at 610 m (2000 ft), surrounded by 250-plus m (800-plus ft) tall ridges. A few gaps in the ridge lead west toward Paradise. The dramatic 250 m deep West Branch canyon separates Paradise from Concow.

Paradise is relatively flat east to west, with a north to south downhill slope from 700 m to 60 m (2300 ft to 200 ft) over a distance between 15 km and 20 km (9 mi and 12 mi) into the Sacramento Valley. South of town, the landscape is divided by dozens of fingering creek drainages and valleys.

The west side of Paradise is defined by the Butte Creek and Little Butte Creek Canyons. In some locations there is a 300 m (1000 ft) drop-off to the bottom.

## 5.2. Fuels Description

Fuels around the point of origin and downwind towards and within Paradise and Magalia consisted of heavy conifer timber with brush understory. At lower elevations, oak woodland and grass savannah were the primary fuels. The area near the fire origin had burned previously in 2008; however, fuels west of the West Branch of the Feather River, in Paradise and Magalia, had not burned in recorded history (see Section 5.4). Timber was characterized by close crown spacing with heavy manzanita and oak cover underneath.

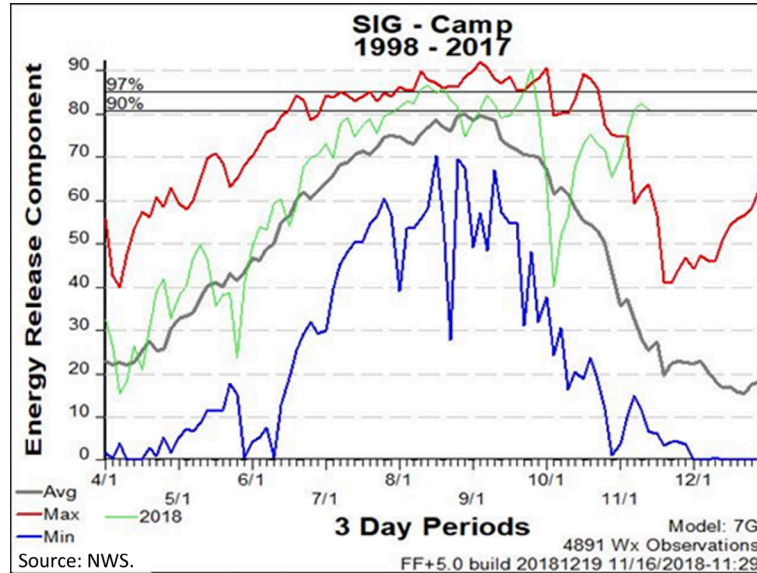
Fuel moisture levels were uncharacteristically low for the time of year due to the protracted dry period and late arrival of rain beginning the wet season. Fuel moisture levels [34] for 1000-hour time lag fuels measured at the Pike County Lookout south east of the fire area were at 5 % on November 1, well below the 17 % average for the Northern Sierras in November. Live fuel moisture in manzanita was 74 %; the critical level, in terms of fire hazard, for manzanita is 80 %. The average for November is 93 % [TD-131].<sup>3</sup>

The Energy Release Component (ERC) output by the National Fire Danger Rating System (NFDRS), a measure related to the total fuel energy availability per unit area ( $J/m^2$ ,  $Btu/ft^2$ ), which increases as fuels cure/dry, trended slightly above average for the northern Sierras during the summer, but in early October it began trending well above average. On the day of the fire the ERC calculated amongst a grouping of nearby fire weather stations was 80, above the historic record for the date (60) and above the 90th percentile for all dates in the previous 10 years (80). ERC values are presented in **Figure 4**, developed by Aviva Braun from the National Weather Service. A slideshow by Ms. Braun on the weather conditions during the Camp Fire is presented in Appendix D [35].

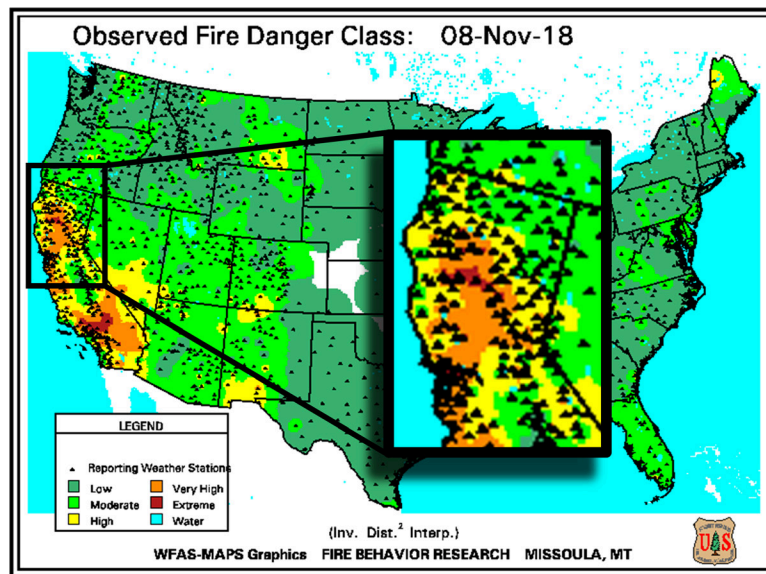
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<sup>3</sup> References to [TD-###] correspond to information provided in technical discussions with first responders and local officials further described in Section 7.

The NFDRS Fire Danger Rating category was Very High or Extreme in the northern Sierras at the four reporting stations in Butte County, indicating the relative potential for high intensity, fast spreading fires. **Figure 5** shows the NFDRS map of the observed Fire Danger Ratings on November 8 [36].



**Figure 4.** The energy release component measured among a special interest group (SIG) of nearby fire weather stations representative of the Camp Fire exceeded the historic record high for early November (60) and was in the 90<sup>th</sup> percentile (80) for the previous 10 years [35].

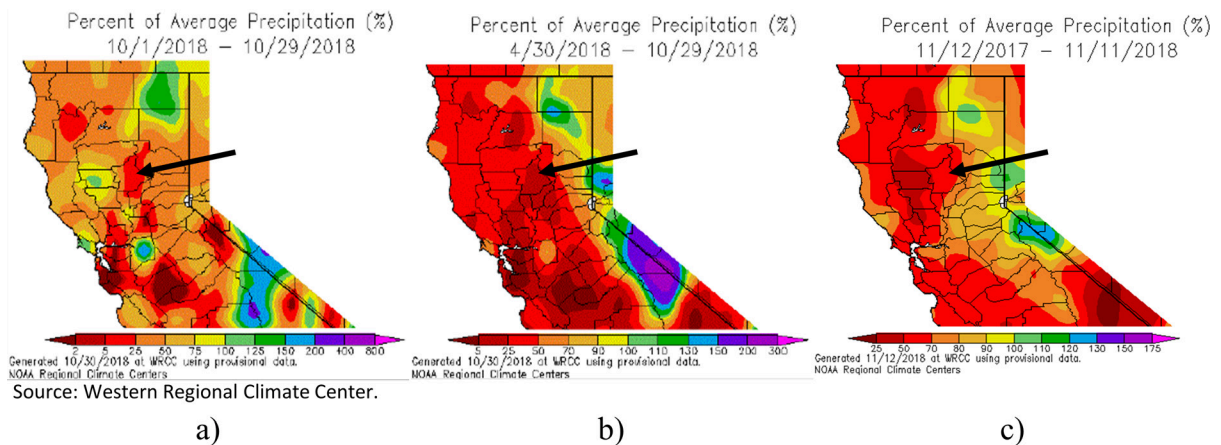


**Figure 5.** National Fire Danger Rating System map [36] indicating Very High to Extreme fire danger in Butte County and northern California.

### 5.3. Weather

Weather before and during the Camp Fire, as for many rapidly spreading fires, was characterized by dry and windy conditions. In California, the windy conditions are often brought by downslope north wind events, bringing warm, dry air through fire prone regions. Jarbo Gap is known for locally high winds,<sup>4</sup> particularly during north wind events which align with the Feather River Canyon. The Big Bend of the Feather River channels and forces winds up and over the ridge at Jarbo Gap. While dry or windy conditions are not unusual in Butte County, the overlap of late season dryness with a north wind event was relatively uncommon. Wetting rains typically begin in September before the frequency of north wind events increases in November and December [TD-003, TD-131].

It was very unusual to have fuel dryness levels so low in November in Butte County. In most years significant rain would have fallen by November, dampening fine fuels and lowering the ignition hazard. However, with the exception of a small amount of rain in early October leading up to the Camp Fire, it had been over 200 days since 13 mm (0.5 in) or more of rain had fallen at the lower elevations of Butte County. The U.S. Drought Monitor [38] reported much of Butte County in the “D0 Abnormally Dry” condition for the 19 weeks leading up to the fire, between June 26 and November 6, moving into “D1 Moderate Drought” on November 13<sup>5</sup>. The percentages of average precipitation in Butte County for the periods 1 month, 6 months, and 1 year prior to the Camp Fire were well below average, indicated by the red areas in **Figure 6** [39].



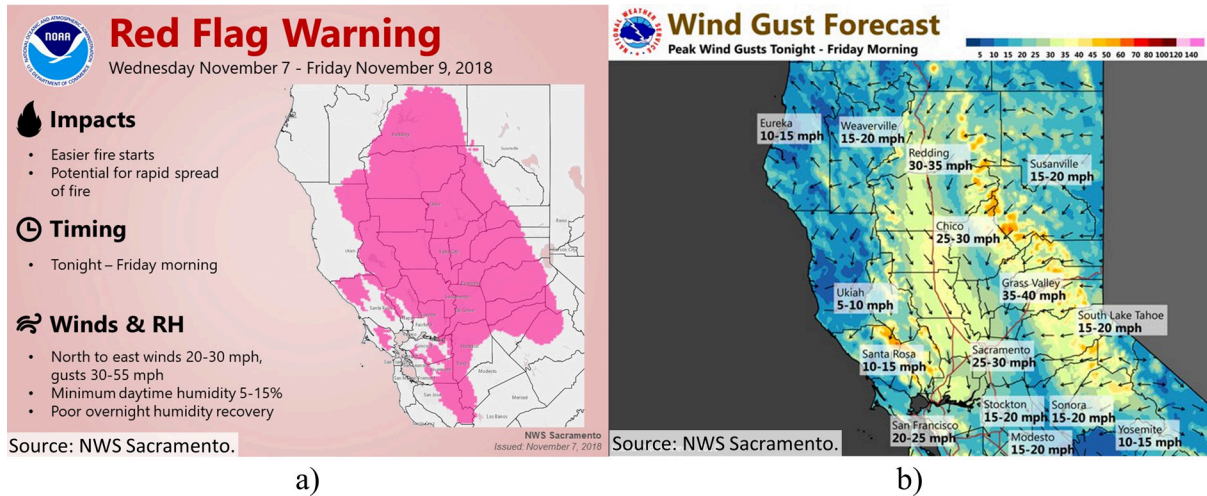
**Figure 6.** Percent average precipitation across northern California for a) 1 month (< 25%), b) 6 months (< 25%), and c) 1 year (< 70%) prior to the Camp Fire. Figures from Western Regional Climate Center [39]. Overlaid arrows highlight Butte County.

A well-forecasted north wind event and critical fire weather period affected northern California on Thursday, November 8. The potential wind event was mentioned in the Day 3-8 Fire Weather Outlook issued by the National Weather Service (NWS) a week before the fire. Subsequently, the first Fire Weather Watch was issued Monday, November 5,

<sup>4</sup> Wind gusts over 13 m/s (30 mi/h) were recorded on 30 % of days in the 10 years prior to the Camp Fire (data from Ref. [37]).

<sup>5</sup> The U.S. Drought Monitor is issued weekly.

followed by a Red Flag Warning on Tuesday, effective for Wednesday night through Friday morning (November 7–9). Forecast graphics [40, 41] from the NWS office in Sacramento are shown in **Figure 7**, highlighting the Red Flag conditions and forecasted wind gusts exceeding 22 m/s (50 mi/h) across the Sierras. Thursday morning’s Fire Weather Forecast for the foothills predicted north to northeast winds at 7 m/s to 12 m/s (15 mi/h to 27 mi/h), gusts to 22 m/s (50 mi/h), and single-digit relative humidity. Winds in the valley (i.e., Chico) were forecast to come from the northwest, indicated in **Figure 7b**.



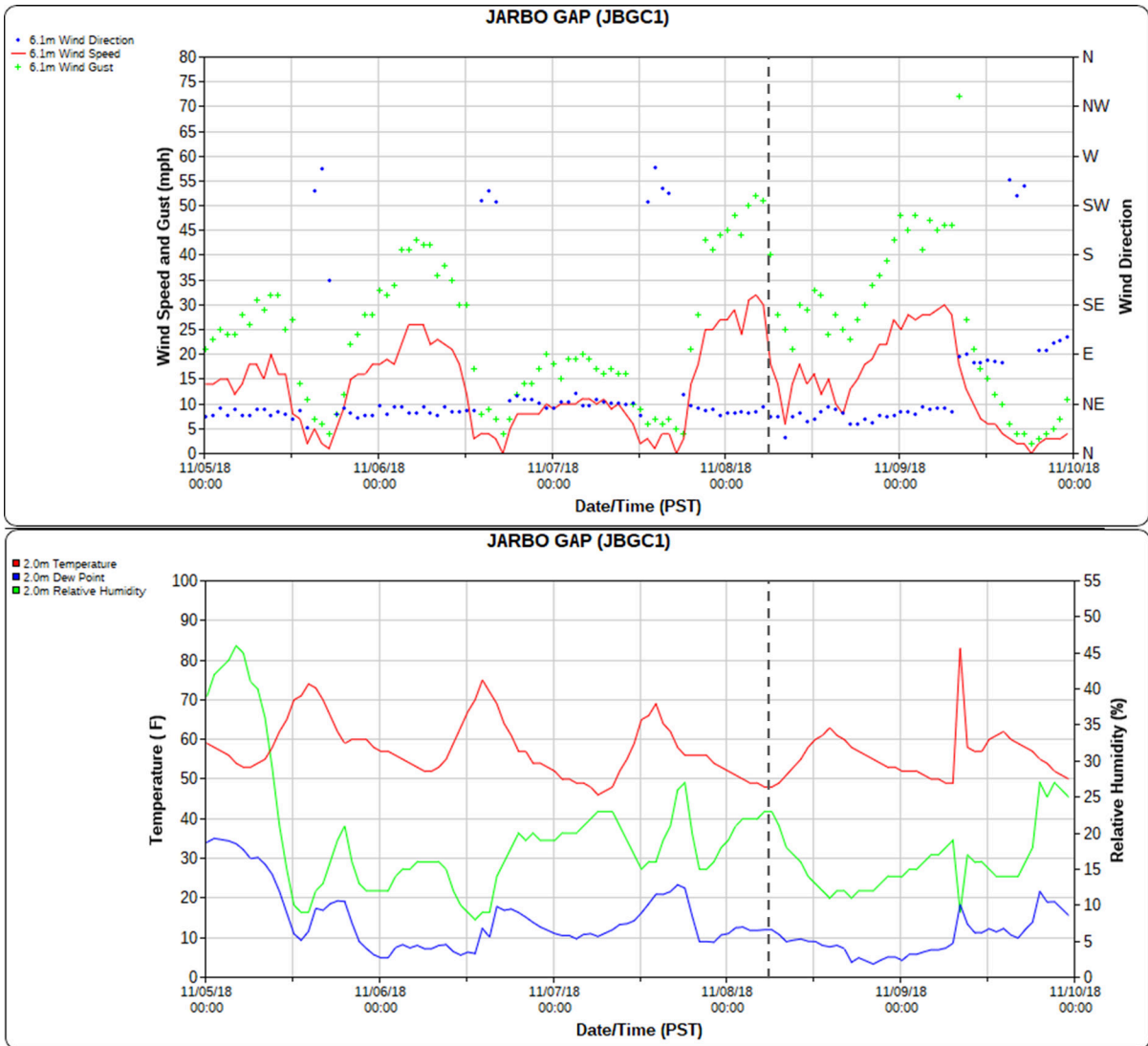
**Figure 7.** NWS Sacramento published forecast graphics [40, 41] on November 7 highlighting a) widespread Red Flag Warnings for November 8, and b) wind gust forecast showing peak winds exceeding 22 m/s (50 mi/h).

Gusty winds were measured at the Jarbo Gap Remote Automated Weather Station (RAWS) [37] starting around 19:00 on November 7, becoming very strong by 21:00. Sustained winds of 12 m/s (27 mi/h) continued overnight with gusts over 22 m/s (50 mi/h). At the time of ignition on November 8, the RAWS station reported 8 m/s (18 mi/h) winds gusting to 18 m/s (40 mi/h) with relative humidity of 23 %. Wind direction across the foothills and ridgetops was almost exclusively from the northeast, driving the fire toward Concow and Paradise. Wind gusts during the day on November 8 were around 13 m/s (30 mi/h) with sustained winds of 5 m/s to 9 m/s (12 mi/h to 20 mi/h) from the northeast. Relative humidity dropped to 10 % during the day. **Figure 8** shows the wind and temperature observations recorded at the Jarbo Gap RAWS. The vertical dashed line indicates the ignition time. Fire impacted the weather station in the early morning hours of November 9 [TD-008, TD-028, TD-131] and is indicated by spikes in temperature and wind gusts. Data after this time is questionable.

Weather in the Sacramento Valley, on the southwest side of the fire, could be observed from the Openshaw RAWS [42] on Highway 149 near Highway 70. Observations are plotted in **Figure 9**. As anticipated, winds in the valley were slightly lower than in the foothills and from the northwest on November 8 at 5 m/s to 7 m/s with gusts to 10 m/s (12 mi/h to 16 mi/h, with gusts to 22 mi/h). Around sunset between the 16:00 and 17:00 observations, the wind direction shifted, coming downslope from the northeast. A sharp drop in relative humidity came with the wind shift.

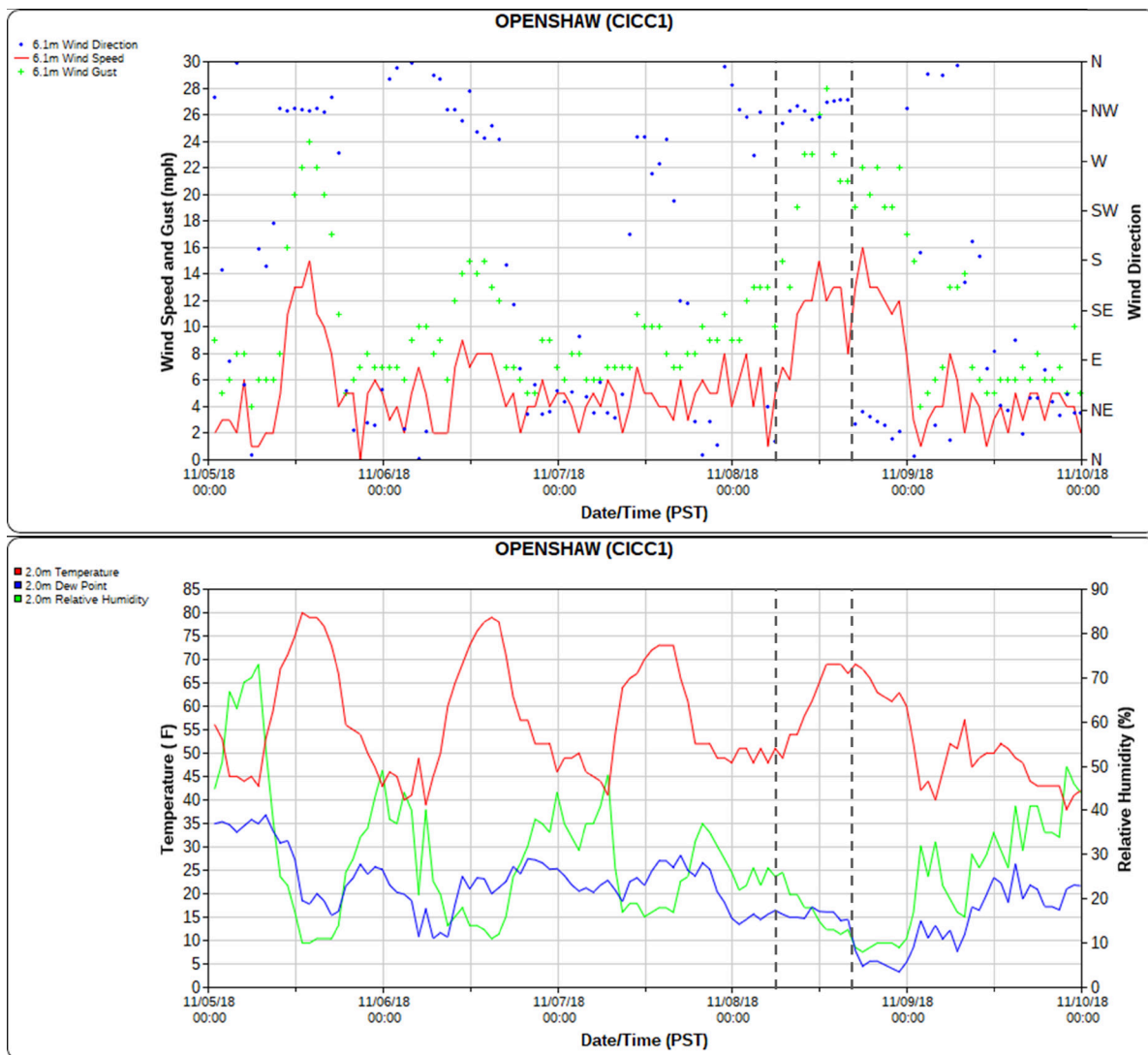
Critical fire weather conditions of breezy north-to-east winds and low relative humidity continued over the fire area for several days, including an additional Red Flag Warning on November 10 and 11 for conditions similar to November 8. After Monday, November 12, fire weather conditions slowly improved each day as the wind became less widespread, and relative humidity began to increase. Finally, significant rain arrived in the area on November 21, helping firefighters fully contain the fire.

Additional weather information is provided in Appendix D.



Source: MesoWest

**Figure 8.** Wind and temperature observations at the Jarbo Gap RAWS on Highway 70 [37]. The vertical dashed line indicates the ignition time.



Source: MesoWest

**Figure 9.** Wind and temperature observations at the Openshaw RAWS on Highway 149 in the Sacramento Valley [42]. The vertical dashed lines indicate the ignition time and the wind shift.

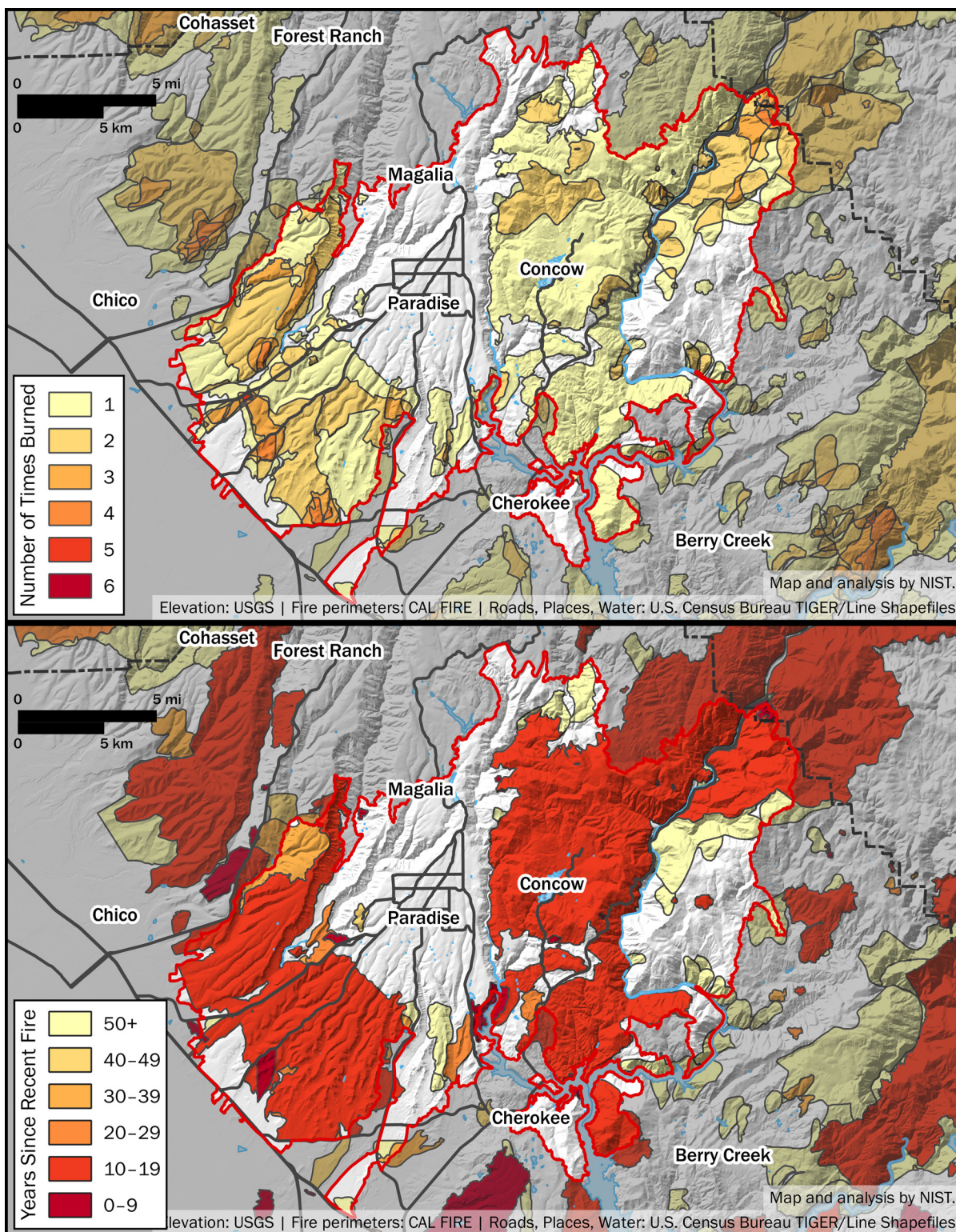


#### 5.4. Fire History

Butte County has an extensive fire history, as shown on the maps in **Figure 10** developed using data from the CAL FIRE historic fire perimeter database [43]. A significant portion (58 %) of the region burned during the Camp Fire had a previous fire history. **Figure 10a** indicates the number of times areas within and surrounding the Camp Fire had burned between 1911 and 2018. Notably, Paradise and Magalia have no recorded fire history despite the numerous nearby fires. Fires in Concow had historically been kept to the east side of the West Branch of the Feather River, including the 2008 BTU Lightning Complex. To the southwest, fires had been limited to the canyons and the foothills on the edge of Paradise town limits. Additional areas on the east side of the fire also had no fire history or had not burned in over 50 years. More frequent fire activity has been observed along the Feather River Canyon, in the foothills southwest of Paradise, and in Butte Creek Canyon.

In 17 of the 20 years prior to the Camp Fire there had been at least one fire recorded within the Camp Fire perimeter. **Figure 10b** highlights the number of years since the most recent fire activity. The most prominent fires within the Camp Fire perimeter burned within the last 10 years to 19 years, including the Humboldt Fire (southwest of Paradise) in 2008, the BTU Lightning Complex (in Concow and northeast) in 2008, and the Poe Fire in 2001 that burned through Yankee Hill. In addition to the Humboldt Fire, Butte Creek Canyon previously burned in other fires including the Bidwell Fire in 1984 and the Doe Mill Fire in 1999. Several recent fires near the town limits were contained outside of Paradise, including the Saddle Fire in 2016 and the Honey Fire in 2017.

While selective fuel treatments were conducted in and around both communities (see Section 13.2), the lack of fire history throughout Paradise and Magalia was directly connected to the vegetative fuel loading in both communities.



**Figure 10.** Historic fire perimeters in northern Butte County (1911–2018) [43] are overlaid to show a) the number of times each area has burned and b) the number of years since the last fire. The Camp Fire is highlighted and outlined in red for comparison.

## 6. Pre-Fire Response Preparations

### 6.1. Town and County Preparedness

Butte County and the Town of Paradise had a number of programs in place at the time of the Camp Fire to communicate the risk of WUI fires and enable residents to reduce WUI fire hazards within and around Paradise, Magalia, and Concow. As described in the 2015–2020 Butte County Community Wildfire Protection Plan (CWPP) [44], the Town of Paradise had been identified as a Community at Risk going back to 2001. The CWPP addressed structure ignitability, including the concept of the Home Ignition Zone. The CWPP also included a vegetation management component that incorporated fuel modifications and specifically highlighted topography, weather, and fire history.

The Town of Paradise and Butte County addressed emergency notification through opt-in Reverse 911 call systems and an evacuation plan. The emergency notification and evacuation plan details will be discussed in NIST Camp Fire Report #4.

The Paradise Public Works (PPW) played an active role in monitoring and preparing for a potential fire in the days leading to November 8. PPW and the Town Hall monitored the weather forecasts and were aware of the potential fire hazard. PPW prepared to respond to a WUI fire through selective fire training for personnel, including how to respond to burnovers [TD-035]. Backup batteries at their communication towers had been replaced on the evening of November 7, and in the week prior to the fire PPW had conducted a road sweep through Paradise to remove pine needles and other vegetative debris. Additionally, during the first week of November, yard debris could be delivered to the town recycling center to facilitate vegetative fuels maintenance at no cost to the residents. A Town of Paradise ordinance enabled residents to remove vegetation up to 23 cm (9 in) in diameter without any permit requirement [45].

Butte County has a Vegetation Management Program and a Fire Prevention Bureau. The Vegetation Management Program designs, executes, and maintains vegetative fuel treatments in and around Paradise, Magalia, and Concow. A few examples of this type of work are the fuel mastication program executed around Pine Ridge School in Magalia, the fuel treatment between Magalia Reservoir and Coutolenc Road, and the fuel treatment around Paradise Irrigation District (PID) critical infrastructure [46]. Fuel treatments are further discussed in Section 13.2, Density of Vegetative and Structural Fuels.

Butte County also has an active Fire Safe Council (FSC) [47]. FSC activities include a Chipper Program, which offers a monthly service available to residents who are working on their wildfire safety clearance. The program provides an alternative to burning or hauling fire-hazardous brush and has been in operation for over fourteen years [48].

The above-mentioned hazard mitigation programs and actions reduced fire hazard in the Camp Fire-affected communities by promoting and enabling fuels reduction within and around the communities. They also helped the communities prepare for the fire event through education outreach and enhanced communications. The extensive vegetative fuels are possibly representative of an older intermix community that had not experienced fire in decades. This lifestyle of *living in the forest* is what attracted many residents to the

community [TD-025]. Additionally, the immediate community of Paradise has had limited recent fire history, further contributing to the pre-fire vegetative fuel loading.

## **6.2. Infrastructure**

Paradise Irrigation District (PID) [49] services the Town of Paradise, while Magalia and areas south of Paradise are serviced by the Del Oro Water Company [50]. Pre-fire preparations included maintaining all water storage tanks at full capacity, with additional water available in the supplying reservoirs. Additional details of the water systems and their response to the fire will be discussed in NIST Camp Fire Report #5.

To facilitate evacuation during power outages, the traffic lights at major intersections in the Town of Paradise were equipped with battery backups. There are four egress arteries to the south and one to the north of Paradise. Traffic flow through town and evacuation will also be discussed in NIST Camp Fire Report #4. The impact of vegetation clearance around primary egress arteries on burnovers is briefly discussed in Section 9.3 and will be further discussed in NIST Camp Fire Report #5.

The vast majority of electric utilities in Paradise were above ground. Power poles and power lines caused evacuation problems during the Camp Fire. Many poles burned and fell over; on others the cross bar burned through and caused power lines to fall. Some power lines partially fell and prevented or slowed traffic while others fell onto civilian vehicles and first responder apparatus. The impact of power pole failures on evacuation will be further discussed in NIST Camp Fire Report #4.

Pre-fire cell phone coverage in Paradise was available throughout town except for some unreliable coverage on Pentz Road south of Feather River Hospital and in the Pentz-Pearson Road intersection area. Good cell coverage in town significantly aided first responder operation and communication for civilian notification and during evacuation, although reception was intermittent depending on time and location during the Camp Fire. Notification and evacuation during the Camp Fire will be further discussed in NIST Camp Fire Report #4. Comments from local first responders and town officials did not reveal any pre-fire limited cell phone coverage in Magalia. The complex topography in and around Concow resulted in variable coverage in that area.

In terms of overall infrastructure preparedness in the communities affected by the Camp Fire, all tanks in the water system were topped off, traffic lights were ready for a power outage, and multiple egress arteries were available to move civilians out of town and enable first responder access. Power lines and vegetation fires around roadways were the two primary factors that impacted evacuation, which will be further discussed in the Camp Fire Report #4.

## **6.3. Firefighting Preparedness**

Pre-fire firefighting preparedness, including staffing in Paradise and Butte County and preparations and coordination with the Geographic Area Coordination Center (GACC) will be discussed in Report #5, as will regional fire activity and USFS staffing.

## 7. Data Collection and Analysis Methodologies

This section details the data collection and analysis methodologies that were used to integrate the various data sources and reconcile them in space and time in order to produce a unified timeline of the Camp Fire. The extent of the data collection is briefly described, followed by details of the data collection process, database construction, data integration and reconciliation, quality control procedures, and uncertainties in the data. Improvements and successes identified during the data collection and analysis are presented in Appendix E.

### 7.1. Data Collection

Data collection was accomplished in 11 field deployments, each averaging two weeks long, with two to six personnel on each deployment. Data collection focused on perishable data first [22, 24], including field data on damaged structures, Automatic Vehicle Locator (AVL) GPS time-stamped data, and dashboard camera video. Such data are only stored for finite time periods before being overwritten due to limited data storage.

Much of the data relies on direct first-hand observation accounts. A total of 151 technical discussions (TDs) with 157 individuals were conducted to collect accounts of first responders and other personnel directly involved in the event. In addition, photos and videos captured during the event provided detail and significant context to the observations.

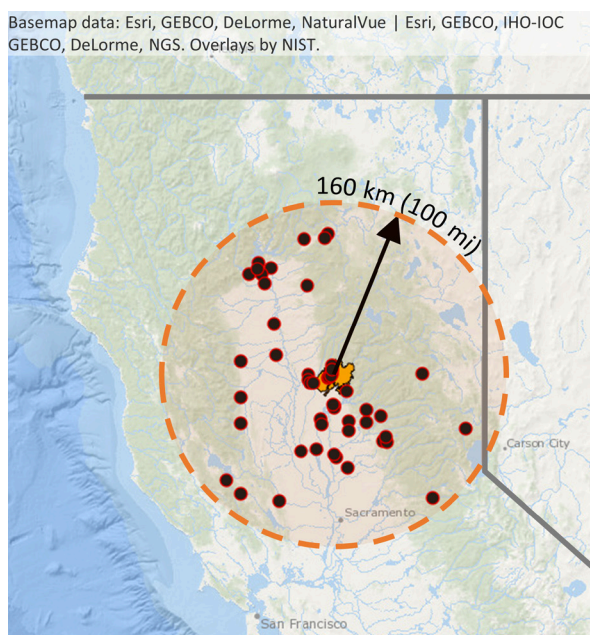
Technical discussions were conducted with the Incident Commander (IC), Division Supervisors and Branch Chiefs, and personnel on apparatus including air attack, engines, dozers, water tenders, and hand crews. Initial focus was on resources located in Butte County that were first on the scene. TDs expanded to include out-of-unit CAL FIRE personnel, the California Governor's Office of Emergency Services (Cal OES), and other mutual aid response such as the US Forest Service and local government engine strike teams. TDs with law enforcement (LE) organizations included the Paradise Police Department (PPD), Butte County Sheriff's Office (BCSO), and California Highway Patrol (CHP). Non-emergency personnel also participated, including infrastructure-related organizations in public works and transportation.

**Table 4** lists the number of TDs by the type of organization. A full listing of departments and agencies is found in the Acknowledgments section. Emergency personnel responded from all over the state; **Figure 11** shows the locations where TDs were conducted and/or the location of the participating departments. The circle marks a 160 km (100 mi) radius to show scale; however, TD participants were not limited to this radius.

**Table 4.** Distribution of TDs by organization type.

<b>Organization Type</b>	<b>TD Count<sup>a</sup></b>
<b>Fire Department (<i>n=100</i>)</b>	
Local	14
State	72
Federal	14
<b>Law Enforcement (<i>n=19</i>)</b>	
PPD	12
PPD Dispatch	3
BCSO	3
CHP	1
Emergency Medical Service	1
Town of Paradise	8
Water District	2
Transportation	13
National Weather Service	1
Resident	7
<b>TOTAL</b>	<b>151</b>

<sup>a</sup> In some cases, data was collected from more than one person during a TD.



**Figure 11.** Locations of TDs across northern California.

## 7.2. Resources Accounted for in First Responder Technical Discussions

A significant fraction of the state's firefighting resources in northern CA responded to the Camp Fire. Within the first hour of ignition, the IC placed one of the largest resource orders in California history, including 90 engines, 38 hand crews, and 24 dozers, on top of the initial dispatch. Field deployment constraints limited the number of first responders that could be contacted for this case study. However, the approach of reconstructing the event starting from the initial dispatch and focusing first on local responders helped prioritize data collection.

The information gathered from the TDs, with the help of AVL and radio log data, allowed estimation of the number of resources involved in the early stages of the incident. Based on the estimated number of resources tracked and the low number of unknown cross-references in the TD data, the collected data provided a representative coverage of the responding apparatus throughout the geographic area covered by the fire in the first 24 hours. Analysis of the response in terms of defensive actions will be further discussed in Report #5.

TDs were conducted with a large fraction of fire personnel who were on the scene early (before 10:00). TDs were conducted with the IC and all of the Division Supervisors and Branch Directors involved on November 8, along with at least one fire fighter from 60 % of CAL FIRE engines from the local Butte Unit (BTU) that were involved in the incident. Of the 100 TDs with fire department personnel (from any department), 86 unique apparatus were covered, including 3 strike team leaders who were responsible for the operations of the entire team of engines.

Two additional CAL FIRE engine strike teams (without AVL) were known to have arrived before 10:30, based on information in the radio log and technical discussions. AVL data from 6 additional CAL FIRE engine strike teams assigned to the fire line between 14:00 and 20:00 located these additional units in areas where other TD participants were working; therefore, significant changes to the timeline are not expected even if there had been an opportunity to include these engines in the study.

In addition to the apparatus previously mentioned, approximately 45 additional fire apparatus (including engines, dozers, water tenders, hand crews, and others) were identified as having been assigned to the incident before 11:00, based on AVL, radio log, and technical discussion details. According to the IC, 252 engines, 19 water tenders, 35 hand crews, and 17 dozers were deployed to the fire line by 20:30. Based on the information collected from the 151 TDs, the spatial distribution of TD participants in relation to the fire, and the small number of cross-references that could not be verified or followed up, it is expected that all significant fire progression activity is accounted for in the dataset, even as the day progressed and more apparatus arrived at the fire line.

In addition to the fire response, there was also a massive law enforcement and medical transport response. Dozens of agencies responded. TDs were carried out with 12 of the 21 PPD officers and three dispatchers, about half of the PPD personnel who were involved during the first day. Technical discussions with personnel from the Butte County Sheriff's Office and California Highway Patrol were focused on the broader picture of law

enforcement response, as opposed to detailed accounts of local observations. It is estimated that TDs with law enforcement represent between 10 % and 20 % of personnel on location and therefore do not represent all law enforcement activities. From the limited number of law enforcement TDs, it was determined that law enforcement was present in most, if not all, major intersections throughout the fire directing traffic from very early on. The fire behavior data collected from law enforcement TDs is included in the timeline data and maps; however, the identified locations of law enforcement officers do not capture all of the law enforcement personnel present.

### **7.3. Technical Discussion Methodology**

Technical discussions (TDs) with personnel involved in the fire were the primary method to collect firsthand information from the incident. This section describes the methodology employed to guide each TD. Every TD was unique not only because of the information shared but also because TDs were conducted with personnel with different roles and from different agencies, including fire, law enforcement, local government officials, and transportation and public works officials. Even in the case of two apparently similar sources, such as TDs with two Captains from two different fire engines, the data collected could be very different if one was involved in early civilian rescues while the other was on initial attack. TDs were held with personnel in the fire service ranging from the Geographic Area Coordination Center to fire apparatus personnel (Captains and/or Firefighters). Town employees ranged from Paradise Town Hall officials to Paradise Public Works personnel, and law enforcement included officials from several local and state agencies.

Each TD started with an introduction by the TD Lead. The TD Lead was either a NIST or USFS team member with field experience in NIST WUI case studies. The TD Lead outlined the scope of the Case Study and highlighted the non-regulatory role of NIST and the type of anticipated product. The previous three NIST WUI Case Studies [9-13] were used (hard copies were available during each TD) to familiarize the TD participant with the NIST WUI fire research program. A brochure was provided to the TD participant, and the key aspects of the NIST technical work were highlighted. The TD participant signed-in, and the information was stored by the NIST Principal Investigator (lead science researcher) to ensure safekeeping of personally identifiable information.

The workflow for the TD was explained to the Participant. They were asked to share with the NIST team their involvement during the event, with emphasis on fire and rescue/evacuation observations, actions they took, and contacts they made with other first responders during the event. The NIST Lead provided examples of tools that could be used to help build the timeline during the narration, such as pictures and videos or other time-stamped events (e.g., a text message) that might be used to refine the timeline of the narration. Emphasis was also given to contacts with other first responders, even if these interactions were brief. Examples of how this information might be used to refine the event timeline were provided to the TD participant.

If GPS tracking data was available (Automatic Vehicle Locator data is discussed in Section 7.4.4), the data was prepared in advance to facilitate access during the TD. GPS data was not used to lead the discussion but was available in the event the TD participant wanted



to clarify a sequencing question during their narration. **Table 5** lists, roughly in the order of accuracy, the tools used to define/refine the event(s) timeline for observations presented in technical discussions.

The NIST Lead assigned the participant a number, and the number was recorded along with their contact information.<sup>6</sup> The TD participant was told that only the TD numbers would appear in the NIST Case Study, and that they would be able to track their contributions by their TD number. TDs frequently took place around a large table so that large maps could be spread out as seen in **Figure 12**.

**Table 5.** Tools, “hooks,” and methods used to define/refine the event timeline during and after technical discussions.

Tool	Source	Primary Value Added
AVL	Electronic database or prepared route of travel summary	Timestamp, location
Pictures and/or videos	Participant	Usually timestamp and location, as well as visual context or audio
Radio communication	Radio log	Timestamp, context
Phone or Text Message	Participant	Timestamp
Meeting with other apparatus that has AVL	AVL (can be used even if TD for that apparatus is not available)	Timestamp, location
Participant’s notes taken during event	Participant (frequently from Battalion Chiefs, Division Supervisors and Branch Chiefs)	Possibly timestamp, additional details
Meeting with another first responder	Primary Database – used after the TD	Cross-reference
Unique visual observation <sup>a</sup>	Primary Database – used after the TD	Cross-reference

<sup>a</sup> e.g., traffic conditions, presence or absence of civilians, presence or absence of fire behavior, presence or absence of other first responders

Two printed ANSI E-size maps, with an area of 112 cm × 86 cm (34 in × 44 in), were used for each TD.<sup>7</sup> One map included the entire Camp Fire perimeter and one zoomed in on Paradise. The map files were created by CAL FIRE and included all the Damage Inspection information color-coded by status of structures (destroyed, damaged, and undamaged). The participant TD number was marked on both maps.

<sup>6</sup> The number was marked on the cover of the NIST WUI Brochure provided to TD Participants.

<sup>7</sup> A new set of E-size maps was used for each TD.

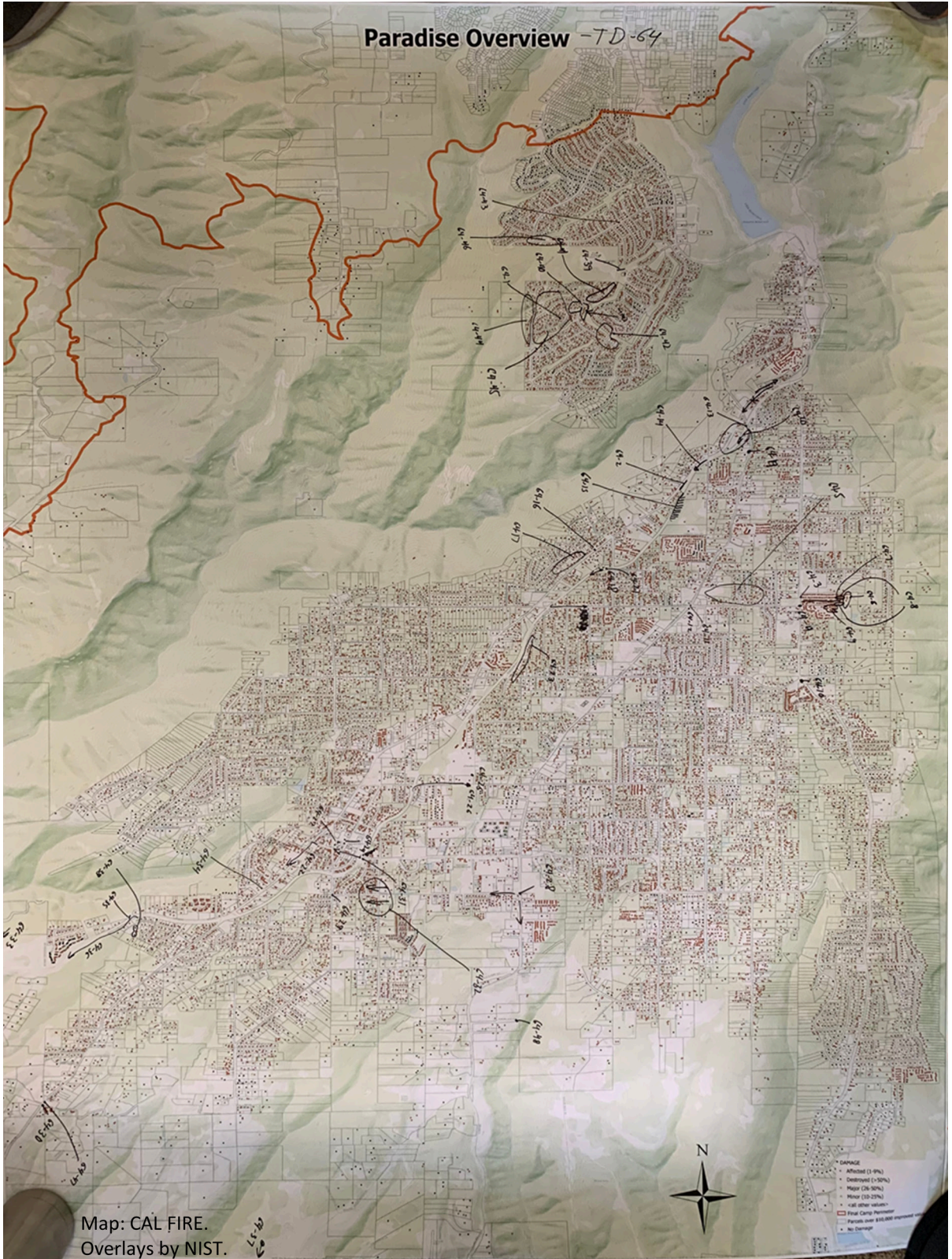
The TD participant started the narration of the day's event and the NIST Lead annotated the maps. **Figure 13** shows an annotated map from TD-064. Sequential numbering (e.g., for TD-064 the map is annotated with *64-1, 64-2, etc.*) was used to link the map and scribed accounts. Two scribes from the NIST Field Team captured the information shared by the TD participant (TDs were not audio or video recorded). The maps and TD notes were later used to assemble the TD timeline in the Primary Database (see Section 7.4.1). The session continued until the participant had completed his or her narration of their perspective and contribution to the event. The accounts, contributions, and perspectives differed among TDs, and therefore any clarification or follow-up questions that might be asked were not standardized. Questions might also arise based on the accumulated knowledge from prior TDs to determine if certain information needed clarification. If the TD participant had pictures or videos they wished to share, file sharing was set up.<sup>8</sup>

The NIST Lead then asked if there were any general comments, including lessons learned, that the participant might wish to share about the entire event. The comments were documented by the NIST Field Team. At the end of the field data collection, after all the TDs were completed, all of these comments were assembled, sorted, and analyzed (see Section 12).



**Figure 12.** NIST Field Team with CAL FIRE personnel at Fire Station 35 in Paradise.

<sup>8</sup> There were numerous ways to share photos and videos, and they were often hardware/operating system specific.



**Figure 13.** Annotated Paradise Overview Map from TD-064.

## 7.4. Database and Tools

Database construction and reconciliation were facilitated by several different data sources and cross-referencing methods. Multiple databases were developed to organize the data; the main framework built on the content of the technical discussions is labeled here as the Primary Database. Other timeline-related data were tabulated by adapting the primary database. To facilitate data refinement, integration, timing, and positioning, various other tools and data were also utilized.

### 7.4.1. Primary Database

The primary database was built from the contents of the technical discussions. Each observation was binned into the following categories:

- a. *Fire and fire behavior*  
Fire observations ranged from basic statements of fire burning at a particular location to detailed accounts of observed fire behavior, such as ignitions, fuels detail, fire spread rates and pathways, ember showers, fire whirls, and other fire phenomena.
- b. *No fire*  
In some cases, a lack of fire was also an important observation. Examples include neighboring structures that were not yet burning, unburned islands, or the fire flanks.
- c. *Evacuation/people*  
The evacuation/people category was particularly wide-ranging. To support further analysis, each entry was coded by the following categories: evacuation, rescue, or emergency notification; traffic conditions; whether a roadway was blocked or otherwise impassable; and description of a temporary refuge area (TRA). These observations will be further detailed in Report #4.
- d. *Defensive actions*  
In the context of this case study, defensive actions were defined as any action taken to reduce or influence the fire behavior. Structure preparation, fuel reduction or relocation, fire attack or suppression, exposure protection, and dozer or hand lines were all considered defensive actions. These actions will be further detailed in Report #5.
- e. *Weather*  
Observations of wind speed or direction and visibility were placed in the weather category.

In addition to the observations itself, other attributes included information about time, location, and cross-referencing information. **Table 6** lists and describes each of the columns included in the database. Many are intuitive; however, a few will be highlighted here.

Keeping track of time and location was the basis of the dataset, thus the time and location source were noted within a hierarchy. Location was specifically listed in two forms: the location of the observer and the location of the observation. In many cases these were the same; however, if a structure was burning or fire was visible across a ravine or down the street from the position of the observer, the specific location of the observation superseded the location of the person.

Fire behavior observations were also supplemented with additional metadata, including a classification of the type of fire, whether the observation described residual fire conditions, and whether structure-to-structure fire spread was observed. Fire observations were categorized into five types:

- Spot fire (S): described as a spot fire or other small isolated fire not burning structures
- Vegetation (V): specifically described as burning vegetation or burning wildland areas
- Residential structure (R): residential structure was burning (other fuels might also be burning on a parcel)
- Commercial structure (C): commercial structure was burning (other fuels might also be burning on a parcel)
- Other (O): category for undetermined or general statements of fire, or specific indication of other fuels such as sheds, vehicles, or fences.

Residual fire conditions were considered to apply if the observation was of reduced fire activity after passage of the fire front, such as lightly flaming structural rubble or isolated heavy fuels burning among already burned finer fuels with no significant threat to continued fire spread, or completely burned areas with no flaming observed.

Defensive actions influenced the final status of structures and were critical to provide context and explanation of surviving structures. Each structure that was identified as having been defended at some point was logged in the database into one of three categories. The most confidence was placed in structures that were “confirmed defended,” meaning that the TD participant specifically described or identified a particular structure, or that there was photographic record of such actions taking place. A structure was listed in the “assumed defended” category if defensive actions were specified without a specific address or photographs showed unspecific firefighting activity in an area. In these cases, AVL (if available) and/or Damage Inspection (DINS) data [30] were consulted to identify the structure. The third category was defined as “inferred.” This classification was reserved for cases where defensive actions likely took place based on AVL or radio data, or photos showed signs of probable action, but there was no direct record of such actions. Report #5 will further discuss the defensive actions and damaged structures.

Additional comments provided by TD participants that were descriptive of general observations without specific times and locations, challenges, successes, recommendations, or lessons learned were tabulated separately. These comments are summarized and discussed in Section 12.

**Table 6.** Primary database attributes and definitions.

<b>Time Information</b>	
<b>Column Title</b>	<b>Definition</b>
TD#	Technical discussion identification number
Date	Date of observation
Time: start   end	Time that an observation occurred, or a time period during which the observation could have occurred
Time Source	How the time of observation was determined
Observation Window (min)	Duration of the observation, or time window in which the observation occurred (End time – Start time)
<b>Observation Information</b>	
<b>Column Title</b>	<b>Definition</b>
Notes	Full description of the observation
Information Source	Where the information came from
Notes/Map #	Bookmark or tag number from the TD map annotation to identify location on the map and in the notes
<b>Location Information</b>	
<b>Column Title</b>	<b>Definition</b>
Observer: Latitude   Longitude	Where the observer was physically located
Observer Source	How the location of the observer was determined
Observation: Latitude   Longitude	True location of the observation
Observation Source	How the location of the observation was determined
Map: Latitude   Longitude	The final record of where an observation is located. If different, the observation location supersedes the observer location.
Area/Line Location	Check box: does the location of the observation describe a large area or line/path
Description	Description of the area or line location of the observation
<b>Cross-Reference Information</b>	
<b>Column Title</b>	<b>Definition</b>
Accompanied by	List of other apparatus or people that were mentioned or known to be in the same location that could be used as cross-references
Verified Cross Reference	List of TD# that cross-reference the same observation
Related TD	List of TD# that have related observations but have not been specifically cross-referenced

**(Table 6 cont.)**

<b>Categorized Observation Details</b>	
<b>Column Title</b>	<b>Definition</b>
Fire Behavior Observations	Details of fire observations; from the Notes column
<i>Type of Fire (S/V/R/C/O)</i>	Letter code categorization of the type of fire observation (spot, vegetation, residential structure, commercial structure, or other)
<i>Residual Fire?</i>	Check box: does the observation describe fire activity that is lingering after fuels have burned?
<i>Documented Structure to Structure Ignition</i>	Check box: does this observation specifically describe structure-to-structure fire spread
No Fire Observations	Details of comments related to areas where there is no fire observed at the time; from the Notes column
Evacuation/People Observations	Details of observations relating to civilian evacuations, rescues, temporary refuge areas, emergency notification, traffic; from the Notes column
<i>Road Blocked</i>	Check box: does this observation describe a roadway being blocked and impassable, by fire, vehicles, power lines or poles?
<i>Traffic Conditions</i>	Check box: does this observation describe traffic conditions?
<i>Evacuation/ Rescue/ Notification</i>	Check box: does this observation describe emergency notification, evacuation (excluding traffic), or a rescue attempt?
<i>TRA</i>	Check box: does this observation describe or relate to a temporary refuge area?
Defense Actions	Details of observations describing actions taken to protect, defend, or suppress structures or unburned areas
<i>Water / Hydrants</i>	Check box: does this observation describe the use, or attempt to use, a fire hydrant or other water source
Weather Observation	Details of observations related to weather, most commonly wind and visibility
Key statements	Includes any other non-categorized observation or comment that contributes to understanding of the incident, conditions, response, or critical situation
<b>Defended Structure Details</b>	
<b>Column Title</b>	<b>Definition</b>
Defended (Address Confirmed)	Address of structure that was specifically identified in the TD as being defended in some way
Defended (Address Assumed)	Address of structure that was defended, was only generally identified in the TD, and was confirmed using other data sources as being the specific structure
Inferred Defended (stop not specific in TD)	Address of structure that was possibly defended, as determined by AVL, radio log, but had no specific record or comment of TD comment
Defended Structure Latitude   Longitude	Location of identified structure

### 7.4.2. Additional Databases

Additional timeline-related data from audio-visual sources were entered into supplemental databases according to the data source. These data included photos and videos shared by the TD participants, dashboard/body camera video recordings from PPD, 911 call recordings, and publicly available photos and videos from the internet. Each audio-visual file could be interpreted as an independent TD, and multiple observations were often documented from a single photo or video. All observation details remained the same as those presented in Section 7.4.1 above, with the exception of another suitable identifier (e.g., filename) replacing the TD#.

A large amount of information was available online through public social media sites, including YouTube and Twitter. Civilians who took photos or videos during the Camp Fire and shared them online provided valuable supplementary firsthand observations. Additionally, several documentary programs have been produced using videos from inside the Camp Fire. Numerous news agencies also published videos and photos during their coverage of the event.

These media were searched to identify additional observations; these were referred to as “virtual” technical discussions (VTD). This effort was made possible by significant cross-referencing to previously known information in the primary database and familiarization with the event and geography of the area. While dozens of videos and photos were available, most did not provide enough context to reliably identify time and/or location. A total of 30 VTDs were documented, incorporating observations from 36 photos and videos.

### 7.4.3. Other Data Sources

Numerous additional data sources, listed in **Table 7**, were utilized as tools to facilitate data refinement and timeline reconstruction. While these sources did not provide direct observations (aside from the VTD and PPD videos previously mentioned), they provide additional information for identifying locations and clarification/confirmation of other data.



**Table 7.** Other data sources and tools that provided location, time, or other supporting information.

<b>Data Type</b>	<b>Data Source</b>
CAL FIRE DINS data	CAL FIRE
CAL FIRE radio log	CAL FIRE
CAL FIRE AVL	CAL FIRE
911 call recordings	CAL FIRE, PPD
PPD dashboard/body camera recordings	PPD
Butte County property parcel information	Butte County; <a href="http://gis.buttecounty.net/Public/index.html?viewer=dssearch">http://gis.buttecounty.net/Public/index.html?viewer=dssearch</a>
Butte County post fire drone imagery	<a href="https://www.arcgis.com/home/webmap/viewer.html?useExisting=1&amp;layers=eaed23c1b7154091896c572b6bc9b6fd">https://www.arcgis.com/home/webmap/viewer.html?useExisting=1&amp;layers=eaed23c1b7154091896c572b6bc9b6fd</a>
Google Earth (satellite imagery, mapping tools)	Google
Google Maps (map, Street View images)	<a href="https://www.google.com/maps">https://www.google.com/maps</a>
Bing Maps (map, Streetside images)	<a href="https://www.bing.com/maps">https://www.bing.com/maps</a>
YouTube videos	Various public videos uploaded to <a href="https://www.youtube.com">https://www.youtube.com</a>
News media	Various newspapers and television clips accessed online
Social media (e.g., Facebook and Twitter)	Various public posts on social media discovered by searching for Camp Fire related content
NIST-collected damaged structure field data	NIST Preliminary Reconnaissance

#### 7.4.4. AVL and AVL Data-Mining Tools

Automatic Vehicle Location (AVL) data provided a critical dataset and tool for developing the timeline. At the time of the Camp Fire, a large number of CAL FIRE apparatus were equipped with the technology.<sup>9</sup> During the first 48 hours of the incident, over 725 000 data points describe the location of 261 unique apparatus, including fire chief vehicles, engines, crew transports, dozers and transports, and aircraft.

TDs were conducted with personnel from 44 apparatus equipped with AVL. During data entry, three types of AVL discontinuities were encountered. They included:

1. A nearly system-wide loss of data recording from 11:35 to 11:50 on November 8.
2. Individual dropouts of several minutes (possibly due to reduction in connectivity related to location).
3. No data recordings when the system (vehicle) was turned off.

<sup>9</sup> CAL FIRE is in the process of implementing AVL in state-owned apparatus. Local and federal fire apparatus as well as law enforcement were not equipped with AVL, or data was not available.

Of the three discontinuities, the first one was particularly notable. The dropout affected over 50 % of all active apparatus, including over 66 % of apparatus located within the Paradise town limits. It was unclear what caused the dropout, although it may have been related to localized fire and smoke column conditions under the plume, or to an interruption in cell tower communications equipment or frequency.

In addition to geolocating the data points on a map and using this data to directly identify time and location of observations from TDs with AVL, a few tools were developed to facilitate searching through the AVL data. These calculation tools allowed the identification of nearby apparatus and determinations of when two specific apparatus crossed paths, how close an apparatus was to a particular location, and the arrival time of apparatus at a particular location. These search tools allowed for various queries of the data depending on the known information in each situation.

## 7.5. Data Integration

### 7.5.1. Data Integration Methodology

The data integration process utilized all the available data to refine actions and observations in both time and space. Data entry was performed in a sequence with decreasing spatiotemporal information as follows:

1. TD with AVL
2. PPD video, audio
3. TD with photos but no AVL
4. TD with no photos and no AVL
5. VTD

Technical discussions accompanied by AVL records contained the most complete information, providing direct time and location of each observation. These were added to the database first in order to provide a sound initial timeline of the events during the fire. PPD videos were reviewed next, as these recordings also provided direct time and location information (through visual identification). They were also accompanied by radio communications that could be heard through most of the videos.

Technical discussions with photos but no AVL were evaluated third. The photos provided discrete points in the narrative that anchored time and location. The rest of the observations in these TDs relied on participant-provided times and locations or other cross-references to fit between the anchor points.

The TDs without photos or AVL relied on the participant-provided times and locations and on the accumulated knowledge of the researcher to identify cross-reference “hooks” to information and events previously entered in the database or available through the tools listed in **Table 7**. Examples of these known events included face-to-face meetings or unique observations (specific evacuation action, traffic activity, fire behavior or defensive action) which could narrow down the potential time window or identify a specific location.

Additionally, the “accompanied by” column, described in **Table 6** helped to keep track of other mentions of specific apparatus/personnel. TDs without accompanying AVL or photos were held for last so that the prior TDs could be leveraged to supplement the details provided by the TD participant.

Virtual TDs typically did not include readily defined times or locations. These attributes had to be deduced by using “hooks” to known information. For example, driving past an engine with AVL could provide time and location, enabling the use of all observations within the same continuous video.

All the above data was used to refine and integrate the details of events described in the technical discussions and improve the timeline and spatial resolution. The process was iterative, with a specific event first entered into the database with often limited details, and then built upon as additional details supplemented the initial data.

### 7.5.2. Examples of Data Integration

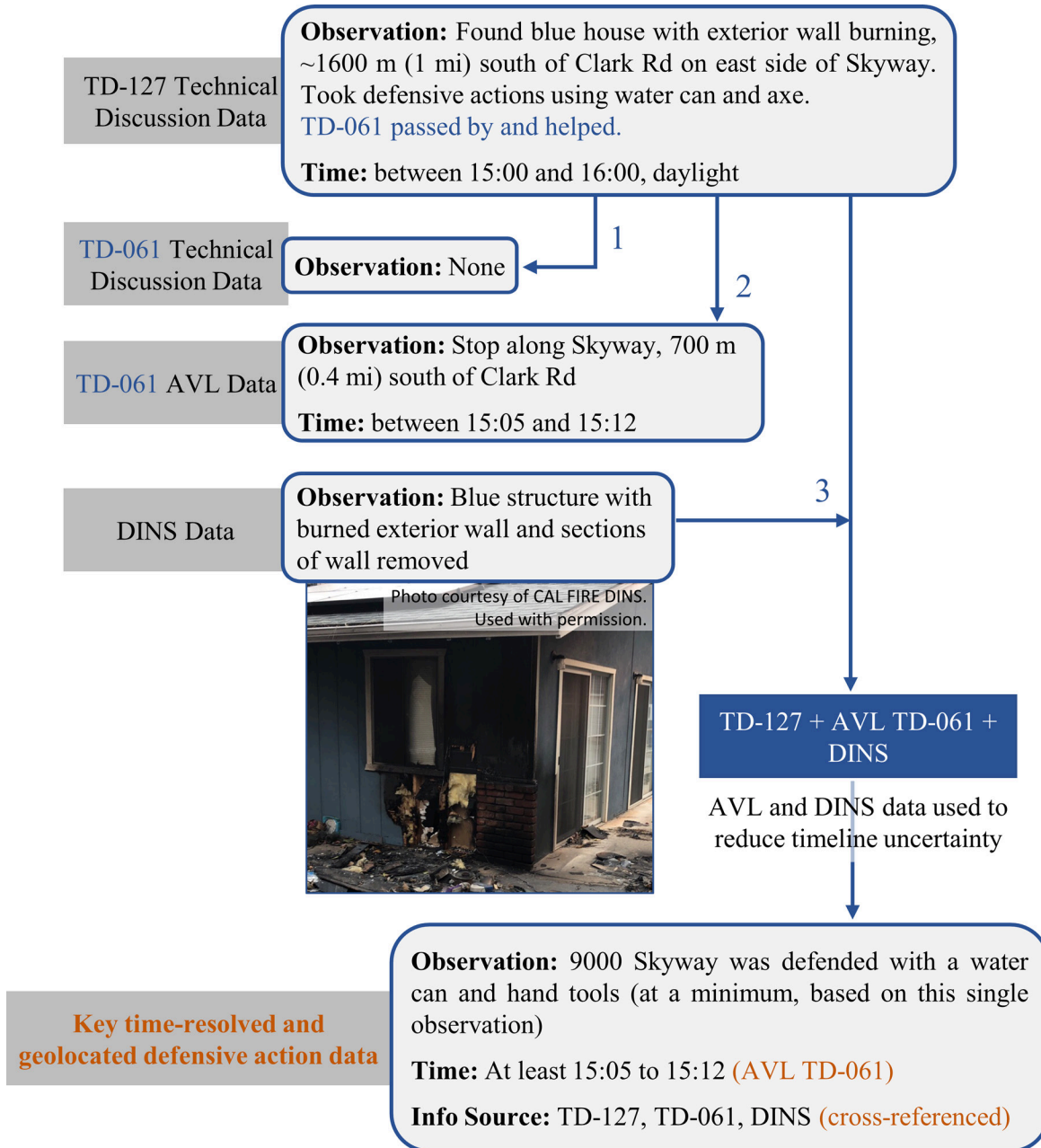
In the primary database, AVL was used to fill-in the driving directions/sequence when assembling a TD. For the TDs that did not have AVL, estimates of drive time were used when necessary to refine the TD timeline.

**Figure 14** illustrates a specific example of data integration. In this case, TD-127 reported taking defensive actions on an unspecified residential structure, with the assistance of TD-061, while it was still daylight, estimated between 15:00 and 16:00. While TD-061 did not mention this action (#1), the AVL was used to place TD-061 at a structure near the location described by TD-127 (#2). Additional data from the DINS database confirmed the structure by matching the color and damage of the structure described by TD-127 (#3). The combination of TD, AVL, and DINS data sources refined the initial observation of a non-specific location and time to a valuable account of a defended and saved structure while also providing context and support for the individual timelines of each TD account.

**Figure 15** shows a photo of an unidentified engine taken by a TD participant. Multiple engines were in the area at the same time, and several TDs reported fire damage to apparatus, so confirmation of the engine was not possible. However, the photo was later matched to an engine seen in a *60 Minutes* television program about the Camp Fire, confirming the information in the original photo.

Another example of data integration and refinement is shown in **Figure 16**. TD-106 described encountering a fire whirl when they were driving south on Neal Road at an unspecified time in the afternoon. The time was originally estimated to be sometime between 17:30 and 18:30 using additional cross references with other TDs. However, TD-106 also mentioned that a news crew was present and recorded the event. **Figure 16** shows an image of a fire whirl that was captured on video by news reporter Laura Anthony, KGO-TV. Its location was determined to be on Neal Road by comparing to Google Street View images. The earliest possible time of the observation was identified by a Twitter post by Ms. Anthony at 17:53. Follow-up with Ms. Anthony further refined the time of the observation to 17:18.

The data integration methodology enabled the creation of a database of time-resolved series of events that can be queried both in time and space.



**Figure 14.** A flowchart illustrating an example of data integration and the method of cross-referencing multiple data sources for TD refinement.



**Figure 15.** a) An unidentified engine in a photograph from TD-041 matches scorch marks on E2390 seen in b) an interview on *60 Minutes*.



**Figure 16.** TD-106 described a fire whirl as they were driving south on Neal Rd and mentioned that a news crew recorded the event. News reporter Laura Anthony/KGO-TV captured a video of the event at 17:18, and the location was confirmed using [Google Street View](#) imagery.

**Table 8** is an example of the type of data that was extracted at the completion of the data integration and documentation effort. The table includes a time summary of the events on Clark Road, one of the four primary egress arteries from Paradise. The road was temporarily closed due to fire exposures during the Camp Fire evacuations. Events are listed in the order of time when they occurred, with the column “Source” listing the primary source of data. The yellow highlighted cells represent data relevant to traffic control actions by first responders and red highlighted cells represent road closures due to fire activity. Traffic and evacuation data will be analyzed in NIST Camp Fire Report #4 and the defensive actions will be analyzed in NIST Camp Fire Report #5.

**Table 8.** Excerpt of preliminary data along Clark Rd (yellow=traffic direction actions by first responders, red=road closure due to fire activity).

Time	Event <sup>a</sup>
08:45	Clark Rd at Wagstaff Rd is gridlocked.
08:53	Clark Rd is fouled up along the entire length.
08:59	Clark Rd south of Pearson Rd is normal traffic.
08:59	Traffic at Clark Rd and Pearson Rd is directed by PPD.
09:03	Clark Rd southbound is bumper-to-bumper Pearson Rd to Wagstaff Rd.
09:09	Clark Rd at Wagstaff Rd is completely blocked.
09:13	Clark Rd and Wagstaff Rd is gridlocked.
09:19	Clark Rd and Wagstaff Rd: people are beginning to drive southbound in northbound lanes.
09:23	Clark Rd and Bille Rd is complete gridlock.
09:25	Clark Rd and Skyway is jammed – traffic is driving down the bike path.
09:31	Clark Rd is completely packed. All lanes are southbound at Nunneley Rd.
09:34	There is need for additional traffic direction at Pearson Rd and Clark Rd. Get all lanes southbound.
09:47	Clark Rd and Wagstaff Rd is still total gridlock.
09:55	There is heavy traffic southbound on Clark Rd south of the airport.
10:02	Fire is burning the west side of Clark Rd at American Way.
10:06	Traffic is backed up, 5 lanes southbound on Clark Rd.
10:15	Clark Rd south of Pearson Rd is one lane southbound, bumper-to-bumper the whole way from Durham-Pentz Rd.
10:18	Need to detour Buschmann Rd over to Skyway; no more traffic southbound on Clark Rd [due to fire].
10:25	Gridlock is freed at Clark Rd and Wagstaff Rd and traffic is flowing all lanes southbound.
10:27	Clark Rd southbound is closed.
10:32	There is no traffic southbound on Clark Rd beyond Buschmann Rd.
10:46	First responders are reopening one lane on Clark Rd for southbound.
10:51	Repeat: one lane is open southbound on Clark Rd.
10:56	Traffic is locked up at Elliott Rd and Clark Rd.
11:00	Trying to get all lanes southbound at Elliott Rd.
11:12	Firefighters are turning around southbound vehicles on Clark Rd at American Way due to fire.
11:18	Clark Rd northbound at Skyway is blocked.
11:22	There is no traffic on Clark Rd between Elliott Rd and Bille Rd.
11:23	Most traffic on Clark Rd has made it south of Nunneley Rd.
11:30	Arriving engines must stop and wait for fire to clear Clark Rd, at Airport Rd and at American Way.
11:32	Fire is burning really close to Clark Rd. Need to divert vehicles on Buschmann Rd north and south on Foster Rd to clear backup.
11:33	Skyway at Bille Rd is jammed and backed up on Bille Rd. Vehicles are being turned around back toward Clark Rd.

Time	Event <sup>a</sup>
11:35	Civilians begin abandoning vehicles at Skyway and Clark Rd.
11:36	There is no traffic at Clark Rd and Elliott Rd.
11:42	A steady stream of cars (one by one) is heading southbound on Clark Rd at Central Park Dr.
11:44	Fire officials are about to start sending vehicles trapped at Bille Rd/Pentz Rd into Kmart parking lot TRA.
11:45	No vehicles are travelling on Clark Rd at Wagstaff Rd.
11:53	Clark Rd south of Buschmann Rd is clearly engulfed in flames.
11:57	Intense fire cuts off Clark Rd at Fire Station 35. Powerlines are falling.
12:26	Clark Rd is passable from Pearson Rd to the south past the airport.
12:26	Reroute Pearson Rd traffic back down Clark Rd.
12:26	Heavy fire at Central Park Dr and Clark Rd.
12:28	Zero visibility at Clark Rd and Pearson Rd.
13:45	Clark Rd is clear of traffic.
15:40	All traffic has cleared out. There are no cars on Pearson Rd or Clark Rd or Skyway.

<sup>a</sup> Observations related to evacuation and traffic have not yet been quality controlled or cross-referenced as have been the fire observations detailed in this report. They are provided as-is and are subject to revision.

This type of data enables the reconstruction of the event in terms of fire progression, evacuation (traffic/gridlock information, burnovers, Temporary Refuge Areas (TRAs)), and defensive actions.

### 7.5.3. Quality Control

Technical discussion notes and maps were entered into the Primary Database in chronological sequence, along with the location of each observation. This was accomplished by keeping track of time, including reported actions or meetings with other first responders and accounting for drive times as needed. All available data sources were used to cross-reference with other actions and observations in time and in space. This was achieved by searching the database for key words or through visual analysis of mapped data to identify related data points.

The database captured the information collected during TDs and from other sources. In several cases, the data from the TD offered only a fraction of the event because of spatial situational awareness during the event. Because of this, data integration required an in-depth understanding of the incident to allow consistent and repeatable utilization of the data. An example is provided to illustrate this. Data collected from PPD video on Pentz Road indicated that there was “no access to Pearson Road” at a specific time without making any mention of the reason. Additional information in the database confirmed that intense fire was burning on Pearson Road at that same time. These separate pieces of information, when used together, provided a clearer picture of the events that took place at that location and time.

The quality control methodology was aimed at capturing spatial and temporal errors. The visualization of the data enabled the identification of spatial errors. An example is provided

in Section 7.5.4, Potential TD Errors. The TDs were checked for continuity in location and time using geographic information systems (GIS). Spatial discontinuities were identified and resolved by mapping each data point. The data was then animated in GIS based on the time of observation and visualized sequentially. The animation of the data enabled temporal quality control on the data. As an example, TD-034 reported “fire approaching the area” near Bushman at 11:00 ± 15 min. Based on the timeline visualization TD-065 reported fire in the same area at 10:45. The GIS animation was used to identify the discontinuity and the TD-034 time was adjusted to 10:45, which fell within its original time window.

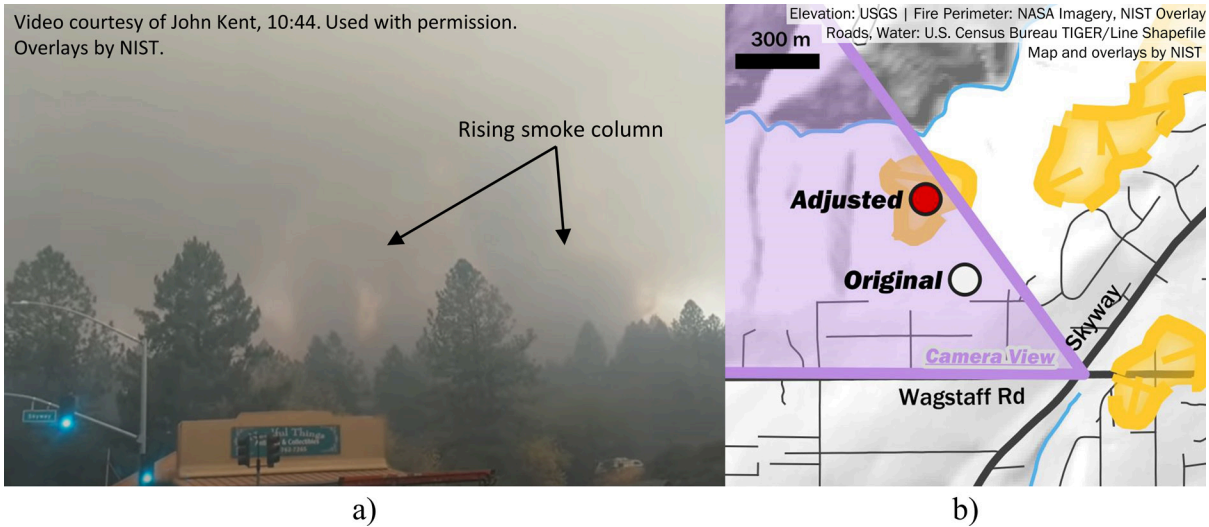
Quality control also included the cross referencing of TD information with other data sources to confirm the event location, time, or both. An example is provided here to illustrate the methodology. During TD-207, the first responder described a defensive action on a structure on Joplin Court in Magalia where the “deck had caught fire.” This was captured in the TD map as 207-24; however, the precise structure out of the three structures circled was not known. **Figure 17** shows a zoomed-in portion of the annotated map from TD-207. The DINS data, including a photo of the damaged structure, was used to confirm the TD-207 statement and identify the structure with the burned deck.



**Figure 17.** Cross-referencing TD and DINS data; a) section of TD-207 map indicating a defended structure marked as 207-24 b) DINS image confirming the identification of the described structure.

Two examples illustrate the use of satellite imagery. A virtual TD (VTD) video source observed a distinct smoke column rising from the canyon beyond some trees. The original point was assigned an estimated location based on the video. The video was taken at the same time as a multispectral image of the fire was taken by the Landsat satellite, highlighting the active fire perimeter [51]. Cross-referencing with the Landsat imagery adjusted the location of the original point estimated from the video by 300 m to correspond with the Landsat-observed spot fire (**Figure 18**). In a second case, the Landsat perimeter was compared to video observation on Skyway at the southwest head of the fire. In this case, the Landsat perimeter was within 60 m (200 ft) of the video-recorded direct observation of the fire. A broader comparison of the Landsat perimeter and the collected data can be seen in **Map 6**, which includes all data points between 10:00 and 11:00, including the Landsat observation at 10:45.





**Figure 18.** An example of cross-referencing: a) video data shows a rising smoke column. b) Landsat data used in the quality control process identified an adjustment of 300 m to the original placement of the spot fire observation.

#### 7.5.4. Potential TD Errors

There are four different types of errors that could occur during TDs as well during the data transfer process into the primary database: temporal, spatial, narration transcription, and coordinate transcription errors.

##### *Temporal Errors*

These errors occurred when a TD participant confused the sequencing of events. The tools identified in **Table 5** were used during and after the TD to help identify a number of these errors. There were cases, however, where there were no usable “time hooks” to anchor the TD, and large time windows represented several observations or actions that could not be further pinpointed in time. In these cases, the observation time was assigned the entire time window in which it could have occurred.

##### *Spatial Errors*

Misplaced information on the TD maps could result from marking the wrong place (by the TD Lead), from misreading the map (by TD participants), or from getting the location of the event wrong (by TD participants). The documentation and descriptions within the TD were used to identify and rectify this type of error. However, there were cases where there was only a single observer of an event/action at a specific location, meaning that errors might be introduced that could not be tracked and rectified. The tracking and cross-referencing of events during database assembly was intended specifically to reduce the occurrence of these potential errors.

Another potential spatial error source resulted from the difficulty of precisely estimating spot fire areas while in the field. This problem was confounded when rapidly burning fires moved through light fuels. The following example illustrates this. A spot fire that began in the field

at Merrill Road and Pentz Road was reported by two different first responders at 08:16 and 08:21. The first observation described a one-acre fire, and the second report, five minutes later, was of a half-acre fire. While estimate uncertainty was a possible explanation, it was also possible that the flaming area or its visibility decreased over the span of five minutes, with the result that the fire appeared to be smaller at the later time. More information would be required to reconcile these two statements. The same issue was a problem for larger spot fires seen from a distance.

#### *Narration Transcription Errors*

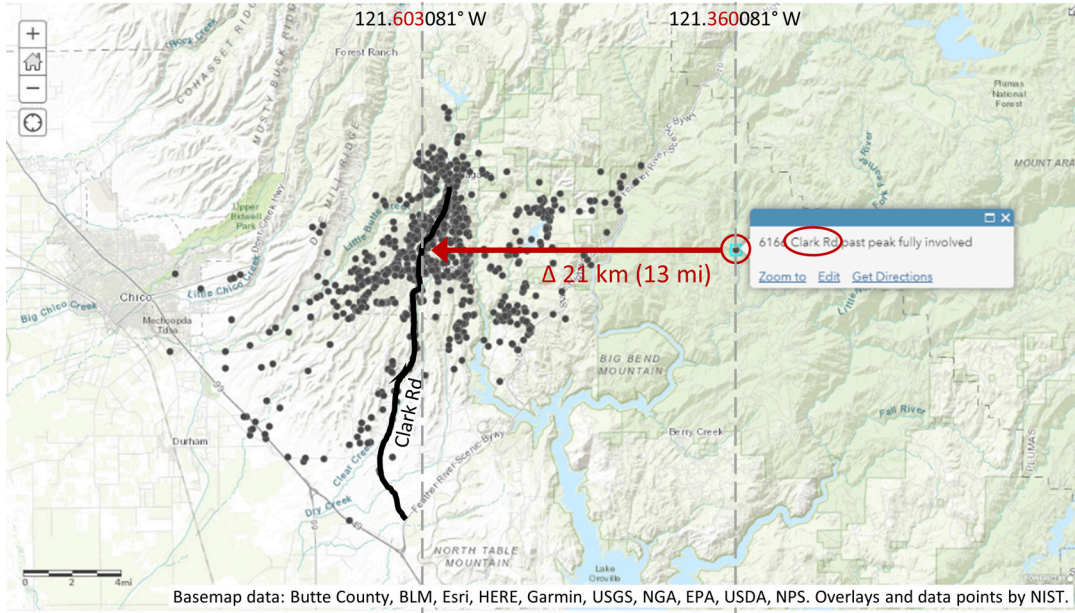
Narration transcription errors were a possibility. This issue was addressed by having more than one experienced scribe taking notes during the TDs. Data collection for the previous NIST studies had identified that three is the optimal number of TD scribes. While several TDs were conducted with two scribes, it also should be noted that one scribe was insufficient to capture all the information provided by TD participants. An experienced scribe who had also participated in the field reconnaissance and data collection activities had a better awareness of the locations and could capture TD information more reliably than a person who was unfamiliar with the locations and streets described during the TD.

#### *Coordinate Transcription Errors*

The data documented on the E-size maps was transcribed into the primary database. Geolocation tools, including Google Earth, Google Maps, Bing Maps, and ArcGIS Online, were used to get the coordinates for the identified point.<sup>10</sup> A number of these tools permitted a seamless “cut-and-paste” of the coordinates while some required manual input, which could result in transcription errors. The visual data integration as part of the Quality Control process could identify this type of error. **Figure 19** illustrates a transcription error identified during the quality control process. The erroneous point location was identified as an outlier on the map and the associated note indicated the data point corresponded to 6166 Clark Road in Paradise, 21 km (13 mi) to the west. The arrow illustrates the transcription error in longitude, in this case 121.360°W was initially recorded instead of 121.603°W.

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<sup>10</sup> Certain commercial entities, equipment, or materials may be identified in this document in order to describe an experimental procedure or concept adequately. Such identification is not intended to imply recommendation or endorsement by the National Institute of Standards and Technology, nor is it intended to imply that the entities, materials, or equipment are necessarily the best available for the purpose.



**Figure 19.** Example of a longitude coordinate transcription error identified during the quality control process.

### 7.5.5. Spatiotemporal Uncertainties

There is a range of spatial and temporal uncertainties within the data. AVL and geolocated/time-stamped images<sup>11</sup> provided very precise statements about the event. Although many images may be geotagged by cameras or cell phones, care was needed to ensure that an accurate location was recorded, especially in difficult terrain and smoky conditions. All photos used in this study were individually re-geotagged to precise locations based on the contents of the photos. Some photos provided from the TD participants were not geotagged and were not descriptive enough to deduce the location; information from such photos was not captured in the datasets.

Radio log data could also be very precise; however, sometimes statements by Division Supervisors and other ICS personnel were more general in nature. Defensive actions conveyed to the NIST data collection team by Division Supervisors and Strike Team Leaders (STLs) were often longer or shorter than what was reported.<sup>12</sup> Cross referencing of these defensive actions was used when available to further refine the temporal component of the statement.

TDs without AVL or accompanying photos had the widest range of temporal and spatial uncertainties of all the data collected. By utilizing the methodology described in Section 7.5.1, the TD observations could be refined in space and time.

<sup>11</sup> All images were from cell phones or body/dashboard cameras with accurate times. A few images were copies with altered time and date and were adjusted if possible, otherwise they were not included in the dataset.

<sup>12</sup> This is because the Division Supervisors and STLs frequently travelled between resources and surrounding areas to maintain situational awareness.

**Table 9** lists the range of uncertainties that were expected within the different data types. Overall, Type B evaluation of uncertainties [52] was implemented based on scientific judgment, review of visual data, and the recording intervals of timestamped data. Further discussion about the variable uncertainties related to TD observations follows.

**Table 9.** Uncertainty ranges of various data sources.

Data Source	Data Attributes	Temporal Uncertainty	Spatial Uncertainty
Picture/video	Geolocated Timestamped	±1 min	±5 m
AVL position	Geolocated Timestamped	±1 min	±10 m
Radio log (fire or PPD)	Variable location Timestamped	±1 min – Variable	±0 m – Variable
Picture/video	Geolocated No timestamp	±1 min – Variable	±5 m
TD observation	Location estimated Time estimated	Variable	Variable
TD Inferred time	Time estimated	Variable	n/a
DINS Post Fire Damage Pictures	Geolocated	n/a <sup>a</sup>	Linked to structure
NIST Post-fire Pictures	Geolocated Timestamped	n/a	±5 m
Drone and Satellite Imagery	Geolocated	n/a	±(1 m to 100 m) <sup>b</sup>

<sup>a</sup> Data without temporal information (such as DINS, drone, and NIST post fire images) were used as supplemental information to cross-reference and confirm events in time.

<sup>b</sup> For a limited area on the west edge of fire east of Chico, there was an imagery “stitching” offset.

#### 7.5.5.1. Temporal uncertainty of all observations

The observations with a temporal window fell into two distinct categories. They either encompassed a general action, such as “we were parked here for two hours and during that time defended these five structures,” or they described a more specific action such as “we defended this one house for two hours.” In the first case, the different structures were defended sometime within the time window without specification of individual duration or sequence, whereas in the second case the action took place over the entirety of the duration.

Large temporal windows were common for locations where the density of first responders was low. This was typical in low population density areas or wildland areas that were not critical to evacuation, life safety, or the containment of the fire. One example was a statement from the heel of the fire, near Pulga, where fire jumped onto the east side of Highway 70. The collected data placed the event between 12:35 and 23:30. The large window was associated with the limited available data. In this case there were a limited number of firefighters in the area and limited anchor points to narrow down the event time window. The 11 hour time window was an outlier in the dataset; typical time windows and uncertainties are provided in **Table 9** and Section 7.6, Data Summary Statistics.

The time of a photo without a timestamp was often determined by the content of the photo. The content could set the photo at a specific time, such as with AVL positioning of a visible apparatus, or could be set within a time window of possibility. Therefore, these data sources had variable time uncertainties.

Another source of temporal uncertainty was associated with defensive actions performed by residents who stayed behind and defended their property. Specific actions have not been systematically collected from the public in this study; instead, information about civilian structure defense was determined through TDs and VTDs in which such actions were observed. Therefore, to address this temporal issue, generalized defensive actions by civilians (e.g. “a resident defended this property”) were listed with a time window extending all day unless more specific details were known to narrow down the time of the action. While not time-resolved, the location and action were known; the fact that a structure was defended provided critical information to understanding structure survival.

Some times were noted as “inferred” times. While this indicated that a time was not stated or identified for a particular observation, there was data supporting the time window. For example, an observation or sequence of events might be provided in a TD or VTD without a specific time. By identifying cross-references, time windows could be determined for these other observations. Another example was the refinement of a time window by approximating travel time between two known locations. These inferred times may have uncertainties similar to AVL times or videos, which were very precise, or may span larger time windows like some TD-provided time estimates.

#### **7.5.5.2. Geolocation uncertainty of fire observations**

TDs provided information on operations, fire behavior, and the presence of fire. Fire observations included information on spot fires, building fires, vegetation fires, and fire line extent and location. The information was provided verbally during the TD, and the TD map was annotated as described in Section 7.3. TD statements about evacuation, notification, and traffic will be further discussed in NIST Camp Fire Report #4. TD statements about defensive actions will be further discussed in NIST Camp Fire Report #5.

TD statements on fire observations and their associated TD map locations were associated with a broad range of spatial uncertainties determined by a combination of data cross-referencing and engineering judgment, as described below.

##### *Spot Fires*

Spot fires fell into two categories: spot fires in developed areas and spot fires in the wildlands. Spot fires sometimes involved auxiliary structures such as fences or sheds and could also include vegetation. In town, streets and other landmarks were typically used to locate the spot fire, and frequently there was more than one observation. Early on during the incident (before 10:00 on November 8), spot fire information from first responders was frequently also reported by civilians via 911 calls before or during their evacuation. Spot fires in town were estimated to be within 15 m to 45 m (50 ft to 150 ft) of their actual location. For the wildland spot fires, the spatial uncertainty was estimated at 0.1 km to 0.5 km (0.06 mi to 0.3 mi). The observations of spot fires in limited access locations were

associated with increased uncertainties, as were the size estimates for spot fires. An example was provided in **Figure 18** in Section 7.5.3, demonstrating the use of different data sources to reduce the spatial uncertainty of a spot fire in wildland fuels.

### *Structure Fires*

Structure fires included both residential and commercial structures. These two categories are further subdivided in the timeline fire progression maps in Section 10. Building fires, like spot fires in town, were typically very precisely geolocated. When commercial buildings were involved, there was little ambiguity about the exact building. When residential buildings were involved, there was sometimes uncertainty about the precise building on a cul-de-sac or block of a street. Multiple tools were used to identify the specific building; in the majority of cases this was accomplished successfully. An example of this was shown in **Figure 17** in Section 7.5.3. The estimated spatial uncertainty for structure fires ranged from 0 m to 45 m (0 ft to 150 ft).

### *Vegetation Fires*

Vegetation fires encompassed specific statements about fire activity in ornamental or wildland vegetation and specifically did not include any burning of structures (auxiliary, residential or commercial). Like spot fires, vegetation fires fell into two categories: fires in developed areas and fires in the wildlands. In the wildlands, this category described the fire location. In developed areas, observations were categorized as vegetation fires only if the description was specifically limited to vegetative fuels. Spatial uncertainties for vegetation fires were similar to those for spot fires. In developed areas, the spatial uncertainty range was estimated to be within 15 m to 45 m (50 ft to 150 ft) of their actual location. For wildland vegetation fires, the spatial uncertainty was estimated to be 0.1 km to 0.5 km (0.06 mi to 0.3 mi).

### *Other Fires*

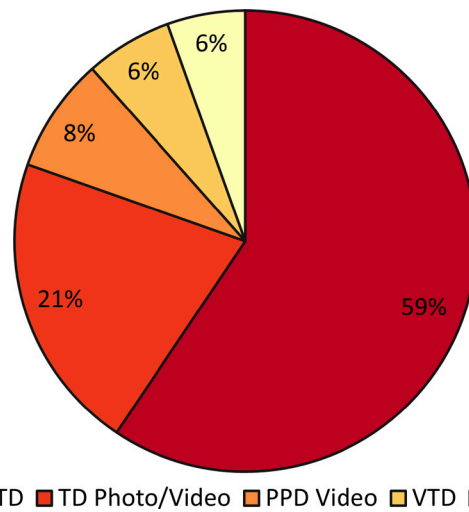
Fires included in this category encompassed fire activity that was not explicitly listed as spot fire, vegetation fire or building fire (commercial or residential). These included statements like “Fire reached the east side of Clark between Pearson and Elliott,” or “there is fire behind the Ace Hardware.” A range of spatial uncertainties was associated with these fire observations. In this category, there was no distinct difference between “in town” and “in the wildlands”. If the observation was described as occurring across a spatial range, the location used was the geographic center of the observation area. The annotated TD maps were used along with other data sources to refine the location if possible. Spatial uncertainty for other fires was estimated to be 0.1 km to 0.5 km (0.06 mi to 0.3 mi).

## **7.6. Data Summary Statistics**

As described in the sections above, multiple databases were developed for different sources of data. Sources included TDs, of which nominally one-third were supplemented with photos/videos, VTDs from civilian videos and other news sources, dashboard camera recordings from the Paradise Police Department, and 911 call recordings. Combined, these sources yielded 2260 fire observation data points. Thousands of additional observations

related to evacuation/emergency notification and defensive actions will be detailed in subsequent reports.

The distribution of data sources is shown in **Figure 20**. Technical discussions comprise a majority of the database, contributing 59 % of all fire observations. Accompanying photos and videos from TD participants yielded 21 % of the data, plus 8 % of fire observations from PPD video recording. Contributing 6 % of the observations each, 911 calls and VTDs proved tremendously valuable. The 911 calls that were included in this case study were all made before 09:30 and described the early stages of the fire. VTDs provided additional information from a civilian perspective, sometimes providing information from locations otherwise not covered by other data sources, or by providing supplementary information and context to first responder observations.

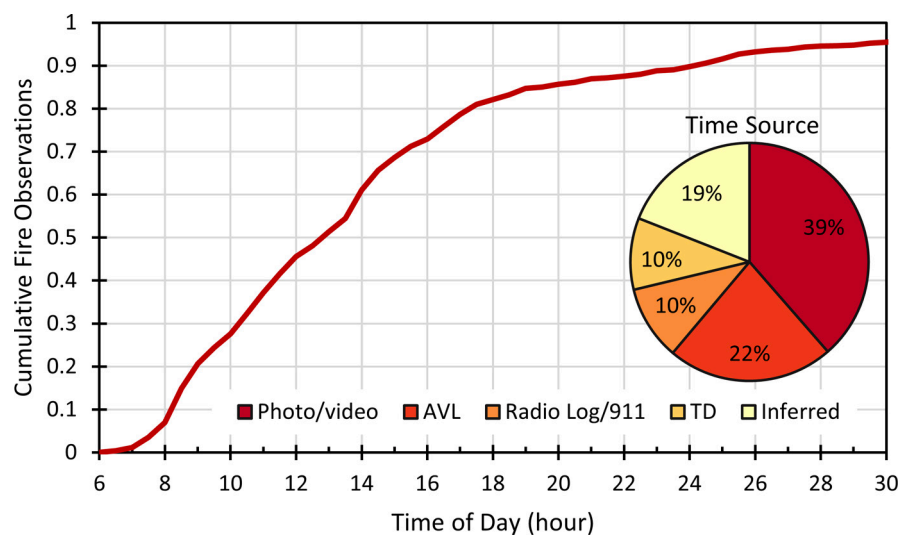


**Figure 20.** Distribution of fire observation data sources.

**Figure 21** plots the cumulative fraction of fire observations as a function of time of day (hours greater than 24 indicate time on November 9, e.g., 25 is 01:00). This plot indicates how quickly fire overtook the town, with over 80 % of recorded fire observations occurring before 18:00, within the first 12 hours of the incident. Steeper portions of the line indicate more frequent observations, notably from 08:00 to 09:00 and from 13:30 to 14:30. The earlier window, 08:00 to 09:00, is characterized by a rapid increase in fire activity and a large number of resources (i.e., TD participants) arriving to the scene. The afternoon increase can be attributed to fire activity along Clark Road and northern Skyway. After a relative lull from 18:00 to 24:00, another smaller increase is seen from 24:00 to 26:00 (00:00 to 02:00 on November 9) as fire activity increased in Magalia.

**Figure 21** also illustrates the distribution of time sources for each observation. Note that 71 % of observations were placed in time using cross-referenced timestamps, including photos or videos, AVL, radio log transcriptions, or 911 calls. The inferred times were usually also well-defined in time and were often similarly linked to cross-referenced times.

Time resolution of the observations was very precise. Sixty-three percent of the observations were known within a zero- or one-minute observation window. This does not necessarily indicate that a majority of the observations were instantaneous; the observations often related to conditions that existed before and/or after the particular observation. Eighty percent of the observations were bounded within a 30-minute period.



**Figure 21.** Cumulative fraction of fire observations as a function of time (hours greater than 24:00 correspond to November 9) and distribution of time source for fire observations.



## 8. Incident Commander Overview for November 8, 2018

An incident timeline from the perspective of the Incident Commander (IC) is presented in **Table 10**. The summary contains the transcribed notes from the technical discussion with the Camp Fire IC, in which he described the first 18 hours after ignition. The bulk of observations were made between ignition at 06:30 and 09:00, illustrating the rapid development of the fire. Beyond this time period, the scope of the incident expanded dramatically. Rows are shaded gray and white to visually separate each hour. *Italics* are explanations of specific points/events and *italics in blue* are additional key events related to evacuation that were determined during the fire timeline reconstruction. The table contains the original transcription of the TD, including thoughts of the IC and snippets of radio communications, to provide a brief introduction to the incident timeline, which will be described in further detail in the following sections. The notes also provide insight to the situational awareness challenges presented to the IC.

**Table 10. Incident Commander Technical Discussion.**

<b>IC Technical Discussion</b>	
06:31	First dispatch by/under power lines, dispatch B2118, P2121, T2107, E2176, E2161, E2167, E2186, E2182, E2162, Company 67, WT37, WT67, TD2140, TD2142, BFC2, BFC3. These were all sent up to NOPS.
06:44	First engine confirms fire off Camp Creek Road, 35 mi/h sustained wind.
06:44	ECC places request for 15 additional engines, 4 dozers, 2 water tenders, and 4 strike teams of hand crews.
06:45	Received call at home. BC informed me of the incident. Cool morning 40 °F. Fire appears on Flea Mountain camera.
06:54	E2161 request a mandatory evacuation order for Pulga and stage resources at Scooters.
06:55	ECC called BCSO and requested Mandatory Evacuation order for Pulga.
07:02	Duty Chief calls. IC send him to Concow.
07:10	Duty Chief calls back, reports flames visible from Hwy 149.
07:14	B2118 assumes IC.
07:21	Camp IC – “Pulga has been evacuated. If you could make notifications, request representative to Scooters. Have the Sheriff respond to Camelot area for evacuations.”
07:22	Camp IC – “Request evacuation warning for the Concow area – working on exact area and warning/order.”
07:22	ECC called BCSO requesting mandatory evacuation warning for Concow Immediately.
07:26	Camp IC – “shut down Hwy 70 and standby for resource order. Close Hwy 70 from Pentz to Belden.”
07:30	Requests to early up all aircraft - Paradise burning not being considered at that time.
07:32	EVAC warning Pentz Rd west side.
07:33	Resource order for an additional 15 engine strike teams, 15 hand crew strike teams, 10 dozer strike teams, with appropriate overhead.
07:40	T2107 needs 5 engine strike teams on Hoffman Rd can’t get ahold of Camp IC – request relay info.
07:44	ECC takes call at 1900 Drayer Dr/Pentz Rd reporting fire on the Paradise side of canyon – reporting 3 spots.
07:45	At ICP develop incident objectives, box it in: North of Hwy 70, east of Pentz, then west of Pulga and south of Empire Creek. Before objectives are announced on the radio, there are spot fires reported outside the box.
07:44	IC change over to new IC – <i>for remainder of first day.</i>
07:45	Camp IC – “We are extending the mandatory evac zone to east of Pentz Rd 3, 8, 14 and everything east of Pentz Rd and everything north of Hwy 70.”
07:46	ECC calls BCSO requesting the above Evacuation Warning. Not thinking spot fires is a crazy issue, spot fires are normal.

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### IC Technical Discussion

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- 07:50 T2107 relaying 10 to 15 large spots on the backside of Sawmill Peak Jordan Hill Rd area currently. *Consider putting Pentz zones in evacuation warning.*
- 07:52 AA210: “Off Chico [Airport] showing about 1000 ac. Request a total of 6 tankers, 1 lead plane, 6 Type 1 helicopters. [Personnel] en route to Oroville Airport to setup Oroville Helibase. Have all rotary wing aircraft report to Oroville Airport.”
- 08:01 Camp Air Attack (AA) via radio: “The fire is now in Paradise. You are going to have significant structure threat issues. About 2000 ac along Pentz Rd. Dangerous to Critical ROS” - *well into Paradise Zones 2, 7 and Morgan Ridge.*  
Information on fire spread is coming in from 911 calls. Traditional information from fire fighters is broken because they are saving lives.
- 08:01 D2102 -CAMP IC going to evacuate orders – expand to Zone 2, 7, 13, Morgan Ridge. Everything west of that will be an evacuation warning.
- 08:02 ECC calls BCSO Immediate Mandatory Evacuations for all of Paradise.
- 08:02 Go into rescue mode.
- 08:07 60 civilians sheltered in creek and field, burn injuries, medivac request made.  
Think Skyway could be line, don’t give up fire control when evacs are done plan B is suppression.
- 08:15 FF report of new 10 ac fire in Paradise on Merrill Road, homes burning, wildfire response and 10 engines requested. Kids getting dropped off at Paradise Elementary School – *FFs did not realize at the time that this was the Camp Fire.*
- 08:15 Contacted Paradise CAL FIRE Chief and said: “evacuate the whole town.” Chief replied, “you will break the system.”
- 08:15 Camp IC – “ready to copy resource request...30 strike teams of engines, any type, immediate need, 10 strike teams of dozers, 10 strike teams of crews, 5 Dozer Bosses. That’s on top of what’s already been ordered.”
- 08:16 Mandatory evacuations ordered (on the radio) for Zones 3, 2, 7, 8, 13, 14, Morgan Ridge, and Lower Pentz.  
Main fire is still in Concow but not aware how fast and widespread spot fires were.  
ECC called Town PD and instructed them to “evacuate the whole town.” ECC calls Sheriff, Sheriff calls his dispatch and informs of evacuation – *this was not the exact order from IC, but the town initiated a full evacuation to be conservative.*  
IC not getting much info, call volume ~200 calls/hour.
- 08:21 Multiple spot fires off Shay Ln and June Way area multiple structures threatened E82 assisting with evacuations.
- 08:25 Fire is at the Feather River Hospital, need to evacuate hospital, people are in surgery. Few resources in the area, coordinate air evacuation (helicopters are flying to move patients) with fire in the area.  
*~08:30–10:00 First evacuation convoy of buses up to Paradise.*
- 08:40 IC told LE to start contraflow all roads, except Clark and Neal, told engines responding that driving uphill to not push civilians off the road to go north, let evacuation happen, concede the town is burning – *maintaining two way traffic was difficult.*
- 08:42 Camp IC changes staging at Spring Valley School – *improving staging and communications. Stayed in Spring Valley School briefly before moving to Butte College.*
- 08:45 Camp AA – Information: fire progressed approx. halfway through Paradise. Picking up spot fires halfway through Paradise and spot fires in the community in Old Magalia with a threat to the lower end of Paradise Pines. Suggest also consider evacuation warnings in the Butte Creek Canyon area; it should be impacted in the next few hours. Clark Rd is currently a Warning. Do you recommend an Order. Camp AA suggest everything west of Steiffer Rd an Order - *Decide to go all rescue, town is lost.*
- 08:45 Camp IC (calls): orders no firefighting, all life safety and evacuation protection “save lives, keep evacuation moving.”
- 08:49 Camp IC advises ECC new Evacuation Orders from Steiffer Rd to town limits. Evacuation Zones 2, 1, 4, 5, 5, 12, 11. Put Evac Warning Butte Creek Canyon/Centerville. BCSO is advised of the plan this is for PPD.
- 08:49 BCSO Officer radioed in the above Evacuation orders(s) on their frequency to their dispatch.
- 08:51 ECC calls PPD and advises them of the above Evacuation.
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### IC Technical Discussion

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08:53 Branch II advises IC that Pentz Rd is a parking lot. We cannot get engines up and down we need to get PPD in here or to start working on safe refuge zones. At the very least get one lane open for fire.

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09:00-10:00 Reports begin coming in about evacuation routes being blocked, traffic is now a big issue, civilians with luggage etc. leaving vehicles even if not in immediate need. Vehicles blocking roads impacting evaluation and rescues.

09:14 E8332 lets ECC know fire is established in the Butte Creek Canyon while responding to Paradise—probably approximate to Pearson Rd. (Butte Creek Canyon was under Evacuation Warning since 08:49) — *first time IC hears about this spot fire.*

~09:30 Power and gas disabled before this time.

~09:30-10:00 Realize the intersection in Chico is jammed.

09:33 Camp IC —“... there is a handful of people trapped in the basement of FRH. Copy, right now the Hospital is secure. Actually, the safest place to be right now. Relay to PPD that we need to start sheltering people in place at the Hospital if we can to try evacuate clogging the road. We need to keep people in place the fire has moved past the hospital right now so it’s the safest place.”

09:40 Camp AA: 6000 ac, dangerous to critical rate of spread.

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*10:00 First Convoy back to Butte College [TD-057, TD-059, TD-046].*

*10:00 Second Convoy up to Paradise.*

10:00-11:00 Calls of walking people, jammed roads. Hearing officer traffic of trapped officers, 12 LE helicopters on the scene.

~10:00 ordered 50 ambulances and 10 medivac helicopters by phone.

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11:21 About 1000 cars stuck up town due to stalled and abandoned vehicles. Rounding people up and setting up multiple TRAs up.

11:30 Water pressure issues start being reported.

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12:00 Did not know how many structures were burned, just that there were a lot, maybe ~1000.

12:00-14:00 cell phone call to engage in critical infrastructure fires.

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13:00 No water.

*13:21 Third Convoy preparing to send BCSO and one small B-Line convoy with USFS engine escort up Clark Rd — Convoy turned around because of fire blocking Clark Rd [TD-046, TD-054].*

*13:30 Second Convoy back to Butte College [TD-059].*

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14:49 Fourth Convoy up Clark to Paradise with BCSO buses [Radio log, IC].

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~15:38 Fifth Convoy B-Line buses with Dozer and Engine escort up Skyway to Paradise and Magalia [B-Line, IC].

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16:06 Establish division for Butte Creek Canyon with 15 engines.

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17:00-18:00 Wind pattern picked up again, wind shifts from N to E.

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18:50 Fire reaches Hwy 99.

Resources on way to ICP on Durham Pentz put out fire off the highway before checking in.

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19:43 Fire reaches Stilson Canyon.

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20:27 Fire reaches Hwy 149.

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~21:00 Estimated 83 000 ac.

21:08 Division in Butte Creek is overrun, 2 civilian fatalities, (*civilians*) fought with fire fighters — refusing to evacuate.

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23:23 Fire activity begins increasing at Coutolenc Rd, Magalia Reservoir, then impacts Magalia structures.

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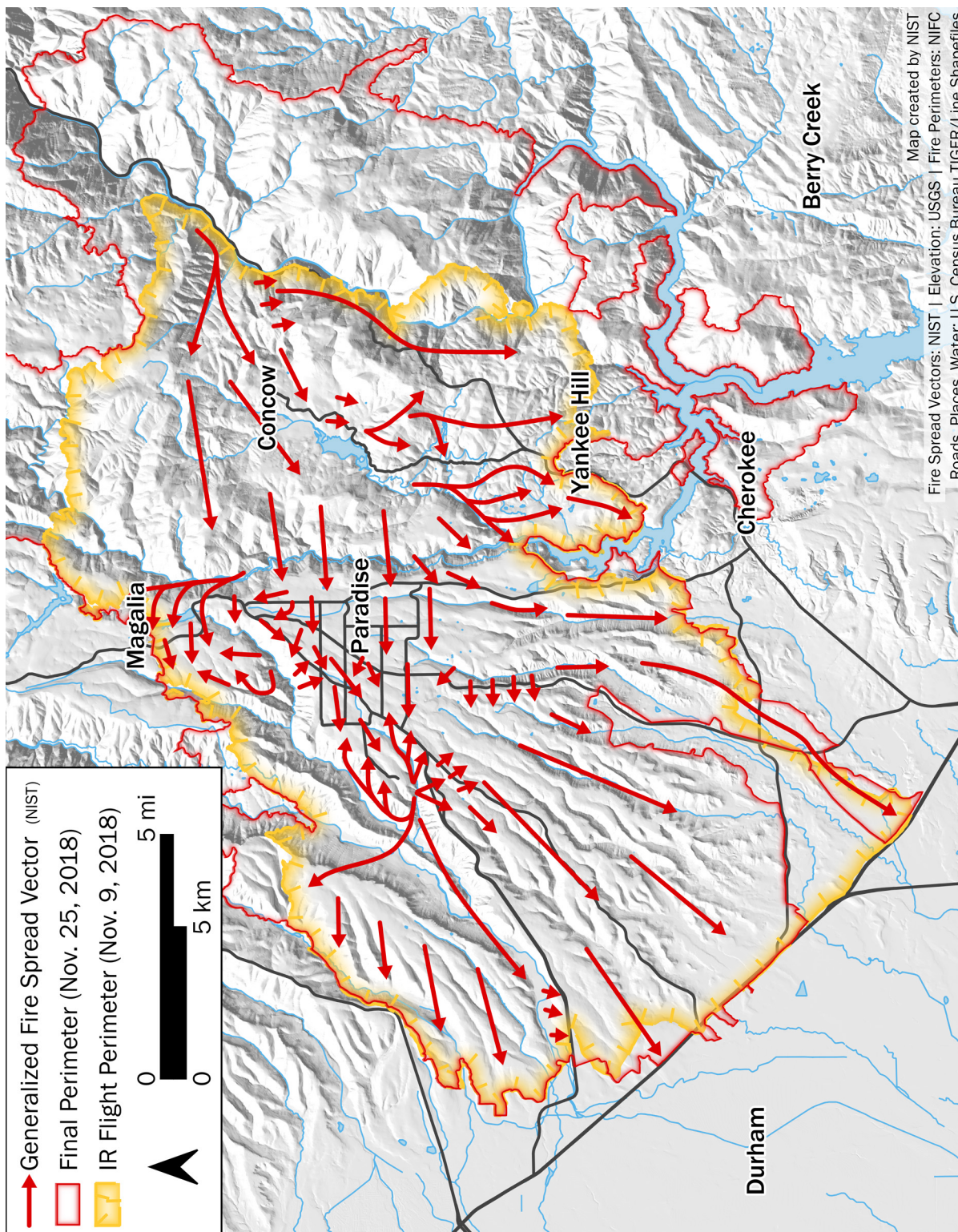
The information provided by the Camp Fire IC highlights the rapid development of the event and the need for having access to real-time situational awareness and fire location information. There is potentially a readily available data source of early fire spread information, namely early 911 reports. If this information could be geolocated and made available to the IC in real-time in a readily accessible format that could be displayed in an engine's or vehicle's mobile data system, this information would enhance the early situation assessment of the incident.

## 9. Fire Timeline Reconstruction

A detailed summary of the reconstructed timeline and discussion of additional fire behavior findings are presented in this section. A progression map shown in **Figure 22** presents a summary of the fire spread data over the first 24 hours of the Camp Fire. The final perimeter is indicated by the red outline. The extent of fire progression on the evening of November 9 is indicated by the yellow outline. While 12 hours beyond the extent of the data presented in this report, the evening perimeter on November 9 provides context to the outlying areas of the fire perimeter which burned over the course of the following two weeks. Arrows indicate primary spread directions identified from the fire observation data as the fire progressed from the origin northeast of Concow. Additional details, including the time and sequence of the fire spread, are provided in the following sections and tables, and detailed annotated fire progression maps are presented in Section 10.

Fire spread data collected and represented in this report were restricted by the number of first responder TDs (and VTDs) as well as the location of those individuals throughout the incident. TDs were not conducted with all fire personnel on scene, and fire spread data were not available for every location within the perimeter. However, the data collection process resulted in only a few major key events that were described by a single TD; most were cross-referenced and further supported by the collective dataset. Therefore, it is believed that the extent of the data collected is representative of the overall fire progression through the first 24 hours.

Additional findings include numerous times when fire burned over civilians and/or firefighters and when evacuation routes were blocked due to fire conditions. These events are presented in Section 9.3. The impact of winds, fuels, and terrain on fire behavior is discussed in Section 9.4. Comments about ground-level smoke and reduced visibility caused by the fire are offered in Section 9.5.



**Figure 22.** Generalized fire spread vector map indicating the direction of fire progression from the origin northeast of Concow.

## 9.1. Fire Progression

Fire progression data is presented in three layers of detail. Due to the fire's large geographic area and multiple concurrent events, the data are divided into 15 geographic focus regions. A detailed summary of fire progression for each of the 15 regions is presented in this section. An abridged incident-wide summary can be found in Section 16.3 of the Summarized Technical Findings. Finally, all 2260 fire observations are listed in Appendix F.

The geographic focus areas are identified in **Figure 23**. They are presented in a semi-chronological order based on the time of day that significant fire occurred within each region; however, many of the observations were concurrent. In the sections detailing each focus region, fire activity is summarized and accompanied by a timeline table (Table 11 to Table 32). The data displayed in the Fire Progression Timeline tables are aimed at providing an overview of the event, using data excerpted and condensed from the full dataset.

**Map 1**, Camp Fire Points of Interest, labels roads and locations frequently referenced in this report. **Map 1** also includes each geographic focus area. Maps illustrating the fire progression timeline are presented in Section 10 and include all the collected data points.

Toward the east, Section 9.1.1 covers the area for Concow, including the ignitions near Pulga. In Paradise, Pentz Road from Old Magalia to Kunkle Reservoir is presented in Section 9.1.2, which is further divided into five subsections. Feather River Hospital is described separately from its location on Pentz Road, is described in Section 9.1.3.

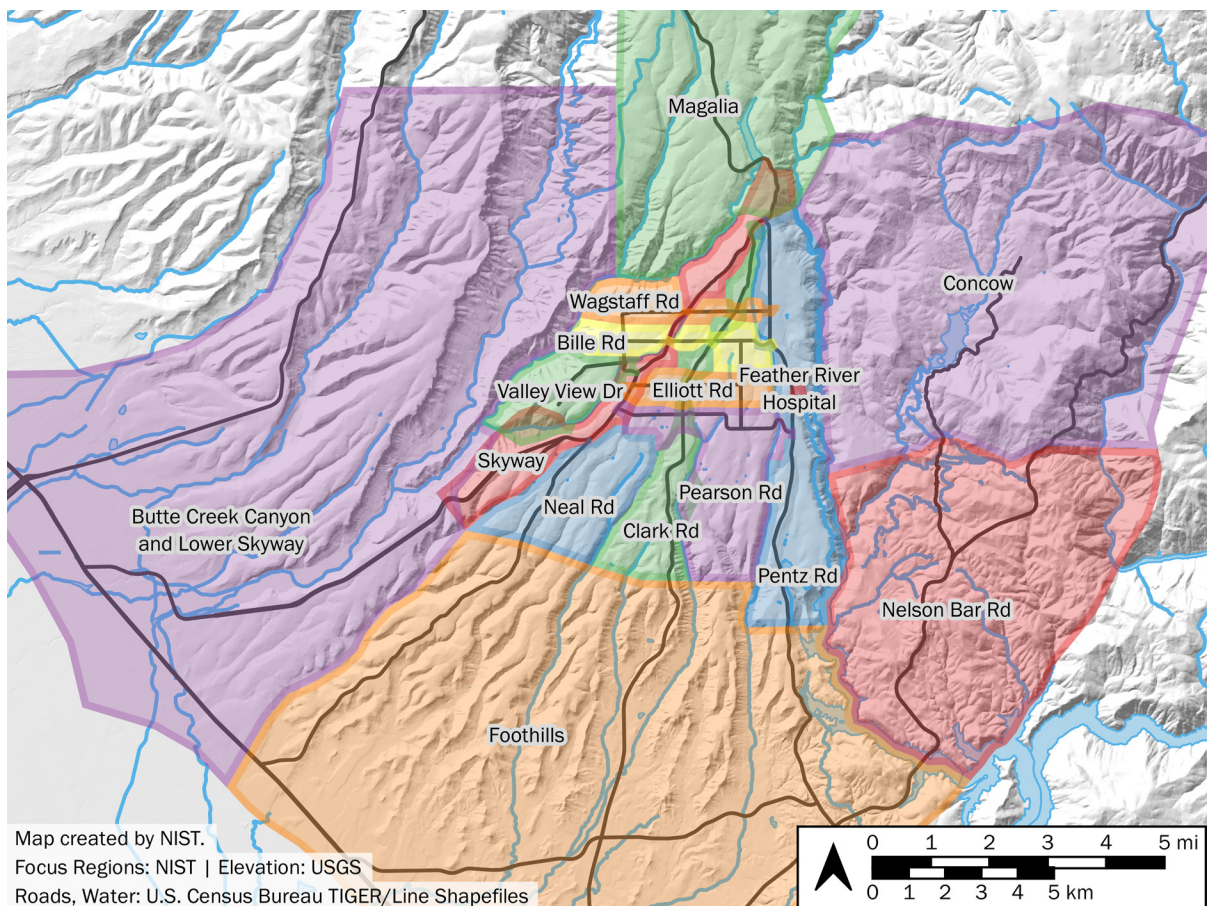
There are four Sections associated with the east-west traffic arteries in Paradise; Wagstaff Road (Section 9.1.4), Bille Road (Section 9.1.5), Elliot Road, also including Nunneley Road (Section 9.1.6), and Pearson Road (Section 9.1.7). Three subsections divide Clark Road between Skyway and Airport Road in Section 9.1.8. Skyway (Section 9.1.9) was also divided into multiple subsections between Coutolenc Road and the overlook at Lookout Point 3.2 km (2 mi) southwest of the town limits.

Neal Road, from Skyway to Goa Way, is summarized in Section 9.1.10. Butte Creek Canyon and Skyway south of Lookout Point all the way to Chico are covered in Section 9.1.11. In Paradise, neighborhoods off Valley View Drive are covered in Section 9.1.12. The Foothills, from Lookout Point, Airport Road, and Kunkle Reservoir south to Highways 99 and 70, are covered in Section 9.1.13. The area surrounding Nelson Bar Road and Highway 70 is documented in Section 9.1.14. To the north, Magalia and Coutolenc Road are covered by Section 9.1.15.

Observations are occasionally located at the intersection of two focus regions (e.g., Pearson Road and Skyway). In these cases, observations are listed in the data tables of both focus regions. This data is displayed in *italics* to facilitate locating it between tables to follow the progression.

The data included in Table 11 to Table 32 list the start time and/or time range of the observation. If no end time is listed, the information collected was placed precisely in time. If both values are used, the observation took place within that window.<sup>13</sup> Times in the tables were rounded to 5 min windows for ease of dissemination. The timeline tables also include a general description of the location as well as the identification of the contributing sources. Appendix F contains additional information, including the precise observation times and geographic coordinates, along with time and location source information. The fire spread information in this section and in Appendix F represents all the fire observation data collected during the Camp Fire reconstruction; however, the data does not include all fire activity that occurred within the fire perimeter. The observations of surface/ground level winds were included when available.

Temporary Refuge Areas (TRAs), together with traffic and evacuation data, findings, and recommendations, will be presented in NIST Camp Fire Report #4. Defensive actions and findings from the NIST documented damaged structures will be addressed in NIST Camp Fire Report #5.



**Figure 23.** Map of 15 fire timeline focus regions. Some regions overlap slightly indicated by relative discoloration.

<sup>13</sup> An observation in a time window, as discussed in Section 7.5.5.1, does not necessarily imply that this is the only time the event took place.



### 9.1.1. Concow Fire Progression Summary

At 06:25 on November 8, 2018, the first 911 call was received reporting a vegetation fire in the Feather River Canyon near the Poe Dam, approximately 10 km (6 mi) north of Jarbo Gap. Initial reports indicated the size of the fire was 30 m × 30 m (100 ft × 100 ft), burning underneath electrical transmission lines on the north side of the river. Multiple callers reported the fire and indicated there were significant winds in the canyon. The initial dispatch was sent at 06:31.

The first engines, arriving from Fire Station 36 at Jarbo Gap (10 min travel time), observed the fire and gave an initial report of conditions at 06:44.

“We have eyes on the vegetation fire. It’s going to be very difficult access; Camp Creek Road is nearly inaccessible. It is on the west side of the river underneath the transmission lines. It’s got about a 35 mi/h sustained wind on it. We’ll keep working on access. I’m going to go up the highway to try and get a better idea about how to get to it. It’s a possibility we may have to come in off the top of Concow Road; Flea Mountain... This has got potential for a major incident. Request 15 additional engines, 4 additional dozers, 2 water tenders, 4 strike teams of hand crews. I’ll get back to you on a reporting location.”

Within 20 minutes of the first report of ignition, the fire was threatening structures in Pulga.

At 07:04, the IC was notified about a possible second fire ignition on Rim Road between Pulga and Concow. Post-fire investigation [5] confirmed a second ignition occurred at approximately 06:45 when the first engines were arriving on Highway 70.

By 07:10, estimates put the fire between 80 ha and 120 ha (200 ac to 300 ac), burning in the Flea Valley and Pulga areas with a rapid rate of spread toward Concow. Sustained winds of over 15 m/s (35 mi/h) were observed in the canyon. Over the next 15 minutes the fire pushed westward out of Flea Valley and spotted west of Rim Road into Concow and across Concow Reservoir. **Figure 24** shows a view looking north from the Caltrans Pulga Maintenance Yard on Highway 70 at 07:23. By 07:25 the fire had spotted up to 8 km (5 mi) ahead of the main fire.

At approximately the same time, 07:20, engines responding to the north flank via Rim Road encountered multiple rapidly growing spot fires west of Rim Road with very strong winds on the ridgetop. **Figure 25** shows a snapshot from a video taken from the ridgetop. Firefighters described softball-sized rocks pelting the side of their engine.

Calls to 911 reporting fire burning in yards in Concow started at approximately 07:30. Conditions in Concow deteriorated as the fire continued to spread and involve the Concow geographical bowl. Shortly after, residents in Paradise began reporting spot fires on the west side of Sawmill Peak. Before 08:00, air attack was providing information on fire conditions and spread from the air.

Video courtesy of TD-028, 07:23.  
Used with permission.  
Composite image by NIST.



**Figure 24.** View of the fire looking north from Highway 70 at the Caltrans Pulga Maintenance Yard at 07:23. Panorama created from video recording.

Video courtesy of TD-005, 07:32.  
Used with permission.



**Figure 25.** Strong wind gusts blew dirt and rocks whipping across the ridgetop at Rim Road.

Around 09:20, the fire was hung up on the east side of Concow Reservoir and burning north of Ishi Trail. Fires on the west side of Concow Reservoir continued to grow and were spreading toward the south end of the reservoir.

There was limited data on fire spread south of Concow between 10:00 and 11:00 because first responders were located within the fire working on rescues and evacuations. After 11:00, the fire continued spreading south of Jeffrey Pine Lane and reached the south end of the reservoir by 12:00.

About the same time at 11:30, intense fire reached the intersection of Jordan Hill Road and Granite Ridge Road, where 30 m to 45 m (100 ft to 150 ft) flames were observed. Engines on Jordan Hill Road looking for civilians drove through fire and sustained damage while escaping to Concow Road with civilians following.

Throughout the morning, the fire continued burning near the origin, backing into the wind and starting multiple spots from rollouts down the hill. After noon and into the night, the fire became well established along Highway 70 and began running southwest down the canyon towards Jarbo Gap. The fire was approximately 2 km (1 mi to 2 mi) from Jarbo Gap (Fire Station 36) shortly after midnight into November 9.

**Table 11** contains a summary of fire progression data in Concow. Common for tables throughout Section 9.1, the table lists the date and time window of selected fire observations along with a brief description of the location and the contributing source of the observation. When an observation was confirmed by multiple independent sources, or the description is a combination of multiple related observations, each independent data source identifier is listed (911-###-# indicates data from a recorded call to 911. TD and VTD indicate technical discussions and “virtual” technical discussions, respectively. PPD indicates information obtained from video recordings from Paradise Police Department).

**Table 11.** Summary of fire progression in Concow.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	06:25 - 06:40	First report of vegetation fire via 911. Caller reports fire under electric transmission lines within 6 m (20 ft) of tower, estimated size 30 m × 30 m (100 ft × 100 ft). Others call to report same fire.	West side Feather River, CA Hwy 70 at Poe Dam	911-001-1 911-002-1 911-004-1
11/8	06:45	First engine gets sight of well-established fire, reports difficult access in nearly inaccessible location. Approximately 15 m/s (35 mi/h) sustained winds. Captain declares potential for a major incident.	West side Feather River, CA Hwy 70 at Poe Dam	TD-028
11/8	06:45	Investigators determined a second power line ignition started another fire which was enveloped in the Camp Fire.	Near intersection of Rim Rd and Concow Rd	VTD-28
11/8	06:45	Fire begins threatening structures in Pulga.	Pulga	TD-029
11/8	07:10	Engine reports fire is now 80 ha to 120 ha (200 ac to 300 ac) with rapid rate of spread toward Concow Reservoir.	Pulga	TD-028
11/8	07:15	Fire spread SW from origin and got established in Flea Valley above Pulga.	Pulga	TD-028
11/8	07:20	Wind pushing fire up slope W, WSW; fire extending up slope and well beyond ridge to W.	Pulga	TD-028
11/8	07:20	Multiple (5) small spot fires (3 m × 3 m, 10 ft × 10 ft) visible on east facing slopes west of Concow Reservoir.	West side of Concow Reservoir	TD-013

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	07:20	Engines attempting access to the north flank of the fire encounter large, a well-established spot fire, 0.1 ha to 0.2 ha (0.25 ac to 0.5 ac).	Rim Rd between Concow and Pulga	TD-005
11/8	07:25	Spot fires are igniting in Concow and homes start to catch fire.	Concow	TD-062
11/8	07:30	Engines responding to Concow encounter 6 m × 6 m (20 ft × 20 ft) spot fire burning upwind, threatening homes.	Concow Rd at Cribbage Ln	TD-013
11/8	07:30	First 911 call reporting active fire in yard.	Concow	911-037-1
11/8	07:30	Spot fires up on Rim Rd have grown to several acres within 10 min, spreading up slope, consuming the draw.	Rim Rd between Concow and Pulga	TD-005
11/8	07:40 07:45	Multiple 911 calls report multiple spot fires just below Sawmill Peak, burning on the Paradise side.	Sawmill Peak	911-048-1 911-058-1
11/8	07:50	Fire is well-established in Concow. Multiple structures are burning, and fire is impacting evacuation.	Concow	911-075-1
11/8	08:00 08:30	Hoffman Rd burnover event (see Section 9.3). Heavy fire is burning in the Hoffman Rd area, blocking the road. Civilian evacuation impacted.	Hoffman Rd	TD-013
11/8	08:00 08:30	Concow Rd burnover event (see Section 9.3). Flame front too intense to pass, burning vehicles in road. Crown, timber, 3 m to 4.5 m (10 ft to 15 ft) brush burning; 18 m to 24 m (60 ft to 80 ft) flames.	Concow Rd near Cribbage Ln	TD-008
11/8	08:15	Intense fire conditions, embers blowing across roadway, trees torching, fire up against roadway.	Concow Rd between Hoffman Rd and Cribbage Ln	TD-110
11/8	08:30	Most structures in Camelot are already burning.	Concow	TD-062
11/8	08:30	Fire burning the hills on the west side of Concow Reservoir.	West side of Concow Reservoir	TD-115
11/8	09:20 10:00	Head of fire is hung up on east side of Concow Reservoir, burning to the north of Ishi Tr. Spot fires are igniting in pine and leaf litter 1.6 km (1 mi) ahead of fire front.	Concow Rd near Ishi Tr	TD-013, TD-090 TD-115
11/8	11:00	Fire is intensifying, moving south, burning both sides of Concow Rd near Jeffrey Pine Ln.	Concow Rd near Jeffrey Pine Ln	TD-062
11/8	11:20 11:40	Intense fire is burning on the ridge and in the canyons near Jordan Hill Rd. Flame lengths of 30 m to 45 m (100 ft to 150 ft) observed. Engines looking for civilians must drive through fire to escape to Concow Rd.	Jordan Hill Rd and Granite Ridge Rd	TD-031, TD-062
11/8	12:00 14:00	South flank of the fire reaches the south end of Concow Reservoir in the early afternoon.	Concow	TD-027
11/8	12:00 12:30	At the heel, fire is backing into wind burning in steep terrain in the canyons near the origin. Numerous small spots are igniting from rollout down the hill.	West side of Feather River near Caltrans yard, CA Hwy 70.	TD-008, TD-028 TD-108
11/8	12:00 23:00	At some point after noon fire crossed Hwy 70. Later at night, began making runs along the canyon to the southwest.	CA Hwy 70, 5 km to 8 km (3 mi to 5 mi) north of Jarbo Gap	TD-013, TD-028
11/9	00:30	Fire gets well established 1.6 km to 3 km (1 mi to 2 mi) below Station 36. Engines drive through fire on Hwy 70 to return to Station 36 for structure prep.	CA Hwy 70, 1.6 km to 3 km (1 mi to 2 mi) north of Jarbo Gap	TD-028, TD-029

### 9.1.2. Pentz Road Fire Progression Summary

The initial impact on Paradise was primarily focused along the Pentz Road corridor. To convey the various concurrent events, fire progression along Pentz Road is divided into five separate regions. From the north, the five sections of Pentz Road are:

- Apple View Way to Dean Road,
- Merrill Road to Wagstaff Road,
- Bille Road to Feather River Hospital (FRH),
- FRH to Pearson Road, and
- Pearson Road to Kunkle Reservoir.

Fire was visible up on the Paradise side of Sawmill Peak by 07:40. Shortly after, the first 911 call reporting fire in Paradise was at 07:49 on Lowry Lane off Pentz Road. Between 07:50 and 08:20, there were an additional 16 spot fires reported between Apple View Way and Lowry Lane. The early spots intensified as the fire front arrived from the east at 08:30. Structures began igniting on the east side of Pentz Road between 08:30 and 09:00, and the fire crossed Pentz Road between 09:00 and 09:15 at numerous locations north of Pearson Road.

Fire reached the Bille Road intersection and vehicles on Bille Road started igniting just before 10:00, significantly impacting civilian evacuation. At the same time, another burnover occurred between Bille Road and Feather River Hospital (FRH). This burnover further restricted traffic flow on Pentz Road. At the same time, between 09:00 and 10:00 there was intense fire activity on Pentz Road south of FRH limiting traffic flow to the south towards Pearson Road or Pentz Road out of town. These burnover events are further described in Section 9.3. By 10:30, fire had burned through the vegetation, and many structures along Pentz Road were already burned. The Pearson Road intersection remained fully involved at 10:40, and there was active fire to the south. Bille Road access will be further discussed in Section 9.1.5.

South of Pearson Road, fire activity on Pentz Road increased significantly between 09:20 and 11:00. The fire spread west out of the West Branch canyon in the area south of the town limits before 11:00. Between 11:30 and noon, 6 m (20 ft) tall flames were hopping the 9 m (30 ft) wide dozer lines and threatening structures to the east and south of Lago Vista Way. The fire reached the Kunkle Reservoir by 12:15, and by 16:00 the main fire activity had passed through that area.

### 9.1.2.1. Apple View Way to Dean Road Fire Progression Summary

Between 07:50 and 08:00, multiple residents called 911 reporting a spot fire in the Noble Orchard, with additional spots reported between 08:00 and 08:10. At approximately 08:30, the wind picked up, and the approaching fire front “sounded like a freight train or 747 on full power” [TD-040]. Between 08:30 and 10:30 local visibility decreased to zero and fire activity increased rapidly in the area with propane tanks exploding. By 09:15 the fire crossed to the west side of Pentz Road, where it was well established by 11:00, igniting structures. **Table 12** contains a summary of fire progression on Pentz Road between Apple View Way and Dean Road.

**Table 12.** Summary of fire progression on Pentz Rd between Apple View Way and Dean Rd.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	07:50 08:00	Multiple residents call to report a spot fire burning in Noble Orchard. Fire begins approximately 6 m × 6 m (20 ft × 20 ft) with 3 m (10 ft) flames in 1 m to 1.5 m (3 ft to 5 ft) tall dead brown grass. Spot consumes ~0.4 ha (1 ac) by 08:10.	end of Apple View Way	TD-021, TD-022 TD-023, TD-040 911-074-1 911-082-1 911-086-4
11/8	08:00 08:10	Additional spot fires continue to be reported.	area of Dean Rd, east of Pentz Rd	TD-024, TD-042 911-141-1 911-144-1
11/8	08:30	Wind increases dramatically and ignites numerous (10+) additional spot fires in Noble Orchard as fire comes out of the Feather River Canyon.	Apple View Way	TD-021
11/8	08:35 10:30	Fire coverage and intensity greatly increases. Fire is well-established and threatening structures. Fire spreads all around, visibility drops to zero, propane tanks begin exploding, and structures ignite.	Chapman Ln and Dean Rd	TD-040, TD-042
11/8	09:15 09:30	Spot fires begin on west side of Pentz Rd.	Pentz Rd near Dean Rd and Apple View Way	PPD-02
11/8	09:45	Beyond Fitness gym building is igniting and the Children's Community Charter School is burning.	Pentz Rd	TD-086
11/8	10:20	Multiple spot fires ignite around Paradise Ridge Southern Baptist Church and the fire wraps around and becomes established to the west toward Clark Rd.	Paradise Ridge Southern Baptist Church, west side of Pentz Rd	TD-079, TD-089
11/8	10:30	Fire continues to involve structures on Apple View Way throughout the day after the main fire front has passed.	Apple View Way	TD-023, TD-040 TD-084, TD-089
11/8	11:00	Fire is well-established on west side of Pentz Rd burning heavy brush, trees, structures. Structures begin igniting on Sweetbriar Ln and spreading west structure to structure. Blue Spruce Mobile Estates is burning.	Sweetbriar Ln	TD-060, TD-079 TD-083

### 9.1.2.2. Merrill Road to Wagstaff Road Fire Progression Summary

Spot fires were reported via 911 calls around the Merrill Road area, simultaneously with the spot fire on Apple View Way, between 07:50 and 08:10. The number of spots continued to increase between 08:10 and 08:20, when structures began igniting on the east side of Pentz Road. Fire spotted across Pentz Road between 08:40 and 08:50. **Figure 26** shows the progression of fire as it impacted Pentz Road at Merrill Road. **Figure 26a** shows traffic observed travelling both directions on Merrill Road, with southbound traffic backed up and a fire engine heading south. Twenty seconds later, the roadway was impacted by intense flame and ember exposure and low visibility (**Figure 26b/c/d**). **Figure 26e** shows the view south down Pentz Road as the officer responded to attempt to escort vehicles to safety. Details about response, traffic, and evacuation will be detailed in subsequent reports.

By 09:00, fire had burned through Ridgewood and Ponderosa Mobile Home Parks near Wagstaff Road and was impacting Pentz Road, threatening evacuating vehicles. Structures began igniting on the west side of Pentz Road shortly after 11:00. Before 12:30, the mobile home parks were burned down, vegetation had burned through, and the main fire activity in the area was over. **Table 13** contains the fire progression summary for Merrill and Wagstaff Roads.

**Table 13.** Summary of fire progression on Pentz Rd between Merrill Rd and Wagstaff Rd.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	07:50 08:10	Multiple 911 calls report widespread spot fires scattered on the east side of Pentz Rd.	Merrill Rd, Stark Ln and cross streets	911-077-3
				911-088-1
				911-110-1
				911-1026-1
				911-1027-1
				911-1034-2
11/8	08:10 08:20	The number of spot fires in the area continues to increase. Two spot fires have become well-established in grass and manzanita, rapidly spreading and threatening structures.	Merrill Rd, Stark Ln and cross streets	911-1040-1
				911-1046-4
				TD-020, TD-022 TD-061
				911-1049-8
				911-1049-6
11/8	08:20 08:40	Spot fire in 0.6 m (2 ft) tall grass field continues to spread west and north, consuming field. Structures begin igniting along Merrill Rd.	Merrill Rd, Stark Ln and cross streets	911-1048-2
				911-1053-4
11/8	08:40 08:50	Fire begins spotting west of Pentz Rd. Mobile Homes in Ridgewood Mobile Home Park are on fire. Heavy fire from the field impacts Pentz Rd.	Pentz Rd between Merrill Rd and Wagstaff Rd	TD-014, TD-022 TD-043, TD-045 TD-061, TD-143
11/8	09:00	Fire has burned through Ridgewood and Ponderosa Mobile Home Parks and is impacting Pentz Rd, threatening evacuating vehicles. Spot fires ignite in the Ponderosa Elementary School parking lot.	Pentz Rd and Wagstaff Rd	TD-014, TD-042 TD-064, TD-067 PPD-02
11/8	09:10	Fire impacts structures on Chris Ct from the southeast. Sheds and fences are burning, homes are igniting.	Chris Ct	TD-021, TD-043 TD-067, TD-085 PPD-02, PPD-04
11/8	11:05	Buildings at Ponderosa Elementary School are on fire.	Ponderosa Elementary School	TD-045
11/8	12:15	Portable classroom buildings have burned, and the cafeteria is on fire.	Ponderosa Elementary School	TD-014, TD-015
11/8	12:30	Before 12:30, the mobile home parks are burned down, vegetation has burned through, and the main fire activity in the area is over.	Pentz Rd between Merrill Rd and Wagstaff Rd	TD-021
11/8	12:30			TD-043



**Figure 26.** Scenes from a Paradise Police Department dashboard camera show how rapidly conditions can change and impact evacuation routes, as fire is seen impacting evacuating vehicles on Pentz Rd at Merrill Rd.



### 9.1.2.3. Bille Road to Feather River Hospital Fire Progression Summary

The 911 calls from residents reporting burning sticks falling from the sky started at 08:00, and spot fires began at 08:10 just east of Feather River Hospital (see Section 9.1.3). Fire impacted civilians and first responders on Pentz Road between Bille Road and Norwood Drive starting shortly after 09:00. The burnover was characterized by sideways flames, torching trees, evacuating vehicles on fire, civilian's hair igniting, and tires on a fire engine melting. The burnover is further described in Section 9.3. By 09:20 structures were igniting on the east side of Pentz Road between Norwood Drive and Peach Lane. Structures ignited on the west side of Pentz Road by 09:35, and by 09:50 vehicles in the traffic jam at Bille Road ignited. The main fire activity in this part of Pentz Road had passed by 11:15 as the fire front moved to the southwest. **Table 14** summarizes the fire progression along Pentz Road between Bille Road and the Feather River Hospital.

**Table 14.** Summary of fire progression on Pentz Rd between Bille Rd and FRH.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	08:00	Calls to 911 report burning sticks falling from the sky and spot fires.	Pentz Rd near Bille Rd	911-085-2 911-095-1 911-098-1 911-100-1
11/8	08:00	Fire is burning within feet of structures at the end of Canyon View Dr at the edge of the canyon.	Canyon View Dr	911-086-3 911-1035-1
11/8	08:10	<i>Spot fires begin on Feather River Hospital campus. See Section 9.1.3 for additional details related to the hospital.</i>	<i>Feather River Hospital</i>	<i>911-1047-1</i>
11/8	09:00	Dangerous fire between Bille Rd and Norwood Dr. East side of Pentz Rd is more heavily involved than west side. Flames are sideways, trees are torching, evacuating vehicles are on fire, civilian's hair is igniting, and tires on the engine are melting. See Section 9.3 for burnover event details.	Pentz Rd between Bille Rd and Norwood Dr	TD-015, TD-060 TD-079, TD-083 TD-116
11/8	09:00	Numerous spot fires begin igniting along Pentz Rd between Norwood Dr and Peach Ln.	Pentz Rd between Norwood Dr and Peach Ln	TD-015, VTD-23
11/8	09:20	Structures between Norwood Dr and Peach Ln are igniting. Evacuating vehicles are exposed to intense fire. Dark as night, visibility in places drops to zero.	Pentz Rd between Norwood Dr and Peach Ln	TD-069, TD-090 VTD-23, PPD-05 911-234-1
11/8	09:35	Structures on the west side of Pentz Rd ignite, including mobile homes in Eden Roc Estates.	Pentz Rd at Bille Rd	TD-060, TD-079
11/8	09:50	<i>Vehicles in traffic jam on Bille Rd catch fire as fire front progresses west-southwest. Structures continue to burn. See Section 9.3 for description of the burnover event.</i>	<i>Bille Rd just west of Pentz Rd</i>	<i>TD-021, TD-060 TD-079 PPD-02, PPD-05</i>
11/8	11:00	Structures on Del Rio Way are burned and collapsed. Yards, fences, and one structure are burning on Vineyard Dr.	East side of Pentz Rd near hospital; Del Rio Way, Vineyard Dr	TD-005
11/8	11:15	Main fire activity along Pentz Rd has passed; structures are burned down; vegetation has burned through. Pentz Rd is passable.	Pentz Rd between Bille Rd and Feather River Hospital	TD-015, TD-090, TD-111, PPD-08

#### 9.1.2.4. Feather River Hospital to Pearson Road Fire Progression Summary

The first call reporting a spot fire in Paradise was placed at 07:49 off Lowry Lane. Paradise Police responded to the area, and body camera video recording captured the plume from the initial spot fire, seen in **Figure 27**.



**Figure 27.** Body camera recording shows the initial stages of the spot fire off Lowry Ln and Riverside Dr.

Additional spot fires ignited along the west side of the river as the initial fire grew. Fire reached Pentz Road by 08:30, burning structures and vegetation. Between 09:00 and 10:00, everything along Pentz Road was on fire between FRH and Chaney Lane. **Figure 28** shows a picture taken in this area at 09:42, showing structures burning and smoky conditions. The initial spot grew to an estimated area of 24 ha (60 ac) in approximately 2 hours.

The fire continued to expand into the drainage to the north of Pearson Road by 09:30, where it soon flared up and burned over evacuees (see Section 9.1.7 detailing Pearson Road and Section 9.3 discussing burnovers). Some structures continued to burn; however, by 10:30 the main fire had subsided between FRH and Pearson Road. The Pearson Road intersection remained fully involved at 10:40, and there was more active fire to the south.

**Table 15** summarizes the fire progression on Pentz Road from FRH to Pearson Road.



Photo courtesy of TD-005, 09:42.  
Used with permission.

**Figure 28.** View of everything burning at the intersection of Pentz Rd and Riverview Dr. View west at 09:42.

**Table 15.** Summary of fire progression on Pentz Rd between FRH and Pearson Rd.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	07:50 - 08:00	Multiple 911 calls and PPD officer report a spot fire on the west side of the canyon behind homes on Lowry Ln and Riverview Dr.	Lowry Ln, Riverview Dr	911-064-1 911-066-1 911-071-1 911-084-1 TD-063 PPD-01
11/8	08:10 - 08:20	Fire is burning vegetation around homes on east side of Pentz Rd.	Riverview Dr	TD-063 911-104-1 911-1054-2
11/8	08:30 - 08:40	Fire is established on east side, spotting to west side of Pentz Rd. Spot fires are growing bigger than “back pump size” in seconds. Flames are blowtorching and embers are flying everywhere. Yard decorations not typically observed burning are on fire.	Riverview Dr	TD-005, TD-016 TD-084, TD-143
11/8	08:40 - 09:00	Homes are threatened by fire, many are igniting and burning both sides of Pentz Rd. Bumpers of evacuating vehicles are igniting. “100% of embers are igniting spot fires when they land.”	between Riverview Dr and Chaney Ln	TD-005, TD-014 TD-016, TD-060 TD-079, TD-084 TD-103, TD-109 TD-122, TD-123 TD-124, TD-209 PPD-04
11/8	09:00 - 09:30	Spot fire becomes well-established and begins to consume the drainage on Pearson Rd at Hilbe Dr, burning up behind homes on Fickett Ln. The fire in the drainage results in the burnover event on Pearson Rd. <i>See Section 9.3 for description of the burnover event.</i>	west of Fickett Ln towards Hilbe Dr	TD-016, TD-123 TD-129, TD-209
11/8	09:00 - 10:00	Everything along Pentz Rd is burning, intense fire both sides of roadway, heavy ember showers, wind is variable	Hospital to Chaney Ln	TD-063, VTD-17 VTD-21, VTD-23
11/8	10:30	Vegetation has been burned through, many structures have been destroyed, others are still actively burning.	Hospital to Pearson Rd	TD-037, TD-103 TD-209

#### 9.1.2.5. Pearson Road to Kunkle Reservoir Fire Progression Summary

The lower part of Pentz Road from Pearson Road to Kunkle Reservoir saw fire almost one hour after the first spots were reported on Apple View Way and Merrill Road. Fire was well established north of Pearson Road at Chaney Lane by 08:40. Between 08:40 and 09:00 there were several fingers of fire burning across Pentz Road between York Towne Manor and Malibu Drive, and by 09:20 there were structures reported burning on York Towne Manor. Shortly after, between 09:40 and 09:50, fire encroached on the intersection of Pentz Road and Pearson Road from all directions. The intersection remained fully involved until approximately 10:40. The structures south of town limits on Lago Vista Way and Sierra del Sol were threatened in the late morning, with structures burning on both sides of Pentz Road by 10:50.

The fire spread west out of the Feather River Canyon in the area south of the town limits before 11:00. Between 11:30 and noon, 6 m (20 ft) tall flames were hopping the 9 m (30 ft) wide dozer lines and threatening structures to the east and south of Lago Vista Way. The fire reached Kunkle Reservoir by 12:15. Fire progression slowed down in the afternoon. By 16:00 the main fire activity had passed. **Table 16** summarizes the fire progression in this focus area.

**Table 16.** Summary of fire progression on Pentz Rd between Pearson Rd and Kunkle Reservoir.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	08:40	<i>Fire is well-established north of Chaney Ln. (Table 15)</i>	<i>Pentz Rd north of Chaney Ln</i>	<i>TD-005, TD-016 TD-123, TD-122</i>
11/8	08:40 09:00	Several fingers of fire are burning across Pentz Rd between York Towne Manor and Malibu Dr. A defined wall of flames and smoke marks the southern edge across Pentz Rd at Malibu Dr.	Pentz Rd between York Towne Manor and Malibu Dr	TD-079, TD-122 TD-129, TD-209
11/8	09:20	The first report of structures on fire south of Pearson Rd is on Yorke Town Manor. There is a wall of flames and heavy ember cast.	York Towne Manor	TD-086
11/8	09:30	Fire crosses Pentz Rd between York Towne Manor and Malibu Dr	Pentz Rd between York Towne Manor and Malibu Dr	TD-009
11/8	09:40 09:50	Fire encroaches on the intersection of Pentz Rd and Pearson Rd from all directions.	Pentz Rd at Pearson Rd	TD-122, TD-129 VTD-21, VTD-23
11/8	10:00	Fire is burning in on the edge of the canyon south of town limits, east of Lago Vista Dr.	east of Lago Vista Dr	TD-086
11/8	10:40	<i>The intersection of Pentz Rd and Pearson Rd remains fully involved. (Table 21)</i>	<i>Pentz Rd and Pearson Rd</i>	<i>TD-037</i>
11/8	10:50	Peak vegetation fire activity has subsided, but significant fire remains. Most structures and heavy fuels are burning on both sides of Pentz Rd. The road is passable with variable visibility.	Pentz Rd between Pearson Rd to Malibu Dr	TD-020, TD-090 TD-209
11/8	11:30 12:00	Fire activity in thick, 3.6 m (12 ft) brush and grass is increasing and spreading west toward Lago Vista Dr. 6 m (20 ft) tall flames are hopping 9 m (30 ft) wide dozer lines and threatening structures.	east of Lago Vista Dr	TD-086
11/8	11:45 12:15	The southern extent of fire has reached Sierra del Sol and Kunkle Reservoir.	Pentz Rd and Sierra del Sol	TD-086, TD-118 PPD-08
11/8	13:00	Fire continues west, spotting over dozer lines toward structures on Pentz Rd south of Lago Vista Dr.	Pentz Rd at Lago Vista Dr	TD-086
11/8	14:00	Fire is actively crossing to west of Pentz Rd at Dry Creek Rd; numerous spot fires are burning in Sierra del Sol. Fire continues spreading south and threatening rural structures south of Sierra del Sol.	Kunkle Reservoir	TD-086, TD-115 TD-121
11/8	16:00	Main fire activity has passed. Multiple structures have burned to foundations. A few scattered structures are fully involved.	Sunset Oaks Dr and Sierra del Sol	VTD-27
11/8	17:00	<i>Fire activity increases and blows westward across Pentz at Kunkle Reservoir. Fire quickly spreads south/southwest down the canyon. (Table 30)</i>	<i>south of Sierra del Sol</i>	<i>TD-121</i>

### 9.1.3. Feather River Hospital (FRH) Fire Progression Summary

The first spot fire reported in the vicinity of the hospital was the Lowry Lane spot at 07:50, and fire subsequently approached the hospital campus. The first 911 calls reporting hospital buildings on fire were received at 08:30. **Figure 29** shows conditions on the FRH campus as evacuations were nearing completion at 08:54, with structures seen burning in the background. Within a short time period, blackout conditions prevailed as ember showers impacted the campus.



a)



b)

**Figure 29.** a) Fire burning on the Feather River Hospital campus before 08:54. b) Blackout conditions and heavy showers of large embers at 09:08. The video documents ember showers coming from the west as the fire front arrived from the east.

Between 08:30 and 13:30, multiple buildings on the FRH campus ignited; many were defended. **Figure 30** illustrates the morning conditions at FRH as spot fires started in vegetation, threatening the structures and generating embers. The main clinic building was destroyed, and other buildings were damaged. A large portion of the hospital, the cardiology building, ignited in the late morning and fire became established inside, as shown in **Figure 31**. Much of the building was destroyed, but the overall hospital structure was saved from burning. The defensive actions at the FRH will be detailed in NIST Camp Fire Report #5. **Table 17** summarizes the fire progression at FRH.



**Figure 30.** Spot fires in vegetation threatened FRH and generated additional ember showers.



**Figure 31.** The cardiology section of FRH was destroyed. Extensive firefighting efforts prevented spread to other portions of the facility.

**Table 17. Summary of fire progression at Feather River Hospital.**

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	07:50 08:00	Multiple 911 calls and PPD officer report a spot fire on the west side of the canyon behind homes on Lowry Ln and Riverview Dr.	Lowry Ln, Riverview Dr, just south of FRH	a
11/8	08:00 08:10	Fire approaches the hospital campus from the canyon by the retirement home and from the spot fire near Lowry Ln. Spot fires also ignite on campus.	Feather River Hospital	a
11/8	08:30	The first 911 calls reporting hospital buildings on fire are received.	Feather River Hospital	a
11/8	08:40	The clinic building is on fire to the southeast of the main hospital building.	Clinic	a
11/8	08:40	Fire is burning on the patio of the OB unit.	Birth Day Place	a
11/8	09:10	Ember showers increase dramatically. Embers are exploding and skittering across pavement. Multiple spot fires ignite in mulch and bushes. There is widespread surface fire burning on the west side of Pentz Rd, southwest of the hospital.	Feather River Hospital	a
11/8	09:20	<i>Pentz Rd is inaccessible due to heavy fire and fire engine activity south of hospital. (Table 15)</i>	<i>Pentz Rd south of FRH</i>	a
11/8	09:30	Flames are showing from the HVAC support building. The building continues to burn and flare-up over the next 24 hours.	HVAC/utility building	a
11/8	09:43	A spot fire against the building alcoves is torching juniper trees and a fence, spewing embers.	Birth Day Place	a
11/8	10:00 10:30	There is a fire in attic of the cancer center.	Cancer Center	a
11/8	10:15 11:30	There is a small fire on the roof of the main building of the retirement home. Bark mulch against the building is burning and igniting OSB underneath the vinyl and shows rapid fire growth. All condo units are burned to foundation. Multiple auxiliary buildings are burning. The main fire activity in the surrounding area is over.	Feather Canyon Retirement Home	a
11/8	10:30	Fire begins in the eaves and gutters of the lower portion of the hospital cardiology wing. Fire spreads in the roof. Throughout the day, wind directed straight down the hallways would flare-up through trench cuts in the roof.	Cardiology	a
11/8	11:45 12:00	A patient room catches fire in the Family Health Center and damages the patient room and exterior wall.	Family Health Center	a
11/8	13:30	The cardiology building is well involved, beginning to threaten the main hospital.	Cardiology	a
11/8	13:30	Multiple structures are still burning, fully involved on the west side of Pentz Rd. Others have already burned down.	Eastwoods Professional Park	a
11/8	15:00	The cardiology building is still burning, and the north end is partially collapsed. The building continues to burn overnight.	Cardiology	a

<sup>a</sup> Information sources for the fire events at Feather River Hospital include: TD-005, TD-014, TD-016, TD-020, TD-055, TD-063, TD-069, TD-090, TD-103, TD-109, TD-111, TD-112, TD-124, TD-130, TD-143, VTD-17, PPD-01, PPD-04, PPD-05, 911-064-1, 911-066-1, 911-071-1, 911-084-1, 911-086-3, 911-1035-1, 911-104-1, 911-1047-1, 911-1054-2, 911-131-1, 911-134-1, 911-137-1, 911-179-1, 911-208-1, 911-210-1



#### 9.1.4. Wagstaff Road Fire Progression Summary

Wagstaff Road was affected by multiple spot fire ignitions. The first report was at 07:55 at the Ridgewood Mobile Home Park on Pentz Road as the fire started becoming established along the Pentz Road corridor. At 08:30, a wave of spot fires ignited along the length of Wagstaff Road, including one west of Skyway in Little Butte Creek Canyon (2.5 km, 1.6 mi, west of Pentz Road), several near Rocky Lane and the bike path, and several around the intersection with Clark Road. Each of these spot fires grew and caused significant impacts. The first structure fire was also observed at 08:30, reported via 911 on Harvey Road.

The main fire front impacted Pentz Road at Wagstaff Road by 09:00 and was consuming the mobile home parks and threatening evacuating vehicles. At the same time, the spot fire near Rocky Lane was becoming well-established, burning toward the intersection of Wagstaff Road and Skyway and overrunning evacuees by 09:30.

At 10:00, there were multiple areas of significant fire on Wagstaff Road with numerous structures burning. These included the intersection of Pentz Road, the residential structures behind (east and south of) the Save Mart and Kmart at Paradise Plaza shopping center, and the area near Skyway at Berkshire Avenue and Oak Way. **Figure 32** shows an image from a video recorded at Oak Way at 10:17. The image shows significant fire activity, airborne embers, and dark, smoky conditions. **Figure 33** is a photograph taken five minutes later at 10:22 behind the Save Mart, just over 1 km (0.75 mi) east of the location in **Figure 32**. There was a significant difference in visibility and fire activity in a short distance. Spot fires began behind the structures seen in **Figure 33** between 08:35 and 08:45.

At 11:00, there was significant fire impacting the area north and west of the Skyway intersection. The spot fires that began in Little Butte Creek Canyon had grown and were consuming structures between the canyon and Wagstaff Road. The fire continued to spread through the area west of Skyway. By 16:00, the main fire activity along Wagstaff Road was over; however, structures were threatened throughout the evening. **Table 18** contains the fire progression summary for Wagstaff Road.



**Figure 32.** Midnight darkness, swirling winds, heavy ember showers, and fully involved structures at the intersection of Oak Way and Wagstaff Rd at 10:17. View north.



**Figure 33.** A structure on Wagstaff Rd just east of Clark Rd (behind Save Mart) is burning at 10:22. View south.

**Table 18.** Summary of fire progression on Wagstaff Rd.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	07:55	<i>A call to 911 reports the first spot fire in vegetation in Ridgewood Mobile Home Park. (Table 13)</i>	Wagstaff Rd and Pentz Rd	911-077-3
11/8	08:25	The first spot fire west of Clark Rd, located near Rocky Ln and Wagstaff Rd, is called in to 911.	Wagstaff Rd and Rocky Ln	911-128-1 911-129-1
11/8	08:30	Additional spot fires start on the north side of Wagstaff Rd between Clark Rd and Pentz Rd.	Wagstaff Rd between Clark Rd and Pentz Rd	TD-064
11/8	08:30	A citizen reports a house on fire on Harvey Rd.	Harvey Rd	911-141-2
11/8	08:35 08:45	<i>A spot fire begins in a grass field behind (east of) Save Mart and spread to pine trees. At the same time, an additional spot fire is starting at the Paradise United Methodist Church and the School District office. (Table 22)</i>	Wagstaff Rd east of Clark Rd	TD-067, TD-075 PPD-02 911-157-1 911-158-1
11/8	08:40	Smoke is seen rising from a spot fire in Little Butte Creek Canyon.	Little Butte Creek Canyon north of Wagstaff Rd	911-163-1
11/8	08:40 08:50	<i>Multiple citizens report a new spot fire in the area of Wagstaff Rd and the bike path, near Berkshire Ave. (Table 25)</i>	Wagstaff Rd and Berkshire Ave	TD-015 911-162-1 911-169-1 911-178-2 911-195-4
11/8	08:40	<i>The main fire front is approaching Pentz Rd. Multiple spot fires are burning in the area of Pentz Rd and Wagstaff Rd. Half of Ridgewood Mobile Home Park is burning. (Table 12)</i>	Wagstaff Rd and Pentz Rd	TD-014, TD-042 TD-043, TD-067 PPD-02
11/8	08:50 09:00	The fire reaches Pentz Rd. Ridgewood and Ponderosa Mobile Home Parks are burning. Trees are igniting at the intersection and fire is threatening evacuating vehicles.	Wagstaff Rd and Pentz Rd	TD-043, TD-085 PPD-02
11/8	08:50 09:15	<i>Fire is pinching Wagstaff Rd between Skyway and Clark Rd. Fire is burning from the NE into the area of Rocky Ln, and the spot near the bike path is well established. The intersection of Skyway and Wagstaff Rd will be impacted soon. Multiple cars are on fire. (Table 25)</i>	Wagstaff Rd between Skyway and Clark Rd	TD-017, TD-042 TD-053, TD-111 TD-127
11/8	09:30 09:45	Additional pine trees torch behind Save Mart and fire wraps south around the shopping center.	Wagstaff Rd east of Clark Rd	TD-052, VTD-18
11/8	09:35	<i>Structures are burning and vehicles are about to be overrun by fire on Wagstaff Rd near Skyway and the bike path as fire spreads across to south of Wagstaff Rd. (Table 25)</i>	Wagstaff Rd and Berkshire Ave	TD-055, TD-127
11/8	10:00	The general area of Wagstaff Rd and Oak Way is fully involved. Everything is burning and considerable ember showers are swirling. The fire continues pushing S and W.	Wagstaff Rd between Berkshire Ave and Rocky Ln	TD-022, TD-014 TD-127, VTD-26
11/8	10:45	The spot fire(s) in the canyon has become more established and is generating a noticeable smoke plume.	Little Butte Creek Canyon north of Wagstaff Rd	VTD-26
11/8	11:00	Structures and vegetation north of Wagstaff Rd on the edge of the canyon are engulfed in intense fire. Embers enter vehicle when opening the door.	Wagstaff Rd and Paragalia Way	TD-017
11/8	11:30	Fire continues to spread through area of Wagstaff Rd west of Skyway.	Wagstaff Rd west of Skyway	TD-127
11/8	11:30 13:00	Kmart and the shopping center are threatened as fire burns structures around the perimeter. Shrubs are igniting from embers throughout the parking lot.	Wagstaff Rd and Clark Rd	TD-015, TD-017 TD-043, VTD-18
11/8	12:00 13:00	Fire continues impacting more structures along Wagstaff Rd. Most activity is to the west side of Clark Rd by this time.	Wagstaff Rd west of Clark Rd	TD-065, TD-100 TD-127, VTD-18
11/8	16:00	The main fire activity is over, and the majority of structure destruction has already occurred. Remaining fire activity continues to threaten surviving structures for several hours.	Wagstaff Rd	TD-014, TD-065 TD-108, TD-127 TD-200, TD-202 TD-205, TD-207

### 9.1.5. Bille Road Fire Progression Summary

Multiple calls to 911 and observations by first responders reported fires along Bille Road between 08:30 and 09:00, including one on the west side of Skyway. By 09:00, several scattered structures were burning in this region ahead of the main fire, which was located on Pentz Road. At approximately 09:30, the main fire front impacted the intersection of Bille Road and Pentz Road. Shortly after, fire impacted traffic that was stuck near Tyden Way. **Figure 34** shows the burned vehicles 48 hours after the burnover and after vehicles were moved by a bulldozer to clear the roadway. Heavy fire conditions surrounded the intersection, burning structures and vehicles until 11:30. Section 9.3 describes the burnover event in more detail.



Photo courtesy of TD-041, 09:04 (Nov 10).  
Used with permission.

**Figure 34.** Abandoned vehicles on Bille Rd, seen after the fire, pushed aside by a bulldozer. Evacuees were overrun by fire around 09:50. View west.

Spot fires between Skyway and Clark Road grew, and fire spread south from the established fire on Wagstaff Road between 10:00 and 11:00. Shortly after 11:30, fire was encroaching on the intersection of Skyway and Bille Road. At the same time, fire was also impacting Bille Road west of Skyway. Vehicles stuck in traffic were igniting, and structures were burning in the area north of Bille Road between Oliver Road and Skyway.

Throughout the early afternoon, fires continued burning more structures, merging, and filling in the unburned areas along Bille Road west of Clark Road. In the evening, most fire activity was on the west end of Bille Road; **Figure 35** shows the view east on Bille Road at Lucky John Road. Fire activity increased in the Little Butte Creek Canyon, and wind driven flames torched the area of Cliff Drive and burned toward Oliver Road.

Surviving structures east of Clark Road were threatened again overnight around Lancaster Drive, as indicated in the radio transcription. Based on radio communications, 7 or 8 engines were sent to the area. Many structures survived. **Table 19** contains the fire progression summary for Bille Road.



Video courtesy of TD-127, 17:14.  
Used with permission.

**Figure 35.** Fire activity on Bille Rd near Lucky John Rd, west of Skyway, at 17:14. Numerous structures are fully involved, while others are burned down or just starting to ignite.

**Table 19.** Summary of fire progression on Bille Rd.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	08:30	Spot fire west of Skyway	west of Skyway	911-143-1
11/8	08:40 09:00	Multiple spot fires have started between Skyway and Clark Rd.	Bille Rd between Skyway and Clark Rd	TD-105, TD-111 911-170-2 911-195-4
11/8	08:45	Call to 911 reports a spot fire burning a fence toward the east end of Bille Rd.	Bille Rd near Pentz Rd	911-174-1
11/8	08:50	<i>A spot fire is burning behind the Paradise Irrigation District offices on Clark Rd. (Table 23)</i>	<i>Bille Rd and Clark Rd</i>	<i>TD-077, TD-111 911-183-4</i>
11/8	09:00	Two structures are burning, fully involved, ahead of the fire front. The main fire is east of Pentz Rd at this time.	Bille Rd and Vista Knolls Dr	TD-116
11/8	09:00	Heavy ember cast is impacting Pentz Rd.	Bille Rd and Pentz Rd	TD-116
11/8	09:00	A structure is burning fully involved behind the post office somewhere near Harvey Rd.	Bille Rd west of Clark Rd, near Harvey Rd	PPD-02
11/8	09:25	Homes are igniting on the east side of Pentz Rd. Fire is about to impact Bille Rd.	Pentz Rd and Bille Rd	TD-021, TD-038
11/8	09:35 11:15	Fire is burning through and around the Bille Rd and Pentz Rd intersection. Mobile homes in Eden Roc Estates ignite and burn.	Pentz Rd and Bille Rd	TD-015, TD-021 TD-060, TD-079 PPD-02
11/8	09:50	In the curve on the east end of Bille Rd, fire is impacting vehicles stuck and abandoned on road. <i>See Section 9.3 for description of the burnover event.</i>	Pentz Rd and Bille Rd	TD-021, TD-060 TD-079, PPD-05
11/8	09:55	Fire is burning on the east side of the bike path near Berkshire Ave.	Bille Rd and Berkshire Ave	TD-064
11/8	10:15	Fire is now pushing SW from Wagstaff Rd toward Bille Rd between Skyway and Clark Rd.	Bille Rd between Skyway and Clark Rd	TD-014, TD-127
11/8	10:30	Structures are burning at Bille Rd and Harvey Rd.	Bille Rd and Harvey Rd	PPD-02
11/8	11:00	The main fire is pushing south down Berkshire Ave, spreading to structures. Fire spreads from structure to structure through Skyway Villa Mobile Home Park.	Bille Rd and Berkshire Ave	TD-022, TD-055 TD-116
11/8	11:00	Vehicles west of Skyway are igniting. Fire is burning the area north of Bille Rd between Oliver Rd and Skyway.	Bille Rd between Oliver Rd and Skyway	TD-030
11/8	11:30 12:30	<i>Fire is approaching and pinching the Walgreens and intersection of Bille Rd and Skyway. Bushes and vegetation are igniting around the area. (Table 25)</i>	<i>Bille Rd and Skyway</i>	<i>TD-127</i>
11/8	12:00	Vehicles are burning on Bille Rd east of Sawmill Rd. It sounds like another push of fire is coming.	Bille Rd between Sawmill Rd and Pentz Rd	TD-118
11/8	12:30	Areas along Bille Rd that initially experienced only scattered spot fires are beginning to merge and fill in.	Bille Rd between Skyway and Clark Rd	TD-101, PPD-08
11/8	14:45	Vehicles are still burning on Bille Rd, but now the roadway is passable at this time.	Bille Rd near Pentz Rd	TD-069
11/8	14:00 15:00	Most structures along Bille Rd near Skyway are fully involved. Some vehicles are burning and blocking the roadway.	Bille Rd between Lucky John Rd and Skyway	TD-066, PPD-15
11/8	16:30	The fire activity is past peak, and many structures are burned down.	Bille Rd and Clark Rd	VTD-18
11/8	16:30 17:30	The main fire activity is on the west end of Bille Rd. Fire is burning out of the Little Butte Creek Canyon with 90 m (300 ft) flames. Many structures are burning. Embers are blowing around like a blizzard, wind is blow-torching flames. Homes on Cliff Dr were first to burn down.	Cliff Dr, Bille Rd, Oliver Rd, Valley View Dr	TD-014, TD-044 TD-111
11/8	23:30	Surviving structures in the Lancaster Dr area are again threatened by fire.	Bille Rd and Lancaster Dr	TD-008

### 9.1.6. Elliott Road Fire Progression Summary

Spot fires in this focus area began at 08:00, east of Clark Road. The first spot was reported by multiple 911 calls and Paradise Police officers on Nunneley Road near Ingalls Road. This spot expanded during the morning until it was enveloped by the main fire front. Between 08:00 and 09:00, numerous additional spot fires were reported east of Sawmill Road as the fire burned intensely along Pentz Road further east. By 10:00, multiple structures were burning on Sawmill Road. Spot fire coverage increased during this time to affect the area between the early, now well-established fire on Nunneley Road and the main fire front now on Sawmill Road. By 11:00, fire was burning up to the back of the Safeway and other buildings in the Old Town Plaza shopping center at the intersection of Elliott Road and Clark Road. Most fire activity east of Clark Road was over, and structures had burned before 13:15.

In the early afternoon, the main fire activity shifted to the west side of Clark Road as fire progressed toward Skyway. By 15:00, the fire front was near the Holiday Market, burning along Maxwell Drive and affecting Paradise High School. Around 16:00, the fire impacted the downtown area of Skyway.

Note that while the main fire activity accounted for a large majority of the destruction, residual fires and scattered structure fires continued to threaten localized unburned areas and structures for an extended period of time. For example, at 01:45 November 9, a surviving structure on the east end of Elliott Road was discovered to be just starting to ignite and was able to be saved. **Table 20** contains the fire progression summary for Elliot Road.

**Table 20.** Summary of fire progression on Elliott Rd.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	08:00	A spot fire begins on Nunneley Rd. A large tree is burning, flames are 2 m (6+ ft) tall. Pine needles are built up against structures. Matchbox-sized embers are reaching at least as far west as Clark Rd.	Nunneley Rd between Copeland Rd and Ingalls Rd	TD-035, TD-065 TD-067, TD-074 PPD-01 911-1030-10 911-1041-1 911-1051-1
11/8	08:00	A structure is reportedly burning on Sawmill Rd.	Sawmill Rd, north of Elliott Rd	TD-069
11/8	08:20 09:00	Multiple 911 calls report numerous scattered spot fires between Sawmill Rd and Pentz Rd.	between Sawmill Rd and Pentz Rd	TD-013, TD-015 PPD-04 911-127-1 911-156-1 911-148-1 911-186-1 911-195-1
11/8	09:20	The early spot fire on Nunneley Rd has spread. Additional 911 calls report fire on Nunneley Rd east of Clark Rd is impacting the evacuating traffic.	Nunneley Rd near Newland Rd	911-230-2 911-230-4
11/8	10:10	Fire is blocking Sawmill Rd north of Nunneley Rd. Structures on the east side of Sawmill Rd are burning.	Sawmill Rd and Nunneley Rd	TD-070, TD-123 PPD-05
11/8	10:25	Widespread fire is affecting the area east of Clark Rd, north of Nunneley Rd. Spot fires are numerous in the area of Nunneley Rd and Middle Libby Rd.	Nunneley Rd east of Clark Rd	TD-112, PPD-02
11/8	10:50 11:20	Fire is right behind (east of) Safeway. Spots are burning west of Clark Rd.	Clark Rd and Nunneley Rd	TD-035, TD-037 TD-068, TD-070 VTD-26 PPD-02, PPD-08
11/8	11:20	The fire front is progressing west from Sawmill Rd. Structures east of Ingalls Rd, previously unaffected by the early spot fire, are starting to burn west of Sawmill Rd on Nunneley Rd.	Nunneley Rd between Ingalls Rd and Sawmill Rd	TD-037, TD-112
11/8	12:45	<i>Structures are burning south and east of Skyway in the area of Almond St and Fir St. (Skyway)</i>	<i>Almond St and Fir St</i>	<i>TD-026</i>
11/8	13:15	Heavy fire activity is mainly west of Clark Rd. Multiple active structure fires are burning along Nunneley Rd.	Nunneley Rd west of Clark Rd	TD-021, TD-130
11/8	13:15	Structures on Elliott Rd east of Clark Rd have already burned.	Nunneley Rd east of Clark Rd	TD-210
11/8	14:00	<i>Main fire activity is west of Clark Rd; commercial structures on Clark Rd are burning. (Table 23)</i>	<i>Clark Rd between Elliott Rd and Pearson Rd</i>	<i>TD-055, TD-108 TD-133, TD-141</i>
11/8	14:30 15:30	The active fire front is approaching Skyway from the east. Significant structure fires are burning on Almond St. Fire is approaching the rear of Holiday Market (east) from the bike path. East of Maxwell Dr, structures have already burned down, and fire activity is past peak. Residential structures on Maxwell Dr north of Elliott Rd are burning.	Skyway and Elliott Rd	TD-014, TD-066 TD-132, TD-135 PPD-15
11/8	15:00	<i>The downtown commercial area between Pearson Rd and Elliott Rd gets heavily impacted by the fire front. (Table 26)</i>	<i>Skyway between Elliott Rd and Pearson Rd</i>	<i>TD-014, TD-142</i>
11/8	15:30	Fire is burning on the high school campus. Portable classrooms are burning, and a fire is on the roof of the main building.	Paradise High School, Maxwell Rd	TD-015, TD-132 TD-133, TD-141
11/9	01:42	A structure is found to be just igniting on east end of Elliott Rd.	Elliott Rd and Nielsen Dr	TD-014
11/9	09:55	Shadowbrook Apartments are burning.	Shadowbrook Way	TD-030, TD-111



### 9.1.7. Pearson Road and Buschmann Road Fire Progression Summary

The first recorded observation of fire activity along Pearson Road was well into town at Paradise Elementary School before 08:30. Additional data about this observation was not found in this study, and the effects and timing of this fire observation are not known.

Around 09:00, spot fires first ignited in the drainage in the area of Stearns Road and Hilbe Drive as the main fire activity in Paradise was heavily impacting the Pentz Road corridor to the east. Before 09:30, multiple spots also started along Pearson Road as far west as Sawmill Road. The spot fires in the drainage grew rapidly, and by 09:40 the drainage was overcome with intense fire and ember showers, as seen in **Figure 36a**. Dozens of civilian vehicles were trapped on the roadway, seen in **Figure 36b**, and exposed to intense flames and large embers. Section 9.3 describes the burnover event in more detail.

The areas east of Sawmill Road were heavily impacted by fire during this time. The fire progressed westward down Pearson Road, with localized areas burning between Clark Road and Sawmill Road until about 11:30, after which fire had filled in and everything was burning or already burned. The majority of destruction and fire activity east of Clark Road was over by 14:00.



**Figure 36.** Intense fire activity in the drainage at Pearson Rd and Hilbe Dr while civilians and first responders are stuck in the area. Views are eastbound, a) just east of Hilbe Dr, and b) just east of Hilltop Dr at the tail end of the traffic jam.

The area along Buschmann Road was affected earlier than the rest of Pearson Road west of Clark Road. Intense fire and ember showers impacted the intersection of Clark Road and Buschmann Road between 10:00 and 11:00, as fire from further south on Clark Road spread north and west into the area. This fire activity had significant impact on evacuating vehicles using Clark Road and Buschmann Road.

After noon, the fire continued its push west and involved the areas west of Clark Road toward Skyway. Widespread and intense fire activity burning vegetation and structures was observed between 14:00 and 16:00 on western Pearson Road, particularly between Skyway and Academy Drive. **Figure 37** shows representative conditions along this stretch of Pearson Road, with black out conditions and intense fire activity on fully involved parcels. By 16:00, there were approximately equal numbers of standing, burning, and destroyed structures visible on Pearson Road west of Clark Road. The majority of active fire spread had now moved to Skyway and the downtown portion of Paradise. **Table 21** contains the fire progression summary for Pearson Road.



**Figure 37.** A fully involved parcel on Pearson Rd at Sierra Park Dr.

**Table 21.** Summary of fire progression on Pearson Rd and Buschmann Rd.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	08:15 08:30	Report of flames <sup>a</sup> visible in area of Paradise Elementary School.	Paradise Elementary School	TD-054
11/8	08:30	A spot fire, estimated about 12 ha (30 ac), is established in the drainage east of Clark Rd near American Way.	drainage east of Clark Rd near American Way	TD-100
11/8	08:30 09:00	<i>An ember storm is impacting the east end of Pearson Rd at Pentz Rd. Propane tanks and ammunition are heard exploding as Pentz Rd is impacted by the fire. (Table 15, Table 16)</i>	Pearson Rd and Pentz Rd	TD-005, TD-034 TD-036, TD-123
11/8	09:00	Spot fire(s) ignite and become established in drainage south of Pearson Rd in the area of Stearns Rd and Hilbe Dr.	Pearson Rd and Hilbe Dr	TD-037, TD-100
11/8	09:15	6 m to 9 m (20 ft to 30 ft) flames are observed in the drainage near Hilbe Dr.	Pearson Rd and Hilbe Dr	TD-068
11/8	09:20 09:30	The first spot fire, 6 m × 6 m (20 ft × 20 ft) in pine needles and leaf litter, is observed along Pearson Rd near Edgewood Ln. To the east, fire is consuming the drainage including Stearns Rd, Pearson Rd, and Hilbe Dr.	Pearson Rd east of Sawmill Rd	TD-037, TD-087
11/8	09:35	Homes are burning on Henson Rd. This is the first report of burning structures along Pearson Rd east of Sawmill Rd.	Henson Rd; north and east of Pearson Rd and Sawmill Rd	TD-111
11/8	09:40 10:00	Intense fire consumes the drainage. Heavy fire in vegetative fuels on both sides of the road with gusty NW winds produce extensive ember showers that sound like pebbles. Fire burns through ground fuels, debris in pickup truck bed ignites, fire overtakes civilian vehicles and fire engine. Fire shelters were placed over windows, engine gets torched, blew diesel tank vents. Structures begin igniting from pine needles, propane tanks are exploding, and vehicles melt and catch fire. Several civilians and law enforcement officers escape on foot surrounded by heavy vegetation fire and ember showers. <i>See Section 9.3 for a description of the burnover event.</i>	Pearson between Cherry Ln and Pentz Rd	TD-087, TD-122 TD-129 VTD-23 VTD-24 VTD-16 PPD-05
11/8	10:00	Fires are observed on Angel Dr south of Pearson Rd.	Pearson Rd and Angel Dr	PPD-05
11/8	10:00	Pearson Rd is blocked by fire across roadway at Sawmill Rd.	Pearson Rd and Sawmill Rd	TD-070
11/8	10:00 <sub>b</sub>	Numerous spot fires, ember showers, and strong winds begin on Buschmann Rd. Conditions last for several hours, threatening and destroying structures.	Buschmann Rd	VTD-02
11/8	10:00 10:20	All structures around Pearson Rd and Stearns Rd are burning. Quarter sized embers are falling. The main fire activity passes by 10:20. <i>See Section 9.3 for a description of the burnover event.</i>	Pearson Rd and Stearns Rd	TD-087, TD-123 VTD-23
11/8	10:25	Scattered structure fires and woodpiles are burning along South Libby Rd between Pearson Rd and Keller Ln. <sup>c</sup>	South Libby Rd	TD-020
11/8	10:30 10:45	<i>Fire overtakes vehicles evacuating on Clark Rd at Buschmann Rd. Wind is blowing flames like a blow torch, spot fires and trees ignite. Fire jumps to the west side of Clark Rd. Spot fires and scattered structures begin burning west toward Scottwood Rd. (Table 24)</i>	Buschmann Rd	TD-034, TD-065 PPD-02
11/8	11:00 11:15	Structures are igniting along Pearson Rd between Clark Rd and South Libby Rd. The area is not fully involved yet, but fire is present. Heavy fire is east of Middle Libby Rd; structures, vegetation, and fences are all burning. Propane tanks are exploding about 1 per minute.	Pearson Rd between Clark Rd and Sawmill Rd	TD-020, TD-124 TD-130
11/8	11:30	Houses on the east side of Pearson Rd and South Libby Rd are burning. Enchanted Forest Mobile Home Park is burning, and fire continues pushing westward.	Pearson Rd and South Libby Rd	TD-37, TD-123
11/8	11:45 12:00	<i>Fire approaches Pearson Rd and Clark Rd and becomes established in the area around the intersection. Spot fires, areas of surface fires in heavy brush with 4.5 m (15 ft) flames and blowing embers threaten Ace Hardware and ignite the Mobil gas station and mobile homes. (Table 24)</i>	Pearson Rd and Clark Rd	TD-037, TD-074 TD-130

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	12:00 - 13:00	Significant fire activity on both sides of Pearson Rd between Clark Rd and Libby Rd make the road barely passable. Enchanted Forest Mobile Home Park is fully involved. The area south of Pearson Rd on Newland Rd and Garden View Ln is a furnace; everything is burning.	Pearson Rd between Clark Rd and South Libby Rd	TD-014, TD-020 TD-111, TD-130 TD-210
11/8	12:00	At the end of South Libby, timber and heavy fuels are still burning. Structures are burning and some have already burned to the ground.	south end of South Libby Rd	TD-014, TD-020 TD-111, TD-123
11/8	13:00	Paradise Community Park is burning and 10 cm to 13 cm (4 in to 5 in) diameter embers are falling. Structures to the north of Paradise PD are burning.	Black Olive Dr and Birch St	TD-026, TD-064
11/8	13:00	Areas previously burned are observed burning a second time.	Pearson Rd and Hilbe Dr	TD-014
11/8	13:45 - 14:15	The main fire activity is over east of Clark Rd. There is minimal fire activity and most structures are burning rubble by this time.	Pearson Rd between Clark Rd and Pentz Rd	TD-130, TD-209
11/8	14:50 - 15:00	The main fire activity on Pearson Rd is now west of Clark Rd. A majority of structures are burning along Pearson Rd, including Paradise Elementary School. Intense fire is burning on both sides of Pearson Rd between Black Olive Dr and Academy Dr, including many structures fully involved.	Pearson Rd between Skyway and Academy Dr	TD-055, TD-069 TD-100, TD-101 TD-132, TD-141 PPD-15
11/8	15:00	<i>A spot fire is observed burning against a commercial structure at Skyway and Foster Rd. Smoke may be coming from the building. (Table 26)</i>	Skyway and Foster Rd	TD-132
11/8	15:20	<i>A building is fully involved at Skyway and Foster Rd and there is no other fire around. Waves of golf ball-sized embers are blowing along the roadway. (Table 26)</i>	Skyway and Foster Rd	PPD-15
11/8	15:45	Pearson Rd is passable between Skyway and Clark Rd. Structures are equal parts burned to foundation, fully involved, or unburned and standing.	Pearson Rd between Skyway and Clark Rd	PPD-15
11/8	16:45	<i>Fire gets well-established in multiple commercial structures at Skyway at Fir St, and fire continues to burn structures in the area of Fire Station 81. (Table 26)</i>	northeast of Pearson Rd and Skyway	TD-111, TD-142

<sup>a</sup> This observation is an outlier from a single source. It is possible that there are early spot fires in this area.

<sup>b</sup> Time is a general estimate provided by single source VTD.

<sup>c</sup> Conditions further south on South Libby Rd were not described and fire may extend further than Keller Ln.

### 9.1.8. Clark Road Fire Progression Summary

Much of the fire activity on Clark Road occurred simultaneously, as numerous spot fires ignited along this corridor, and the main fire front also passed through within roughly an hour on either side of 12:00 noon, with most significant destruction completed around 14:00. Clark Road is divided into three sections for added clarity. **Table 22–Table 24** contain the fire progression summary for Clark Road.

#### 9.1.8.1. Skyway to CMA Church near Bille Road

The first spot fires along Clark Road north of Bille Road ignited before 08:30 in the area of Apple Tree Village Mobile Home Park. Shortly after, a spot fire also began a mile north near the intersection with Skyway. Before 09:00, additional spots ignited near Wagstaff Road at the School District Office and east of the Save Mart in Paradise Plaza shopping center. Soon after, trees and vegetation were torching around the rear of the commercial buildings as fire wrapped around the southeast corner. Several residential structures were destroyed before 11:00.

Around the same 09:00 timeframe, a spot fire was becoming well-established in timber west of the CMA Church, between Wagstaff Road and Bille Road, working its way south toward Bille Road. Initial estimates were that it was already 0.4 ha (1 ac) in size.

At 11:00, fire had burned through surface fuels in the area of Clark Road and Forest Service Road near Fire Station 35. Mobile homes in Apple Tree Village were burning. Fire intensity increased between Adams Road and Kimberly Lane. By noon, the fire had spread north, with active fire now burning on both sides of Clark Road north of Kimberly Lane. The area immediately around the Skyway and Cabernet Lane intersections were still unburned; however, fire was moving closer to this area. Fire activity peaked around Clark Road and Skyway in the afternoon at about 14:30.

Through the evening, additional structures throughout the area were still burning. Trees and power poles blocked roadways in multiple locations. The area west of the Paradise Plaza, including the Pine Grove Mobile Home Park was generally unburned until 18:30, when fire got established and spread through the park, becoming fully involved by 20:00.

**Table 22.** Summary of fire progression on Clark Rd between Skyway and CMA Church.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	08:15 – 08:30	Multiple spot fires are burning in and around Apple Tree Village Mobile Home Park.	Clark Rd and Kilcrease Cir	TD-015, VTD-09 911-161-2
11/8	08:30	<i>A spot fire ignites on the south side of the intersection between Skyway and Clark Rd, estimated initially at 0.1 ha (0.25 ac). Multiple citizens report the fire to 911. Trees are also observed on fire at the northern end of Clark Rd. (Table 25)</i>	Clark Rd and Skyway	TD-058 911-141-1 911-141-2 911-152-1 911-153-1 911-155-1 911-164-1
11/8	08:35 – 08:45	<i>A small spot fire is starting in grass at the Paradise United Methodist Church and the School District office. A spot fire also begins in a grass field behind (east of) Save Mart and spreads to pine trees. (Table 18)</i>	Wagstaff Rd and Clark Rd	TD-067, TD-075 PPD-02 911-157-1 911-158-1

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	08:50 09:20	A spot fire is observed in trees and vegetation behind the CMA church (west). The fire is about 0.4 ha (1 ac), burning in timber, and working its way south toward Bille Rd.	Clark Rd at Paradise Alliance CMA Church	TD-017 911-188-2
11/8	09:00 09:30	The spot fire east of Save Mart grows. Trees are torching and fire is becoming well-established in area of Wagstaff Rd. Structures to east are burning.	Wagstaff Rd east of Save Mart	TD-017, TD-052 TD-053, TD-055 TD-058, VTD-18
11/8	09:30	The surface fuels in the wedge between Skyway and Clark Rd at the intersection have burned through and the main fire activity has subsided in immediate area and moved south along Skyway.	Clark Rd and Skyway	TD-067
11/8	10:15 10:45	Fire is burning around Fire Station 35 on the west side of Clark Rd. On the east side, Pine Springs Mobile Home Park being impacted. Most active fire is on east side of Clark Rd between Kimberly Ln and Adams Rd. Spot fires are burning throughout Clark Rd north of Wagstaff Rd.	Clark Rd near Forest Service Rd	TD-037, TD-043 VTD-13
11/8	10:50	Residential structures around Save Mart and Kmart have been burning. Several are fully involved and beginning to collapse.	Paradise Plaza, Clark Rd and Wagstaff Rd	VTD-18
11/8	10:55	Surface fuels around Fire Station 35 have already burned. Mobile homes in Apple Tree Village are catching fire.	Clark Rd and Forest Service Rd	TD-009, TD-041 TD-043
11/8	11:30 12:30	Spot fires are burning in juniper bushes on both sides of Clark Rd south of Wagstaff at the Kmart and the CMA church.	Clark Rd between Wagstaff Rd and Bille Rd	TD-015, TD-017 VTD-18
11/8	11:40	Structures on Gate Ln are igniting and spreading south.	Gate Ln	TD-041
11/8	11:45	Intense fire conditions between Kimberly Ln and Adams Rd. North of Kimberly Ln, numerous spot fires are burning mostly on the east side of Clark Rd in surface vegetation and fences. South of Adams Rd to Wagstaff Rd there are still only a few spot fires.	Clark Rd north of Wagstaff Rd	PPD-08
11/8	12:00	Spot fires on the north side of the storage facility at Skyway and Clark Rd, Bader Mine Rd.	Clark Rd and Skyway, Bader Mine Rd	TD-042, TD-075 PPD-10, PPD-12
11/8	12:00	Fire has become more established north of Kimberly Ln and is beginning to spread significantly west of Clark Rd.	Clark Rd north of Kimberly Ln	PPD-08
11/8	12:30	<i>Multiple structures are burning on Wagstaff Rd just west of Clark Rd. Several spot fires are burning around the intersection and Paradise Plaza shopping center. (Table 18)</i>	Clark Rd and Wagstaff Rd	VTD-18
11/8	13:00	Clark Rd north of Wagstaff Rd is burning.	Clark Rd north of Wagstaff Rd	TD-015
11/8	13:15 14:15	<i>Fire is coming toward the Clark Rd and Skyway intersection from the canyon to the west. Structures on the east side of Skyway are burning intensely, fire is coming from the north through structures, threatening Optimo and Fastrup. (Skyway) Many homes are on fire near Clark Rd and Cabernet Ln.</i>	Clark Rd and Skyway	TD-041, TD-067 TD-127, TD-111 TD-200, TD-207 PPD-13
11/8	14:00	Residential structures south of Kmart continue to burn and ignite additional homes.	Clark Rd south of Wagstaff Rd	VTD-18
11/8	14:30	<i>Peak fire activity around Clark Rd and Skyway, at the Optimo and Fastrup. (Table 25)</i>	Clark Rd and Skyway	TD-067, TD-075 TD-041, TD-127 TD-200, TD-205 PPD-14
11/8	15:00	Peak fire activity around Optimo is subsiding, but multiple structures are still burning in area. Fire continues to burn for several hours. A few homes are also burning on Gate Ln.	Clark Rd and Skyway	TD-108, TD-111 TD-114, PPD-15
11/8	17:00	Structures up and down Clark Rd and on side roads continue to burn. Large trees and power poles are also burning and threaten or block roadways.	Clark Rd north of Wagstaff Rd	TD-014, TD-108 TD-114
11/8	18:30	An island of unburned area SW of Wagstaff Rd and Clark Rd begins to be affected by fire. Mobile homes in Pine Grove Mobile Home Park begin to ignite.	Pine Grove Mobile Home Park, Clark Rd between Wagstaff Rd and CMA church	TD-108, TD-114
11/8	20:00	Pine Grove Mobile Home Park is completely burning and other structures surrounding the park are also beginning to burn.	Pine Grove Mobile Home Park, Clark Rd between Wagstaff Rd and CMA church	TD-108, TD-205 TD-207

### 9.1.8.2. CMA Church to Nunneley Road

This region of Clark Road was impacted early. Matchbook-sized embers were observed at Clark Road and Elliott Road as early as 08:00. The first spot fire was established within the hour, burning east of the Paradise Irrigation District office just south of Bille Road by 08:50.

Significant fire activity was observed before noon. The localized area near Central Park Drive was impacted first around 10:00 when multiple commercial structures were burning on both sides of Clark Road. **Figure 38** shows buildings continuing to burn at 11:43, with flames blowing and encroaching on the roadway. Some structures had already burned down by this time.

By 11:00, fire was moving west down Elliott Road and burning up against the Safeway. Around 12:00, a majority of the area along Clark Road between Bille Road and Nunneley Road had been impacted. By 14:00, many structures had burned and collapsed.

As an example of the continual threat of ignition even after the fire front had passed, structures in this area were still igniting many hours later. The Lisa Family Pharmacy was burning around 01:45 on November 9 and threatening the nearby Masonic Lodge and library buildings. Even in the mid-morning of November 9, structures at the Shadowbrook Apartments were burning.



**Figure 38.** Commercial structures burning along Clark Rd at Central Park Dr. View north.

**Table 23.** Summary of fire progression on Clark Rd between CMA Church and Nunneley Rd.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	08:00	Matchbox-sized embers are landing at Clark Rd and Elliott Rd.	Clark Rd and Elliott Rd	TD-065, TD-074
11/8	08:50	A significant spot fire is burning a field just east of Paradise Irrigation District office.	Clark Rd and Rossi Ln	TD-077, TD-111 911-183-4
11/8	09:50	<i>Fire is burning in the area of the medical complex on the west side of Clark Rd. (Table 19)</i>	<i>Clark Rd just south of Bille Rd</i>	<i>PPD-05</i>
11/8	10:00	Fire is beginning to burn both sides of Clark Rd in buildings and vegetation.	Clark Rd near Central Park Dr	TD-009
11/8	10:25	<i>The area north of Nunneley Rd, east of Clark Rd is catching fire. (Table 20)</i>	<i>Clark Rd and Nunneley Rd</i>	<i>PPD-02</i>
11/8	10:30 11:00	Fire impacts structures from the east and everything is burning. Intense fire consumes the area of Central Park Dr. Surface fuels burn through first, while heavy fuels, including landscape timbers and structures, continue to burn.	Clark Rd between Elk Ln and Saxberg Dr	TD-037, TD-041 TD-058, TD-070 VTD-26, PPD-08
11/8	10:45	Numerous spot fires are burning in parking lot vegetation at the intersection of Clark Rd and Bille Rd.	Clark Rd and Bille Rd	VTD-26
11/8	10:50	<i>Fire is impacting the rear (east side) of the Safeway shopping center. (Table 20)</i>	<i>Clark Rd and Elliott Rd</i>	<i>TD-037, TD-068 PPD-02</i>
11/8	11:00	Spot fires are burning in vegetation at the Arco gas station. Fire is now approaching from the west.	Clark Rd and Elliott Rd	TD-034, TD-035 TD-070
11/8	12:00	Areas west of Clark Rd are burning as fire pushes further west.	Clark Rd and Nunneley Rd	TD-118, PPD-08
11/8	12:20	A lot of damage has been done on Clark Rd around Central Park Dr. Vegetative surface fires are burned through. Remaining structures continue to ignite and burn.	Clark Rd near Central Park Dr	TD-101, PPD-08
11/8	12:20	<i>Structures on Bille Rd are burning just west of Clark Rd. (Table 19)</i>	<i>Clark Rd and Bille Rd</i>	<i>TD-101</i>
11/8	12:30	There are several moderately active surface fires between Elliott Rd and Nunneley Rd. Limited structures are burning close to roadway due to the numerous parking lots.	Clark Rd between Elliott Rd and Nunneley Rd	PPD-08
11/8	13:00	Fire is blowing across Clark Rd at Tahoe Way, just south of Bille Rd.	Clark Rd and Tahoe Way	TD-038
11/8	14:00	The main fire activity has moved on mainly west of Clark Rd, burning on Central Park Dr, Elliott Rd, and Nunneley Rd where structures continue to burn. Many structures along Clark Rd are past peak and have collapsed.	Clark Rd between CMA and Nunneley Rd	TD-069, TD-118 TD-141, PPD-15
11/8	15:30	There is fire on the roof of Rite Aid.	Clark Rd and Elliott Rd	TD-122, TD-124
11/9	01:45	Structures continue to ignite throughout town. Lisa Family Pharmacy has smoke coming from the attic, and the Masonic Lodge and library are threatened.	Clark Rd and Elliott Rd	TD-022, TD-110
11/9	09:55	Shadowbrook Apartments are burning.	Shadowbrook Way	TD-030, TD-111



### 9.1.8.3. Nunneley Road to Airport Road

Impacts on the southern portions of Clark Road within Paradise began as early as 07:45 when hot embers were observed falling on American Way, and by 08:30, a spot fire was established in the drainage east of American Way. Spot fires and a structure burning on the west side of Clark Road near Easy St were reported as early as 08:45.

By 10:00, fire was impacting Clark Road in multiple locations while people were attempting to evacuate. Near the “S”-curve and near American Way, flames were burning across the roadway. At this time, fire was burning as far south as Meadow Song Drive, with flames also right against the roadway. Within the hour, by 10:45, most structures along Clark Road south of Buschmann Road were burning. Conditions deteriorated at the intersection with Buschmann Road as intense wind-driven flames spread across Clark Road.

Clark Road became barely passable again near the town limits for a brief time window. However, another flare-up between 11:00 and 11:30 closed the roadway again as 15 m (50 ft) flames crossed Clark Road near Round Valley Ranch Road, and fire again crossed the roadway near American Way. Further down Clark Road at Airport Road, fire also burned over the roadway, delaying access of the arriving strike teams as they waited for conditions to abate, seen in **Figure 39**. The fire continued with high intensity south of the airport, where it paused and hung up for a period of time between about 13:00 and 15:00 before again advancing down into the flats south of Circle J Road as described in Section 9.1.13.

Around 12:00, the intersection of Clark Road and Pearson Road was impacted as the fire front moved in from the east and also spread up from Buschmann Road. Structures burned all afternoon, but by 14:00 the main fire activity along Clark Road was over and most structures were already destroyed.



Video courtesy of TD-208, 11:20.  
Used with permission.

**Figure 39.** Heavy fire exposure from the canyon burns over Clark Rd just north of Airport Rd, delaying civilian evacuation and first responder access. View north at 11:20.

**Table 24.** Summary of fire progression on Clark Rd between Nunneley Rd and Airport Rd.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	07:45	Hot embers are observed falling at American Way at the south end of town.	American Way	TD-035
11/8	08:30	A large spot fire east of Clark is established in drainage, estimated up to 12 ha (30 ac).	between Clark Rd and Morgan Ridge Rd	TD-100
11/8	08:45	Fire is spotting onto the west side of Clark Rd near the town limits. A structure is burning. <sup>a</sup>	Clark Rd near Easy St	TD-105
11/8	09:30	Fire from the drainage east of Clark Rd is spreading uphill towards Lanser Dr and American Way.	Clark Rd "S"-curve	TD-034, TD-077 911-201-1
11/8	10:00	Fire impacting Clark Rd at the south end of town at the S-curve near American Way and further south near the town limits. Vehicles are burning and flames are fully or partially blocking the roadway. <i>See Section 9.3 for a description of the burnover event.</i>	Clark Rd "S"-curve	TD-009, TD-041 TD-049, TD-065 PPD-02
11/8	10:00	Fire has reached as far south as Meadow Song Dr, burning in vegetation.	Clark Rd and Meadow Song Dr, south of town limits	TD-014
11/8	10:30	Spot fire ignitions are increasing on the west side of Clark Rd down Round Valley Ranch Rd. The main fire activity now extends as far south as Airport Rd on the east side of Clark Rd.	Round Valley Ranch Rd and south	TD-100, TD-110
11/8	10:45	All structures are burning along Clark Rd between Buschmann Rd and Lanser Dr.	Clark Rd between Buschmann Rd and Lanser Dr	TD-110
11/8	10:45	<i>Conditions at Clark Rd and Buschmann Rd deteriorate. The field on the east side is burning, flames are being blown like a blowtorch, and fire is jumping to the west side of Clark Rd. (Table 21)</i>	Clark Rd and Buschmann Rd	TD-034, TD-065
11/8	10:45	Clark Rd is barely passable again using a single lane at Round Valley Ranch Rd. Fire is burning both sides, with the more intense fire on the east side burning up from the drainage. Some active areas of vegetation fire are up against the roadway, other areas already burned through with spot fires still active on heavier fuels.	Clark Rd south of Round Valley Ranch Rd	TD-130, TD-210 PPD-02
11/8	11:00 11:30	Fire is burning over Clark Rd again at multiple locations at the south edge of town, re-closing the roadway preventing evacuations. 15 m (50 ft) flames are crossing Clark Rd at Round Valley Ranch Rd, and fire is blocking Clark Rd at American Way again.	Clark Rd south of the S-curve	TD-100, TD-208 TD-211
11/8	11:00 11:30	Intense vegetation fire is burning up out of the canyon, with heavy fire near Airport Rd threatening structures on Good View Ln.	Clark Rd and Airport Rd	TD-110, TD-208
11/8	11:15	Structures are burning on Round Valley Ranch Rd.	Round Valley Ranch Rd	TD-110
11/8	11:30 12:00	Fire makes another push across Clark Rd between Pearson Rd and Lanser Dr, burning many structures and threatening others. Clark is impassable at Buschmann Rd.	Clark Rd between Pearson Rd and the S-curve	TD-035, TD-130 TD-208, TD-211 PPD-08
11/8	11:45 12:00	<i>The intersection of Clark Rd and Pearson Rd is impacted. Fire gets established, burning structures. (Table 21)</i>	Clark Rd and Pearson Rd	TD-037, TD-074 TD-130, TD-210 PPD-08
11/8	12:30 12:45	The main fire front continues pushing south along Clark Rd beyond Airport Rd. Guardrail posts are burning, burning debris is in the roadway, heavy fire is coming from structures on Good View Dr. 30 m (100 ft) flames are burning up the canyon walls west toward the airport.	Clark Rd and Airport Rd	TD-035, TD-208 VTD-06, PPD-08
11/8	13:00	There are heavy fire conditions in commercial structures along Clark Rd north of Pearson Rd.	Clark Rd north of Pearson Rd	TD-021, TD-108 TD-130, TD-132 TD-141, TD-142
11/8	13:00 14:00	The main fire activity is over at the south end of town and many structures are already destroyed. Structures continue to burn all afternoon.	Clark Rd south of Pearson Rd	TD-014, TD-020 TD-108, TD-112 TD-122, TD-123 TD-126, TD-133 TD-142, TD-209 TD-211, TD-18

<sup>a</sup> This early observation is an outlier point that was not verifiable through cross-reference at this time of day.

### 9.1.9. Skyway Fire Progression Summary

Due to the length of the road and the number of simultaneous events on the north and south ends of Paradise, Skyway is divided into two sub-regions; north of Bille Road in **Table 25** and south of Bille Road in **Table 26**.

#### 9.1.9.1. Coutolenc Road to Bille Road Fire Progression Summary

At the north end of Paradise, numerous spot fires ignited in the 08:30 to 09:00 window. These included a fire just south of the intersection with Clark Road, a fire off of Rocky Lane near the bike path, a fire a little further south at Wagstaff Road and Berkshire Avenue, and also already several spots west of town on the Paradise side of Little Butte Creek Canyon. By 09:00, fire was also burning in Old Magalia, influencing the ability to travel north on Skyway from Paradise.

By 09:30, the four major spot fires were well-established, igniting structures and impacting evacuating vehicles. The area of Skyway south of Clark Road near Lofty Lane was particularly intense between 09:30 and 10:30. By 10:30, nearly all of Skyway north of Wagstaff Road was about to be impacted by fire from both the east (Rocky Lane spot fire and Clark Road spot fire) and from the west (spot fires now pushing up from the canyon burning structures on Montna Drive). South of Clark Road, evacuees and first responders were overrun by fire as they were stuck in traffic. Further south, the area of Wagstaff Road just east of Skyway at Berkshire Avenue and Oak Way was heavily involved, with intense ember showers and multiple structures burning.

Before 11:00, the escape routes from the unburned area surrounding the intersection of Skyway and Clark Road were blocked by fire. By 13:00, fire activity was increasing north of Clark Road, with fire encroaching on civilians sheltered at the Optimo restaurant parking lot and threatening commercial buildings, including the Fastrip gas station.

Between 12:00 and 15:00, nearly every structure was fully involved in the area between Wagstaff Road and Clark Road, and dozens of abandoned vehicles were burning in the roadway. Engine strike teams had to wait for fire to subside before they could pass through, while everything was still burning.

By 14:30, Skyway between Wagstaff Road and Bille Road had been completely destroyed. Although foundations and rubble were still flaming, the main fire had moved further south and west. At the same time, fire activity was wrapping around the intersection at Clark Road and burning structures along Skyway and on Gate Lane and Cabernet Lane.

After 15:00, the fire activity on Skyway north of Bille Road had passed by, and the downtown areas of Skyway south of Bille Road were impacted. See **Table 26** describing that region.

During the early morning hours on November 9, fire activity blew up in the West Branch canyon, sending intense fire west over the ridge of Skyway and Coutolenc Road directly toward Magalia. This blow up is further detailed in the Magalia section, **Table 32**, and the burnover section, Section 9.3.

**Table 25.** Summary of fire progression on Skyway between Coutolenc Rd and Bille Rd.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	08:00	Spot fires have started on the west side of the Feather River Canyon by Sawmill Peak.	Skyway and Pentz Rd	911-092-1
11/8	08:25	A spot fire has started on the bike path at Rocky Ln and is burning in backyards.	Rocky Ln	911-128-1
11/8	08:30 09:00	3 to 4 spot fires start down in Little Butte Creek Canyon west of Skyway, spreading uphill towards Montna Dr.	in canyon NW of Skyway and Wagstaff Rd	TD-113 911-183-2 911-163-1 911-205-1
11/8	08:30	<i>A spot fire ignites on the south side of the intersection between Skyway and Clark Rd, estimated initially at 0.1 ha (0.25 ac). Multiple citizens report the fire to 911. Trees are also observed on fire at the northern end of Clark Rd. (Table 22)</i>	Clark Rd and Skyway	TD-058 911-141-1 911-141-2 911-152-1 911-153-1 911-155-1 911-164-1
11/8	08:40 08:50	<i>Multiple citizens report a new spot fire in the area of Wagstaff Rd and the bike path, near Berkshire Ave. (Table 18)</i>	Wagstaff Rd and Berkshire Ave	TD-015 911-162-1 911-169-1 911-178-2 911-195-4
11/8	08:40	Spot fires are burning in Old Magalia.	Old Magalia	TD-006 911-207-1
11/8	08:50	Another spot fire, estimated at 0.1 ha (0.25 ac), is burning in the ball field between Skyway and Clark Rd.	Moore Rd ballfield between Skyway and Clark Rd	TD-064 911-188-1
11/8	09:00	The upper portion of Skyway, parallel with the bike path, is fully involved in fire both sides of roadway.	Skyway near Lofty Ln	TD-064
11/8	09:00 10:00	A large spot fire is burning on both sides of Skyway north of Pentz Rd blocking traffic. Structures are burning in Old Magalia. Dense white, light gray smoke is drifting across roadway, north of Pentz.	Old Magalia	PPD-02 911-217-1 911-230-1
11/8	08:50 09:15	<i>Fire is pinching Wagstaff Rd between Skyway and Clark Rd. Fire is burning from the NE into the area of Rocky Ln, and the spot near the bike path is well established. The intersection of Skyway and Wagstaff Rd will be impacted soon. Multiple cars are on fire. (Table 18)</i>	Wagstaff Rd between Skyway and Clark Rd	TD-017, TD-042 TD-053, TD-111 TD-127
11/8	09:20	The initial spot fire burned through surface fuels in the area at Skyway and Clark and the fire activity is increasing near Lofty Ln.	Skyway and Clark Rd	TD-067, PPD-02
11/8	09:30	Fire is burning in 4 large areas along Skyway. One spot to the west in the area of Montna Dr, one to the east at Wagstaff Rd and Rocky Ln, one spot further to the east at Station 35, as well as the initial spot location near the intersection of Clark Rd.	Skyway north of Wagstaff Rd	TD-064
11/8	09:55	Vegetation fire is established at the west end of Pheasant Ridge Dr. On Skyway, fire is still burning intensely near Lofty Ln. Sheeting flames are impacting vehicles.	Skyway near Lofty Ln	TD-022
11/8	10:30	Structures are now burning in the area of Skyway and Kemen Ln and west of Skyway on Montna Dr. A fire front is coming hard from Little Butte Creek Canyon.	Skyway between Wagstaff Rd and Firland Dr	TD-014, TD-113
11/8	11:00	Fire burning south east of Skyway through Berkshire Ave and Skyway Villa Mobile Home Park, pushing south and west toward Bille Rd	Skyway near Bille Rd	TD-116, TD-030 TD-127
11/8	11:00 13:00	The fire stalls north of Pentz Rd. The north flank of the main fire is on Skyway between Pentz Rd and Coutolenc Rd. There are some spot fires down in canyon to the east.	Skyway between Pentz Rd and Coutolenc Rd	TD-009, TD-041 TD-060, TD-079
11/8	11:25	Heavy fire continues on Skyway south of Clark Rd. Civilians are encircled in the upper portion of town with fire compromising all roads.	Skyway and Clark Rd	TD-041, PPD-02
11/8	11:35	Evacuating vehicles and law enforcement officers are trapped and surrounded by fire in the area of Skyway and Coldren Rd, south of Clark Rd.	Skyway and Coldren Rd	PPD-08
11/8	11:45	Skyway is overtaken by fire and everything is burning between Wagstaff Rd and Bille Rd.	Skyway between Wagstaff Rd and Bille Rd	TD-127, PPD-08

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	12:00	Multiple spot fires and structures are burning on the east side of Skyway north of Clark Rd and on Bader Mine Rd. Structures in Old Magalia, Ishi Dr and Indian Dr, are burning. The old fire station in Old Magalia near the Magalia Community Church on Old Skyway is impacted.	Skyway north of Clark Rd	TD-041, TD-060 TD-075, TD-079 TD-083 PPD-10, PPD-12
11/8	12:20 15:00	There is a significant period of intense fire between Wagstaff Rd and Clark Rd. Crowning fire pushes from west of Skyway and fire closes in on both sides of roadway. Vehicles and structures are burning. The area is like a furnace.	Skyway between Clark Rd and Wagstaff Rd	TD-015, TD-061 TD-111, TD-113 TD-127, TD-128 TD-200, TD-205 TD-207, PPD-08
11/8	13:00	Fire activity increases around Optimo, with fire coming up from the west along Bader Mine Rd. Structures on east side Skyway burning, fully involved.	Skyway and Clark Rd	TD-041, TD-067 TD-127, PPD-13
11/8	13:00	All structures on Ishi Dr are burning in Old Magalia.	Ishi Dr and Indian Dr, Old Magalia	TD-079
11/8	13:20	There is significant fire in the area of Skyway and Wagstaff Rd. Skyway Villa Mobile Home Park is burning, and structures are fully involved on Bille Rd and Berkshire Ave.	Skyway and Wagstaff Rd	TD-011, TD-030 TD-055
11/8	14:00 14:30	Many homes are on fire near Cabernet Ln down Clark Rd. Most structures are burning on Skyway north of Clark Rd. Commercial buildings, including the propane facility and storage units, are burning. Fastrip and Optimo are threatened.	Skyway and Clark Rd	TD-041, TD-067 TD-075, TD-111 TD-127, TD-200 TD-207
11/8	14:20	The area of Skyway between Wagstaff Rd and Bille Rd is completely destroyed. Foundations are still flaming, but the main fire activity is over. Burning power poles and power lines and local flare-ups occasionally make passage difficult.	Skyway between Wagstaff Rd and Bille Rd	TD-055, TD-065
11/8	14:20	Vehicles in the roadway are burning. Structures are destroyed, with some still burning fully involved. Surface fuels have been completely consumed.	Skyway north of Wagstaff Rd	TD-055
11/8	15:00	One structure is still burning but everything else is pretty much done around Optimo, Clark Rd and Skyway.	Skyway and Clark Rd	PPD-15
11/8	15:00	Everything has burned north of Bille Rd to Clark Rd.	Skyway between Clark Rd and Bille Rd	TD-108, TD-205
11/8	16:30 18:00	Fire activity south of Skyway down Clark Rd picks up again. Structures continue igniting and burning on Clark Rd, Cabernet Ln, and Gate Ln.	Clark Rd, Cabernet Ln, Gate Ln	TD-108, TD-114
11/8	17:30	<i>South of Bille Rd, commercial structures along Skyway in the downtown area are threatened. (Table 26)</i>	<i>Skyway south of Bille Rd</i>	<i>TD-127</i>
11/8	18:30	Fire in the drainage is burning heavy brush, pushing NE uphill toward Ishi Dr from Little Butte Creek Canyon toward a few unburned homes.	Old Magalia, Ishi Dr	TD-079, TD-085 TD-087, TD-089
11/8	21:00	Low-intensity fire is burning east of Skyway in the Feather River Canyon. Fire is bumping scattered structures.	Skyway between Coutolenc Rd and Pentz Rd	TD-043, TD-045
11/9	00:00 01:00	<i>Fire runs up out of the West Branch canyon and pushes hard N and W into Magalia with strong winds and large, softball-size embers. (Table 32)</i>	<i>Skyway and Coutolenc Rd, and north</i>	<i>TD-007, TD-045 TD-061, TD-115 TD-125, TD-126 TD-209</i>
11/9	01:30	Areas of northern Old Magalia are hit hard again by lots of scattered spot fires and fire pushing hard out of canyons from all directions.	Old Skyway, Sugar Pine Rd	TD-043, TD-087 TD-089

### 9.1.9.2. Bille Road to Lookout Point Fire Progression Summary

Early fire activity on Skyway south of Bille Road was related to the burnover of Skyway near the town limits. At 08:45, a spot fire began in the Honey Run Canyon between Skyway and Redbud Drive. After becoming well-established in the canyon, it made a run south up the canyon walls toward the Canyon View Apartments and burned over Skyway beginning around 10:15. During this time, Skyway was full of heavy, slow-moving traffic from evacuating vehicles. Incoming emergency vehicles and outgoing citizens were overrun by fire burning across the roadway. **Figure 40** shows conditions experienced by evacuating civilians on Skyway as they travelled southbound in the northbound lanes because of burned trees and power poles blocking the normal southbound traffic lanes. Peak fire activity along this part of Skyway occurred between 10:15 and 11:15, with significant ember showers and burning of vegetation, fences, power poles, and structures on both sides of Skyway. Fire continued pushing into the neighborhood of Princeton Way, the drainage between Skyway and Neal Road, and westward beyond Skyway Crossroad. By noon, fire was well involved on Neal Road (see **Table 27**).



Source: ViralHog  
Used with permission.

**Figure 40.** Skyway was burned over during the middle of evacuation efforts. Conditions are seen here at 10:44 just west of the lane divide at the town limits.

Further north, fire pushed into the Skyway area at Bille Road around 11:00 to 11:30 as it spread from initial spot fires on Wagstaff Road and Bille Road. After noon, structures east of Skyway in the area of Fir Street and Almond Street began burning.

Spot fires began affecting the area of Skyway between Pearson Road and Neal Road around 12:30, which up to this point had not seen fire activity. The Honey Run spot fire, while initially running south over Skyway, had also been progressing up the drainage north of Skyway along Honey Run Road, burning structures behind the medical center and Town Hall. By 15:00, fire was burning toward Skyway from multiple directions: from Honey Run Road to the west and from Pearson Road, Almond Street, and Black Olive Drive to the east.

The first commercial structure in the area was in the early stages of burning at 15:00 at Skyway and Foster Road. Downtown structures were increasingly threatened as fire closed in on the area, and heavy fire conditions were observed between 15:30 and 18:00 when many structures were destroyed between Bille Road and Neal Road. Fires continued to burn after 18:00 and through the night. **Table 26** has additional details.

**Table 26.** Summary of fire progression on Skyway between Bille Rd and Lookout Point.

Date	Time Range	Fire Behavior Observations	Location	Source #
				TD-006, TD-038 TD-055, TD-111 911-182-1 911-200-1 911-202-1 911-204-1 911-218-1 911-221-1 911-225-1
11/8	08:45 - 09:15	A spot fire ignites in Honey Run Canyon and becomes well-established. (Table 29)	Honey Run Canyon between Redbud Dr and Skyway	
11/8	10:10	Fire is well established in Honey Run Canyon just below Canyon View. Multiple spots are running back up towards Canyon View Apartments and will impact Skyway. (Table 29)	Honey Run Canyon between Redbud Dr and Skyway	TD-007 Radio Log
11/8	10:15 - 11:15	Skyway is burned over at the southwest end of town (see Section 9.3). Significant ember showers and fire activity on both sides of Skyway is impacting evacuating vehicles. Fences, power poles, structures, and vegetation are all burning. Structures in the split between the NB and SB lanes are burning. Fire is spreading south of Skyway toward Neal Rd.	Skyway between Neal Rd and just west of the Crossroad.	TD-011, TD-025 TD-068, TD-155 VTD-13 VTD-14
11/8	11:00 - 11:30	Fire is pushing south and west toward Bille Rd, threatening structures on Skyway.	Skyway and Bille Rd	TD-030, TD-127
11/8	11:15	Fire activity at the Skyway split is still active on both sides of roadway, but Skyway is passable. Heavy flaming activity has subsided immediately against the road. Structures to the south of Skyway are fully involved. North of Skyway is also burning, down into the Honey Run Canyon west of the health center. A burned power pole is blocking SB lanes at the split.	Skyway near the lane split	TD-011, TD-058 VTD-13 VTD-26
11/8	11:15	The western extent of the fire is past the crossroad to where the lanes rejoin.	Skyway, 800 m (0.5 mi) out of town	VTD-26
11/8	12:15	Fire activity is increasing from Honey Run Canyon, moving behind the health center north of Skyway at Neal Rd.	Honey Run Canyon, Skyway near Neal Rd	TD-070
11/8	12:30	Spot fires are beginning along Skyway between Pearson Rd and Neal Rd.	Skyway between Pearson Rd and Neal Rd	TD-066
11/8	12:45	Structures are burning south and east of Skyway in the area of Almond St and Fir St. (Table 20)	Almond St and Fir St	TD-026
11/8	13:15	Paradise Community Park is burning and 10 cm to 13 cm (4 in to 5 in) diameter embers are falling. Structures to the north of Paradise PD are burning. (Table 21)	Pearson Rd and Black Olive Dr	TD-026, TD-064
11/8	14:00 - 14:30	Fire is threatening structures in the downtown area of Pearson Rd and Almond St. At town hall, a large woodpile and fence are burning and threatening the building.	Skyway between Elliott Rd and Neal Rd	TD-011, TD-015 TD-017, TD-064 PPD-15
11/8	14:00	Fire down in Honey Run Canyon is moving SW with moderate rate of spread. On the ridgetops, flames are shooting out of the canyon with 30 m to 60 m (100 ft to 200 ft) flame lengths.	Honey Run Rd north of Centerville Rd	TD-117
11/8	14:00	Spot fires are burning along the ridge east of Skyway, south of town. In town, fire along Skyway south of Neal Rd is past peak, but some structures are still burning.	Skyway south of Neal Rd	TD-011, TD-118 VTD-20
11/8	14:30	Midtown, fire is approaching Skyway from the east. Spot fires and trees are torching near Holiday Market.	Skyway near Oliver Dr	TD-064, TD-066 TD-071



Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	15:00	Heavy fire activity is burning everything on the west side of Skyway between Black Olive Dr and Jewell Rd. The burning woodpile continues threatening town hall; shrubs and junipers are torching, threatening additional structures. Skyway between Pearson Rd and Neal Rd is being pinched from both east and west: Fire is spreading uphill, upwind in Honey Run Canyon into structures on the west side of Skyway. The main fire front is pushing west from Pearson Rd. Structures are burning along Pearson Rd, Almond St, and Black Olive Dr, approaching Skyway.	Skyway between Pearson Rd and Neal Rd	TD-015, TD-055 TD-101, TD-132 VTD-20 PPD-15
11/8	15:00	Fire is threatening downtown structures, approaching Skyway from the east. So far, a single commercial building on Skyway in the downtown area is burning. Additional structures burn shortly thereafter. Waves of golf ball-sized embers from burning structures are blowing and bouncing down the street.	Skyway between Elliott Rd and Pearson Rd	TD-135, PPD-15
11/8	15:30 18:00	Heavy ember showers and fire are everywhere downtown, Bille Rd to Neal Rd. Commercial structures are fully involved and burning down.	Skyway between Bille Rd and Neal Rd	TD-014, TD-030 TD-049, TD-111 TD-114, TD-116 TD-122, TD-123 TD-124, TD-127 TD-142, TD-201 PPD-15
11/8	18:00	Many structures are destroyed by this time. Residual fire continues threatening downtown structures overnight.	Skyway between Bille Rd and Neal Rd	TD-017, TD-122 TD-123

### 9.1.10. Neal Road Fire Progression Summary

The first recorded observations of fire in this region were between 08:30 and 09:00 when fire was burning in the drainage east of Foster Road between Eldridge Drive and Scottwood Road and working into backyards on the side streets on the east side of Foster Road.

At 10:30, spot fires were burning along Red Sky Lane off Neal Road, near Wayland Road. It is unclear if these spot fires were from the main fire to the east or from the fire that was burning over Skyway just to the north of this location. However, at 11:00, flames were burning closer to Neal Road; the fire was burning in the canyons to the west, along Indian Springs Lane and Red Sky Lane. Fire impacted along Neal Road between 11:45 and 12:15 as fire came from the canyon north and west of Neal Road. Fire burned over Neal Road north of Wayland Road, impacting evacuating vehicles and burning structures. Throughout the afternoon into early evening, fire was widespread north of Wayland Road.

By 14:00, structures off Foster Road were burning, and Foster Road was being encroached upon by fire to the east and west of the ridge. Fire continued to close in on the ridge, and structures burned through the afternoon and overnight. Limited direct observations in the area between Neal Road and Scottwood Road are supported by the overall observation dataset in finding that fire encroached upon this area in the early afternoon hours as fire spread into the area from both the east and west.

In the evening, from 17:00 to 17:30, fire activity at Neal Road and Wayland Road increased, and the fire ran south and west down into the lighter fuels of the foothills. **Table 27** contains the fire progression summary for Neal Road.

**Table 27.** Summary of fire progression on Neal Rd between Skyway and Goa Way.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	08:30 <sup>a</sup>	Fire in the canyon is burning westward into backyards at end of Eldridge Dr	drainage east of Eldridge Dr, Foster Rd	TD-104
11/8	09:00 <sup>a</sup>	Backyards are igniting. Embers and ash are falling.	drainage east of Eldridge Dr, Foster Rd	TD-104
11/8	10:30	Spot fires are burning in the area of Neal Rd and Wayland Rd, Red Sky Ln.	Neal Rd and Wayland Rd	TD-106
11/8	11:00	Flames are coming up Red Sky Ln toward Neal Rd. Fire is on the NW side of the road, with glow of significant fire coming from drainage to west.	Neal Rd and Wayland Rd	TD-053, TD-068 TD-078, PPD-02
11/8	11:30	Flames very close to Neal Rd at Wayland Rd; north of Wayland Rd, fire activity on both sides of Neal Rd.	Neal Rd and Wayland Rd	TD-066, TD-073 PPD-08
11/8	11:45	The south edge of the fire is burning on ridge west of Neal Rd. This fire is spreading from the Skyway area toward Neal Rd and south down the drainages.	Indian Springs Ln and Red Sky Ln	TD-205
11/8	11:45	Fire encroaching on Neal Rd and Roe Rd from the north, large area of fire burned over Skyway.	Neal Rd and Roe Rd	PPD-08
11/8	12:00	Fire is bumping structures along Neal Rd, burning all around the intersection of Neal Rd and Wayland Rd. Structures on Red Sky Ln are also threatened.	Neal Rd and Wayland Rd	TD-050, TD-073 TD-091, TD-092 TD-106
11/8	12:00	Fire is all around Neal Rd and Roe Rd north toward Skyway. Vehicles are being overrun by fire. Some vehicles are burning.	Neal Rd and Roe Rd	TD-014, TD-066 TD-200
11/8	12:00	Intense fire activity is moving up hill in vegetation, east toward Grinding Rock Rd. Fire is burning in the backyards on the south side of the street threatening structures. Flames are 40 ft tall, and trees are torching.	Grinding Rock Rd	TD-128, TD-205 TD-207
11/8	12:15	Fire is crossing lower Neal Rd north of Wayland Rd, jumping dozer lines.	Neal Rd between Grinding Rock Rd and Wayland Rd	TD-091, PPD-08
11/8	13:00 14:00	Fire is heading S/SW down drainages to west of Neal Rd, burning behind structures. The fire activity on Neal Rd is still to the north towards Wayland Rd.	Neal Rd and Indian Springs Rd	VTD-05
11/8	13:45	Structures are burning on the east end of Eldridge Rd (east of Foster Rd).	Foster Rd and Eldridge Rd	TD-104
11/8	14:00	Fire is pinching Foster Rd from the east and west. Fire in the drainage between Neal Rd and Foster Rd is intense and sounds like a freight train or jet engine. Large flaming embers are flying.	Foster Rd near Apple Ln	TD-104
11/8	14:00 <sup>a</sup>	Golf ball sized embers arrived with the fire front. Wood shake roof on a shed ignited first. Residential structure ignited at roof-wall intersection.	Filbert St area between Roe Rd and Neal Rd	TD-002
11/8	14:00 17:30	Structures continue to ignite and burn on Neal Rd and cross streets.	Neal Rd between Roe Rd and Wayland Rd	TD-091, TD-092
11/8	15:00	Commercial structures and vegetation are burning at Neal Rd and Skyway.	Neal Rd and Skyway	TD-066, VTD-20 PPD-15
11/8	15:30	Several structures along Foster Rd are burning.	Foster Rd near Apple Ln	TD-104
11/8	17:30	<i>Fire activity at Neal and Wayland increases, pushing into area from the northeast. The fire then runs down into the Foothills (Table 30).</i>	<i>Neal Rd south of Wayland Rd</i>	<i>TD-091, TD-092 TD-106, VTD-01</i>

<sup>a</sup> Observations were in locations with low data density and rely on estimated times from single TDs. They were unable to be directly cross-referenced.

### 9.1.11. Butte Creek Canyon and Lower Skyway Fire Progression Summary

Fire activity in Butte Creek Canyon began with an 08:45 spot fire on Honey Run Road that impacted Skyway by 10:00. Additional impacts to lower Skyway south of town limits and the canyons were limited until after noon.

At 13:00, additional spot fires were encountered along Honey Run Road north of Centerville Road. Fire activity picked up through the afternoon, and at 14:00 fire was spreading southwest down the canyon and up on the ridgetops. By 16:00, fire progressed halfway down Skyway in the lighter fuels of the foothills, reaching Tuscan Ridge. Spot fires were also beginning to impact Centerville Road and further west into the Wilder Drive and Doe Mill Ridge area. Around 18:00, 30 m to 60 m (100 ft to 200 ft) flames broke out of the canyon onto Wilder Drive and fire became well established up on the ridge. **Figure 41** shows a view north into Butte Creek Canyon from the Lookout Point overlook on Skyway showing the steep canyon walls. Wilder Drive is on the ridge to the left side of the photo.

By 20:00, the fire was burning towards Highway 99 between Skyway and Neal Road. Containment efforts in Butte Creek Canyon were unable to keep up with the fire, and many structures were lost. North of Honey Run Road, fire continued pushing west out of the canyon, reaching Stilson Canyon, Humboldt Road, and Highway 32 by 22:00. Additional structures were threatened in the subdivisions of Spanish Garden Drive, Oak Ridge Drive, and Eagle Nest Drive of Skyway around midnight. **Table 28** contains the fire progression summary for Butte Creek Canyon and lower Skyway south of Lookout Point.



**Figure 41.** A view into Butte Creek Canyon from Lookout Point on Skyway shows the steep canyon walls. View north. Photo March 2019.

**Table 28.** Summary of fire progression in Butte Creek Canyon and on lower Skyway.

Date	Time Range*	Fire Behavior Observations	Location	Source #
				TD-006, TD-038 TD-055, TD-111 911-182-1 911-200-1 911-202-1 911-204-1 911-218-1 911-221-1 911-225-1
11/8	08:45 09:15	A spot fire ignites in Honey Run Canyon between Redbud Dr and Skyway and becomes well-established. (Table 26, Table 29)	Honey Run Canyon between Redbud Dr and Skyway	
11/8	09:10	Another spot fire is reported on Honey Run Rd about 1.6 km (1 mi) north of Centerville Rd.	Honey Run Rd north of Centerville Rd, off Lookout Point	911-223-1
11/8	10:10	Fire is well established in Honey Run Canyon just below Canyon View. Multiple spots are running back up towards Canyon View Apartments and will impact Skyway. (Table 26, Table 29)	Honey Run Canyon between Redbud Dr and Skyway	TD-007 Radio Log
11/8	10:55 12:45	On Skyway, an evacuating pickup truck is on fire. The fire is prevented from spreading to vegetation.	Skyway just west of Lookout Point	TD-014, TD-026
11/8	13:00	Spot fires are observed on both sides of Honey Run Rd.	Honey Run Rd near Centerville Rd	Radio Log
11/8	14:00	Fire is spreading SW down canyon toward Centerville Rd. Ember showers and flames are threatening multiple structures. In the canyon flames are 2 m to 3 m (6 ft to 10 ft) long. Flames are 30 m to 60 m (100 ft to 200 ft) long burning up the canyon walls and on the ridgetops.	Little Butte Creek Canyon	TD-117
11/8	15:40	Spot fires are beginning in the Wilder Dr area west of Butte Creek.	Wilder Dr	TD-007
11/8	16:00	Fast moving fire fronts are merging from the ridgetops down into Honey Run Canyon. Fire is moving west over into Centerville Rd and Butte Creek Canyon. Homes are burning.	Butte Creek Canyon, Honey Run Rd, Centerville Rd	TD-117
11/8	16:00	On Skyway, fire has progressed west to near Tuscan Ridge on Skyway (approximately 3.5 mi from Hwy 99).	Skyway and Tuscan Ridge	TD-114
11/8	16:30	A 10 ac to 20 ac spot fire is burning in Butte Creek Canyon, west of Centerville Rd.	Centerville Rd and McClure Ln	TD-076
11/8	18:00	Intense fire is licking up canyon walls into the Wilder Dr area. Flames are 30 m to 60 m (100 ft to 200 ft) coming out of the canyon. Flames are laying down into thick brush, sheeting with 15 m to 18 m (50 ft to 60 ft) flame lengths.	Wilder Dr	TD-012
11/8	20:00	Fire approaching within 1.6 km (1 mi) of Hwy 99 near Skyway and Spanish Garden Dr.	Skyway and Spanish Garden Dr	TD-201
11/8	21:00	Fire has overcome containment efforts on Honey Run Rd to Centerville Rd. Many structures are lost.	Honey Run Rd between Skyway and Centerville Rd	TD-009, TD-117
11/8	22:00	North of Honey Run Rd, fire is spreading west down slopes through grass toward east Chico.	between Honey Run Rd and Stilson Canyon Rd	TD-117
11/8	22:00	Fire has moved up out of Stilson Canyon and is coming up over Humboldt Rd approaching Hwy 32. The fire spots into tall grass.	Humboldt Rd and Stilson Canyon Rd	TD-009, TD-012
11/8	23:30	Fire activity has decreased along Humboldt Rd.	Humboldt Rd and Stilson Canyon Rd	TD-009
11/8	23:30	Subdivisions off Skyway, at Spanish Garden Dr and Oak Ridge Dr are threatened by fire.	Skyway and Oak Ridge Dr / Spanish Garden Dr	TD-201

### 9.1.12. Valley View Drive Fire Progression Summary

At 08:45, a long-range spot fire started down in the Honey Run Canyon between Redbud Drive and Russell Drive to the south on Skyway. The fire became well-established, and by 10:00 it was spreading south out of the canyon and overran Skyway. The fire did not spread up and impact the Valley View Drive area directly; it slowly worked west around the ridge, and at 13:30 the fire was burning along the ridge at the end of Point West Drive.

Flames were observed in the Little Butte Creek Canyon, west of Valley Ridge Drive, an hour later around 14:30. The fire spread up out of the canyon toward homes on Valley Ridge Drive and Valley View Drive. By 17:00, most of the homes along Valley Ridge Drive had been destroyed. The fire pushed through the Valley View Drive area from the canyon to the west and from Oliver Drive to the east. Structures throughout the area continued to ignite during the evening hours and overnight. **Table 29** contains the fire progression summary for Valley View Drive.

**Table 29.** Summary of fire progression on Valley View Dr.

Date	Time Range	Fire Behavior Observations	Location	Source #
				TD-006, TD-038 TD-055, TD-111
11/8	08:45 09:15	A spot fire ignites in Honey Run Canyon and becomes well-established.	Honey Run Canyon between Redbud Dr and Skyway	911-182-1 911-200-1 911-202-1 911-204-1 911-218-1 911-221-1 911-225-1
11/8	10:10	<i>Fire is well established in Honey Run Canyon just below Canyon View. Multiple spots are running back up towards Canyon View Apartments and will impact Skyway (Table 26).</i>	Honey Run Canyon between Redbud Dr and Skyway	TD-007 Radio Log
11/8	13:30	Fire is burning on the ridge at the end of Point West Dr on the west side of Paradise.	Point West Dr, end of Valley Ridge Dr	TD-012
11/8	14:30	Flames are observed down in Little Butte Creek Canyon, west of Valley Ridge Dr.	Little Butte Creek Canyon	TD-044
11/8	16:55	<i>Fire is burning all around the intersection of Valley View Dr and Oliver Dr. Structures are also burning on Castle Dr to the north of Valley View Dr (Table 19, Table 26).</i>	Valley View Dr and Oliver Dr	TD-014
11/8	17:00	Fire is making a hard run out of the canyon toward Valley Ridge Dr. All but 3 structures on the north loop are burned to foundations and flaming. Two are standing, one other is well-involved.	Valley Ridge Dr	TD-014, TD-020
11/8	19:00	Structures further east of the canyon rim are being threatened and burning now and there are heavy ember showers. The handful of surviving structures on Valley Ridge Dr continue to be threatened by residual fire activity in the area.	Valley Ridge Dr and Valley View Dr	TD-044, TD-111
11/8	20:00	Multiple structures are burning, and fire is widespread south and east of Valley View Dr on Crestmoor Dr, Crestview Dr, and surrounding neighborhood.	Crestmoor Dr and surrounding neighborhood	TD-109
11/8	22:30	Additional structures ignite on Valley Ridge Dr near Valley View Dr.	Valley Ridge Dr and Valley View Dr	TD-044
11/8	23:00	Structures continue to be threatened in the Valley View Dr and Redbud Dr area. Fences, sheds, and homes are burning.	Redbud Dr	TD-017, TD-030 TD-044

### 9.1.13. Foothills Fire Progression Summary

Fire reached the foothills south of town in the afternoon. In the early afternoon, the fire was generally hung up north of an arc connecting Kunkle Reservoir on Pentz Road, north of Circle J Road on Clark Road south of the airport, and north of Wayland Road on Neal Road. Fingers of fire were burning in the numerous drainages and ridges south of town.

The fire spread beyond this general line around 15:00 along Clark Road. After the fire paused south of the airport, a wind shift pushed fire quickly into the grassy flats along Clear Creek, east of Clark Road. Three firefighters were injured in a burnover on Rattlesnake Flats Road [17]. On the west side of Clark Road, fire was spreading down slope toward Circle J Road.

Increased fire activity was observed across the entire fire front around 17:00 (sunset was at 16:56). On Pentz Road, fire picked up and spread quickly through structures near Pardes Way and Silvera Court and burned into the Dry Creek drainage and the Messilla Valley Road area. Activity along the west side of Clark Road pushed fire along the ridgetops, burning up against structures on the cross streets of Clark Road south of Circle J Road and over the ridge into the Cory Canyon area. Further west, along Neal Road, fire activity increased at the edge of town near Wayland Road, and fire spread quickly downwind and down canyon. A fire whirl was documented at this time along Neal Road, as shown in **Figure 16**. The increase in fire activity was likely due to the diurnal wind shift at sunset, captured in the observations of the Openshaw RAWS shown in **Figure 9**. The wind shifted from the northwest to the northeast, bringing dry air with it and accelerating fire spread down slope.

By 19:00, fire had jumped Durham-Pentz Road near Highway 99 as well as east of Clark Road. Fire spread between 17:00 and 19:00 showed an average rate of spread nominally 0.9 m/s (2 mi/h or 160 ch/h) downslope through the grasslands. Fire did slop over Highway 99, burning in three different places.

Fire spread away from structures along Clark Road, jumped south of Durham-Pentz Road, and crossed to the west side of Clark Road around 19:30. By 20:30, the fire had reached Highway 149 near Shippee Road. Again, the rate of spread through the grass was nominally 0.9 m/s based on these observations. **Table 30** contains the fire progression summary for the Foothills.

**Table 30.** Summary of fire progression in the foothills between Paradise and Hwy 99.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	13:30	<i>The fire front has slowed down on Clark Rd south of the airport. Lower intensity fire is burning on both sides of Clark Rd (Table 24).</i>	Clark Rd, 1.5 mi south of Airport Rd	TD-035, TD-046 TD-110, TD-132 TD-133, TD-141 TD-210
11/8	14:00	Fire is working further south on ridgetops east of Clark Rd, as far south as Dulcinea Dr.	ridgetop east of Clark Rd	TD-132, TD-141
11/8	14:00	<i>On Pentz Rd, fire is spreading south beyond Kunkle Reservoir, threatening structures near Zephyr Point Rd. (Table 16)</i>	Pentz Rd and Zephyr Point Rd	TD-121
11/8	15:00	A wind shift in the afternoon blows fire down the drainage through the flats on the east side of Clark Rd.	Clark Rd between Clear Creek Cemetery Rd and Circle J Rd	TD-110
11/8	15:00 15:30	With the wind, fire spreads quickly south through grass east of Clark Rd. Crews and engines get trapped and burned over on Rattlesnake Flats Rd (see Section 9.3). Several spot fires start on the west side of Clark Rd near Clear Creek Cemetery Rd.	Clark Rd between Clear Creek Cemetery Rd and Circle J Rd	TD-208, TD-210
11/8	15:30 16:00	On the west side of Clark Rd, fire is moving down slope from the airport and Round Valley Ranch Rd into the Circle J Rd area.	Circle J Rd, Clark Rd	TD-102, TD-110
11/8	17:00 21:00	Fire activity increases on ridges west of Clark Rd; structures at the ends of side streets are threatened and destroyed. The fire front burns further south and west into Cory Canyon.	Clark Rd between Durham-Pentz Rd and Circle J Rd; Cory Canyon Rd	TD-065, TD-102 TD-119, TD-120
11/8	17:30 18:00	<i>Fire activity increases and pushes down Neal Rd to the recycling and waste facility. Fire is aligning with drainages (Table 27).</i>	Neal Rd	TD-091, TD-092
11/8	17:30	Fire is quickly moving south along Pentz Rd, near Pardes Way and Silvera Ct, threatening structures. Fire is also burning south in the Dry Creek drainage, along Dry Creek Rd.	Pentz Rd and Pardes Way, Dry Creek Rd	TD-121
11/8	18:30	Fingers of fire are spreading through the grass foothills towards Hwy 99, and consuming the rest of the hillside east of Neal Rd.	south and east of Neal Rd	TD-091, TD-092
11/8	18:45	Fire jumps Durham-Pentz Rd east of Clark Rd, pushing SW through the grass.	Durham-Pentz Rd just east of Clark Rd	TD-071, TD-076 TD-110, TD-211
11/8	18:50	Fire has reached Hwy 99. Flames are bumping Hwy 99 between Neal Rd and Durham-Pentz Rd. Fire also jumps Durham-Pentz Rd near Hwy 99.	Hwy 99 between Neal Rd and Durham-Pentz Rd	TD-106 Radio Log
11/8	19:00 20:00	Fire spots over Hwy 99 in several places. The spot fires grow and burn several acres of slopover west of Hwy 99. Fire is burning in fingery patterns through grass, with winds 11 m/s to 13 m/s (25 mi/h to 30 mi/h).	Hwy 99 between Neal Rd and Durham-Pentz Rd	TD-042, TD-091 TD-092, TD-106 TD-201, TD-211 VTD-01
11/8	19:30	Fire is about to jump Clark Rd south of Durham-Pentz Rd.	Clark Rd 1.6 km (1 mi) south of Durham-Pentz	TD-102, TD-110
11/8	19:30	Fire is threatening communities off Pentz Rd on Sunview Dr and Messilla Valley Rd.	Pentz Rd and Messilla Valley Rd	TD-020, TD-121
11/8	20:30	Fire has reached Hwy 149 and Shippee Rd, 3 km (2 mi) SW from Clark Rd, and is threatening to jump Hwy 149.	Hwy 149 and Shippee Rd	Radio Log
11/8	22:00	By this time, fire has gone through the Cory Creek area. Several structures destroyed. Residual fire continues to threaten communities along Durham-Pentz Rd.	Durham-Pentz Rd	TD-102



#### 9.1.14. Nelson Bar Road and Highway 70 Fire Progression Summary

As the fire progressed beyond the south end of Concow Reservoir into the Nelson Bar Road focus region in the early afternoon, observations of the fire spread became limited due to first responder locations and the topography. In the late morning the fire became hung up by wind/topography/fuel interactions beyond the south end of Concow Reservoir, burning north of Deadwood Road and in the Concow Creek drainage.

The fire continued to build in the drainages during the afternoon hours. **Figure 42** shows the view seen during the afternoon by first responders in the Nelson Bar Road area, with smoke coming from the Concow Creek drainage and West Branch canyons.

Fire activity dramatically increased around 17:00, and intense fire came out of the drainages<sup>14</sup> and toward Nelson Bar Road with flame heights of 15 m to 30 m (50 ft to 100 ft). Numerous spot fires aided the spread of fire through the flatter grasslands in the area. **Figure 43**, a panorama compiled from a video recording, shows the fire front and spot fires from nearly the same position seen in **Figure 42**.

The fire front passed and was burning on the east side of Nelson Bar Road and toward Lunt Road by 19:00. The fire continued to burn the area between Nelson Bar Road, Lunt Road, and Concow Road during the overnight hours. At approximately 03:30 on November 9, strong winds estimated at 20 m/s (45 mi/h) sent the fire front south of Lunt Road, jumping containment lines and backfiring operations. Around the same time, Fire Station 36 at Jarbo Gap was impacted by slope- and wind-driven fire as the front pushed south down the Feather River Canyon toward Big Bend.

Down on Concow Road near Shuman Lane and Fire Station 37, fire activity subsided overnight. However, around sunrise, fire activity dramatically increased again, threatening firefighters in the area and preventing travel to safety via Concow Road. After a period of sheltering, firefighters were able to progress back to Highway 70.

At approximately 08:00 on November 9, fire continued south and east from Concow Road, jumping Highway 70 and running toward Yankee Hill. **Table 31** contains the fire progression summary for Nelson Bar Road and Highway 70.

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<sup>14</sup> Local fire behavior in the Concow Creek and Nelson Bar Road area was influenced by slope and wind throughout the afternoon resulting in upslope spread into the wind and downslope wind-driven spread.



Video courtesy of TD-136, 15:07.  
Used with permission.  
Composite image by NIST.

**Figure 42.** View west from Nelson Bar Rd where plumes of smoke are seen coming from beyond the ridge in the Concow Creek drainage, and beyond to Paradise (background, left).



Video courtesy of TD-140, 17:29.  
Used with permission.  
Composite image by NIST.

**Figure 43.** Fire activity increased in the drainage area, and the front rapidly spread south and east toward Nelson Bar Rd.

**Table 31.** Summary of fire progression on Nelson Bar Rd and Highway 70.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	11:00	Fire is established in the West Branch Feather River Canyon where the river turns into the lake.	Feather River Canyon east of Kunkle Reservoir	TD-008
11/8	12:30 17:00	The southern extent of the fire remains hung up burning in the Concow Creek Canyon northwest of Nelson Bar Rd, and on both sides of Concow Rd north of Comfort Ln.	Concow Rd and Deadwood Rd	TD-013, TD-031 TD-108, TD-136 TD-137, TD-140
11/8	14:40	The fire front is creeping south and is approaching structures on Concow Rd and Deadwood Rd	Concow Rd and Deadwood Rd	TD-027
11/8	15:45	Fire is threatening structures in the Miller Peak area.	Miller Peak between Concow Rd and Hwy 70	TD-013, TD-031 TD-136, TD-137 TD-140
11/8	16:00	The fire front has progressed south of Deadwood Rd.	Concow Rd and Deadwood Rd	TD-027
11/8	17:00	Intense fire comes out of the Concow Creek Canyon towards Nelson Bar Rd. Fire is spotting across the flat grassy areas.	Nelson Bar Rd near Stage Coach Ln	TD-027, TD-062 TD-136, TD-137 TD-140
11/8	17:20	An intense fire front with 15 m to 30 m (50 ft to 100 ft) flames burns through the forest into the grasslands, impacting structures along the west side of Nelson Bar Rd. Numerous short-range spot fires are observed ahead of the front.	Nelson Bar Rd near Stage Coach Ln	TD-137, TD-139 TD-140
11/8	18:00	Fire jumps south of Nelson Bar Rd between Concow Rd and Lunt Rd.	Nelson Bar Rd between Concow Rd and Lunt Rd	TD-013, TD-031 TD-139, TD-140 TD-008
11/8	19:15	The fire front has passed through structures on Nelson Bar Rd north of Lunt Rd. Widespread scattered fires remain. Some structures have been destroyed.	Nelson Bar Rd between Concow Rd and Lunt Rd	TD-008, TD-137 TD-138, TD-139 TD-140,
11/8	22:00 03:30	Overnight, fire is burning west of Nelson Bar Rd, north of Lunt Rd, and west of Concow Rd.	Nelson Bar Rd between Concow Rd and Lunt Rd	TD-013, TD-031 TD-062, TD-136
11/9	02:00	The fire front is burning close to Fire Station 36 at Jarbo Gap.	Hwy 70 and Deadwood Rd	TD-027, TD-028 TD-029
11/9	03:30	Strong winds, 18 m/s to 22 m/s (40 mi/h to 50 mi/h), push the main fire front south of Lunt Rd and fire runs WSW. Flames are laying down and consuming 2 m to 3 m (6 ft to 10 ft) tall brush fuels.	Lunt Rd	TD-008, TD-013 TD-031
11/9	04:00	Fire wraps around and impacts Fire Station 36. Fire is both slope- and wind-driven from the canyon. The fire continues running south toward Big Bend Mountain Mobile Home Park.	Hwy 70 and Deadwood Rd	TD-008, TD-028
11/9	07:20	Sunrise causes fire intensity to pick up dramatically; visibility decreases, suddenly everything is burning again: trees, needles, and houses. Fire is burning across Pinkston Canyon Rd towards Concow Rd, coming hard toward Concow Pool. Firefighters are worried about getting pinched from fire from both sides of Concow Rd. Fire Station 37 is hit hard by fire ( <i>see Section 9.3</i> )	Concow Rd and Shuman Ln	TD-136, TD-137 TD-138, TD-139 TD-140
11/9	07:45	Fire is burning along Hwy 70 north of Concow Rd with 6 m (20 ft) flames up against Hwy 70.	Hwy 70 and Concow Rd	TD-013, TD-136 TD-139, TD-140
11/9	08:40	Fire is well established on the east side of Hwy 70 at Concow Rd and runs through Yankee Hill.	Hwy 70 and Concow Rd	TD-138, TD-140

### 9.1.15. Magalia and Coutolenc Road Fire Progression Summary

Old Magalia, in the area of Old Skyway and Indian Drive, was the earliest area of Magalia to be affected by fire. Observations from the air and from multiple 911 calls indicated spot fires were burning in Old Magalia at 08:40 and structures were burning by 09:20 (see Section 9.1.9.1). Most structures in the Indian Drive and Ishi Drive areas were burning around 12:30.

It was described multiple times that the northern flank of the fire was hung up east to west in the area on Skyway between Pentz Road and Coutolenc Road. Aggregated observations indicated that the area of fire in Old Magalia was initially a large spot fire burning ahead of the main fire. South of this line, fire was not continuous, and several pockets remained unburned, including the area along Skyway and Gate Lane between Clark Road and Pentz Road. Additional spot fires were also burning north of this line in the Andover Drive and South Park Drive areas in the late morning.

Due to the initial response to Concow and Paradise and the impeded access to Magalia, the first documented observation of conditions in Magalia was at 13:00. At this time in the early afternoon, 10 to 15 structures were already burning on South Park Drive, Andover Drive, and Adrian Drive. Landsat imagery taken at 10:45 shows a large spot fire burning in Little Butte Creek Canyon up into the south end of Andover Drive.

Observations throughout greater Magalia are limited as fire fighters focused efforts on the large fire toward the south end of Andover Drive. Observations around 15:00 indicate that structures on the north end of Andover Drive had also been destroyed, and fire was burning in the canyon below the dam. Fire progressed through the canyons and drainages to the south and east, but generally held steady on the perimeter of the community through the evening hours. Fire activity along Andover Drive increased around 23:00, with fire fingering up into structures and jumping burn-out operations. To the east, activity also increased, with spot fires becoming established on the ridge near Coutolenc Road.

After midnight, fire made a significant run across the ridge with 30 m (100 ft) flames and 22 m/s (50 mi/h) winds blowing fire directly over the dam and into Magalia, seen in **Figure 44**. Fire became well-established on the west side of the Magalia Reservoir and burned uphill into Lakeridge Circle and Skyway between Creston Road and Ponderosa Way. Fire spread throughout the residential areas west of Skyway overnight. Between 02:00 and 07:00 on November 9, additional structures burned throughout the majority of Magalia. Fire was continuing to burn with significant intensity.

Another flare-up was observed at approximately 07:20 on November 9 on Ponderosa Way. Fire activity rapidly increased, forcing firefighters to seek safety at the Pine Ridge School. The increase in fire activity led to additional structure ignitions of surviving homes on Ponderosa Way. Throughout the day on November 9, fire continued to threaten structures west of Skyway and south of Cumberland Road. **Table 32** contains the fire progression summary for Magalia including Coutolenc Road.



Photo courtesy of TD-127, 01:24 (Nov 9).  
Used with permission.

**Figure 44.** View south from the Magalia Reservoir dam as flames shoot up from the West Branch Feather River canyon over the ridge and Coutolenc Rd.

**Table 32.** Summary of fire progression in Magalia and on Coutolenc Rd.

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	08:40	Spot fires have started in Old Magalia. Structures are burning by 09:20.	Old Skyway and Indian Dr	TD-006 911-207-1 911-217-1 911-230-1 911-240-1
11/8	11:00 12:00	The northern flank of the fire is hung up between Coutolenc Rd and Pentz Rd. There are some noticeable spot fires down in the West Branch canyon.	Skyway between Coutolenc Rd and Pentz Rd	TD-009, TD-041 TD-060
11/8	12:30	There is a period of increased fire activity in Old Magalia when additional structures begin burning.	Indian Dr and Ishi Dr	TD-060, TD-079 TD-083
11/8	13:00	10 to 15 structures are burning at the south end of Andover Dr and on Adrian Dr.	Andover Dr and Adrian Dr	TD-040, TD-060 TD-079
11/8	14:00 17:00	Active fire is in the structures in the area on the southern end of South Park Dr and Adrian Dr. Fire is burning in the Little Butte Creek Canyon and wrapping around to the west and burning up drainages toward West Park Dr.	Athens Way and Adrian Dr	TD-045, TD-060 TD-079, TD-084 TD-085, TD-089 TD-113, TD-126
11/8	15:00	First recorded observation that structures on east side of the north end of Andover Dr are already burned down. Fire is burning in the canyon east of Andover Dr and south of the dam.	Andover Dr near Huron Ct	TD-041, TD-100
11/8	16:30	First recorded observation that some structures on South Park Dr near Skyway have already been destroyed.	South Park Dr and Andover Dr	TD-143
11/8	17:15	Fires are burning in the area around Sav-Mor Foods and Lakeridge Cir.	Lakeridge Cir and Skyway	TD-114
11/8	17:00 23:00	The evening is a period of generally reduced fire behavior in the Little Butte Creek Canyon. Fire is backing up out of canyon, bumping structures on Andover Dr with creeping fire behind homes. Different portions of Andover Dr are threatened throughout the evening period.	Andover Dr	TD-040, TD-060 TD-061, TD-084 TD-085, TD-125 TD-126
11/8	19:00	Fire is making significant pushes up drainages. Structures are burning on Andover Dr, South Park Dr, and along Skyway by Rite Aid. South Park Dr is inaccessible from Skyway.	Skyway and South Park Dr	TD-014
11/8	21:00	Fire has burned areas predominantly south of the dam, burning in Magalia and Old Magalia. To the east, active fire is still on the east side of the West Branch in the drainages and up on Sawmill Peak.	Skyway and Coutolenc Rd	TD-015, TD-043 TD-045, TD-061

Date	Time Range	Fire Behavior Observations	Location	Source #
11/8	23:00	Fire activity increased from Little Butte Creek Canyon, with fire fingering up into structures and jumping over burn-out operations.	Andover Dr	TD-060, TD-084 TD-126
11/8	23:30	An active spot fire has established in the drainage below Coutolenc Rd off Ridgway and is moving uphill threatening structures. The main fire to east of reservoir is still burning up on the ridge north of Sawmill Peak on the east side of the West Branch.	Coutolenc Rd and Ridgeway	TD-061, TD-126
11/9	00:30 02:00	The fire blows up out of the West Branch canyon with 30 m (100 ft) flames, pushed by strong winds, estimated at (22 m/s) 50 mi/h. Softball-sized embers blow across Coutolenc Rd and Skyway into Magalia and Old Magalia. Several spot fires are established on the west side of the reservoir and fire is working uphill toward Lakeridge Cir. Intense fire blocks Skyway south of the dam ( <i>see Section 9.3</i> ).	Skyway and Coutolenc Rd	TD-007, TD-040 TD-041, TD-043 TD-045, TD-061 TD-087, TD-089 TD-115, TD-125 TD-126, TD-127 TD-209
11/9	00:30 02:00	Spot fire activity dramatically increases in Magalia on Andover Dr and South Park Dr as fire activity blows up to the east. Fires begin burning along Skyway near the commercial areas on Lakeridge Cir.	Andover Dr / Lakeridge Cir	TD-040, TD-041 TD-060, TD-122 TD-127, TD-209
11/9	00:30 02:00	Fire activity also increases in the Little Butte Creek Canyon and fire pushes up into Old Magalia. Fire impacts the water treatment plant and pinches Skyway and Old Magalia from both east and west.	Old Skyway and Sugar Pine Dr	TD-089
11/9	02:00	Significant fire activity reaches Skyway at Ponderosa Way. There are heavy ember showers and fire burning in vegetation and structures. Structure-to-structure fire spread is observed west of Skyway.	Skyway and Ponderosa Way	TD-009, TD-041 TD-045, TD-060 TD-061, TD-084 TD-109, TD-122 TD-123, TD-124 TD-127, TD-143 TD-209
11/9	02:30	Fire pushes into the West Park Dr area towards Pine Ridge School from the east and south. Fire also pushes west of Skyway into the Creston Rd area.	west of Skyway on West Park Dr and Creston Rd	TD-041, TD-123
11/9	02:30 07:00	Additional structures burn throughout the majority of Magalia. Fire is continuing to burn with significant intensity.	Magalia, south of Creston Rd	TD-009, TD-041 TD-045, TD-060 TD-061, TD-079 TD-084, TD-087 TD-089, TD-123 TD-124, TD-127 TD-128, TD-143 TD-209
11/9	06:00	Intense fire activity is burning structures on Chestnut Cir. A propane tank explosion injures firefighters ( <i>see Section 9.3</i> ).	Ponderosa Way and Chestnut Cir	TD-127, TD-209
11/9	07:20	A rapid increase in fire activity on the west end of Ponderosa Way impacts from the south and west. Firefighters must drive through fire to reach the relative safety of Pine Ridge School, where fire also hits from the east. Portable school buildings ignite, and the main buildings are threatened.	Ponderosa Way and Compton Dr	TD-127, TD-128 TD-200, TD-202 TD-205, TD-207
11/9	07:20 10:00	Homes throughout Magalia continue to burn with localized areas of high fire activity.	Magalia, south of Creston Rd	TD-041, TD-200 TD-203, TD-205
11/9	10:00	Fire is affecting homes on the west edge of Ponderosa Way, Creston Rd, Brevard Cir area. Unburned structures are igniting or threatened throughout the day.	Magalia	TD-128, TD-205 TD-207

## 9.2. Fire Observation Histograms

The three histograms in **Figure 45** summarize the number and type of fire observations (described in Section 7.4) in Paradise on Pentz Road, Clark Road, and Skyway throughout the day, and illustrate the general progression and timeline of fire in Paradise from east to west. The data illustrate the number of early spot fires in each of the zones, how the fire moved on from Pentz Road by 10:00 and picked up activity on Clark Road by 10:30. The fire then moved east from Clark Road to Skyway where there were a significant number of fire observations after 13:30, starting to tail off at 16:30. The shift in the observation count is also a function of TD first responder location; however, this is also influenced by fire activity. Note that this figure provides a general sense of the location of fire activity and does not directly indicate the severity or extent of fire for each observation. Some context and interpretation are discussed here, and the reader is directed back to the relevant portions of Section 9.1 for more specifics of individual observations. For the spatial component of the observations in more detail than conveyed by the specified roadway corridors in **Figure 45**, see the individual fire spread maps described in Section 10.

The dark red portions of the bars in **Figure 45** show the frequency of spot fire observations (denoted by “S” in the figure legend) early in the morning in all three zones, but predominantly in the Pentz Road area, peaking in the 08:30 to 08:45 time window as the fire front entered along the east side of Paradise. As the fire grew from each of these spots to include more widespread vegetation (denoted by “V” in the figure legend) and/or structures, the fraction of fire observations that were spot fires decreased.

The observations on Pentz Road were characterized by a relatively short but intense time window corresponding to the near simultaneous impact from the large extent of the fire front. Before 08:30, much of the observations described spot fires. Once the spots became established and the fire front hit, the observations were dominated by the “other” or “residential structure” categories (denoted by “O” and “R,” respectively, in the figure legend) until fire observations and fire activity tapered off by 12:00. The relatively high portion of “other” categorized observations could be attributed to the rapid development of the fire from the wildlands into the community where TD participants reported widespread fire observations without specification of exact fuels. Additionally, note that the large number of observations in this time window was also a function of TD first responder (primarily firefighter) locations, as the initial response was focused on the Pentz Road corridor.

Along Clark Road, the increase in fire observations after 10:30 was attributed to the expansion of fires in the Central Park Drive area and the fire impacting evacuations at the south end of town between American Way and Airport Road. Subsequently, fire impacted Clark Road north of Wagstaff Road, followed by Clark Road between Central Park Drive and Pearson Road. A spike in “commercial structure” category observations (denoted by “C” in the figure legend) was notable in the early afternoon. This was the period in which a majority of commercial structures were burning or already burned down. The spike was also influenced in part by the arrival of additional engine strike teams accessing Paradise via Clark Road from Butte College. As these engines arrived, some of their first observations were burning or destroyed commercial structures.

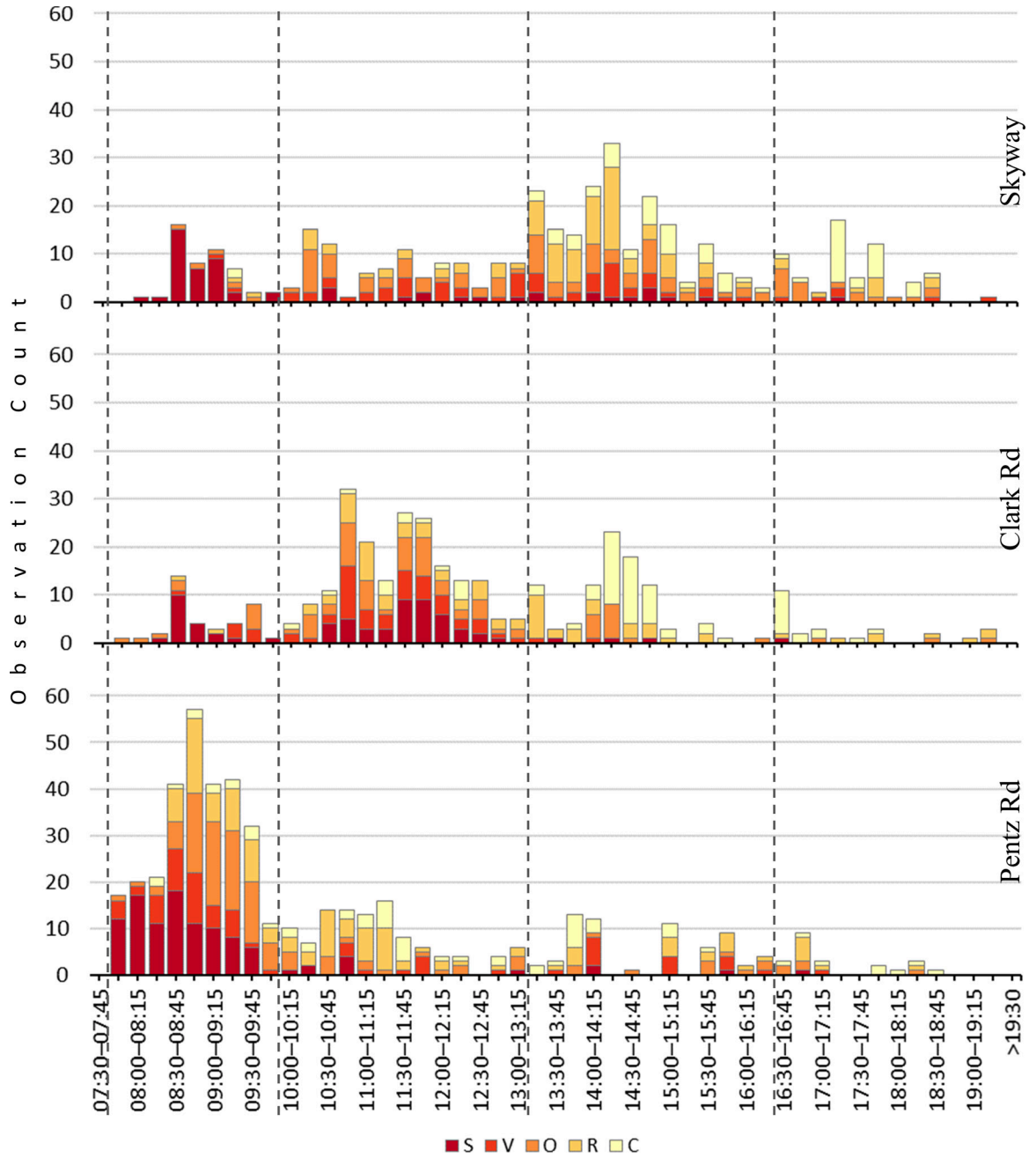
At first glance, Skyway appears to be dominated by afternoon activity. However, the raw number of individual observations (not the quality or resolution of observations) on Skyway may be underrepresented compared to Pentz Road due to the spatial distribution of TD sources. **Figure 45** also does not highlight the severity of the observations by first responders in the mid-morning hours when the Honey Run spot fire burned over Skyway.

Before 09:30, fire observations on Skyway were dominated by spot fires; 40/44 (91 %) of fire observations were categorized as such. This fire activity was primarily in Honey Run Canyon and near the Skyway/Clark Road intersection. Beyond 09:30, only 23/350 (6 %) of observations were categorized as spot fires along Skyway. This may have been a function of two contributing factors: 1) location of first responder TD participants and 2) true differences in general fire behavior. If the observations shared by first responders occurred after the initial fire ignitions and fire spread along Skyway, it may have been the case that spot fires occurred prior to the bulk of observations in the afternoon, which indicated structures burning rather than spot fires (56 % of fire observations between 13:15 and 15:15 were categorized as residential or commercial structure fires). Alternatively, there might have been a difference in fire behavior in this region, characterized more by linear fire progression (spreading from the numerous initial morning spot fire ignitions and the main fire front in the evening) rather than by spot fire behavior comparable to that seen on Pentz Road.

The peak number of observations in the early afternoon relates primarily to the portion of Skyway north of Wagstaff Road where intense fire was burning residential structures. The increase in “commercial structure” observations in the 17:30 timeframe was related to fire impact on the downtown area between Pearson Road and Bille Road.

The tails in all three histograms indicate that fire remained in the area for many hours after the main fire activity had passed. The remaining fires and associated ember exposures threaten surviving structures for many hours, which frequently results in structure losses if first responders are not locally available to prevent or suppress the ignitions.





**Figure 45.** Fire observation histograms shaded by type of fire observation (S = spot, V = vegetation, O = other, R = residential structure, C = commercial structure) for Pentz Rd, Clark Rd, and Skyway focus regions, binned as a function of time of day on November 8. Note the early number of spot fire observations and the differences in time of peak observation counts.

### 9.3. Burnovers

A burnover is defined by the National Wildfire Coordinating Group (NWCG) [25] as “an event in which a fire moves through a location or overtakes personnel or equipment where there is no opportunity to utilize escape routes and safety zones, often resulting in personal injury or equipment damage.” During the Camp Fire, several events occurred where fire temporarily restricted through-access on a major traffic artery or a secondary road, or trapped civilians or first responders amid dangerous conditions. The events varied in intensity and duration. Some impacted civilian evacuation while others impacted first responders only. Burnovers resulted in civilian fatalities, civilian and first responder injuries, and destruction and damage of civilian and first responder vehicles. In several cases, a burnover occurred that did not result in fatalities, injuries, or damage. These were instances in which fire blocked the road and civilians caught in traffic and/or first responders attempting to access the scene either waited it out or opted to take another route if available. These events could be interpreted as entrapments or “near misses” with respect to the NWCG definitions but are included in this report as they have significant impact on civilian and first responder life safety. Identified events are grouped and labeled as burnovers in this report.

Burnovers were identified and documented in nineteen different locations. The first two burnovers occurred at approximately 07:50 on November 8 on Hoffman Road and Concow Road in Concow, and the last two recorded burnovers occurred at 07:15 on November 9 on Ponderosa Way in Magalia and on Concow Road in Concow. Additional burnovers occurred but were not captured during the data collection process because:

- a. no personnel (first responder or civilian) was present to witness the event, or
- b. the event was witnessed by first responder(s) and/or civilian(s), but data was not captured because no TD took place with these individuals.

While documenting the burnovers that occurred during the Camp Fire, it was identified that the severity of the exposure from the burnovers impacted how the first responders assessed the situation. In this context, exposure can be expressed as the integral (or sum) of total heat flux ( $\text{kW/m}^2$ ) over time. Two different burnovers could subject vehicles to similar exposures even through the fire intensities were different, due to a difference in residence time. The amount of traffic and the driving speed through the burnover could have significant impact on the outcome. This was manifested in the burnovers that occurred on Pearson Road and on Skyway, where gridlocked traffic resulted in fatalities, injuries, and/or damage to vehicles. Additional factors that might have affected the decision to drive through a burnover were visibility and whether the extent of the burnover conditions were known.

Burnover situations were assessed differently by civilians, first responders, and first responders escorting civilians. A hardened fire engine with trained personnel might elect to drive through an area that they would not allow civilians to drive through. An example of this occurred on Clark Road, where a fire engine, having driven through a high intensity area, informed a police officer that they could get through if they “drive fast,” while civilians were kept in a Temporary Refuge Area (TRA) until the hazard subsided. **Figure 46** shows conditions that first responders drove through but were considered unsafe for civilians.



**Figure 46.** Snapshot from PPD dashboard camera showing representative conditions throughout a 1 km (0.6 mi) stretch of Clark Rd near Forest Service Rd at 11:57.

The identified burnovers were divided into two categories with respect to risk of injury or death. Listed in **Table 33**, eleven burnovers were identified as “Category 1,” representing the highest potential of death/injury (highlighted in red), and seven as less-hazardous “Category 2” events. The burnovers are documented in **Table 33**, **Table 34**, and Appendix B to convey the range of different conditions under which burnovers occurred.

**Table 34** summarizes the burnover data on the nineteen identified burnovers, which occurred throughout the fire area and are mapped in **Figure 47**. Timeline details associated with fire behavior for all the burnovers are documented in Appendix B, along with pre and post-fire street view images and overview imagery. Of the nine burnovers that occurred before 10:00 on November 8, seven were listed as Category 1, and two as Category 2. Most of the Category 1 burnovers on the morning of November 8 significantly impacted civilian evacuations. Of the eleven Category 1 burnovers, six resulted in the formation of Temporary Refuge Areas (TRAs). Details of traffic conditions and access to the TRAs will be discussed in NIST Camp Fire Report #4.

Local conditions dictated the spatial and temporal extent of each burnover. Burnover durations typically ranged between 1 hour and 2 hours and were influenced by the type and quantity of vegetative and other fuels in the area. Road widths ranged from 3 m to 23 m (10 ft to 75 ft), and vegetation setbacks ranged from 0 m to 10 m (0 ft to 33 ft). The length of road impacted by burnovers ranged from 150 m to 3000 m (500 ft to 2 mi).

Thirteen burnovers impacted the evacuation of civilians, eight of which occurred before 10:00 on November 8. The final documented burnover that impacted civilian evacuation occurred on Ponderosa Way in Magalia at 07:15 on November 9. Of the nineteen burnovers, only the Rattlesnake Flats incident involved firefighting hand crews. This burnover resulted in serious injuries and has been documented in a CAL FIRE Green Sheet Report [17]. This was the shortest duration burnover event, with the fire driven by wind through flashy vegetative fuels (readily ignitable fuels that burn rapidly). A propane tank explosion resulted in additional firefighter injuries to an engine crew, which was also documented in Ref. [17].

Fire shelters were deployed in two cases: during the Hoffman Road and the Pearson Road burnovers. During the Hoffman Road burnover, a fire shelter was used to shield a first responder and civilians from radiation during rescue operations. The second use of fire shelters occurred during the burnover on Pearson Road. In this case the shelter was deployed inside the fire engine against the window to limit radiation to firefighters and rescued civilians refuging inside. The exterior of the engine was damaged from the fire exposure.

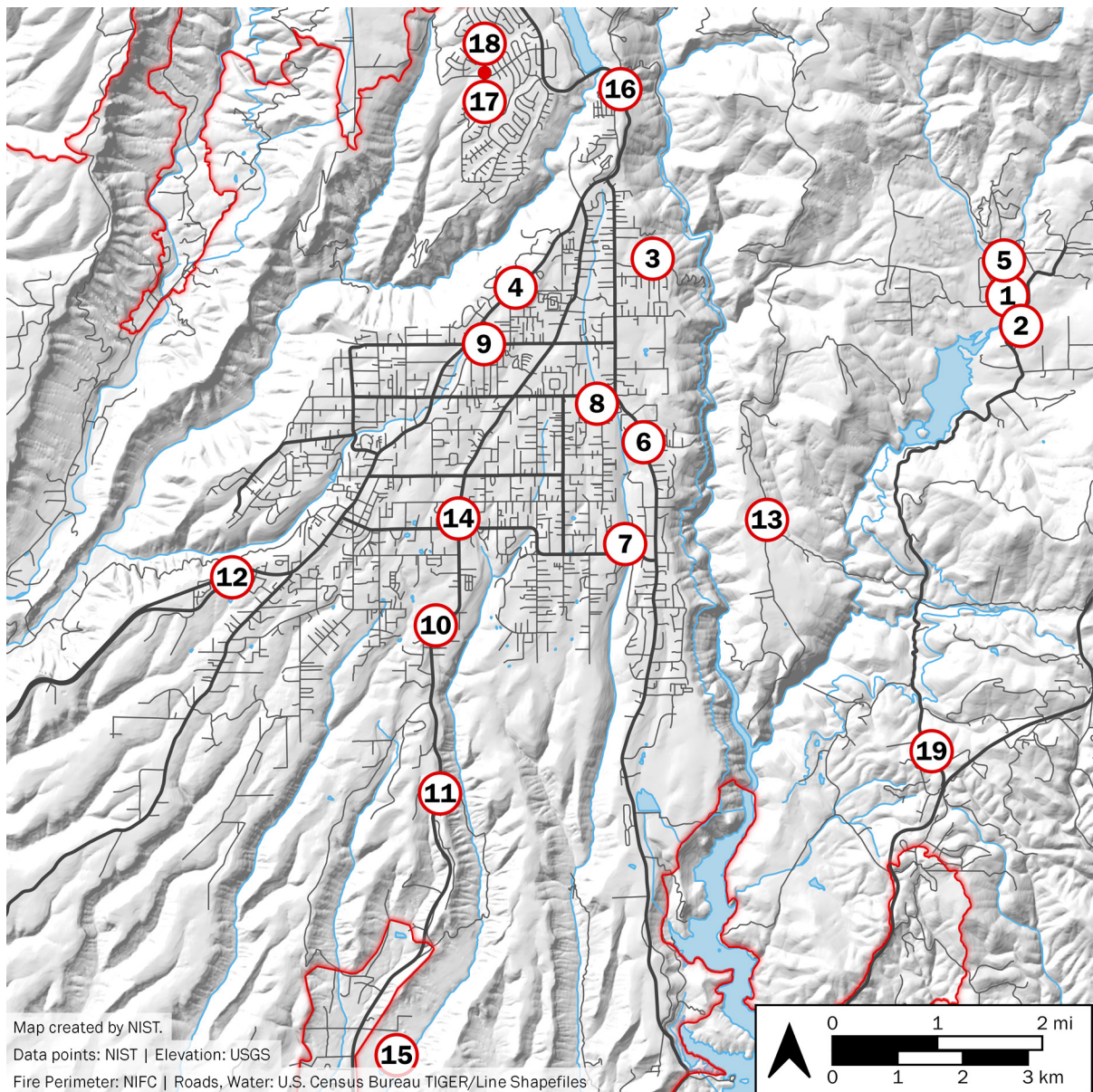
The last two documented burnovers, at Ponderosa Way in Magalia and on Concow Road in Concow, both occurred at approximately 07:15, half an hour after sunrise at 06:44. First responders explicitly attributed the Concow burnover to the increased fire intensity associated with daybreak.

**Table 33.** List of identified burnover locations by time of occurrence and risk of injury or death.

<b>ID</b>	<b>Burnover Location</b>	<b>Time</b>	<b>Risk of Injury/Death Category</b>
1	Hoffman Rd	07:50	1
2	Concow Rd	07:50	2
3	Chapman Ln	08:30	1
4	Skyway (upper, between Clark Rd and Wagstaff Rd)	08:30	1
5	Windermere Ln	08:35 <sup>a</sup>	1
6	Pentz Rd	08:45	1
7	Pearson Rd	09:15	1
8	Bille Rd	09:25	1
9	Wagstaff Rd	09:30	2
10	Clark Rd / American Way	10:00	2
11	Clark Rd / Airport Rd	10:00	2
12	Skyway (lower, west of Princeton Way)	10:15	2
13	Jordan Hill Rd /Granite Hill Rd	11:30	1
14	Clark Rd / Black Bear Diner	13:10	2
15	Rattlesnake Flats Rd	15:15	1
16	Coutolenc Rd	00:00 <sup>b</sup>	2
17	Chestnut Cir	06:00 <sup>b</sup>	1
18	Ponderosa Way	07:15 <sup>b</sup>	2
19	Concow Fire Station 37	07:15 <sup>b</sup>	1

<sup>a</sup> Burnover conditions existed prior to the first recorded observation.

<sup>b</sup> November 9.



**Figure 47.** Map of all identified and documented burnover locations.

**Table 34. Burnovers.**

ID	Location	Burnover Initiation	Burnover Duration	Road Width (m)	Vegetation Setback (m)	Roadway Length Affected <sup>a</sup> (m)	Impacted Civilian Evacuation (Y if yes)	Fire Shelter(s) Deployed (Y if yes)	TRA Formed (Y if yes)
1	Hoffman Rd	07:50	40 min	3	0–2, more at creek	250	Y	Y	Y
2	Concow Rd	07:50	70 min	7	0–1	1000	Y		
3	Chapman Ln	08:30	n/d <sup>b</sup>	3	0–3	250			
4	Skyway (upper)	08:30	360 min	8	0–10	2600	Y (street was gridlocked)		Y
5	Windermere Ln	08:35 <sup>c</sup>	n/d	4	0–2	1100	Y		
6	Pentz Rd	08:45	150 min	8	0–1	1300	Y (street was gridlocked)		Y
7	Pearson Rd	09:15	60 min	11	1–3	800	Y (street was gridlocked)	Y	Y
8	Bille Rd	09:25	140 min	8	0–2	500	Y (street was blocked)		Y
9	Wagstaff Rd	09:30	60 min	8	0–3	500	Y		
10	Clark Rd / American Way	10:00	120 min	11	1–3	700	Y		
11	Clark Rd / Airport Rd	10:00	90 min	9	1	1500	Y		
12	Skyway (lower)	10:15	90 min	7–20	1–3	1000	Y		
13	Jordan Hill Rd / Granite Hill Rd	11:30	n/d	5	0–4	800	Y		
14	Clark Rd / Black Bear Diner	13:10 <sup>c</sup>	n/d	23	3 (structure)	150			
15	Rattlesnake Flats Rd	15:15	15 min	3	0	300			
16	Coutolenc Rd	00:00 (Nov 9)	120 min	7	0–2	3000			Y
17	Chestnut Cir	06:00 (Nov 9)	n/a	9	0–1	150			
18	Ponderosa Way	07:15 (Nov 9)	n/d	12	0–3	400	Y		Y
19	Concow Fire Station 37	07:15 (Nov 9)	n/d	9	0–3	600			Y

<sup>a</sup> The roadway segment affected by each burnover was estimated from the technical discussions.

<sup>b</sup> No data.

<sup>c</sup> First time of observation. Burnover conditions existed prior to the first recorded observation.

#### 9.4. Impact of Winds, Wildland Fuels, and Terrain on Fire Behavior

Section 5.3 in this report presents an overview of the weather during the Camp Fire. Local observations and video documentation provided additional resolution and information on how the wind affected local fire behavior. Firsthand observations on Rim Road at 07:20 on November 8 talked of “softball size rocks hitting the engine” [TD-005]. These reports were consistent with the short video from the TD and likely indicated local winds in the range of 22 m/s to 27 m/s (50 mi/h to 60 mi/h). These values agree with the forecasted ridgetop winds.

Within 30 minutes of these firsthand observations, shortly before 08:00, the spot fires that ignited on the east side of Pentz Road in Paradise were reported as burning under almost calm conditions [PPD video, TD-042, TD-023, VTD-17, VTD-23], although in some locations winds did dramatically increase as the fire front hit. These local low wind observations confirm the significant range of conditions within small spatial distances. The embers that reached Paradise, between the wildlands and Pentz Road, came from the approaching fire front, but there was no way to pinpoint their exact origin. While most of the fuels upwind were vegetative, there were also a limited number of structures that had just ignited in Concow that might have contributed to the ember generation that reached into Paradise.

By 08:30 the main front had reached Paradise from approximately Apple View Way to Merrill Road, a distance of 1 km (0.6 mi). Shortly afterwards, the southern end of the approaching front progressed south and impacted the area between Merrill Road and FRH. A little over 70 minutes later, Paradise was experiencing a direct fire front hit 2.8 km (1.9 mi) in length.

Given the local conditions and the lack of local weather data, it was not possible to determine whether the arrival of the fire front was driven primarily by an increase in local wind, by fire generating its own wind going upslope, or by some combination of the two. The conditions observed in videos taken during the fire indicate that within Paradise the wind never reached the high velocities observed on Rim Road. Wind observations in town ranged from calm to an estimated 9 m/s to 13 m/s (20 mi/h to 30 mi/h) [TD-021, TD-042, PPD Video]. These ambient winds enhanced fire spread in Paradise. As the fire became deep-seated, the increased fire intensity might have generated its own fire induced winds, as appeared to be the case with the approaching fire front. Given the lack of high-resolution spatiotemporal wind data, it was not possible to say if the predominant influence was regional and local winds or the fire-induced winds. An example of the influence of local wind conditions was observed at FRH at 09:08 when a video recording shows embers blowing from the west while the fire front arrived from the east, shown in **Figure 29**.

Other significant wind observations were made during the Coutolenc Road burnover that occurred near 00:30 on November 9. First responders reported very strong, gusty winds coming up from the West Branch canyon with estimates of 22 m/s (50 mi/h) [TD-041, TD-061, TD-209]. The estimates, while not precise, conveyed that this wind event was different from the rest of the wind experienced in Paradise up to that time.



The Feather River Canyon, Concow, and Pulga have experienced a nominal 10-year burn cycle. Significant fires occurred there in 1999 and 2000, 2008, and now 2018. Historically these fires did not cross the Feather River Canyon. The periodic reentry of fire in high country has prevented the regrowth of conifers, gradually converting timber to grass and brush fuels [TD-008]. In Pulga, brush height ranged from 2.5 m to 4.3 m (8 ft to 14 ft) tall. The last two fire cycles (prior to 2018) caused extensive tree mortality and a significant number of fallen trees, resulting in a high loading of dead and down 1000-hour fuels. Pre-Camp Fire fuel-loading estimates around Concow were 2.2 kg/m<sup>2</sup> to 3.4 kg/m<sup>2</sup> (10 ton/ac to 15 ton/ac) with a timber overstock of 125 % [TD-008]. These decaying 1000-hour fuels, together with the fast-growing brush and the strong winds, generated very large heat release rates and long-distance spotting.<sup>15</sup>

Terrain also directly impacted fire behavior, resulting in dramatic fire behavior as observed around 18:00 on November 8, with flame lengths of 30 m to 60 m (100 ft to 200 ft) breaking out of the Butte Creek Canyon into Wilder Drive [TD-117]. Similar effects of topography, compounded with high fuel loading and possible alignment with local winds, resulted in significant fire activity in other areas within the fire perimeter, including the drainages to the north of Nelson Bar Road where flame lengths of 15 m to 30 m (50 ft to 100 ft) were reported.

The terrain also impacted fire spread indirectly by restricting or slowing down access by first responders. An example is provided here to illustrate the impact of topography on access. A straight line from Rim Road (39° 47' 34.89" N, 121° 28' 24.00" W) to the intersection of Pentz Road and Skyway is 9.3 km (5.75 mi); however, it takes 40 km (25 mi) and 43 minutes of drive time to get there. The fire is thus able to travel much faster than ground suppression forces. Further information on incident response and defensive actions will be presented in NIST Camp Fire Report #5.

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<sup>15</sup> Efforts are underway by CAL FIRE, in collaboration with federal agencies, to widen and connect fuel breaks in Butte County. Connecting fuel breaks will compartmentalize the landscape to reduce fire intensity and facilitate fire control in the future [TD-008].

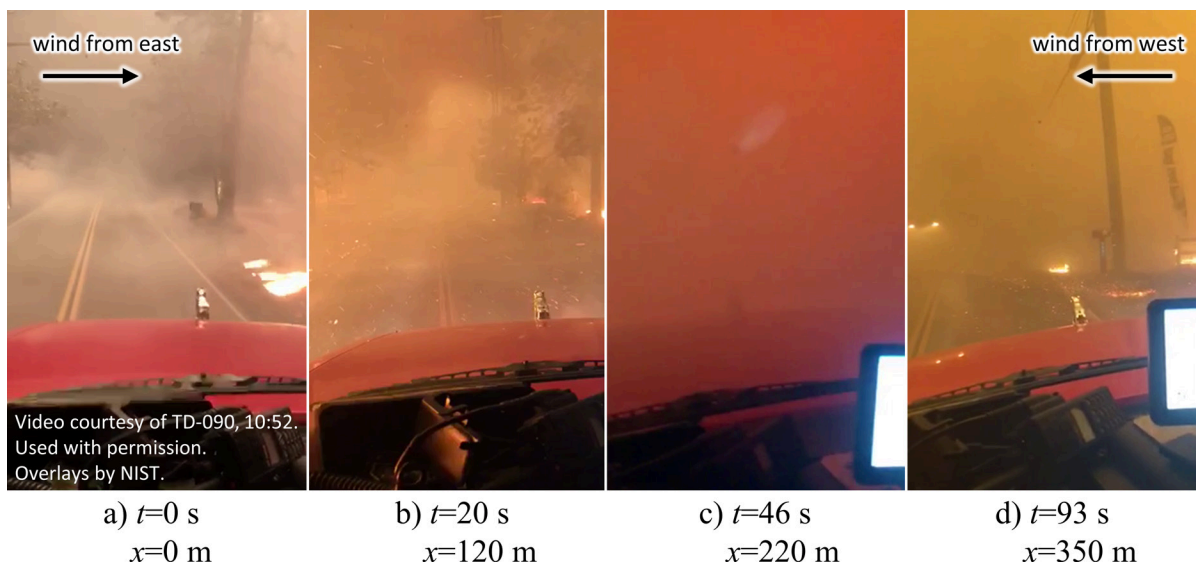
### 9.5. Ground-Level Smoke and Visibility

Ground-level smoke and visibility varied significantly in both space and time throughout the incident. The variability in light levels and visibility was influenced by local conditions as well as by the overhead smoke plume. By mid-morning on November 8, areas of the fire were experiencing nighttime darkness as the high-level smoke column to the east blocked out the sunlight. Photos taken at noon could easily be confused with midnight. In these cases, ground visibility might still be clear despite the darkness.

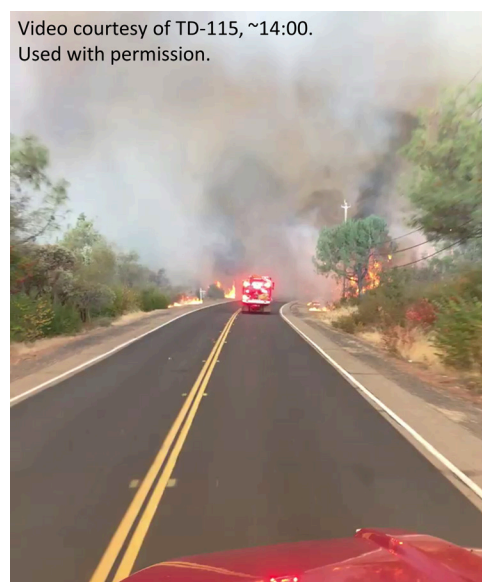
At other times, ground-level smoke affected light levels block by block, with local smoke curtains created by burning structures or vegetation. Video footage from a dozer operator driving south on Pentz Road highlights the extent of this spatiotemporal variability in **Figure 48**. Visibility changed from relatively clear and light to barely being able to see the hood of the transport in less than one minute while moving 220 m (720 ft). Ground visibility was often influenced by local wind variability. Arrows in **Figure 48** highlight the 180° reversal in wind direction within a 400 m (0.25 mi) distance. The variability illustrated was representative of conditions though Concow, Paradise, and Magalia at different locations and times. Reduced ground level visibility conditions could be attributed to the high smoke yield of multiple fully involved structures and/or large quantities of vegetative fuels burning simultaneously.

At the edge of the fire, first responders driving up Pentz Road reported a “wall of smoke” north of Kunkle Reservoir, seen in one case in **Figure 49**. The clear boundary resulted in rapid transition from a clear, no smoke environment to significant reduction in light intensity and visibility. In several cases visibility was less than a few meters and pitch black once past the “wall.” The transition was almost instantaneous over a course of a few meters (10 ft). The conditions along Pentz Road seen in **Figure 49** were described by multiple TDs through the early afternoon [TD-009, TD-079, TD-084, TD-086, TD-090, TD-115, TD-118]. This well-defined “wall of smoke” migrated to the south and eventually became less well-defined.

The early burnovers in Concow (Hoffman Road) and in Paradise (Pearson Road) were accompanied by significant reduction in visibility. On Hoffman Road, first responders reported blackout conditions with glowing fire showing through the blackout and difficulty seeing the headlights on the approaching bulldozer. On Pearson Road, smoke obscuration also reduced visibility to zero. A picture during the burnover, after the initial flaming event and accompanying low visibility, shows an orange glow resembling the interior of a furnace (**Figure 36**). Similar conditions occurred in the other burnovers.



**Figure 48.** Image sequence from a video recording showing visibility and wind conditions along Pentz Rd, heading south at 10:52. Visibility is intermittent and wind directions shift  $180^\circ$  over short distances and time periods.



**Figure 49.** Wall of smoke observed on Pentz Rd, going north, at Dry Creek Rd. This abrupt change in conditions was described by multiple individuals.

## 10. Fire Spread Maps

Fire progression is further documented in an accompanying map book. **Map 1** includes frequently referenced locations and roads in the Concow, Paradise, and Magalia region. The 15 geographic focus regions are also marked for reference. **Map 2–Map 14** provide a look at the entire fire observation data set divided into smaller successive time windows. The maps include annotations to describe highlights of the fire spread within the resolution permitted by the collected data. **Figure 22** includes an overview of the fire spread vectors during the spread of the fire over the first 24 hours.

Each successive map contains the accumulated observation points from previous time windows. Current observations are displayed in full color, while previous observations are faded. The faded symbols from previous time frames remain to facilitate the viewing/interpretation of the data and to visualize the fire progression.

Data point shapes correspond to the different type of fire observations described in Section 7.4.1: spot fire; vegetation fire; residential structure; commercial structure; or other. The size of the symbol in figures is not related to the size of the actual fire but rather indicates a representative location for each observation.

Fire observations are displayed at the time window they occurred in; therefore, a TD observation based on AVL that has a precise time of 09:55 is displayed in the 09:00 to 10:00 map. Data that have a time range associated with them are displayed on every relevant time map, i.e., a TD observation with a time range between 15:00 and 17:00 is displayed on the 14:00 to 16:00 map as well as the 16:00 to 19:00 map.

The maps are presented with the time divisions as follows.

**Map 1.** Camp Fire Points of Interest and Frequently Referenced Roads and Locations

**Map 2.** Fire Observations 06:25 to 07:45, November 8

**Map 3.** Fire Observations 07:45 to 08:30, November 8

**Map 4.** Fire Observations 08:30 to 09:00, November 8

**Map 5.** Fire Observations 09:00 to 10:00, November 8

**Map 6.** Fire Observations 10:00 to 11:00, November 8

**Map 7.** Fire Observations 11:00 to 12:00, November 8

**Map 8.** Fire Observations 12:00 to 13:00, November 8

**Map 9.** Fire Observations 13:00 to 14:00, November 8

**Map 10.** Fire Observations 14:00 to 16:00, November 8

**Map 11.** Fire Observations 16:00 to 19:00, November 8

**Map 12.** Fire Observations 19:00 to 23:00, November 8

**Map 13.** Fire Observations 23:00, November 8 to 02:00, November 9

**Map 14.** Fire Observations 02:00 to 09:00, November 9.

Two maps contain unique comparisons to additional fire perimeter data sources. NASA/USGS's Landsat 8 satellite captured an image of the Camp Fire at 10:45 on November 8 [51] using a combination of visible and short-wave infrared lights. **Map 6** includes a digitized perimeter traced from the overlaid satellite image. Overall, the collected data was further validated by the satellite imagery. In fact, the collected data indicated more detail than the data captured by the infrared (IR) imaging. Much of the eastern half of the fire showed the fire perimeter with good contrast to unburned areas; however, the western half of the fire was obscured by the towering smoke plume. This was the case particularly on Clark Road south of Buschmann Road to Round Valley Ranch Road near the town limits. Data indicated that the fire was more widespread and was impacting Clark Road through this area.

An IR perimeter mapping flight was conducted beginning at 17:54 on November 8. **Map 11** includes this observed fire perimeter [53]. Comparison of the collected data with the IR fire perimeter shapefile was favorable. Observation density dropped as the fire spread beyond the developed area of Paradise into the foothills. The fire perimeter provided a good sense of the extent of the fire as it ran toward Highway 99, Durham-Pentz Road, and across Butte Creek Canyon. The fire spread quickly through the lighter fuels south and west of Paradise, and observations within the 16:00 to 19:00 time window shown on **Map 11** indicated the fire quickly spread beyond the perimeter observed during the IR overflight.

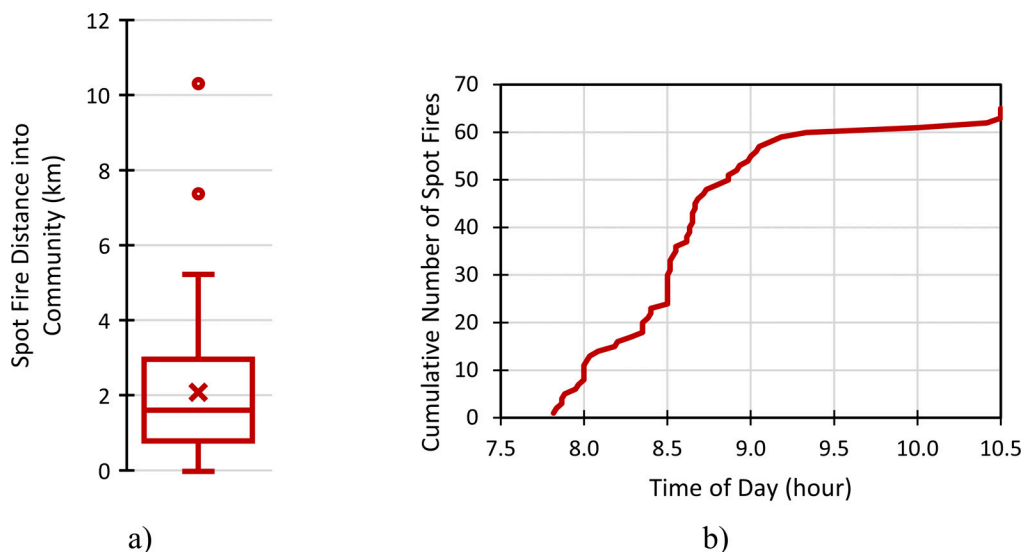
## 11. General Fire Behavior and Structure Ignitions

### 11.1. Fire Behavior Across the Community

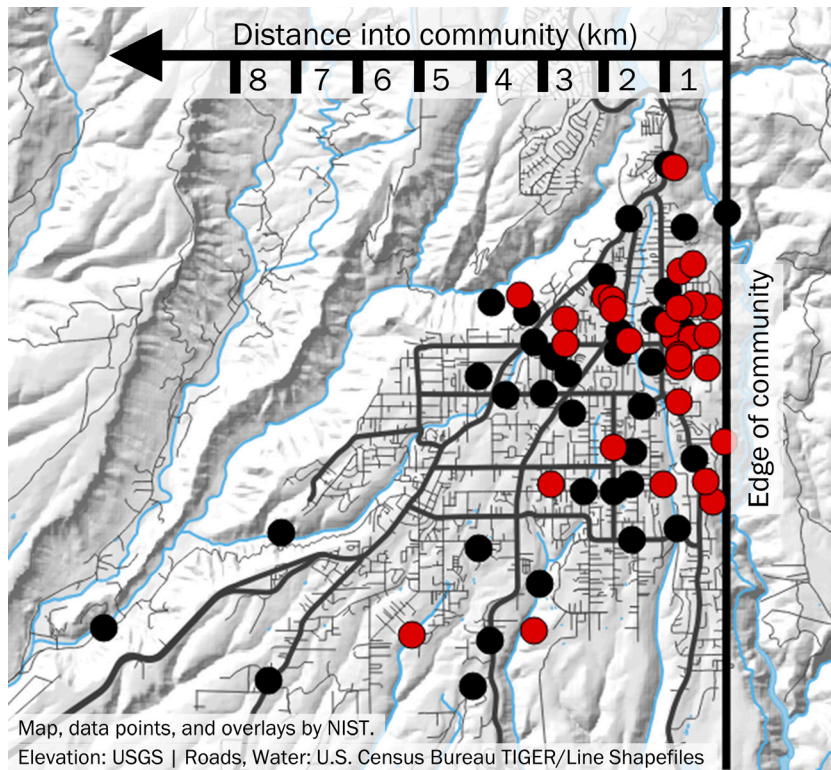
Fire and ember exposures varied across the fire both spatially and temporally. Exposure conditions ranged from severe at the burnover locations and at the Butte Creek Canyon in the vicinity of Wilder Drive where flames reached 30 m to 60 m (100 ft to 200 ft) [TD-117], to creeping surface fires with little to no wind [TD-012, TD-022, TD-045, TD-79, TD-102, TD-126, TD-136].

Spotting ranged from a few meters to several kilometers downwind. Technical discussions, 911 calls, and radio logs were used to identify that spotting was extensive in Paradise by 08:30 on November 8. Many spot fires reached as far as 3.4 km (2.1 mi) west into the town from the edge of the community along the West Branch; 75 % were located within 3 km from the edge of the community. The spot fire in Honey Run Canyon, which was first observed at 08:41 and which ultimately burned over Skyway, was 7.4 km (4.6 mi) from the eastern edge of the community. **Figure 50a** shows the distribution of spot fire distances into the community.

A total of 30 spot fires before 08:30 were identified during the data analysis. **Figure 50b** shows the cumulative number of spot fires as a function of time. The initial wave, mainly before 08:00, was focused along Pentz Road, mostly within 1 km (0.6 mi) from the edge of the community. A second wave of spot fires hit after 08:30, extending deeply into and across town. An additional 35 spot fires were identified between 08:30 and 10:30. **Figure 51** shows a map indicating the locations of spot fire ignitions within Paradise before 10:30. Red symbols mark spot fires before 08:30 along Pentz Road and throughout town. Black symbols mark spot fires that ignited between 08:30 and 10:30. Distance was measured from a straight north-south line along the edge of the canyon.



**Figure 50.** Statistics related to spot fire ignition frequency and location in Paradise: a) distribution of distance into the community of the 65 documented spot fires and b) cumulative number of spot fires before 10:30.



**Figure 51.** Map of the 65 documented spot fire ignitions in Paradise before 10:30. The red symbols (N=30) are spot fires that ignited between 07:49 and 08:30, mostly within 1 km from the edge of the community, but as far as 5 km away. Black symbols (N=35) are spot fires that ignited between 08:30 and 10:30.

The extensive spotting, caused by ember transport and the low ignition threshold of abundant dry vegetative fuels, such as pine needles, discussed below, resulted in multiple ignitions of vegetation and structures that quickly spread and overwhelmed the available firefighting resources. The spot fires then grew and “backfilled,” causing severe local fire exposures in many cases. These high intensity exposures might have then generated strong local winds and blackout conditions downwind.

Needle drop associated with drought-stressed vegetation, time of year, and disease resulted in piles of needles throughout town, even though the Town of Paradise had just swept the streets. The same buildup also occurred on properties and roofs that had been recently cleaned. This further accentuated the hazard on properties that might not have been recently maintained. First responder reports of needles piling up against walls or “tumbleweed”-type needle piles burning as they were blown by the wind further highlight the fire hazard associated with pine trees and how this hazard is compounded by drought and disease. TDs identified that the same area surrounding Fire Station 35 in Paradise burned three separate times as needles fell, accumulated, ignited, and carried fire across the surface within and between parcels. These fires may then have resulted in additional vegetation ignitions and potentially caused either direct or indirect structural ignitions. This fire behavior illustrates the difficulties of maintaining defensible space during high-wind events with this type of surrounding vegetation. Station 35 was not the only location to experience a second

documented fire front. Eastern Pearson Road, near Stearns Road and Hilbe Drive, was also observed burning as a second front moved through at 13:15 [TD-014], after initially burning between 09:00 and 10:30.

Winds and exposure varied in space and time and impacted burnovers and fire behavior in and around Concow, Paradise, and Magalia. The first burnovers occurred on Hoffman Road and on Concow Road at around 07:50 on November 8, followed by the Windermere Lane burnover at 08:35 and the Pearson Road burnover at 09:56. These events were the result of wildland fuel conflagrations (similar to many other burnovers), and they highlight the local impacts of fuel, topography, and weather. TDs often reported very high thermal radiation causing heat damage and ignitions of trapped vehicles.

Severe fire behavior occurred in burnovers and other locations within the fire perimeter. TD-040 and TD-104 reported very loud noise prior to the arrival of the fire front that sounded like jet engines or a freight train. The arrival of high intensity exposures occurred within minutes of first hearing the loud noise. In the case of Apple View Way [TD-040], the approaching fire front was from the east out of the West Branch canyon, while in another location [TD-104] the direction was not identified.

### 11.2. Fire Behavior Across and Within Residential Parcels

Differences in fire behavior at the parcel level result in a range of fire exposures to structures, from large flames in high exposure areas due to high vegetative fuel loading or the proximity of nearby burning structures, to low energy smoldering or creeping spot fires. Structures may ignite due to thermal radiation or convection due to flames, from direct flame contact, or from deposition of embers (from vegetation, upwind structures, or other combustibles) [54]. In the WUI, these fire and ember exposures threatening residential structures may originate from fuels located within a single parcel (intra-parcel exposures) or from adjacent parcels (inter-parcel exposures).

Direct observations of structure ignitions were identified in several TDs, videos, and photos, and highlighted several different ignition pathways. The data presented in **Table 35** illustrate the inter- and intra-parcel ignition pathways that were specifically identified through direct observations. **Figure 52** and **Figure 53** present photos from two structure ignition events with known pathways. **Figure 52a** shows a burning vehicle that was initially located approximately 2 m (6.5 ft) from the building and was moved by a dozer because it was igniting the side of the structure. **Figure 52b** shows a view of the damage as it appeared when surveyed by the NIST team during the field data collection effort. Evidence of ignition and defensive actions were confirmed by TD-091. **Figure 53** shows a structure ignition in Magalia as fire spread from vegetation and combustible fencing. **Figure 53a** and **b** were taken two minutes apart, and show the rapid fire spread to the eaves of the structure. **Figure 54** illustrates parcel-level fire vulnerabilities and hazards and highlights the structure ignition pathway for the case shown in **Figure 53**.

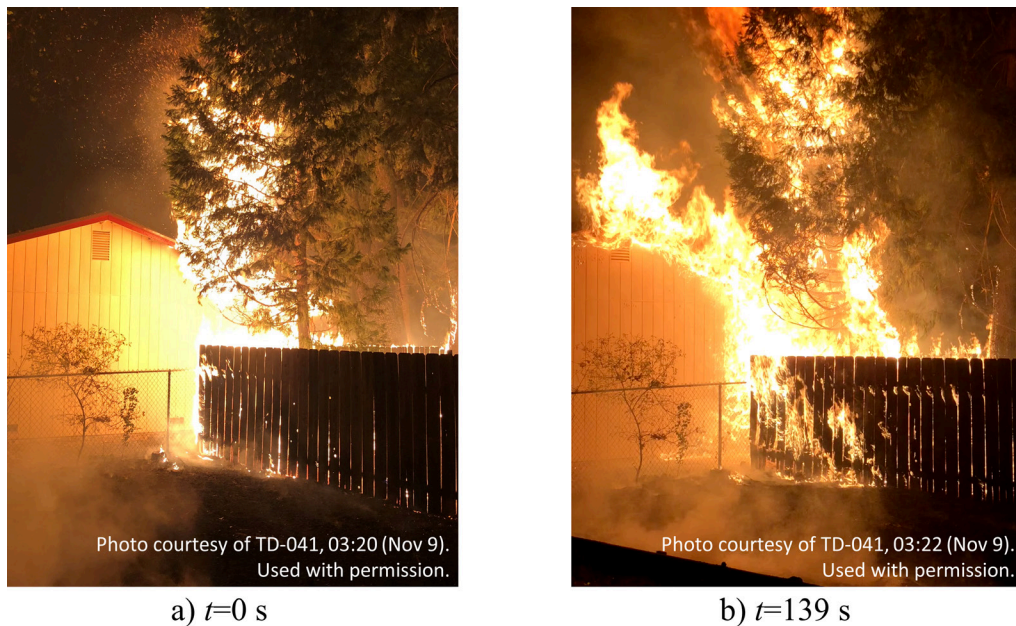
Additional ignition pathways may be identified through post-fire analysis of damaged structures. NIST/USFS/FEMA data collection, in coordination with CAL FIRE, was conducted on 132 damaged residential structures. The relationship between known defensive



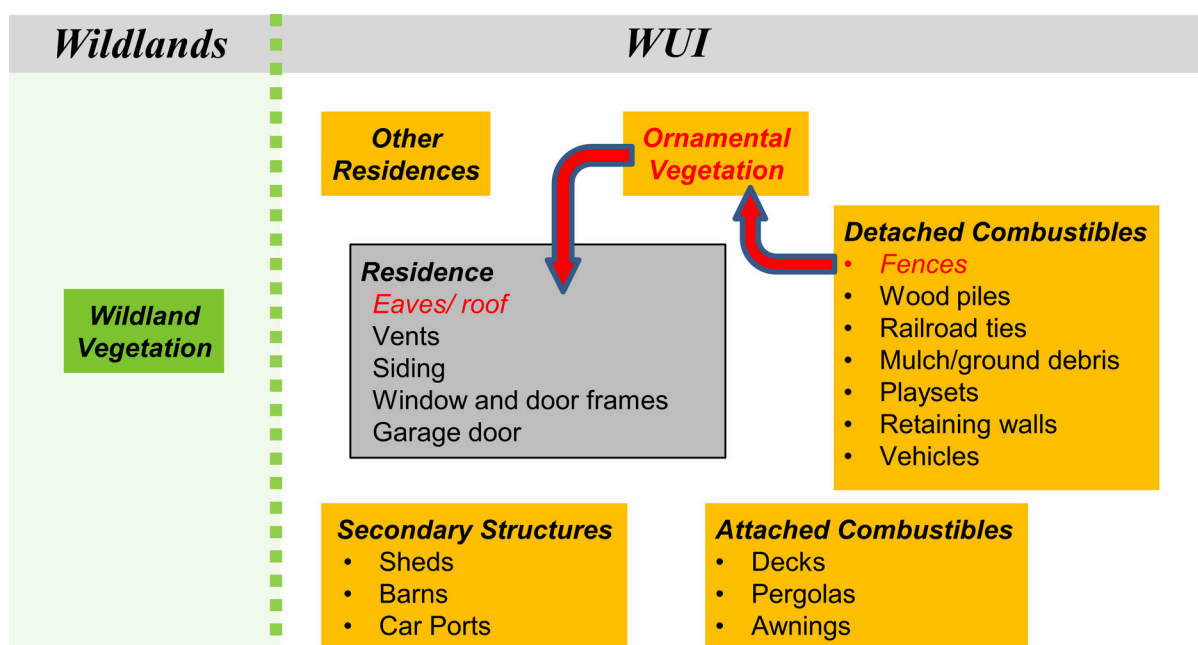
actions and damaged structures will be further analyzed in NIST Camp Fire Report #5. The report will also contain documentation and analysis of the exposure data collected as outlined in NIST Camp Fire Preliminary Reconnaissance and Preliminary Data reports [22, 24].



**Figure 52.** A defended structure on Lewis Ranch Rd where the burning vehicle was igniting the structure, showing a) a dozer displaced the vehicle to stop fire spread, b) the associated evidence of the fire ignition and defensive actions encountered during NIST damage assessments.



**Figure 53.** Structure ignition on Dade Ct in Magalia. Images are two minutes apart and show fire spread from surface fuels to fence to vegetation to eaves. The combustible fence is estimated to be approximately 1.8 m (6 ft) away from the structure.



**Figure 54.** Numerous structure ignition pathways exist from the wildlands and inter- and intra-parcel exposure sources. The ignition pathway for the identified Dade Ct, Magalia structure ignition is highlighted.

**Table 35.** Residential structure ignition pathways identified by direct observation.

Data Source	Time of Obs.	Location <sup>a</sup>	Building Ignition Pathway	Source to Target Distance	
				m	ft
TD-045	09:10	Chris Ct	Shed to fence to shed to house <sup>b</sup>	2.7	9
TD-005	10:20	Canyon View Dr	Bark mulch to wall of house (OSB and vinyl)	unknown	
TD-060	11:06	Sweetbriar Ln	Structure ignition via radiation from neighboring structure on fire	11	35
TD-092	13:52	Neal Rd	Burning car to shed to house	unknown	
TD-091	14:06	Lewis Ranch Rd	Burning car to side of house	1.5–2.4	5–8
TD-091	14:06	Neal Rd	Mulch to garage	unknown	
TD-015 TD-017 TD-064 PPD	14:37	Skyway	Fence to wall of building	2.4	8
TD-100 TD-101	14:53	Pearson Rd	Commercial structure to commercial structure roof to eave	0.7	2
TD-036	14:58	Skyway	Juniper vegetation to eave	against house	
TD-108	17:01	Clark Rd	Juniper vegetation to house	1.3	4
TD-091	17:09	Neal Rd	Burning bark mulch into subfloor vents of house	unknown	
TD-091	17:23	Sutter Rd	8 m × 4 m (26 ft × 13 ft) shed to house eaves	2.4	8
TD-044	19:00	Valley Ridge Dr	Fence to boat to house	2.7–3.6	9–12
TD-205	20:12	Clark Rd	Boat on fire to eaves of house	2.5	8
TD-044	22:30	Valley Ridge Dr	Woodpile to house	0.3–0.7	1–2
TD-041	03:20 <sup>c</sup>	Dade Ct, Magalia	Fence/ground fuel to tree to eaves of house	1.5	5

<sup>a</sup> Location in Paradise unless noted.

<sup>b</sup> Second shed fire resulted in an explosion that caused a firefighter injury.

<sup>c</sup> November 9.

## 12. Analysis of First Responder Comments

Technical discussions (TD) often included statements or comments about the incident or WUI fire in general that were not directly related to establishing the incident timeline or linked to a specific observation. The comments came from a broad range of perspectives and contain a plethora of valuable observations from a range of different first responders.

The TD comments were subdivided into ten categories. Pre-Planning/Mitigation, Pre-Fire Hazard, and Fire Behavior categories are included in this report. The remaining categories will be included in the subsequent NIST Camp Fire reports on Evacuation/Notification and Response. TD comments may fall into more than one category and may therefore be listed more than once.

The full listing of Pre-Planning/Mitigation, Pre-Fire Hazard and Fire Behavior comments are contained in Appendix G. **Table 36** summarizes the comments using subcategories. Comments tagged with the subcategory/keyword *Vegetation* dominated the Pre-Fire Planning/Mitigation category (60 % occurrence), with the second most common keyword, *Water*, appearing only five times (12.5 % occurrence). In the Pre-Fire Hazard category, *Vegetation* also dominated the comments with 44 % occurrence, with *Pine Needles* being the second most common keyword with 4 entries (10 % occurrence). Out of 106 Fire Behavior comments, the three most frequently used keywords were *Wind*, *Conditions*, and *Embers*, with 24, 23, and 19 occurrences respectively.

**Table 36.** List of topics and frequency counts of fire-related first responder comments.

<b>Pre-Fire Planning/ Mitigation</b>		<b>Pre-Fire Hazard</b>		<b>Fire Behavior</b>	
	<b>Count</b>		<b>Count</b>		<b>Count</b>
Vegetation	24	Vegetation	18	Wind	24
Water	5	Pine needles	4	Conditions	23
TRA	4	Infrastructure	3	Embers	19
Utilities	3	Wind	2	Hazards	11
WUI	2	Clearance	1	Fire history	7
Research	1	Conditions	1	Flames	6
Resources	1	Defensive space	1	Structure	6
<b>Total</b>	<b>40</b>	Egress	1	Topography	5
		Embers	1	Vegetation	3
		Fences	1	Pine needles	2
		Fuel model	1	<b>Total</b>	<b>106</b>
		Inspection	1		
		Regulation	1		
		Research	1		
		Structure	1		
		Visibility	1		
		Windows	1		
		<b>Total</b>	<b>40</b>		

### 13. Primary Drivers Influencing the Extent of Damage and Destruction

During the Camp Fire, there were many factors that impacted individual structure survivability and effectiveness of defensive actions at a parcel level. However, when viewing the incident in its entirety, based on all fire observations and additional comments provided in the TDs, four factors have been identified to be the most significant for influencing the extent of damage and destruction during the Camp Fire. They are:

1. Fuel ignition potential
2. Density of vegetative and structural fuels
3. Wind and terrain
4. Extent/size of fire front reaching the communities

It was the confluence of these four factors that resulted in the very aggressive fire behavior that caused dangerous conditions for residents and fire fighters and extensive damage and destruction.

#### 13.1. Fuel Ignition Potential

Fuel receptivity to embers and ignition potential was a result of over 200 days with almost no precipitation (see Section 5.3). The presence of fine fuels, including pine needles and ornamental vegetation stressed by limited precipitation, enabled far-field embers to cause a number of ignitions well ahead of the fire front. Fuel receptivity and ignition by embers were clearly conveyed in multiple first responder statements of “100 % ember ignitions” [TD-041, TD-079]. It is this receptivity within the communities that caused the large number of spot fire ignitions. In Paradise, these ignitions started approximately 30 min to 40 min before the arrival of the fire front and rapidly grew in number when the front reached the community.

#### 13.2. Density of Vegetative and Structural Fuels

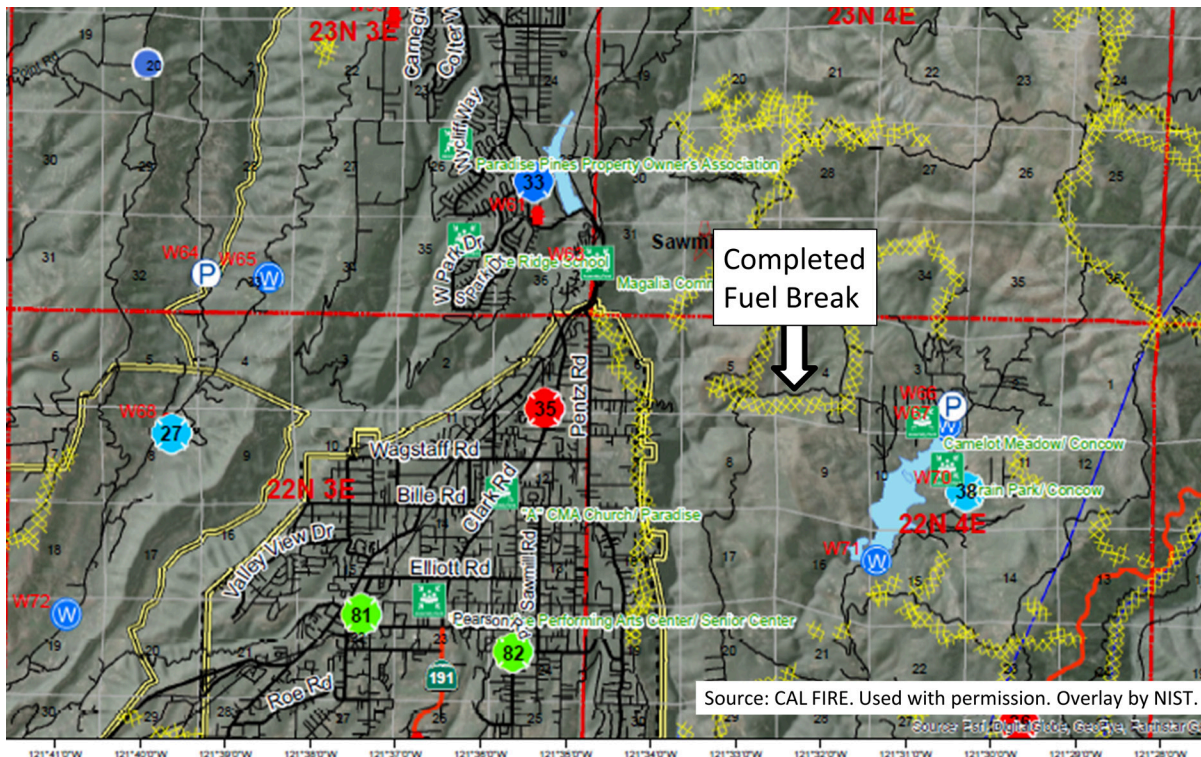
All three communities, Concow, Paradise, and Magalia, are wildland-urban intermix communities that have developed over decades within the local wildland vegetation. Concow can be considered low population density intermix with 10 people/km<sup>2</sup> (26 p/mi<sup>2</sup>), while Paradise and Magalia can be classified as high-density intermix communities with 552 p/km<sup>2</sup> and 312 p/km<sup>2</sup> (1433 p/mi<sup>2</sup> and 808 p/mi<sup>2</sup>) respectively; however, effective densities varied significantly within all three communities as discussed in Section 4.

The absence of fire within most of Paradise for many decades had resulted in significant accumulation of vegetative fuels. The vegetative fuel loading was further impacted by diseased vegetation (specifically conifers) [TD-035]. Seasonal needle dropping, combined with diseased trees and enhanced by wind, resulted in extensive needle accumulation before and during the fire. The historic growth of Paradise and surrounding communities, going back over a century, resulted in many structures on smaller lots, with small structure separation distances. Combined with the vegetative fuel loading, this enabled rapid structure-to-structure fire spread.

Concow has recently experienced wildfires about every ten years. These recent fires have resulted in modification of the local wildland fuels from timber to brush and grass. After the 1999, 2000, and 2008 fires, fuel loading around Concow was estimated at 2.2 kg/m<sup>2</sup> to

3.4 kg/m<sup>2</sup> (10 ton/ac to 15 ton/ac), which allowed the fire to maintain a high intensity and move rapidly through the community [TD-008].

Fuel treatments have been used extensively to compartmentalize the landscape in the area around Paradise, Magalia, and in Concow [TD-008]. The goal of fuel treatments is to provide access for firefighting operations and reduce the total impact of wildfires by reducing the total acreage burned. **Figure 55** is an excerpt from the Butte County Wildland Fire Pre-Plan that illustrates fuel treatments around Paradise and Magalia. Fuel treatments have been used to influence wildland fire behavior and to protect critical infrastructure.



**Figure 55.** Wildland fire pre-plan for Butte County Fire Department Battalion 2.

The fuel treatment around Paradise Irrigation District (PID) critical infrastructure, illustrated in **Figure 56**, was successful in protecting the facility when combined with defensive actions [TD-008]. This specific fuel treatment highlights pre-fire preparation and vegetative fuel reduction aimed at protecting critical infrastructure. The systematic analysis of the effectiveness of fuel treatments and their impact on fire behavior are beyond the scope of this report. There is a need for a detailed study to assess the impact of fuel treatments on wildland fire behavior and on their contributions to structure survivability, particularly when coupled with defensive actions.

At the residential parcel level, the quantification of exposures from various burning vegetative fuels can provide further information to guide defensible space guidance and hazard mitigation efforts. Intermix communities may be particularly vulnerable to the presence of high vegetative fuel loading on residential and commercial properties. While

drought affects all non-irrigated plants, highly flammable plants like juniper can generate severe fire and ember exposures that threaten surrounding structures. While there are a number of plant lists available, there is currently no standard way to assess the hazard associated with a specific plant. As a result, different lists may present different levels of unquantified hazard reduction. There is a need to develop a standardized methodology for assessing the exposures from ornamental vegetation. Such a methodology can then be used to develop a prohibited plant list based on an unacceptably high fire hazard, in order to limit the exposures to residential and commercial structures, specifically in Very High Fire Hazard Severity Zones.



a)



b)



c)

**Figure 56.** Fuel treatment around Paradise Irrigation District critical infrastructure: a) prior to fuel treatment, May 2018, b) fuel treatment showing reduced fuel load, c) rapid post-fire vegetative growth in pre-fire fuel treatment areas.

### 13.3. Wind and Terrain

The impact of wind and terrain on the fire spread was discussed in detail in Section 9.4. Jarbo Gap is known for its high winds [TD-003, TD-008]. The wind event that occurred in the early morning on November 8, combined with the restricted access associated with topography, resulted in the fire not being contained soon after ignition. The wind, augmented by the local topography and fueled by very dry vegetation, caused the fire to grow very rapidly.

### 13.4. Extent/Size of Fire Front Reaching the Communities

All three communities were impacted by large fire fronts. The front length, driving fire over very dry fuels in complex terrain with wind, resulted in fire behavior that could not be readily contained.

The fire front that reached Concow was estimated to be between 0.8 km and 1.6 km (0.5 mi to 1 mi) long. This front impacted most of the community and, in combination with the above three factors, caused very dangerous conditions that rapidly impacted life safety and evacuation (see Section 9.3, Burnovers). The fire front that reached Paradise at 08:30 on November 8 extended from approximately Apple View Way to Merrill Road, a distance of 1 km (0.6 mi). Shortly after, the southern end of the approaching front progressed south and impacted the area between Merrill Road and Feather River Hospital.

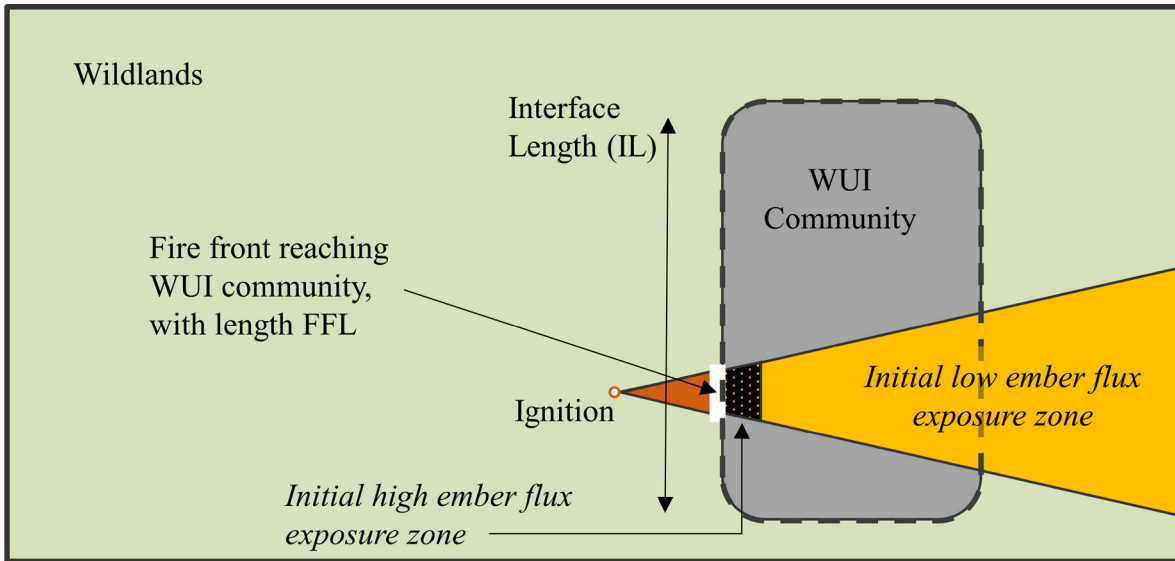
In a little over 40 min after the initial spot fires reached the community, Paradise was experiencing a direct fire front hit 2.8 km (1.9 mi) in length. The extent and severity of that initial exposure, as in Concow, resulted in civilian evacuations and life safety becoming the top priorities of the early first responder resources on the scene. The initial fire front expanded to the south, and by late morning the exposure to Paradise was along the entire town boundary along the West Branch canyon, approximately 8 km (5 mi) in length.

**Figure 57** illustrates idealized fire spread scenarios with two different ignition locations away from the WUI community edge. In both cases the fire is not contained by the first responders before reaching the community. In the case where the ignition occurs near the community, the fire front length (FFL) represents only a small fraction of the community interface length (IL). The resulting initial impact on the community is relatively small,  $FFL/IL \ll 1$ , and therefore the high ember exposure zone downwind of the initial fire front also covers a small area of the WUI community.

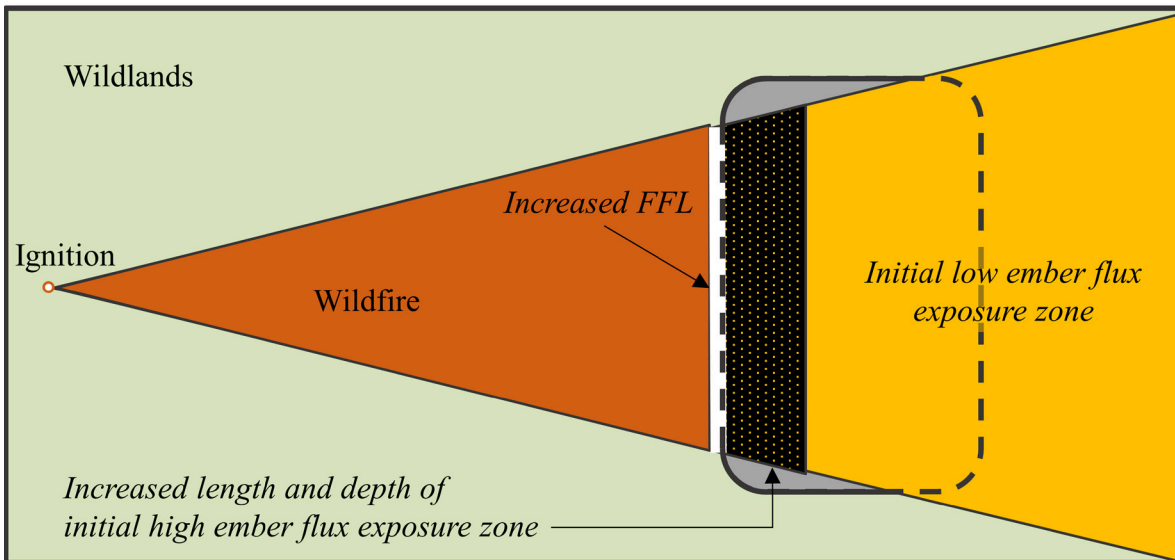
The second (lower) scenario illustrated represents an idealized version of the Camp Fire. In this scenario, the wildland fire ignition occurs far from the community, and the fire has enough fuel and distance to develop a fire front that represents a large fraction of the interface length of the community. In this case, in addition to the extended direct fire front assault, the high ember exposure zone represents a large fraction of the community and is illustrated as having a longer and deeper reach into the community. This deeper reach is related to the higher overall intensity of the fire front. The increased area of initial high ember flux exposure has the potential to easily overwhelm fire-fighting resources and enables the fire to become well established throughout the community.



The rapid increase in fire intensity that caused the Coutolenc Burnover around midnight on November 8 also resulted in a fire front over 1.6 km (1 mi) long that impacted Magalia. The extent of the fire front coupled with the extensive ember cast and very strong winds estimated at 22 m/s (50 mi/h) challenged the large number of available resources on the scene. The intensity of the exposure and the fuel's receptivity to embers led to an uncontrollable situation that resulted in most of the Magalia structural losses.



a) Ignition near WUI community – fire front impacting community



b) Ignition far from WUI community – fire front impacting community

**Figure 57.** Idealized relationship between ignition location, a) near or b) far, from a WUI community and the fire front and ember exposures reaching the community. The wind is directed from left to right.

## 14. Hazard Reduction Pathways

### 14.1. Community-Level Hazard Reduction Pathways

Devastating WUI fires frequently occur during short term limited precipitation windows and/or during extensive droughts. In both cases, water availability may be limited, and statewide or regional water usage restrictions may be in place. Such restrictions can result in low vegetative fuel moisture levels within the community, further enhancing the danger presented by the surrounding very dry wildland fuels.

Wildfires up to 300 ac (size class D) [55] are successfully contained early 97 % of the time [56]. This is achieved by utilizing several pre-fire hazard mitigation techniques such as vegetative fuel treatments and active suppression and containment techniques. Fuel treatments are a critical tool in containing wildland fires in low and moderate wind speeds.

Fuel treatments around communities are a key strategy in reducing WUI community hazard. The fuel treatments serve several purposes. While there is limited scientific information quantifying fire and ember exposure reductions from fuel treatments around communities, fuel treatments can reduce local fire exposures and enable first responders to safely defend the structures along the perimeter of a community. This can be viewed as an extension of the parcel-level defensible space concept to the community and could be a high impact hazard mitigation solution for low and moderate wind WUI fires. When fire ignition occurs near the community under low and moderate wind conditions, these treatments can be very beneficial by enabling effective suppression and reduction of structure ignitions and rapid containment of the fire.

However, fuel treatments around communities may not be able to significantly reduce ember exposures. In WUI fires that occur under severe conditions (with challenging topography, low vegetative fuels moisture, and high wind speeds) the ember assault can potentially result in catastrophic life and property losses in communities with a high density of vegetative and structural fuels. In the case of the Camp Fire, the initial high ember flux zone in Paradise reached 1 km (0.6 mi) into the community, with additional significant spot fires extending to 3.4 km (2.1 mi) into the community. To significantly reduce ember exposure for communities with high fuel ignition potential, such as in the case of the Camp Fire, extensive fuel treatments reaching hundreds of meters from the community would be required. A fuel treatment on that scale would have very significant environmental and financial impacts and would be difficult to initially implement and subsequently maintain.

A review of the four primary drivers influencing extent of damage and destruction described in Section 13 reveals that only two can be readily addressed to potentially reduce losses in existing WUI communities. For communities that are built in regions with complex terrain and strong winds, the density of vegetative and structural (community) fuels and the fuel ignition potential are the two drivers that can be impacted by proactive pre-fire hazard reduction methods. Hazard reduction pathways based on these two drivers are further described in Section 14.2 below.

## 14.2. Reducing the Density of Vegetative and Structural (Community) Fuels and the Fuel Ignition Potential

Section 14.1 identified that the two high impact approaches for reducing structure ignitions under severe exposure conditions are the reduction of fuels within the community and reduction in the ignition potential of these fuels. The ignition of a structure results from the relationship between exposure of a structural component or assembly and its response. Uncoupling the exposure problem into flame and ember components can help clarify the path forward to reduce structure ignitions.

The Camp Fire can be viewed as an example of a severe exposure scenario for a WUI community. This fire resulted in a significant ember exposure from the wildlands reaching 0.8 km (0.5 mi) into the community. In many cases, these wildland embers then ignited other fuels, causing direct or indirect structure ignitions.<sup>16</sup> The exposure from these newly ignited fuels could themselves be further subdivided into embers and fire. In general terms, the end result is two ember exposure sources: wildland fuels and fuels within the community.

In agreement with the other NIST case studies of WUI fires, the Camp Fire has demonstrated that embers can have significant impact on WUI communities. Laboratory and field work by NIST [57] has demonstrated that embers with enough energy to cause ignitions are readily generated from parcel-level combustibles such as landscaping mulch, fences, and firewood piles. These parcel-level fuels can cause ignitions over 40 m (130 ft) downwind. Ember ignitions downwind from parcel-level combustibles enable fire to readily spread from parcel to parcel. In high hazard areas, WUI structures therefore need to be able to withstand the exposures generated from both wildland and parcel-level combustibles.<sup>17</sup>

Measurement science can be used to quantify these exposures and develop a realistic worst-case ember exposure flux. Experiments will need to be conducted to obtain ember flux data from different types of fuels present in and around WUI.<sup>18</sup> To define a worst case ember exposure flux, field-collected ember flux data will need to be compared to laboratory ember ignition studies in order to identify the ember attributes of interest that yield enhanced ignition potential. This realistic worst-case ember exposure flux can then be used as the “Design Ember Flux” that residential and commercial properties in high hazard WUI areas will need to withstand. The proposed approach will harden structures against embers from wildland and community fuels.

Structure-to-structure fire spread was observed during the Camp Fire [TD-045, TD-060, TD-061, TD-089, TD-091, TD-100, TD-101, TD-108] and has been identified as an issue in previous NIST WUI case studies [9-13]. This issue applies to primary residences as well as auxiliary dwelling units (ADUs) and utility buildings. All three types of structures can directly spread fire to primary residences. **Figure 58** shows a photo from the Camp Fire in which a primary structure is being exposed to significant radiation from a large shed 3 m (10 ft) from the primary structure and the eaves are pyrolyzing (white arrow). Wind is from right to left; however, direct flame contact would easily occur if wind were from left to right.

<sup>16</sup> Structure vulnerabilities to embers will be discussed in Report #5.

<sup>17</sup> The definition of these exposures requires further measurement science development and field data collection in different settings with different wildland fuels.

<sup>18</sup> The ember exposure flux must contain specifics on the ember size, material, energy release, and time.



**Figure 58.** Fully involved shed, 8 m × 4 m (13 ft × 26 ft), located 3 m (10 ft) from the primary structure. Eaves of the primary structure are pyrolyzing (white arrow).

The hardening of both residential and non-residential structures to resist ignition from direct flame exposures can be addressed using two different technical approaches: 1) the fuels (exposure sources) can be displaced or 2) the target structure can be hardened. Because radiation and convection heat fluxes from a fire are near-field hazards, it is frequently possible to displace the relevant source term. This can be achieved by a vegetative fuel treatment on the perimeter of the community, by displacement of fuels within a parcel, such as locating a combustible shed away from the residence, or by increasing the structure setback from the property line, thus effectively increasing the structure separation distance (SSD). All three pathways can result in reduced ignitions.

Quantifying fire (radiative and convective) exposures from wildland fuels as well as inter- and intra-parcel level combustibles will enable the development of spacing/hardening cost-benefit relationships. These functions can then be used to reduce the overall implementation burden by providing balanced solutions to issues posed by structure hardening versus increased SSD.

The above approach provides a technical outline to address both the flame and ember structure ignition threats. The proposed approach focuses on using large scale field data to develop test methods that together with cost-benefit tools can enhance cost-effective hazard reduction solutions for WUI communities. By addressing both ember and flame hardening of structures, WUI losses can be significantly reduced.

The data presented in **Table 2** for communities affected by the Camp fire indicates how parcel sizes may vary between and within communities. Hazard mitigation solutions in low housing density, where large parcels may allow for parcel-level fuel displacement, may not be implementable in high density construction. Hazard reduction in high density construction will require both fuel removal and hardening of the structures because of the proximity of residential structures and the fire exposures generated from detached combustibles.

## 15. Community WUI Fire Hazard Framework

WUI fire spread has significant impact on communities well beyond the loss of structures, including community evacuation and incident response. Pre-fire planning and hazard mitigation impact how the fire develops, how the life safety of residents and first responders is impacted during evacuations, and the extent of structural and infrastructure losses. There is a need to document pre-fire hazard in a way that assesses the fire impact beyond potential structural losses.

Appendix C contains a preliminary Community WUI Fire Hazard Framework as a suggested methodology to begin to address the question of “*How unique is Paradise as a community at risk of WUI fires,*” by providing common metrics for comparisons and to support communities at risk in the identification of their unique hazards. This preliminary framework includes information on community size, population, and fuels; on notification and evacuation; and on the community infrastructure and firefighting response potential. Aspects of this framework may already be included in various community-level documents, such as CWPPs or evacuation plans. Development of a standard framework will 1) consolidate relevant WUI fire hazard and planning information in one place, and 2) allow for cross-community comparisons.

The evaluation required to implement this framework would support pre-fire hazard assessment and during-fire response operations. An increased understanding of the relationships between fire-evacuation, fire-structural response, and fire-defensive actions is needed to assess the overall community WUI fire hazard. The quantification of these relationships will enable communities to optimize the community-level response to WUI fire hazards in a more integrated way with the intended result of increased life safety and reduced losses.

## 16. Summarized Technical Findings

### 16.1. Community Preparedness

- F1. Communities did have multiple programs in place to increase awareness of and reduce fire hazards associated with WUI fires.
- F2. The Town of Paradise did have an emergency notification and evacuation plan.
- F3. Paradise Public Works staff had received training in how to respond to a WUI fire.
- F4. Infrastructure was specifically addressed in pre-fire preparations.

Butte County and the Town of Paradise had a number of programs in place at the time of the Camp Fire to reduce the WUI fire hazard within and around communities. The Butte County Community Wildfire Protection Plan (CWPP) addressed vegetation and structure ignitability, including a vegetation management component that incorporated fuel modifications and specifically highlighted topography, weather, and fire history.

The Town of Paradise addressed notification through a detailed evacuation plan and an opt-in Reverse 911 call system. To facilitate the town evacuation during power outages, Paradise equipped traffic lights at major intersections with battery backups to allow the signals to continue operating in the event of power loss.

The Paradise Public Works Department (PPW) was well prepared to respond to WUI fires and took measures to prepare the town as the high wind event of November 7–9 was forecasted. PPW personnel also had selective fire training including how to respond to burnovers. A Town of Paradise ordinance [45] enabled residents to remove vegetation up to 23 cm (9 in) in diameter without any permit requirement.

Infrastructure was specifically addressed in pre-fire preparations. Examples included the fuel treatments around Pine Ridge School in Magalia and Paradise Irrigation District (PID) critical infrastructure. Pre-fire preparations included having all water storage tanks at full capacity with additional water available in the supplying reservoirs.

All the above-mentioned hazard mitigation programs and actions reduced fire hazard in the Camp Fire-affected communities by promoting and enabling fuels reduction within and around the communities and prepared the communities for a fire event by enabling enhanced communications.

Vegetation fires around roadways and downed powerlines and power poles were the two primary factors that impacted evacuation. These factors will be further discussed in a subsequent report (Camp Fire Report #4) detailing emergency notification and evacuation.

Pre-fire firefighting preparedness, including staffing in Paradise and Butte County, as well as preparations and coordination with the Geographic Area Coordination Center (GACC) will be discussed in Camp Fire Report #5. Regional fire activity and US Forest Service (USFS) staffing will also be discussed in the same report.

The extensive vegetative fuels in Paradise, Magalia, and Concow may be representative of an older intermix community. A lifestyle of “living in the forest” might have attracted many residents to the community and may be a quality present in many WUI communities. The limited fire history of the Paradise area further contributed to the pre-fire vegetative loading.

## 16.2. Pre-Fire Conditions

- F5. Dry winds, with recorded gusts at Jarbo Gap exceeding 22 m/s (50 mi/h) from the northeast, increased fire spread in vegetative and structural fuels.
- F6. Steep topographical features including river canyons and creek drainages channeled north winds and accelerated fire spread through vegetative fuels.
- F7. Extremely dry vegetative fuels, associated with over 200 days without any significant precipitation, increased the fuel ignition potential around and within Concow, Paradise, and Magalia.
- F8. Fire spread toward Paradise from Concow was fueled by heavy conifer forests with brush understory. At lower elevations oak woodlands and savannah grass were the primary fuels.

Pre-fire conditions were hazardous, with the Fire Danger Rating of Very High to Extreme in the northern Sierras. The combination of extremely dry fuels and a north wind event, bringing gusty dry winds, were the cause for Red Flag Warnings and critical fire weather conditions. The terrain around the Camp Fire is characterized by the rising foothills of the Sierra Nevada and numerous steep river canyons and creek drainages that are aligned with the north wind in many cases, channeling and accelerating the local winds.

It was very unusual to have fuel dryness levels so low in November in Butte County. In most years significant rain would have fallen by November, dampening fine fuels and lowering the ignition hazard. However, in the time leading up to the Camp Fire it had been over 200 days since 13 mm (0.5 in) or more rain had fallen at the lower elevations of Butte County, with the exception of a small amount of rain in early October. Fuel moisture levels were uncharacteristically low for the time of year due to the protracted dry period and late arrival of wet season rain. Fuel moisture levels [34] for 1000-hour time lag fuels measured at the Pike County Lookout southeast of the fire area were at 5 % on November 1, well below the 17 % historical average for the Northern Sierras in November. Live fuel moisture in manzanita was 74 %; the critical level for manzanita is 80%. The average for November is 93 %.

Fuels around the point of origin and downwind toward Paradise consisted of heavy conifer timber with brush understory. At lower elevations, oak woodland and grass savannah were the primary fuels. The area near the origin had burned previously in 2008; however, fuels west of the West Branch of the Feather River had not burned in recorded history (see Section 5.4). The most prominent fires within the Camp Fire perimeter include the Humboldt and BTU Lightning Complex fires in 2008 and the Poe Fire in 2001. Butte Creek Canyon previously burned in the Bidwell Fire in 1984 and the Doe Mill Fire in 1999. Several recent

fires near the town limits were contained outside of Paradise, including the Saddle Fire in 2016 and the Honey Fire in 2017.

### 16.3. Fire Progression

- F9. Fire ignited near Pulga and Concow, was pushed by gusty wind across steep terrain toward Paradise, swept through Paradise, and then spread into Magalia.
- F10. Extensive intermediate- and long-range firebrand spotting caused multiple ignitions ahead of the main fire line and resulted in different exposures to fire conditions.
- F11. The fire travelled and/or spotted more than 11 km (7 mi) downwind of the origin to reach Paradise in less than 1.5 hours after ignition.
- F12. Fire consumed a significant fraction of the Town of Paradise over a period of 6 hours, between 08:30 and 14:30.
- F13. Fire spread down slope through the foothills at an average 1 m/s (2.2 mi/h, 180 ch/h) through grassy wildland fuels south and west of Paradise.
- F14. Fire spread rates for Paradise and Magalia could not be readily computed due to extensive spotting fire behavior.

#### 16.3.1. Fire Spread Summary

This section summarizes the fire spread on November 8, 2018 from the origin to Concow, when and how the Camp Fire reached Paradise, how rapidly the fire progressed through town, and the fire activity extending into the morning of November 9. The fire spread information presented here, as in Section 9 and Appendix F, represents all the data collected during the Camp Fire reconstruction. The summarized data does not include all fire activity within the fire perimeter.

The Camp Fire started in the Feather River Canyon and climbed the west wall of the canyon rapidly. The fire moved across the Concow Basin and then crossed the West Fork of the Feather River into Paradise. The fire then went downslope with the wind into the lower elevation areas and agricultural areas east of Chico. It also progressed westerly with a flanking spread across Butte Creek Canyon.

##### November 8, 06:25 to 10:00

The Camp Fire was first reported via calls to 911 beginning at 06:25. The caller indicated that the fire was burning on the west side of the Feather River near Poe Dam on Highway 70. The fire quickly became well-established in the steep canyon terrain, spreading from the origin toward Pulga. Shortly after 07:00, the fire was cresting the ridge and pushing towards Concow. By 07:25, the first structures started burning in Concow, 5 km (3 mi) from the origin.

The fire continued growing in Concow, moving westward and spotting over Concow Reservoir and Sawmill Peak. The first spot fires from the Camp Fire arrived in Paradise at 07:50, 12 km (7.5 mi) from the origin. The main fire front reached Pentz Road around 08:30, resulting in a significant number of distinct spot fires within Paradise. A total of 30 spot fires before 08:30 were identified during the data analysis, with spots reaching as far as 3.4 km



(2.1 mi) into the town. Most of these spots (18) were within the first 1 km (0.6 mi) from the wildlands. The fire front reached Pentz Road between Apple View Way and Lowry Lane. Spot fires in and across town before 08:30 were most likely from the wildland fire front and a limited number of structure ignitions in Concow. By 08:45 there were two separate spot fires that had started in the vegetation far ahead of the main fire front. One was burning in the drainage east of Clark Road near American Way, 3 km (1.9 mi) southwest from the Lowry Lane, spotted near Feather River Hospital. The second spot ignited in Honey Run Canyon, located on the west side of Paradise, 6.3 km (3.9 mi) from Lowry Lane.

Between 09:00 and 10:00 in Concow, the head of the fire was hung up on the east side of Concow Reservoir, burning to the north of Ishi Trail. Spot fires were igniting in pine and leaf litter 1.6 km (1 mi) ahead of the fire front. During that same time in Paradise, the fire intensified along both sides of Pentz Road. Initial spot fires deep within town were well established, and the fire was starting to spread to the west impacting Wagstaff, Bille, and Pearson Roads. By 10:00, fire was impacting Pentz, Bille, and Pearson Roads, where civilians were stuck in traffic and trapped in their vehicles. The fire continued to get deep-seated along both sides of Pentz while the earlier spots in town also grew.

#### November 8, 10:00 to 12:00

Between 10:00 and 11:00 on Pentz Road, peak vegetation fire activity had subsided, but significant fire remained. Most structures and heavy fuels were still burning on both sides of the road. The road was passable with variable visibility. The intersection of Pentz Road and Pearson Road remained fully involved, continuing to impact evacuations.

By 10:00, fire was impacting Clark Road in multiple locations, preventing passage while people were attempting to evacuate. The fire overtook vehicles evacuating on Clark Road at Buschmann Road with wind blowing flames “like a blow torch,” and fire jumped to the west side of Clark Road. Clark Road became barely passable again near the town limits for a brief time. However, another flare-up between 11:00 and 11:30 closed the roadway again as 15 m (50 ft) flames crossed Clark Road near Round Valley Ranch Road, and fire again crossed the roadway near American Way. Further down Clark Road at Airport Road, fire also burned over the roadway, delaying access of arriving strike teams as they waited for conditions to abate. The fire continued with high intensity south of the airport into the afternoon, where it paused and hung up for a period of time between about 13:00 and 15:00, before again advancing down into the flats south of Circle J Road.

Between 10:00 and 11:00, the spot fire in Honey Run Canyon, between Russell Drive and Redbud Drive, grew and became well established. Fire ran south up out of the canyon and burned over Skyway. Significant ember showers and fire activity on both sides of Skyway impacted evacuating vehicles.

By noon, intense fire was burning on the ridge and in the canyons near Jordan Hill Road. Flame lengths of 30 m to 45 m (100 ft to 150 ft) were observed. Engines looking for civilians had to drive through fire to escape back to Concow Road. At the same time, the northern flank of the fire was hung up between Coutolenc Road and Pentz Road. In Paradise, the main fire was pushing south down Berkshire Avenue, spreading to structures. Fire spread from

structure to structure through Skyway Villa Mobile Home Park. The main fire activity along Pentz Road had passed; structures were burned down, vegetation had burned through, and Pentz Road was passable. Fire was well-established on the west side of northern Pentz Road, burning heavy brush, trees, and structures. Structures began igniting on Sweetbriar Lane, and the fire spread west from structure to structure. Before noon, fire was approaching the Walgreens store and the intersection of Bille Road and Skyway from multiple directions. Structures were burning south and east of Skyway in the area of Almond Street and Fir Street. At the same time, fire activity at the Skyway split was still active on both sides of the roadway, but Skyway was passable. Fire was encroaching on Neal Road and Roe Road from the north, as a large area of fire burned over Skyway.

November 8, 12:00 to 17:00

Between noon and 15:00 in Concow, the southern extent of the fire continued to burn in the Concow Creek canyon northwest of Nelson Bar Road and north of Comfort Lane on both sides of Concow Road. In Paradise, the fire was well established through most of the town and began impacting the downtown area. By 13:00, 10 to 15 structures were burning at the south end of Andover Drive and on Adrian Drive. On the northern end of Paradise, fire was coming toward the Clark Road and Skyway intersection from the canyon to the west. Structures on the east side of Skyway were burning intensely, and fire was coming from the north through residential structures, threatening commercial structures where trapped civilians were taking temporary refuge. Many homes were on fire near Clark Road and Cabernet Lane. To the southwest, fire in Honey Run Canyon was moving down the canyon toward Centerville Road with a moderate rate of spread. On the ridgetops, flames were shooting out of the canyon with 30 m to 60 m (100 ft to 200 ft) flame lengths. In the canyon, flames were 2 m to 3 m (6 ft to 10 ft) long. Ember showers and flames were threatening multiple structures.

Between 14:00 and 17:00, fire was embedded in the structures in the area on the southern end of South Park Drive and Adrian Drive. Fire was burning in Little Butte Creek Canyon, wrapping around to the west, and burning in ravines uphill into the prevailing wind, toward West Park Drive.

By 15:00, heavy fire was burning everything on the west side of Skyway between Black Olive Drive and Jewell Road, including a burning woodpile that was threatening Town Hall. Torching shrubs and junipers were threatening additional nearby structures. Skyway between Pearson Road and Neal Road was being encroached upon from both east and west; fire was spreading uphill and upwind in Honey Run Canyon into structures on the west side of Skyway, and the main fire front was pushing west from Pearson Road. Structures were burning along Pearson Road, Almond Street, and Black Olive Drive, approaching Skyway.

Between 15:00 and 17:00 the fire approached Nelson Bar Road. To the north, the fire remained burning to the south of Magalia. In downtown Paradise, fire was well-established in multiple commercial structures at Skyway on Fir Street, and fire continued to burn structures in the area of Fire Station 81.

### November 8, 17:00 to 24:00

Around sunset (16:56) in Concow, an intense fire front with 15 m to 30 m (50 ft to 100 ft) flames burned through the forest into the grasslands, impacting structures along the west side of Nelson Bar Road. Numerous short-range spot fires were observed ahead of the fire front. At the same time in Magalia, fire was backing up out of the canyon, impinging on structures on Andover Drive with creeping fire behind homes. In Paradise, structures continued to burn. Large trees and power poles continued burning and threatened or blocked roadways. Also, around sunset, fire activity at Neal Road and Wayland Road increased, pushing into the area from the northeast. The fire then ran down into the foothills toward Highway 99.

Between 18:00 and midnight, the evening was a period of generally reduced fire behavior in the upper part of Little Butte Creek Canyon near Magalia. Different portions of Andover Drive were threatened throughout the evening period. By 22:00, fire had moved up out of Stilson Canyon and was coming up over Humboldt Road approaching Highway 32. Fire had also burned through the Cory Creek area, destroying multiple structures. Residual fire continued to threaten communities along Durham-Pentz Road.

### November 9, 00:00 to 08:00

Between midnight and 02:00 on November 9, the fire flared up out of the West Branch Feather River Canyon with 30 m (100 ft) flames pushed by strong winds, estimated at 22 m/s (50 mi/h). Softball-sized embers blew across Coutolenc Road and Skyway into Magalia and Old Magalia. Several spot fires were established on the west side of Magalia Reservoir, and fire was spreading uphill toward Lakeridge Circle. Intense fire blocked Skyway south of the dam.

Between 02:00 and sunrise, at 06:44, the fire became well established in Magalia and consumed hundreds of structures. During the night in Concow fire was between Nelson Bar Road and Highway 70. Fire intensity was low to moderate, making local runs and overtaking dozer lines towards Lake Oroville.

The fire activity intensified dramatically at several locations at sunrise. In Concow, fire was burning across Pinkston Canyon Road towards Concow Road. Firefighters were worried about getting hemmed in by fire on both sides on Concow Road. Butte County Fire Station 37 on Concow Road was hit hard by the fire. At the same time in Magalia, a rapid increase in fire activity on the west end of Ponderosa Way impacted the south and west. Firefighters had to drive through fire to reach the safety zone of the parking lot at Pine Ridge School, where fire also approached from the east.

### **16.3.2. Fire Spread Rates**

The data presented in Section 9.1 describes the Camp Fire spread in the first 24 hours from its origin until it reached Highway 99 to the southwest, Route 32 to the west, Magalia to the north, and Highway 70 to the south and east.

In reviewing the topography and fuels, the fire can be divided into three distinct sections. From the origin near Pulga to the eastern edge of Paradise along the Feather River Canyon,

the fire burned in primary wildland fuels with the exception of Concow, where the community was low to moderate density intermix. In Paradise and Magalia, both high density intermix communities (see Section 4), the fire burned and consumed almost 20 000 buildings along with wildland and ornamental vegetation. In the Foothills, the fire moved through clusters of residential areas spread out among mostly wildland vegetation that was predominantly grass. In Butte Creek Canyon to the west, the fire moved through a combination of low-density structures and a mixture of wildland fuels including some locally dense forested area. In Concow between Concow Reservoir and Highway 70, wildland vegetation represented the primary fuel. Fuels consisted of forested lands with some grasslands, primarily in the vicinity of the southern end of Nelson Bar Road.

The overall fire spread rate from Pulga to Highway 99 was estimated at approximately 0.55 m/s (30 km/15 h), or a little over 1 mi/h (80 ch/h). However, given the wide variety of fuels and the extensive spotting documented in the previous sections, an overall fire spread might not capture the varying fire behavior in the first 12 to 24 hours of fire spread after ignition.

Breaking down the fire spread rate into three distinct geographic areas may provide additional insight into fire behavior. Within one hour from the first ignition, there were reports of structures burning in Concow. The time interval between the second ignition on Rim Road and the first structures burning was 40 min. Using the location of structures burning near Pine Cluster Lane, fire spread from the origin was estimated at 1.1 m/s (2.5 mi/h, or 200 ch/h). Within 15 min from the time of the first reported structure ignitions in Concow, by 07:50, the fire had spotted to the west side of Sawmill Peak and the east side of Paradise, extending from the orchard on Apple View Way all the way to Lowry Lane, just south of Feather River Hospital. This spotting was approximately 7 km (4.5 mi) ahead of the fire activity in Concow, yielding an effective fire spread rate of 7.8 m/s (18 mi/h). The spots on the west of Paradise became well established, and by 08:30 the community experienced the arrival of the main fire front. However, it was also possible that the front that hit Paradise at 08:30 might have arrived from Concow traveling 7 km (4.5 mi) in 1 hour. This four-fold range in the rate of spread illustrates the difficulty of generating representative values for fire spread, particularly when a fire generates extensive intermediate and long-range ember transport to highly ignition-receptive fuels. Shortly after 08:30, the flank of the main fire front stalled near Ishi Road in Concow into the early afternoon, highlighting the large range in fire behavior over small geographic scales on the order of 5 m to hundreds of meters (15 ft to hundreds of ft). This range of fire behaviors over short geographic scales has also been observed in the previous NIST WUI fire case studies, as fuels, topography, and wind can vary widely at those scales.

In general terms, the fire in Paradise progressed from east to west or southwest. However, as in the wildlands, the extensive spotting in town resulted in areas or clusters of high intensity burning adjacent to other areas that backfilled at a much later time. In WUI areas like Paradise, fire spread estimates can be made by looking at spots or high intensity fire activity. However, given the spotty nature of the fire progression and the highly variable residence times at different locations, these estimates will have very large uncertainties and will not easily capture the local conditions. After the main fire activity moved through Paradise, in

the open areas of the Foothills, fire spread in grass was estimated at 1 m/s (2.2 mi/h, 180 ch/h) with significant variations based on local conditions.

The location and density of spot fires ahead of the main front can have many different outcomes depending on local conditions. Spot fires can grow and generate new fronts ahead of the main front or result in other local disturbances that significantly impact the development of the incident. The spot fire in Honey Run Canyon at 08:45 further illustrates that fire spread rates may not be a valid metric for documenting overall fire behavior. The spot grew rapidly and spread upwind, not with the prevailing wind, because of local conditions. This spot ended up impacting community evacuation.

In summary, fire behavior in varying fuels with complex topography and varying local winds, coupled with extensive intermediate and long-range spotting, results in fire spread rates that can vary locally by almost an order of magnitude. The documentation of this variability is driven by the density of the available data, which almost always lacks quantifiable wind velocity data. This variability is further complicated by the introduction of defensive actions, which impact fire spread; this will be further discussed in NIST Camp Fire Report #5. Together, these complexities and defensive actions point to the challenges of trying to reliably predict or even simulate post-incident, incident-scale fire behavior in the WUI.

#### **16.4. Burnovers**

- F15. Multiple burnovers occurred during the Camp Fire.
- F16. Burnovers adversely affected pre-planned evacuation routes and led to use of Temporary Refuge Areas.
- F17. Intense vegetation and structure fires occurred along roadways and resulted in multiple road closures which adversely impacted response and evacuation activities.
- F18. Fire resulted in downed utility poles along roadways and throughout the communities. The downed poles, along with the associated electrical and utility lines, blocked multiple streets and impaired access for response and evacuation.

The presence of primarily wildland vegetation along egress arteries as well as some secondary roadways, likely amplified by local topography and wind, caused burnovers in different locations during the incident.

Many of the burnovers significantly impacted evacuation and required the formation of Temporary Refuge Areas (TRAs). TRAs were necessary to maintain life safety for residents and firefighters. Burnovers resulted in injuries and fatalities. In at least two cases, fire shelters were deployed by first responders to reduce radiative exposures to civilians and first responders. The relationships between burnovers, evacuation of residents, and TRAs will be documented and analyzed in NIST Camp Fire Report #4.

There is limited technical information to provide reliable guidance on the relationship among vegetative fuel type, density, and setback from the roadway, along with topography and exposures, that can be used to develop reliable guidance for the protection of egress arteries against burnovers. This is an important area of study as the frequency of fast-moving fires requiring large-scale last-minute evacuations increases.

### **16.5. Wildland Fire Ignition Relative to the Community**

- F19. The ignition of the fire in wildland fuels over 11 km (7 mi) from Paradise allowed the fire to grow in intensity and size before reaching the affected communities.

Fire suppression capacity can be rapidly exceeded by large fire front lengths and/or extensive spotting throughout the community. The intense and long fire front and numerous spot fires that reached Paradise also impacted large-scale evacuations. This points to the threat posed by a potentially dangerous region located upwind and some distance away from the communities. Ignitions in the dangerous region that cannot be rapidly suppressed (due to terrain and or wind) may quickly cause dangerous conditions for communities many kilometers (miles) downwind. Far-away ignitions can develop into large fire fronts that can threaten entire communities. In adverse conditions, such as dry conditions and/or locations with high vegetative fuel loads, spot fires developing near or within communities kilometers (miles) ahead of the fire front can impact local conditions and potentially affect evacuation routes.

### **16.6. Structure Ignition Pathways**

- F20. Post-fire field data collection and first responder observations identified structure ignition vulnerabilities including structure-to-structure ignition pathways.
- F21. Fire spread through Paradise, and subsequently Magalia, was fueled by vegetative fuels, including ornamental shrubs, bushes, and trees; structural fuels, including homes, garages, detached auxiliary buildings, commercial occupancies; and cars, trucks, and campers.
- F22. Separation distances between fuel packages within a parcel as well as between parcels did not prevent rapid fire spread.

Documenting structure ignition vulnerabilities and structure ignition pathways is critical to developing technical guidance for improving building codes, standards, and best practices to reduce future losses. During the data analysis, several structure ignitions were identified to have been directly observed by first responders, providing firsthand information about structure ignition pathways. Their observations indicated that fuels on residential parcels can act as wicks to bring fire to the residential structures. Additionally, post-fire field data collection by NIST, together with CAL FIRE, USFS, and FEMA, captured structure damage and ignition vulnerabilities from 132 damaged structures within the Camp Fire perimeter. Parcel-level exposures that resulted in structure damage and structure damage data of these documented structures will be analyzed in NIST Camp Fire Report #5.

Home exposures may be divided into inter- and intra-parcel categories, defined as coming from objects outside and inside the parcel respectively. In this way, exposures that may be controlled by the individual homeowner are separated from those that require decision-making on a community level. Additionally, there is a need to quantify inter- and intra-parcel exposures specifically from neighboring structures and to develop design guidance in the form of minimum structure separation distances necessary to prevent fire spread from structure to structure. Reduction of structural losses from direct fire exposures (radiation and convection) can be achieved by increasing the spacing between the source term (e.g., shed) and the target (residential structure), hardening the structure to provide additional ignition resistance, or a combination of both approaches. Quantifying inter- and intra-parcel fire exposure information would serve as the technical framework for the development of spacing/hardening cost-benefit tools for high energy release sources (i.e., fences, wood piles, sheds, vehicles, RVs, and residences) and the target (residential and commercial) structures.

### **16.7. Community Attribute Impacts**

- F23. A standardized community wildland-urban interface hazard evaluation framework would improve assessment of fire risk for communities.

The documentation and quantification of the effects of Camp Fire on Paradise, Magalia, and Concow highlight the issue that WUI fire spread has significant impact on communities well beyond the loss of structures, including community evacuation and incident response. The data begins to demonstrate the relationship between community preparedness and how a WUI fire event unfolds. Pre-fire planning and hazard mitigation impact how the fire develops, how the life safety of residents and first responders is impacted during evacuations, and the extent of structural and infrastructure losses.

The rapid spread of the Camp Fire through Concow, Paradise, and Magalia suggests that WUI community preparedness may benefit from a holistic approach to hazard assessment. The successful pre-fire planning by Butte County and Paradise suggests that a community's hazard assessment and preparedness for WUI fires can benefit from the inclusion of information on the fire history of the community and surroundings, vegetative and structural fuel loading information, as well as evacuation and response plans.

## 17. Recommendations

There are nine recommendations made in this report. The recommendations are aimed at improving resident and first responder life safety (R1) and reducing structural losses during WUI fires (R2–R9).

- R1. Characterize fire behavior that leads to burnovers and quantify burnover severity. This information will inform fuel setback guidance for primary egress arteries and provide technical input to evacuation plans. (*Section 9.3, F15, F16, F17, F18*)
- R2. Develop technical guidance to quantify parcel level exposures. (*Section 11.2, F20, F21, F22*)
- R3. Quantify fire spread within parcels with focus on fire exposures. (*Section 11.2, F20, F21, F22*)
- R4. Quantify exposures from adjacent parcels, specifically from neighboring structures, and develop design guidance for structure separation distances. (*Section 11.2, F20, F21, F22*)
- R5. Develop methodology to connect field-collected ember data, such as ember flux and size distribution, to laboratory scales and develop worst case ember exposure criteria. (*Section 14.2, F7, F10, F11*)
- R6. Develop spacing/hardening cost benefit relationships for high energy release sources (fences, wood piles, sheds, vehicles, RVs, and residences) and target structures (residential and commercial). (*Section 14.2, F20, F21, F22*)
- R7. Characterize the relationships among fire history, fuel treatments, and fire behavior. (*Section 13.2, Section 14.1, F5, F6, F7, F8, F9, F10, F11, F12, F13, F17, F19, F21, F22*)
- R8. Develop a standardized methodology for assessing the exposures from ornamental vegetation. (*Section 11.2, F20, F21, F22*)
- R9. Develop a plant list for vegetation with unacceptably high fire hazard for northern California and other locations with WUI fire risks. (*Section 11.2, F20, F21, F22*)



## 18. NIST Camp Fire Case Study Reports

The set of reports on the NIST Camp Fire Case Study, including two follow-on reports and a web-based data visualization tool, are outlined below:

### **Camp Fire Report #1: Camp Fire Preliminary Reconnaissance [22]**

NIST Camp Fire Report #1 focused on the initial reconnaissance deployment and field data collection and includes:

- NIST Disaster and Failure Studies Preliminary Reconnaissance Decision Criteria worksheet
- Preliminary Reconnaissance objectives
- Field deployment timeline
- Initial data collection summary
- Initial findings

### **Camp Fire Report #2: Preliminary Data Collected from the Camp Fire Reconnaissance [24]**

NIST Camp Fire Report #2 focused on data collected from the Preliminary Reconnaissance and includes:

- NIST Damage Assessments of 132 damaged residential structures
- Photographs of structure damage
- Automatic vehicle location (AVL) data
- Radio transcripts
- Incident-related maps

### **Camp Fire Report #3: Fire Progression Timeline (*this report*)**

NIST Camp Fire Report #3, this report, focuses on the methodology and the fire progression details, and includes:

- Introduction to the Camp Fire and affected WUI communities
- Pre-fire hazard and preparation
- Data collection and analysis methodology details
- Fire progression details and timeline
- First responder comments
- Technical findings summary
- Recommendations

### **Camp Fire Report #4: Notification, Evacuation, and Temporary Refuge Areas, and Burnovers**

NIST Camp Fire Report #4 will focus on notification, evacuation, and TRAs.

Specifically, the report will include:

- Notification timeline and tie-ins with fire progression (Report #3)
- Evacuation timeline and traffic (by artery)
- Summary of each burnover and connection to TRA
- Summary of each TRA
- Summary of known rescues
- First responder comments
- Technical findings summary
- Recommendations

### **Camp Fire Report #5: Emergency Response and Defensive Actions**

NIST Camp Fire Report #5 will focus on Fire and Law Enforcement response and infrastructure response, including water systems. The report will include:

- An overview of Fire and LE resources on the scene
- Infrastructure response
- Defensive actions: ground operations
- Defensive actions: aerial operations
- Defended structures
- Exposures to NIST-documented damaged structures
- First responder comments
- Technical findings summary
- Recommendations

### **Camp Fire Case Study Data Visualization Tool**

A web-based tool will be provided that will enable users to navigate the Camp Fire in both space and time. All the data presented in NIST Camp Fire Reports #3, #4 and #5 will be included in the tool.

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BTU Station 35–Paradise	Grass Valley Fire Department Station 2	Sutter County Fire Department Station 6–Sutter
BTU Station 62–Harts Mill	Linda Fire Protection District	TGU Station 12–Corning
BTU Station 63–Oroville	LNU–Brooks Forest Fire Station	TGU Station 1–Red Bluff
BTU–Butte Fire Center	LNU–Konocti Conservation Camp	TGU–Elk Creek Station
BTU–Unit Headquarters	Meridian Fire Protection	TGU–Paskenta Station
Burney Fire District Station 17	National Weather Service	Town of Paradise
Butte County Emergency Command Center	NEU Station 61–Loma Rica	Town of Paradise–Department of Public Works
Butte County Fire Safe Council	NEU–Dobbins Forest Fire Station	USFS CA-ENF–Pacific Ranger District, Pollock Pines
Butte County Fire Station 33– Upper Ridge	NEU–Nevada City Forest Fire Station	USFS CA-MNF–Stonyford Work Center
Butte County Fire Station 42–North Chico	Nevada County Consolidated Fire District	USFS CA-PNF–Beckwourth Ranger District, Blairsden
Butte County Fire Station 44–South Chico	Northern California Geographic Area Coordination Center	USFS CA-PNF–Challenge Visitor Center, Challenge
Butte County Fire Station 55– Bangor	Olivehurst Fire Department	USFS CA-PNF–Feather River Ranger District, Oroville
Butte County Fire Station 73–Biggs	Paradise Fire Station 81–Paradise Fire Department	USFS CA-TNF–Truckee Ranger District, Truckee
Butte County Fire Station 74– Gridley	Paradise Irrigation District	USFS CA-TNF–Yuba River Ranger District, Camptonville
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Chico Fire Department– Headquarters	SHU Station 14–Burney	
	SHU Station 22–Shingletown	
	SHU Station 58–Shasta	

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## Appendix A. Incident Fire Progression Map, November 22, 2018

The following map, produced by the Incident Management Team on November 22, 2018, shows the fire progression as determined by various infrared flights. Labels have been enhanced for readability at small scale. The colors represent the fire perimeters on successive days transitioning from purple on November 8 to red on November 21. Three perimeters are shown for November 8, including an estimated perimeter at 12:00, an IR flight perimeter observed at 18:00, and an estimated perimeter at 22:00. **Table 37** below lists the daily and cumulative area burned. Over 70 % of the final area was burned by the end of November 10, three days after ignition. The slower progression after the first few days was located in the remote and rugged wildlands on the north and east sides of the fire.

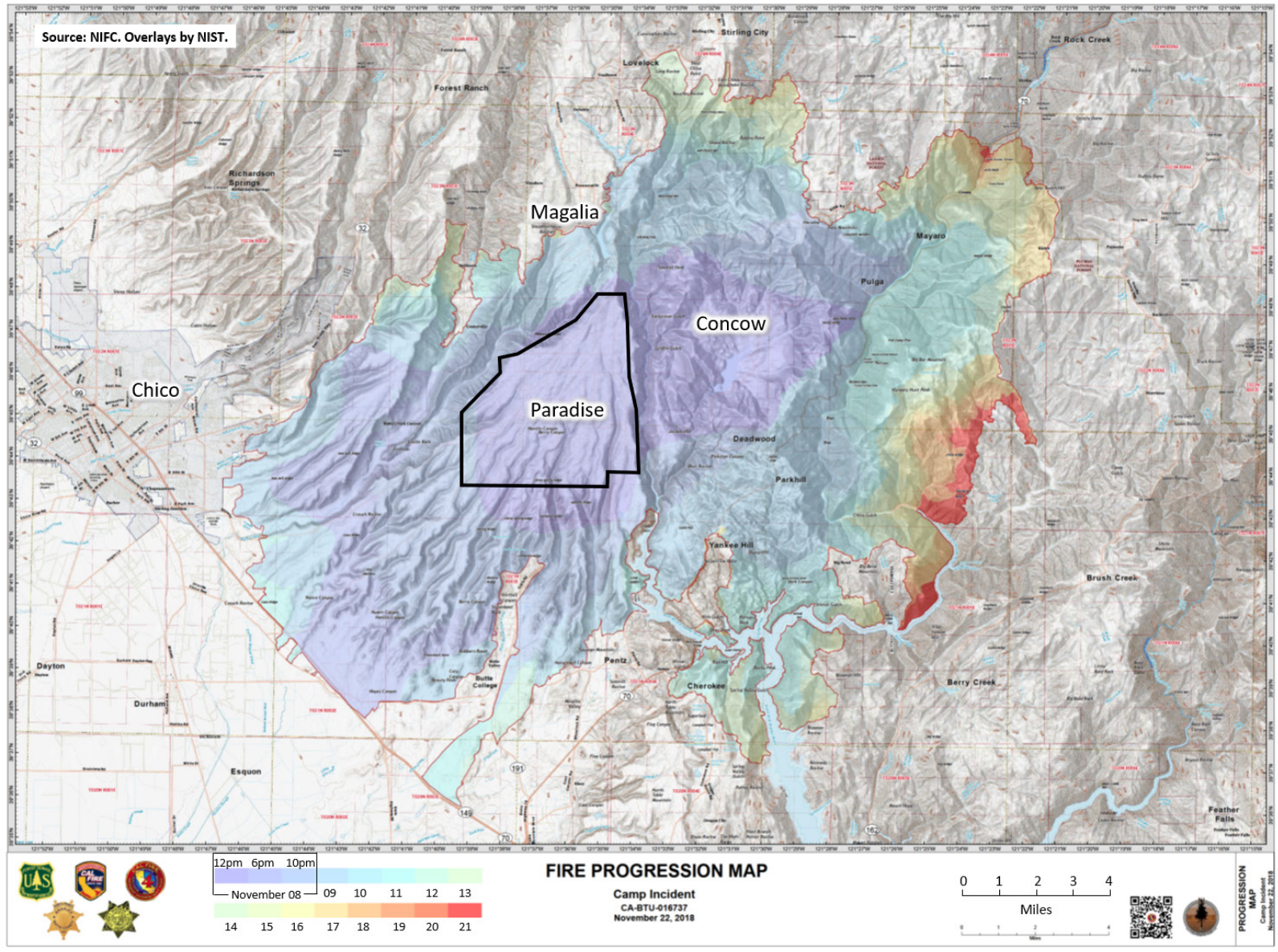
**Table 37.** Fire area progression by date.

Map Color	Date	Daily Area	Cumulative Area	Daily Area	Cumulative Area
		ha	ha	ac	ac
	2018-11-08	12 653	12 653	31 267	31 267
	2018-11-08	9512	22 165	23 504	54 771
	2018-11-08	5767	27 932	14 250	69 021
	2018-11-09	13 745	41 677	33 964	102 985
	2018-11-10	2274	43 951	5619	108 604
	2018-11-11	6651	50 602	16 436	125 040
	2018-11-12	1617	52 219	3996	129 036
	2018-11-13	3176	55 395	7848	136 884
	2018-11-14	2226	57 621	5500	142 384
	2018-11-15	1126	58 747	2783	145 167
	2018-11-16	1287	60 034	3180	148 347
	2018-11-17	946	60 980	2338	150 685
	2018-11-18	323	61 303	799	151 484
	2018-11-19	19	61 322	46	151 530
	2018-11-20	731	62 053	1806	153 336

Fire perimeter data are available from the National Interagency Fire Center (NIFC) Wildland Fire Open Data ArcGIS Online interface, previously known as GeoMAC.<sup>19,20</sup>

<sup>19</sup> <https://data-nifc.opendata.arcgis.com/>

<sup>20</sup> Prior to May 2020 this database was known as GeoMAC.



## Appendix B. Burnover Data

Entrapments are defined by the National Wildfire Coordinating Group (NWCG) as:

*A situation where personnel are unexpectedly caught in a fire behavior-related, life-threatening position where planned escape routes or safety zones are absent, inadequate, or compromised. An entrapment may or may not include deployment of a fire shelter for its intended purpose. These situations may or may not result in injury. They include "near misses."<sup>21</sup>*

Furthermore, the NWCG defines burnovers as:

*An event in which a fire moves through a location or overtakes personnel or equipment where there is no opportunity to utilize escape routes and safety zones, often resulting in personal injury or equipment damage.<sup>22</sup>*

Due to the similarities and uncertainties in the distinction between entrapments and burnovers, and with the understanding that details of each event may be incomplete, the identified events are all referred to as burnovers in this report.

This appendix presents further details of the 19 burnover events that were identified during the data collection and analysis that presented such conditions for civilians and/or first responders. Additional burnover events are known to have occurred but did not have enough first-hand data to include, and many more are likely to have occurred which have no documentation. Selected observations from the complete data are presented in the following summaries to provide a brief synopsis of each event based on the collected data. Observations are largely presented as they were captured and transcribed during the technical discussions. Slight modifications were included for context and clarity, indicated by *[italics]*, as well as incorporation of SI units. **Table 38** lists the burnover events and the technical discussions which contributed data of each event, as well as the page number on which the detailed summary can be found.

The selected observations presented in the following summaries are intended to provide a snapshot of each situation, focusing on fire behavior and progression information of the incidents. Additional information on the impacts to civilian and first responder movements, evacuations, temporary refuge areas, and defensive actions are beyond the scope of the current report.

The start time and duration information is based on the collected observations and may not include the entire time period of dangerous conditions, particularly if the observer moved to a safer location during the incident. Furthermore, durations may include periods of variable exposure conditions as the fire progressed. The start times and durations, as well as the affected areas, are estimated based on the collected data. The affected areas marked on the maps on the following pages indicate a buffer zone approximately 100 m (330 ft) from the roadway. Hazardous conditions may have existed beyond the marked areas.

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<sup>21</sup> <https://www.nwcg.gov/term/glossary/entrapment>

<sup>22</sup> <https://www.nwcg.gov/term/glossary/burnover>

**Table 38.** List of TD-identified turnover events and information source summary.

ID	Location	Time	Duration	Source(s)	Page #
1	Hoffman Rd	07:50	40 min	TD-005, TD-007, TD-008, TD-013, TD-027, TD-062, TD 103, TD-110, TD-137	168
2	Concow Rd	07:50	70 min	TD-008, TD-013, TD-031, TD-062, TD-103, TD-110, TD 115	172
3	Chapman Ln	08:30	n/d	TD-040, TD-042	176
4	Skyway (upper, between Clark Rd and Wagstaff Rd)	08:30	360 min	911-154-1, 911-165-1, 911-167-1, 911-188-1, 911-191-1, PPD, TD-014, TD-015, TD-022, TD-041, TD-042, TD-043, TD-055, TD-064, TD-067, TD-111, TD-127, TD-128, TD-200, TD-203, TD-205, TD-207, VTD-12	179
5	Windermere Ln	08:35*	n/d	TD-062, TD-110	183
6	Pentz Rd	08:45	150 min	911-221-2, 911-230-5, 911-232-1, PPD, TD-014, TD-015, TD-020, TD-038, TD-060, TD-063, TD-069, TD-079, TD-083, TD-084, TD-089, TD-090, TD-111, VTD-23	186
7	Pearson Rd	09:15	60 min	PPD, TD-014, TD-037, TD-063, TD-068, TD-070, TD-071, TD-076, TD-087, TD-100, TD-111, TD-122, TD-123, TD-129, VTD-16, VTD-23, VTD-24, VTD-25	190
8	Bille Rd	09:25	140 min	PPD, TD-015, TD-021, TD-038, TD-040, TD-060, TD-069, TD-079, TD-084, TD-089, TD-090, TD-116, TD-118	194
9	Wagstaff Rd	09:30	60 min	911-129-1, 911-162-1, 911-169-1, 911-178-2, PPD, TD-009, TD-014, TD-017, TD-022, TD-042, TD-053, TD-055, TD-064, TD-085, TD-111, TD-127, VTD-13, VTD-18, VTD-26	197
10	Clark Rd / American Way	10:00	120 min	PPD, Radio Log, TD-009, TD-035, TD-041, TD-049, TD-065, TD-100, TD-110, TD-130, TD-208, TD-211, VTD-15	200
11	Clark Rd / Airport Rd	10:00	90 min	PPD, TD-065, TD-100, TD-101, TD-110, TD-130, TD-208, TD-210, TD-211	203
12	Skyway (lower, west of Princeton Way)	10:15	90 min	TD-011, TD-025, TD-026, TD-058, TD-070, TD-155, VTD-13, VTD-14, VTD-22, VTD-26	206
13	Jordan Hill Rd / Granite Hill Rd	11:30	n/d	TD-008, TD-031, TD-062	209
14	Clark Rd / Black Bear Diner	13:10	n/d	PPD, TD-021	212
15	Rattlesnake Flats Rd	15:15	15 min	TD-208, TD-210	215
16	Coutolenc Rd	00:00 (Nov 9)	120 min	TD-007, TD-040, TD-041, TD-043, TD-045, TD-061, TD-109, TD-115, TD-122, TD-123, TD-124, TD-125, TD-126, TD-127, TD-209	218
17	Chestnut Cir	06:00 (Nov 9)	n/d	TD-127, TD-209	221
18	Ponderosa Way	07:15 (Nov 9)	n/d	TD-061, TD-127, TD-128, TD-202, TD-203, TD-205, TD-207	224
19	Concow Fire Station 37	07:15 (Nov 9)	n/d	TD-136, TD-137, TD-138, TD-139, TD-140	227

## 1. Hoffman Road

<b>Date/Time:</b>	November 8, 07:50–08:30
<b>Location:</b>	Hoffman Road, Concow
<b>Coordinates:</b>	[39.783963, -121.509288]
<b>Related TRA/ Safety Zone:</b>	after the Hoffman Rd burnover, civilians went to the Camelot Wildfire Safety Zone
<b>Summary:</b>	Fire activity in the form of a large spot was first reported in the Hoffman Rd area at 07:35. Within ten minutes conditions deteriorated dramatically, blocking Hoffman Road between the low water crossing and Concow Road, trapping fire fighters and a convoy of civilians trying to evacuate. Evacuees and fire fighters remained at the low water crossing area as the fire burned over the area. Fire shelters were deployed to shield civilians and fire fighters during rescue operations and civilians took refuge in the creek. When local conditions improved the convoy of vehicles migrated towards the intersection of Hoffman Road and Concow Road.

Time	Observation	Source
08:00	four civilians running WB on Hoffman Rd at low water crossing, beard a bit on fire; clothing is burned; civilians advise road ahead is blocked by fire; civilians jump into creek; visibility 0 m to 2 m (0 ft to 7 ft), dark	TD-013
08:00	park on low water crossing; 10 to 15 vehicles of civilians trying to evacuate are stuck in line behind, <i>[west]</i> up Hoffman Rd	TD-013
08:00	small patch of green between Hoffman Rd and lake, fire all around	TD-013
08:00–08:17	vehicles behind <i>[in line to the west]</i> are catching fire; TD-027 goes to evacuate people from vehicles using fire shelters as shields; 4 trips back and forth to grab people; cannot make it back to all vehicles; hard to breathe	TD-013
08:00–08:25	28 to 30 civilians in the creek at the rock wall; 4 to 5 vehicles are burning; wind is from the north	TD-013
08:00–08:25	3 or 4 homes fully involved; propane tanks exploding	TD-013
08:15–08:29	dozer gains access to clear Hoffman Rd, pushing cars off roadway	TD-008
08:15–08:30	head <i>[toward Hoffman Rd on Concow Rd]</i> with a couple engines following; most intense fire conditions; flames horizontal over Hoffman Rd; had to reverse back out of there, engines had difficulty <i>[turning around on narrow road]</i> ; total bottleneck in S-curve	TD-110

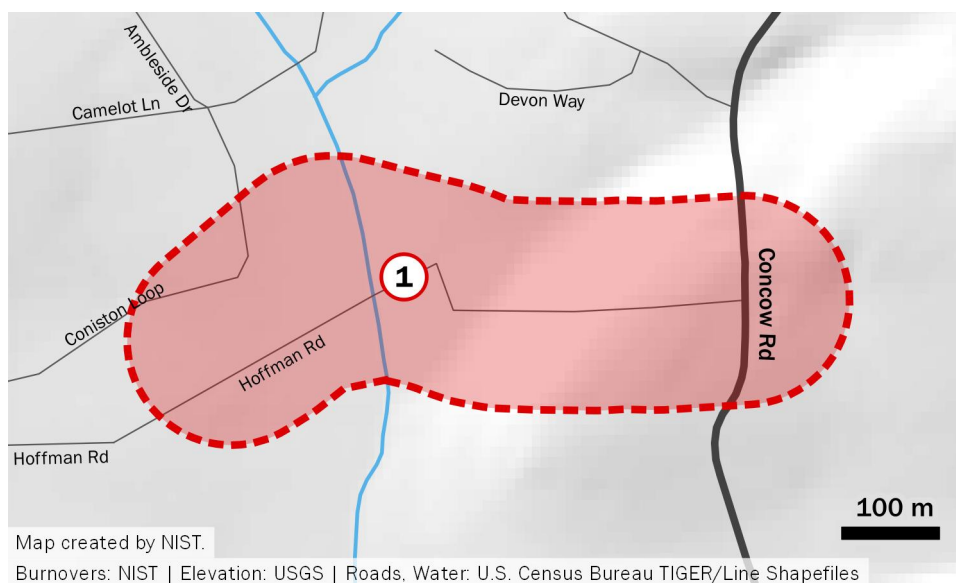
<b>Time</b>	<b>Observation</b>	<b>Source</b>
08:15–08:30	trees torching down Hoffman Rd, not safe to go down there to get to TD-013	TD-110
08:17–08:27	plan to get to Camelot Wildfire Safety Zone; stuff all people into 8 vehicles, leave behind the burning vehicles; 2 civilians in front seat <i>[of fire pickup truck]</i> plus 3 in the back seat and TD-027 in the bed camper shell (total of 7 people in pickup); takes maybe 40 min to 60 min from leaving Hoffman Rd to arrive at Camelot Wildfire Safety Zone	TD-013
08:23–08:31	Concow Rd at Hoffman Rd; dozer coming up Hoffman Rd, meet with TD-013 and evacuees; confirm power is dead, and clear powerlines off Concow Rd with bolt cutters; fire right up against road; significant 13 m/s to 18 m/s (30 mi/h to 40 mi/h) wind	TD-062

<b>Topography:</b>	low concrete road fording across a creek that feeds into Concow Reservoir, road passes along flat ground
<b>Roadway width:</b>	3 m to 3.5 m (10 ft to 12 ft)
<b>Vegetation setbacks:</b>	0 m to 2 m (0 ft to 6 ft) setback on road, more at creek crossing
<b>Duration:</b>	40 min
<b>Extent of burnover (length of road affected):</b>	250 m (0.15 mi)
<b>Fire direction across road:</b>	from northeast to southwest
<b>Wind intensity:</b>	estimated 13 m/s to 18 m/s (30 mi/h to 40 mi/h) from north
<b>Fuels:</b>	brush / trees
<b>Fire behavior:</b>	surface fire, torching trees, visible flames across road or portion of road
<b>Related TD:</b>	TD-005, TD-007, TD-008, TD-013, TD-027, TD-062, TD-103, TD-110, TD-137
<b>Related streets or keywords:</b>	Concow Rd, Concow Creek, Hoffman Rd, Concow Reservoir
<b>Street-level view:</b>	Hoffman Rd looking west at Concow Creek and the low water crossing.
<b>Pre-fire imagery links:</b>	<a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	No imagery available. See NIST photo below.





### Street map:



### Satellite view:



## 2. Concow Road

**Date/Time:** November 8, 07:50–09:00

**Location:** Concow Road, Concow

**Coordinates:** [39.779816, -121.506844]

**Related TRA/ Safety Zone:** after the Concow Rd burnover, civilians went to the Camelot Wildfire Safety Zone

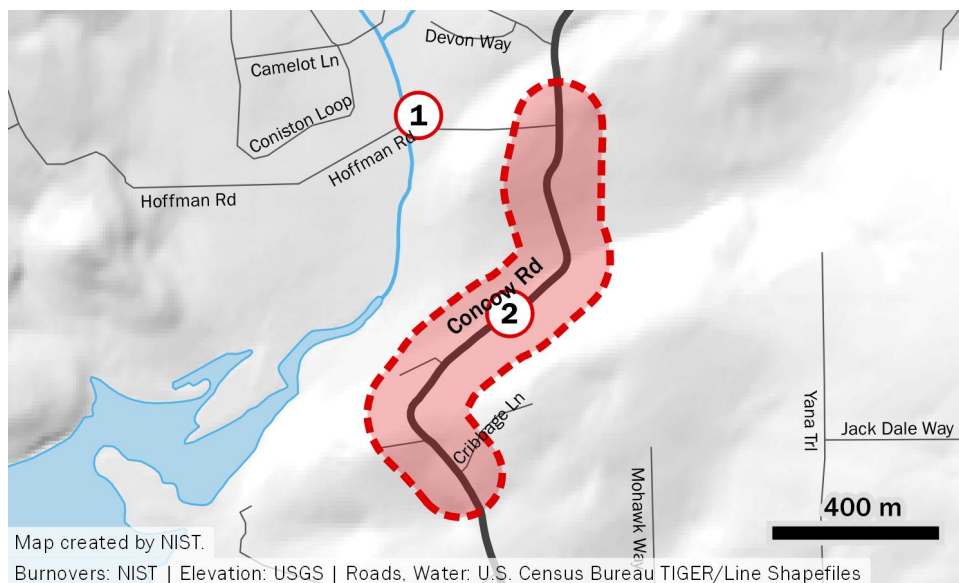
**Summary:** Concow Road is the main access road in and out of Concow. Fire activity was first reported in the area of Concow Road at Cribbage Lane at 07:30. The fire spread and increased in intensity, resulting in the closure of Concow Road, limiting access for first responders and impeding the evacuation of civilians. Firefighters lined up on Concow Road waiting for fire to pass the roadway before they proceeded north into the burn area. Fire engines ultimately drive through fire to reach trapped civilians and other first responders on Hoffman Road and Camelot Lane. However, almost one hour later, at 08:42, firefighters report that they are still blocked by fire near Cribbage Lane. Road access improved by 10:00 with rescue operations for burn victims.

Time	Observation	Source
07:30–07:40	observe 6 m × 6 m (20 ft × 20 ft) spot fire at house near Tweedy Ln, resident attempting to suppress with hose and shovel; fire pulling upwind toward house, wind not too strong; help dig quick line but cannot put out fire with hand tools; dark; no embers falling	TD-013
07:40–07:50	wind blowing hard; multiple vehicles leaving Concow	TD-013
07:45–07:49	Concow Rd at Cribbage Ln; seeing fire, structures not on fire yet; black dark with orange glow	TD-103
07:49–08:15	lots of resources gathered at Cribbage Ln working on plan of action (dozer, 1 or 2 crews, engine) right on edge of fire and smoke cloud	TD-110
08:01–08:30	parked at Concow Rd and Cribbage Ln; flame front too intense to pass, burning vehicles in road. Crown, timber, 3 m to 4.5 m (10 ft to 15 ft) tall brush <i>[all burning]</i> ; 18 m to 24 m (60 ft to 80 ft) tall flames	TD-008
08:15–08:30	embers blowing across roadway; sketchy to drive through but not crazy; encounter more civilians	TD-110
08:15–08:30	head <i>[toward Hoffman Rd on Concow Rd]</i> with a couple engines following; most intense fire conditions; flames horizontal over Hoffman Rd; had to reverse back out of there, engines had difficulty; total bottleneck in S-curve	TD-110

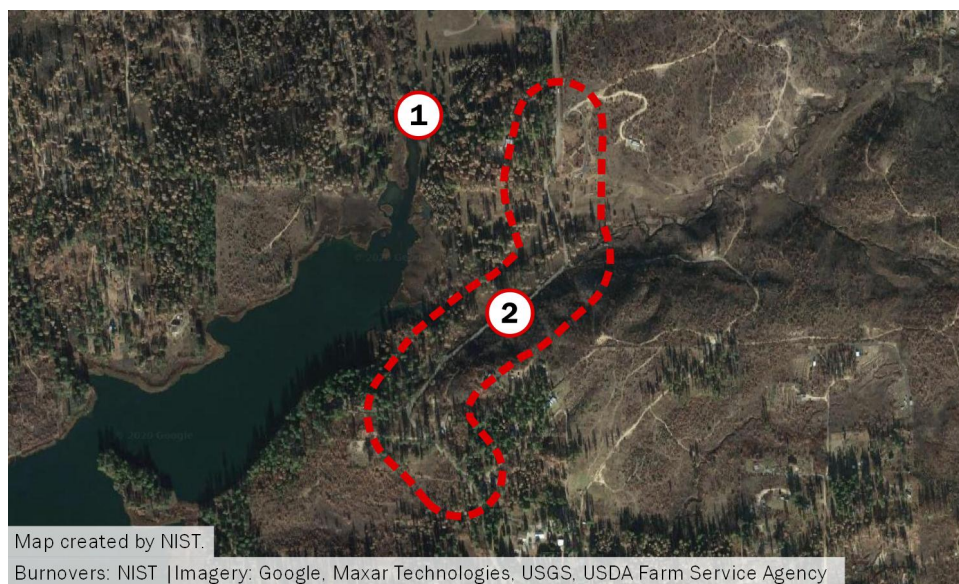
<b>Time</b>	<b>Observation</b>	<b>Source</b>
08:15–08:30	trees torching down Hoffman Rd, not safe to go down there to get to TD-013	TD-110
08:23–08:31	Concow Rd at Hoffman Rd; dozer coming up Hoffman Rd, meet with TD-013 and evacuees; confirm power is dead, and clear powerlines off Concow Rd with bolt cutters; fire right up against road; significant 13 m/s to 18 m/s (30 mi/h to 40 mi/h) wind	TD-062
08:30	house on left at Camelot Ln/Concow Rd intersection burning; vehicle on embankment fully involved; severe ember wash	TD-110
08:30	attempt to get to Camelot Wildfire Safety Zone; north of Hoffman Rd totally black, cannot see intersection to Camelot Ln; moving slowly to find roadway	TD-110
08:31	<i>[fire engines]</i> could finally access beyond Hoffman Rd	TD-008
08:32–08:35	vehicle at entrance to Camelot is on fire; most if not all structures in Camelot already on fire; safety zone is viable; 5 civilian vehicles already refuging at safety zone with law enforcement	TD-062
08:42	stopped by fire on Concow Rd at Cribbage Ln; 2 crew buses and a water tender	TD-115

<b>Topography:</b>	Road passes along a hill, hill slopes down from road west towards lake
<b>Roadway width:</b>	7 m (23 ft)
<b>Vegetation setbacks:</b>	0 m to 1 m (0 ft to 3 ft)
<b>Duration:</b>	70 min
<b>Extent of burnover (length of road affected):</b>	1000 m (0.6 mi)
<b>Fire direction across road:</b>	from northeast to southwest
<b>Wind intensity:</b>	“wind blowing hard” estimated 13 m/s to 18 m/s (30 mi/h to 40 mi/h)
<b>Fuels:</b>	brush / trees / vehicles
<b>Fire behavior:</b>	Crowning fire through thick brush and timber, intense ember showers, visible flames across road or portion of road
<b>Related TD:</b>	TD-008, TD-013, TD-031, TD-062, TD-103, TD-110, TD-115
<b>Related streets or keywords:</b>	Cribbage Ln, Tweedy Ln, Ishi Tr, Concow Reservoir
<b>Street-level view:</b>	Concow Rd looking north toward Hoffman Rd.
<b>Pre-fire imagery links:</b>	<a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	No imagery available.

### Street map:



### Satellite view:



### 3. Chapman Ln

**Date/Time:** November 8, 08:30

**Location:** Chapman Ln, Paradise, off Dean Rd

**Coordinates:** [39.789343, -121.572755]

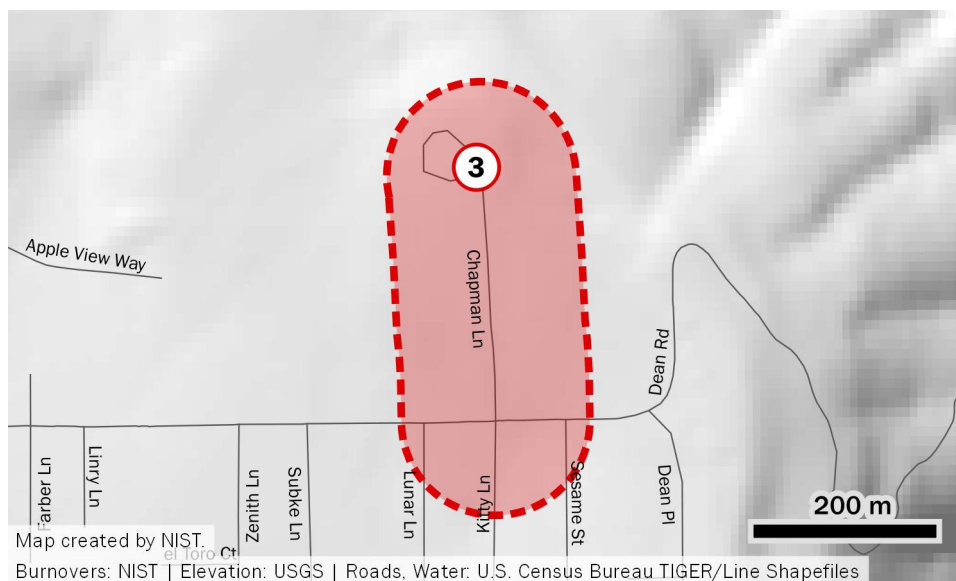
**Related TRA:** n/a

**Summary:** At approximately 08:00 spot fires were reported around Chapman Lane and Dean Road. Firefighters deployed approximately 130 m (400 ft) of hose from their engine on Chapman Lane to try to reach the various spot fires. Fire activity rapidly increased as the main fire front arrived out of the West Branch Feather River Canyon. Because of the rapidly deteriorating conditions, the firefighters cut the hose from the engine as they evacuated the narrow road. There is insufficient data to determine the temporal extent of this burnover.

Time	Observation	Source
08:00–08:40	find another spot off Dean Rd behind the orchard; defended a number of homes with garden hoses; defensible at the time until we saw a structure ignite down the street; wind 5 m/s to 7 m/s (10 mi/h to 15 mi/h)	TD-042
08:36	spots starting along Dean Rd; heavy traffic outbound on Dean Rd, crowded; on loudspeaker for evacuation	TD-040
08:36–10:30	active fire burning in grass behind Chapman Ln	TD-040
08:36–10:30	residents are gone; cut hose and escaped out of Chapman Ln	TD-040
08:36–10:30	visibility zero; stuck on Chapman Ln up against tree; trying to extend hose lines to fire, run about 120 m (400 ft) of hose; propane tanks exploding, fire all around in heavy vegetation and pine needles; civilians evacuating, block in engine	TD-040
08:36–10:30	stretch hose to attack veg fire on lot; structure not burning; ember cast causing ignitions Dean Rd; got very smoky had to leave	TD-040
08:40	fire all along Dean Rd	TD-042

<b>Topography:</b>	Flat, slopes to canyon beyond 150 m (500 ft) to the northeast
<b>Roadway width:</b>	3 m (10 ft)
<b>Vegetation setbacks:</b>	0 m to 3 m (0 ft to 10 ft)
<b>Duration:</b>	n/d
<b>Extent of burnover (length of road affected):</b>	250 m (0.15 mi)
<b>Fire direction across road:</b>	n/d
<b>Wind intensity:</b>	5 m/s to 7 m/s (10 mi/h to 15 mi/h)
<b>Fuels:</b>	brush/trees, grass, structures
<b>Fire behavior:</b>	quick increase in fire activity burning in heavy vegetation and pine needles, igniting structures
<b>Related TD:</b>	TD-040, TD-042
<b>Related streets or keywords:</b>	Dean Rd, Pentz Rd
<b>Street-level view:</b>	View looking north on Chapman Ln from near Dean Rd.
<b>Pre-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , <a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	No imagery available.

### Street map:



### Satellite view:





#### 4. Skyway (upper, north of Wagstaff Road)

**Date/Time:** November 8, 08:30–14:30

**Location:** Skyway, Paradise, between Wagstaff Rd and Clark Rd

**Coordinates:** [39.785431, -121.597351]

**Related TRA:** Walgreens, Optimo

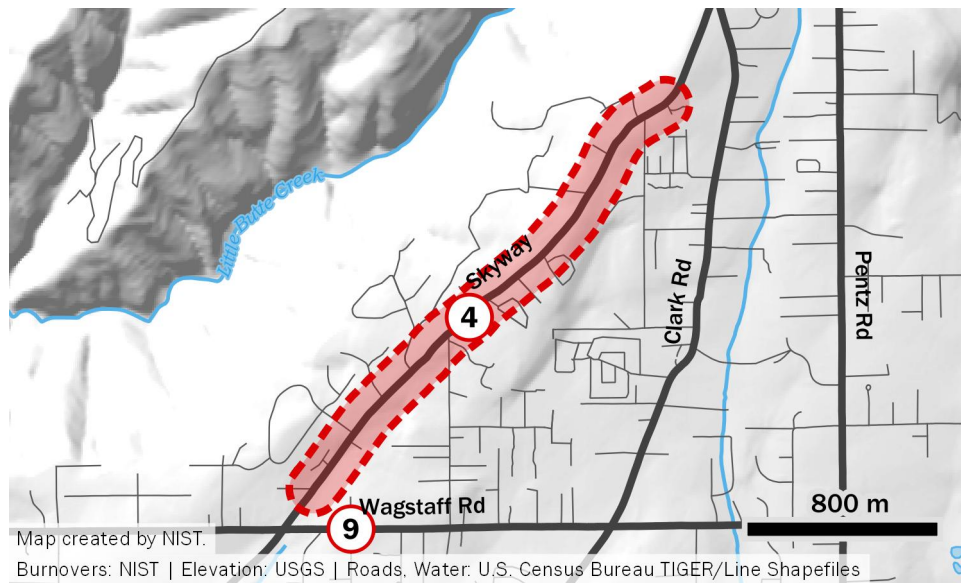
**Summary:** Multiple segments of Skyway were blocked by fire activity during several time periods the morning of November 8. At 08:35 fire was burning along upper Skyway, north of Lofty Lane with multiple large spots reported in the vicinity of the 9100 Skyway. Fire activity on Skyway increased between Towhee Lane and Clark Road and by 09:00 Skyway became impassable due to extensive fire activity. Fire exposures remained severe through the morning. At 11:37 a law enforcement officer was reported trapped by fire on Skyway at Coldren Road. An hour later, a firefighter managed to get through going northbound at 12:45 and described high heat exposures. Into the early afternoon, intense fire exposures from burning structures and vehicles prevented access between Montna Drive and Towhee Lane. The closing of Skyway impacted civilian evacuations and first responder access. Abandoned cars continued to burn into the afternoon. Burned and unburned (abandoned) vehicles and downed power lines made access difficult even after the fire exposures had diminished.

Time	Observation	Source
08:35	spot fire first reported near intersection of Clark Rd and Skyway	911-154-1
08:35–09:59	large spot fires <i>[in the area off]</i> 9100 Skyway	VTD-12
08:35–09:59	drove through, fire and boulders everywhere; round trips, drivers would freeze with fire in front; probably got at least 200 cars through there	VTD-12
09:00–09:30	Skyway SB is gridlocked; NB is clear. Instructing drivers to drive down middle of roadway; visibility 1 to 2 car lengths	TD-064
09:00–09:30	fire still to east of bike path south of Bel Air Dr, north of Fire Station 35	TD-064
09:00–09:30	bike path and Skyway fully involved in fire, both sides of Skyway	TD-064
09:30	help <i>[law enforcement]</i> direct traffic on Skyway at Quail; sending vehicles down one lane during fire, then two lanes after intense fire passed	TD-064
10:00–10:15	traffic SB on Skyway 2 lanes; high heat impacting stuck vehicles and LE in area; attack vegetation fire with booster line; flames are sheeting and wind is blustery	TD-022
11:25	heavy fire on Skyway to the south of Clark Rd	TD-041

<b>Time</b>	<b>Observation</b>	<b>Source</b>
11:37	"I'm trapped by fire, Skyway at Coldren [Rd]"	PPD
12:22	"The blockage [ <i>stopping traffic</i> ] is Skyway below Rocky Ln; crowning fire activity all to the west side"	PPD
12:45–13:00	"drove the gauntlet" [ <i>through intense fire exposure</i> ] to get to Optimo [ <i>Clark Rd</i> ]	TD-127
12:55–13:01	both sides of Skyway on fire (vehicles and houses burning); between Wagstaff and Quail Way	TD-200
13:00–13:19	Skyway between Wagstaff Rd and Towhee Ln; fire on both sides of Skyway	TD-205
13:15–13:19	Skyway blocked with abandoned vehicles; most did not have keys and could not be moved; Turned around on Skyway to head southbound; cars are beginning to ignite - very hot	TD-205
13:16	fire activity intense on both sides of road; road blocked with vehicles; an engine strike team was pushing vehicles with engines staged at Skyway and Firland Dr; intense fire all around; multiple structures fully involved along Skyway - had to pull back; visibility less than 23 m (75 ft)	TD-207
13:34–13:58	took refuge in field/general store lot	TD-205
13:35–13:53	north on Skyway, passing Wagstaff Rd, abandoned vehicles; lots of structures burning, wind pushing hard; wall of flames, cars on fire	TD-207
13:47–13:59	heavy fire along Skyway, visibility 3 m (10 ft), abandoned vehicles burning	TD-111
14:00	motorhome in roadway, fully engulfed; exploded when trying to get past; turn around	TD-128
14:26	the main issue [ <i>preventing civilians from driving through Skyway</i> ] is the abandoned vehicles on Skyway between Clark Rd and Wagstaff are all burning	TD-055
14:45		TD-127

<b>Topography:</b>	Relatively flat in most sections, along slight ridge near Clark Rd
<b>Roadway width:</b>	8 m (26 ft)
<b>Vegetation setbacks:</b>	0 m to 10 m (0 ft to 33 ft)
<b>Duration:</b>	360 min
<b>Extent of burnover (length of road affected):</b>	2.6 km (1.6 mi)
<b>Fire direction across road:</b>	n/d, variable
<b>Wind intensity:</b>	n/d
<b>Fuels:</b>	Brush / trees, vehicles, structures
<b>Fire behavior:</b>	initially numerous spot fires, developing into widespread fires in vegetation, structures, and vehicles
<b>Related TD:</b>	911-154-1, 911-165-1, 911-167-1, 911-188-1, 911-191-1, PPD, TD-014, TD-015, TD-022, TD-041, TD-042, TD-043, TD-055, TD-064, TD-067, TD-111, TD-127, TD-128, TD-200, TD-203, TD-205, TD-207, VTD-12
<b>Related streets or keywords:</b>	Montna Dr, Quail Way, Towhee Ln, Coldren Rd, Firland Dr, Rocky Ln
<b>Street-level view:</b>	Skyway looking north at Firland Dr.
<b>Pre-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , <a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	<a href="#">Google Maps Street View</a>
<b>Street-level view:</b>	Skyway looking north at Towhee Ln.
<b>Pre-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , <a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	<a href="#">Google Maps Street View</a>

### Street map:



### Satellite view:



## 5. Windermere Lane

**Date/Time:** November 8, 08:35–n/d

**Location:** Windermere Ln, Concow

**Coordinates:** [39.788864, -121.509851]

**Related TRA:** Concow, Camelot

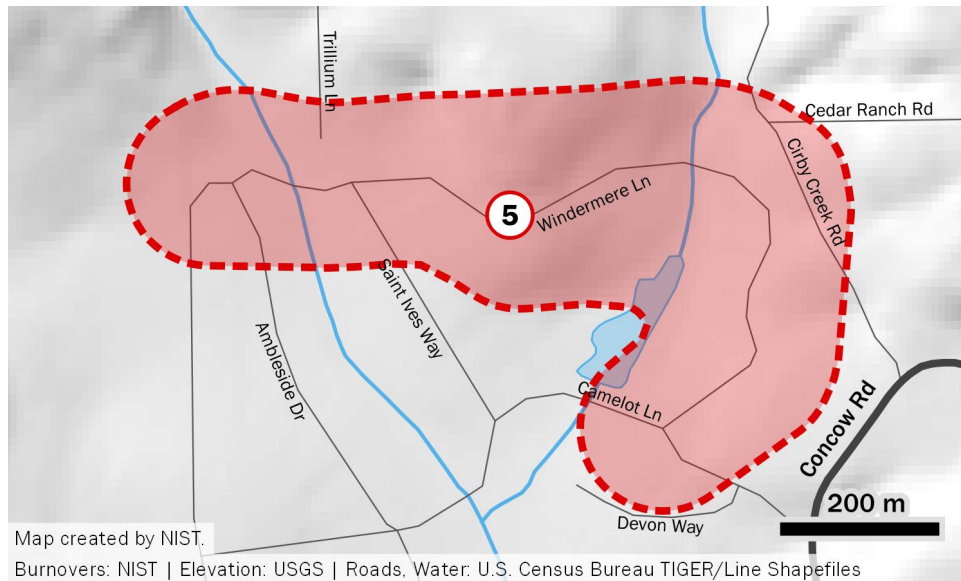
**Summary:** Shortly after 08:30 civilians sheltering in the designated Safety Zone in the Camelot neighborhood of Concow informed first responders of possible civilian entrapments in the Windermere Lane area. First responders made three separate unsuccessful attempts to reach the area between 08:35 and 08:52. Intense fire, lack of visibility, and downed trees and power lines prevented first responders from reaching the Windermere Lane area and conducting search and rescue operations. The full duration of the fire activity and restricted access is undetermined from the collected information.

Time	Observation	Source
08:32–08:35	civilian in safety zone advises about possible entrapment; attempt 3 different routes to access	TD-062
08:35	civilians informed that residents are still trapped in Windermere area; impossible to access—powerlines down and trees torching; structures burning; TD-062 attempts rescues	TD-110
08:35–08:47	attempt to access address; smoke so thick can't see hood of engine; all houses and vegetation on fire; propane venting; road compromised	TD-062
08:47–08:52	tree blocking roadway; wall of flames	TD-062
08:52–08:59	third try to access address; looking for any other evacuees; road blocked by powerlines and downed trees; propane explosions	TD-062

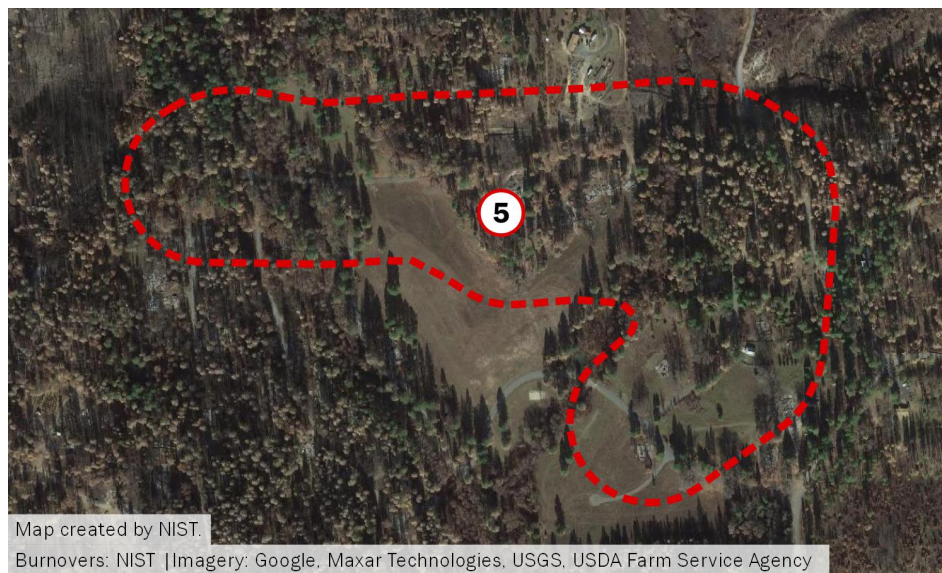
**Topography:** flat ground on both sides of roadway  
**Roadway width:** 4 m (12 ft)  
**Vegetation setbacks:** 0 m to 2 m (0 ft to 6 ft)  
**Duration:** n/d  
**Extent of burnover (length of road affected):** 1100 m (0.7 mi)  
**Fire direction across road:** n/d  
**Wind intensity:** n/d  
**Fuels:** brush / trees, structures  
**Fire behavior:** visible flames across road or portion of road  
**Related TD:** TD-062, TD-110  
**Related streets or keywords:** Camelot Ln, Ambleside Dr, St Ives Way

**Street-level view:** Windermere Ln looking west at St Ives Way.  
**Pre-fire imagery links:** [Bing Maps Streetside](#)  
**Post-fire imagery links:** No imagery available.

### Street map:



### Satellite view:



## 6. Pentz Road

<b>Date/Time:</b>	November 8, 08:45–11:15
<b>Location:</b>	Pentz Rd, Paradise, between Bille Rd and Feather River Hospital (FRH)
<b>Coordinates:</b>	[39.764012, -121.574553]
<b>Related TRA:</b>	Feather River Hospital, Bille Rd
<b>Summary:</b>	Pentz Road is one of the four main north-south arteries in Paradise. Fire activity in the form of multiple spot fires were first reported off Pentz Road at Clearbrook Lane by 08:54. Within ten minutes Pentz Road became impassable, causing evacuation traffic to come to a standstill and simultaneously limiting access to first responders. The first vehicle ignition in the data set was reported shortly before 09:20. Multiple vehicles ignited over the next 20 min to 30 min. Intense fire activity, downed power lines, and burning vehicles resulted in closure of parts of Pentz Road between Bille Road and FRH until approximately 10:45, when fire activity began to subside.

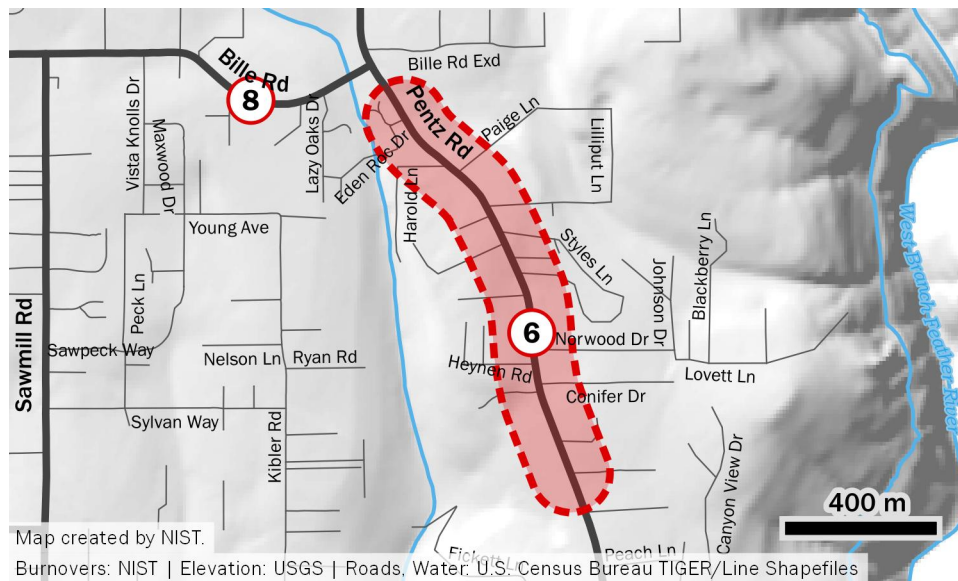
Time	Observation	Source
08:54–08:58	Pentz Rd at Clearbrook Ln; spot fires all around; east side heavily involved; SB Pentz Rd is open, very little traffic. NB Pentz Rd congested, stop for 5 min at a time, flowing slowly but steady, lots of traffic; smoky but visibility okay	TD-015
08:57–09:03	Pentz Rd near Del Rio Way; flags blowing in wind, wind speed variable between calm and 4.5 m/s (10 mi/h) gusting to 9 m/s (20 mi/h) from west	VTD-23
09:00–09:05	meet with [firefighter] who is directing traffic; spot fires all around - east side Pentz Rd heavily involved; civilians evacuating north	TD-015
09:03–09:23	multiple spot fires in area along Pentz Rd at Vineyard Dr; both sides road	VTD-23
09:03–09:35	Pentz Rd is unpassable, fire impacting Pentz Rd north of hospital; major gridlock; engines arriving	TD-014
09:11	ambulances trapped by fire	911-221-2
09:12–09:21	active fire, fire spotting to west side of Pentz Rd. Ambulances drive by with sirens, northbound in southbound lanes.	TD-015
09:18	pass burning ambulance at Chloe Ct; ambulances just igniting	TD-060
09:24	fire is burning on both sides of Pentz Rd; active flames both sides of road; both lanes of Pentz Rd are NB	TD-069
09:27	[traffic] has not moved; active vegetation fire against roadway	VTD-23



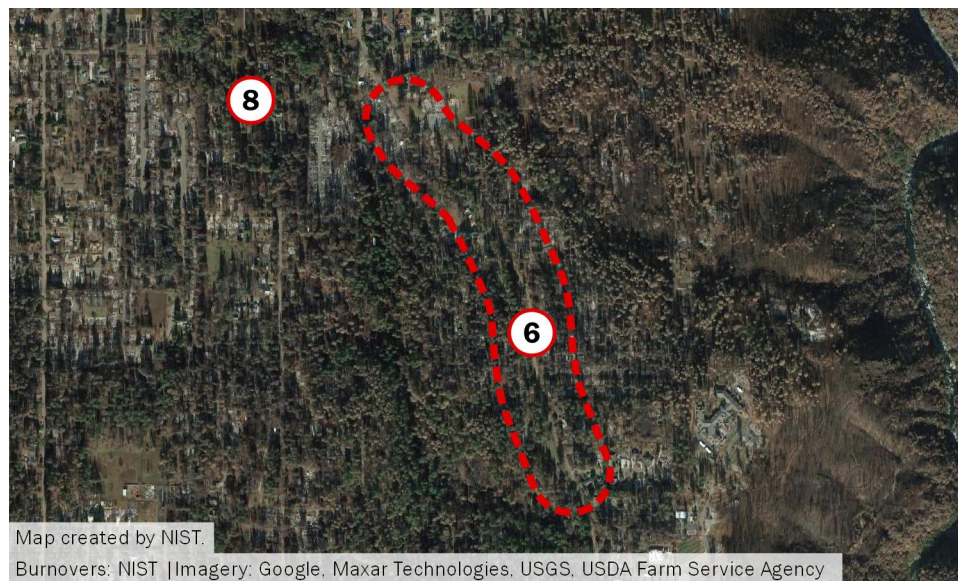
<b>Time</b>	<b>Observation</b>	<b>Source</b>
09:33	fire starting to impact vehicles right now [ <i>Pentz Rd near Conifer Dr</i> ]	PPD
09:39	civilian says there was fire north of hospital on both sides of Pentz Rd, was instructed by [TD-088] to turn around and come back to hospital because that's where the fire trucks were	PPD
09:45–10:40	vehicles are being driven while on fire	TD-090
09:59–11:22	parked [ <i>vehicle</i> ] on Amore Ln; structures are not burning, fire is approaching; powerlines down and sparking	TD-069
10:39	still stuck on side street due to fire activity	PPD
10:46	meet with [TD-020]; smoky, visibility enough to drive slowly, dark as night	TD-015
11:12–11:15	advise paramedics [ <i>from burning ambulances</i> ] to return to hospital parking lot [ <i>after taking refuge with patients and defending residential structure</i> ]	TD-015
11:22	back to FRH; no traffic trouble on Pentz Rd	TD-069

<b>Topography:</b>	slight slope, area relatively flat for the first 100 m (328 ft) on both sides of the road
<b>Roadway width:</b>	8 m (26 ft)
<b>Vegetation setbacks:</b>	0 m to 1 m (0 ft to 3 ft)
<b>Duration:</b>	150 min
<b>Extent of burnover (length of road affected):</b>	1300 m (0.8 mi)
<b>Fire direction across road:</b>	east to west
<b>Wind intensity:</b>	variable (observations from calm to gusts of 9 m/s (20 mi/h))
<b>Fuels:</b>	trees / brush, vehicles, structures
<b>Fire behavior:</b>	visible flames across road or portion of road
<b>Related TD:</b>	911-221-2, 911-230-5, 911-232-1, PPD, TD-014, TD-015, TD-020, TD-038, TD-060, TD-063, TD-069, TD-079, TD-083, TD-084, TD-089, TD-090, TD-111, VTD-23
<b>Related streets or keywords:</b>	Vineyard Dr, Bille Rd, Pentz Rd, Del Rio Way, Chloe Ct
<b>Street-level view:</b>	Pentz Rd looking north, just north of the intersection with Dubarry Ln.
<b>Pre-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , <a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	<a href="#">Google Maps Street View</a>

### Street map:



### Satellite view:



## 7. Pearson Road

**Date/Time:** November 8, 09:15–10:15

**Location:** Pearson Rd, Paradise, between Hilbe Dr and Cherry Ln

**Coordinates:** [39.749969, -121.577933]

**Related TRA:** Pearson Rd, Feather River Hospital

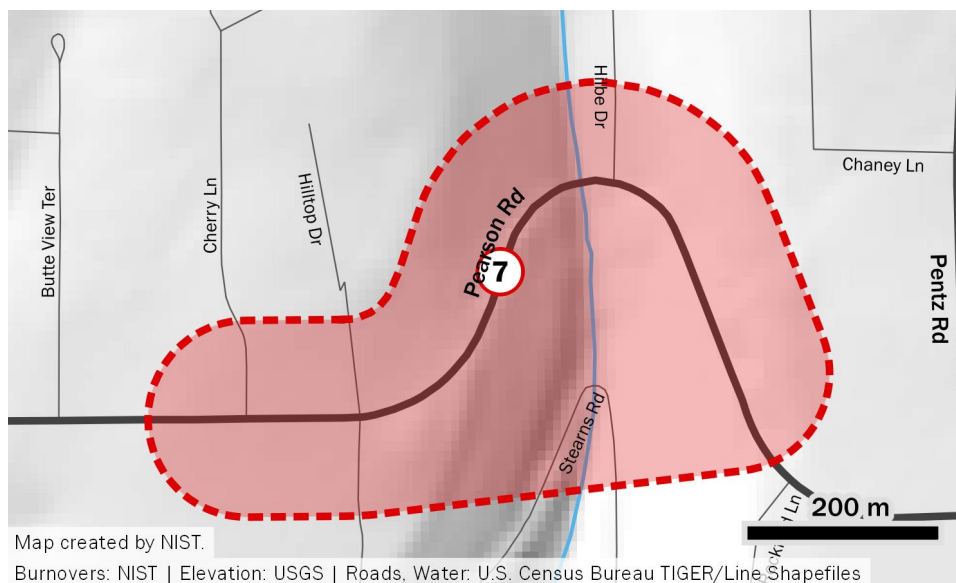
**Summary:** Person Road is one of the four main east-west traffic arteries in Paradise. Fire was first reported in the drainage off Pearson Road at 09:00, and quickly became well established. By 09:30, fire overtook the first responder and civilian vehicles stuck in traffic. Intense fire exposures caused damage to a fire engine and ignited multiple civilian vehicles. Swirling winds, heavy embers showers, and intense radiation were reported during the event. First responders rescued civilians and trapped law enforcement personnel. Fire shelters were deployed to reduce radiative exposures to first responders and rescued civilians. At 10:00 a dozer arrived to support rescue operations, create a Temporary Refuge Area and clear Person Road of burning vehicles. Pearson Road became passable again at approximately 10:15.

Time	Observation	Source
09:00	spot fires down in Pearson Rd drainage; put out spots with hand tools and water, alone in patrol truck with 190 liters (50 gallons) water	TD-100
09:00–09:20	spot fire just becoming established in drainage	TD-037
09:00–09:20	can see spot fire on south side Pearson Rd at Stearns Rd	TD-037
09:00–09:20	wind is picking up; dark as night	TD-037
09:15–09:30	6 m to 9 m (20 ft to 30 ft) flames in Pearson Rd drainage; visibility 15 m (50 ft)	TD-068
09:26	fire established on Pentz Rd at the curves down in the drainage	TD-037
09:32	start seeing spot fires; poor visibility, 15 m to 18 m (50 ft to 60 ft); horrendous wind	TD-087
09:38	moderate to heavy surface fire, single tree torching, heavy ember shower through the curve	VTD-23
09:40	encounter traffic jam both lanes WB on Pearson Rd, hugging south side of roadway; heavy fire both sides; VTD-23 is at end of line	VTD-24
09:41	heavy surface fire, torching trees, ember showers sound like pebbles, cars honking; wind gusty from NE	VTD-23
09:41–10:00	see [TD-087] ahead, wind swirling	TD-122

<b>Time</b>	<b>Observation</b>	<b>Source</b>
09:41–10:00	fire had cleaned ground fuel; stuck here; fire overtakes engine; put fire shelters over windows; engine is torched, blew diesel tank vents	TD-122
09:41–10:00	cars in front of engine are on fire	TD-122
09:41–10:00	debris in back of pickup truck catches fire; bring 5 civilians into engine; ember shower across window	TD-122
09:41–10:00	ground fuels are gone, torched to limbs	TD-122
09:45–10:04	new spot fire 9 m × 12 m (30 ft × 40 ft) in grass. Vehicles are melting	TD-087
09:51	heavy ember shower, swirling winds, dark with light of glowing fire, visibility 0 m to 15 m (0 ft to 50 ft)	VTD-16
09:53	CHP vehicle not burning but cars next to it are burning; move burning vehicles off roadway	TD-129
09:53	visibility 12 m (40 ft), smoky, everything on fire, extensive ember cast; moderate to strong winds 4.5 m /s to 9 m/s (10 mi/h to 20 mi/h); swirling winds; wind knocking trees over	TD-129
09:53	"Pearson Rd W of Pentz Rd, CHP and SO units have disabled vehicles surrounded by fire trying to get out on foot"	PPD
10:00	push burning cars on south side of road to give distance to occupied vehicles on the north side of road	TD-129
10:00–10:15	by the time dozer cut line, fire front had passed	TD-037
10:00–10:15	[civilian] had deployed fire shelter inside pickup truck	TD-037
10:15	dozer verified that Pearson Rd was passable	TD-037
10:18	after fire front all cars left TRA via Pearson Rd to Pentz Rd	TD-087

<b>Topography:</b>	ravine, drainage
<b>Roadway width:</b>	11 m (36 ft)
<b>Vegetation setbacks:</b>	1 m to 3 m (2 ft to 10 ft)
<b>Duration:</b>	60 min
<b>Extent of burnover (length of road affected):</b>	800 m (0.5 mi)
<b>Fire direction across road:</b>	n/d/variable, generally from northeast
<b>Wind intensity:</b>	multiple estimates: “horrendous”, “gusty from NE”, “swirling”, “moderate to strong”, 5 m/s to 9 m/s (10 mi/h to 20 mi/h)
<b>Fuels:</b>	brush/trees, vehicles, structures
<b>Fire behavior:</b>	spot fires, visible flames across road or portion of road, tree torching, vehicle and structure ignitions
<b>Related TD:</b>	PPD, TD-014, TD-037, TD-063, TD-068, TD-070, TD-071, TD-076, TD-087, TD-100, TD-111, TD-122, TD-123, TD-129, VTD-16, VTD-23, VTD-24, VTD-25
<b>Related streets or keywords:</b>	Hilbe Dr, Pearson curve
<b>Street-level view:</b>	Pearson Rd looking west in the middle of the drainage just west of Hilbe Dr.
<b>Pre-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , <a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	<a href="#">Google Maps Street View</a>

### Street map:



### Satellite view:



## 8. Bille Road

**Date/Time:** November 8, 09:25–11:45

**Location:** Bille Rd near Pentz Rd

**Coordinates:** [39.769364, -121.582853]

**Related TRA:** Bille Rd

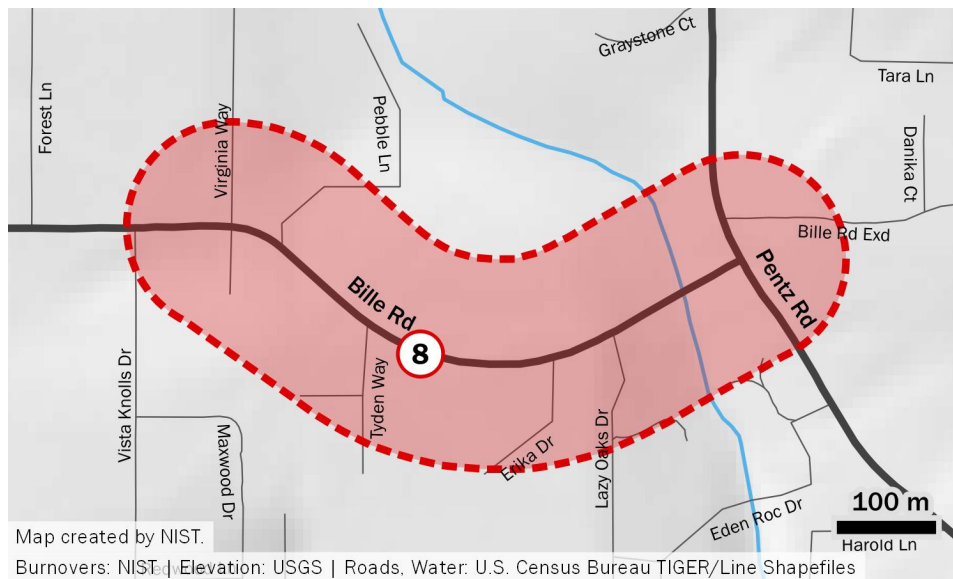
**Summary:** Bille Road is one of the four main east-west traffic arteries in Paradise. Fire activity at the Bille Road/Pentz Road intersection increased shortly before 09:30. Winds increased, gusting between 9 m/s and 13 m/s (20 mi/h and 30 mi/h). By 09:45 fire was impacting the intersection. Multiple vehicles ignited in gridlocked traffic on Bille Road, between Pebble Lane and Pentz Road. Vehicles in the intersection of Bille Road and Pentz Road were cooled by a deck gun water monitor from a fire engine hooked to a hydrant. At noon, civilians and their vehicles were moved out of the intersection to another Temporary Refuge Area.

Time	Observation	Source
09:23	<i>[estimate that]</i> fire will be impacting Bille Rd within 5 min	TD-021
09:23–11:45	hook up to hydrant to protect intersection and commercial structure <i>[using]</i> deck gun (reach of 30 m to 45 m (100 ft to 150 ft)); good hydrant pressure; wind gusting 9 m/s to 13 m/s (20 mi/h to 30 mi/h); variable visibility	TD-021
09:23–11:50	homes igniting on east side Pentz Rd	TD-038
09:35–09:52	mobile homes igniting at Bille Rd/Pentz Rd	TD-060
09:49	<i>[near]</i> 1642 Bille Rd <i>[there are]</i> active flames about 14 m (15 yd) from the roadway	PPD
09:50	fire impacting Bille Rd and vehicles abandoned/stuck on road	TD-021
09:52–10:13	conditions on Bille Rd at Pentz Rd; cars igniting, civilians in cars; put out a few vehicles on fire; side of engine takes heat damage	TD-060
09:54–10:13	gridlock along Bille Rd, unpassable; direct cars into parking lot; pickup on fire down the road	TD-079
10:00–10:30	mobile homes ignite and burn quickly; not enough resources to defend	TD-021
10:16	"the mobile home park is going up near Pentz Rd, it's not safe up here now"	PPD
11:00	Bille Rd is blocked by burning vehicles	TD-021
11:16–11:22	fire all around; Eden Roc mobile home park had already burned; engine at hydrant had deck gun going, spraying on 50 vehicles	TD-015
12:02	"Bille Rd and Pentz Rd has been cleared, they are moving to Kmart and the CMA"	PPD

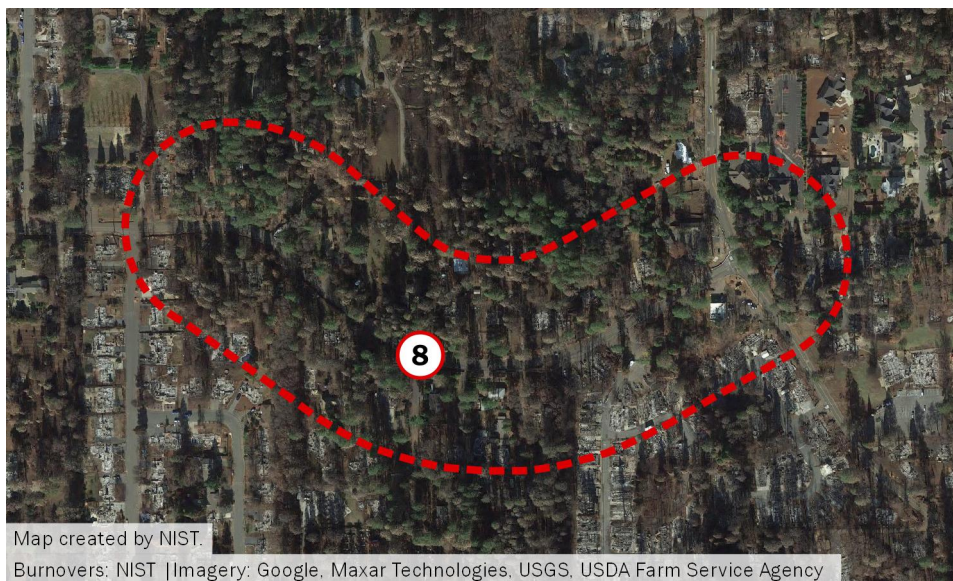


<b>Topography:</b>	flat, curved, roadway with trees closely lining both sides of road
<b>Roadway width:</b>	8 m (26 ft)
<b>Vegetation setbacks:</b>	0 m to 2 m (0 ft to 6 ft)
<b>Duration:</b>	140 min
<b>Extent of burnover (length of road affected):</b>	500 m (0.3 mi)
<b>Fire direction across road:</b>	north to south, east to west
<b>Wind intensity:</b>	gusting 9 m/s to 13 m/s (20 mi/h to 30 mi/h)
<b>Fuels:</b>	brush / trees, structures
<b>Fire behavior:</b>	fire front ignited structures and vehicles
<b>Related TD:</b>	PPD, TD-015, TD-021, TD-038, TD-040, TD-060, TD-069, TD-079, TD-084, TD-089, TD-090, TD-116, TD-118
<b>Related streets or keywords:</b>	Pentz Rd, Tyden Way
<b>Street-level view:</b>	Bille Rd looking west approaching the Tyden Way intersection.
<b>Pre-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , <a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , TD-041 (below)

### Street map:



### Satellite view:



## 9. Wagstaff Road

**Date/Time:** November 8, 9:30–10:30

**Location:** Wagstaff Rd, Paradise, between Oak Way and Rocky Ln

**Coordinates:** [39.777655, -121.603046]

**Related TRA:** n/a

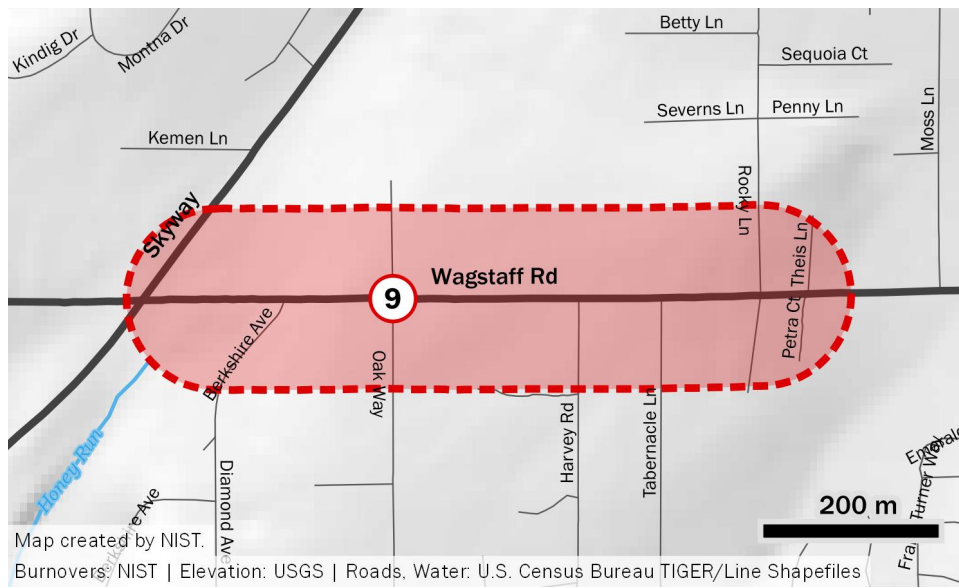
**Summary:** Wagstaff Road is one of the four main east-west traffic arteries in Paradise. Fire was reported on the bike path at Wagstaff Road at 08:46. Spot fire activity increased and expanded, and at 09:21 multiple cars were reported on fire. Before 10:00 power lines were falling into the roadway. Wagstaff Road and side streets experienced severe fire exposures from burning vegetation and structures, limiting access of first responders. Fire progressed toward the southwest in the late morning and the roadway was passable, with structures still burning, at 10:44.

Time	Observation	Source
08:46	fire reported on bike path at Wagstaff Rd	911-178-2
08:50–09:00	Wagstaff Rd; gridlocked, houses burning, trees burning on north side	TD-053
09:15–10:23	spot fires increase [ <i>in number along Wagstaff Rd</i> ] closer to Skyway	TD-042
09:17–11:00	fire spotting in, pinching Wagstaff Rd between Clark Rd and Skyway	TD-017
09:21	well-established spot fire off Wagstaff Rd near the bike path; Skyway at Wagstaff Rd about to be threatened, multiple cars on fire	TD-111
09:30–10:00	fire is burning from the NE into area of Rocky Ln and Wagstaff Rd; [fire engine is] in the area	TD-127
09:37	stuck in traffic on Wagstaff Rd, structures burning	TD-127
09:40	"[a fire engine is] holding position on Wagstaff [400 m] 0.25 mi from Skyway; several structures threatened/involved, it will close off the Wagstaff Rd route; we could use another engine"	TD-055
09:47	powerlines coming down into traffic; fire coming across Wagstaff Rd	TD-127
10:15–10:17	WB on Wagstaff Rd to Harvey Rd, turn around; lots of fire, structures burning both sides of Wagstaff Rd	TD-014
10:17	stuck in intersection of Oak Way and Wagstaff Rd waiting for fire to die down	TD-127

<b>Time</b>	<b>Observation</b>	<b>Source</b>
10:44	multiple structures fully involved; homes to the west of Harvey Rd on north side of Wagstaff Rd are fully involved, some have collapsed	VTD-13
10:57	fire heavily impacting Oak Way and towards Bille Rd	TD-127

<b>Topography:</b>	Mostly flat
<b>Roadway width:</b>	8 m (26 ft)
<b>Vegetation setbacks:</b>	0 m to 3 m (0 ft to 10 ft)
<b>Duration:</b>	60 min
<b>Extent of burnover (length of road affected):</b>	500 m (0.3 mi)
<b>Fire direction across road:</b>	north to south
<b>Wind intensity:</b>	n/d, variable
<b>Fuels:</b>	brush/trees, structures
<b>Fire behavior:</b>	initial spot fires progressed to structures, with high radiation, flame, and ember exposures
<b>Related TD:</b>	911-129-1, 911-162-1, 911-169-1, 911-178-2, PPD, TD-009, TD-014, TD-017, TD-022, TD-042, TD-053, TD-055, TD-064, TD-085, TD-111, TD-127, VTD-13, VTD-18, VTD-26
<b>Related streets or keywords:</b>	Wagstaff Rd, Oak Way, Harvey Rd, Rocky Ln
<b>Street-level view:</b>	Wagstaff Rd looking west approaching the Oak Way intersection.
<b>Pre-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , <a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	<a href="#">Google Maps Street View</a>

### Street map:



### Satellite view:



## 10. Clark Road/American Way

**Date/Time:** November 8, 10:00–12:00

**Location:** Clark Rd, Paradise, near American Way

**Coordinates:** [39.738857, -121.611887]

**Related TRA:** Best Western, Ace Hardware

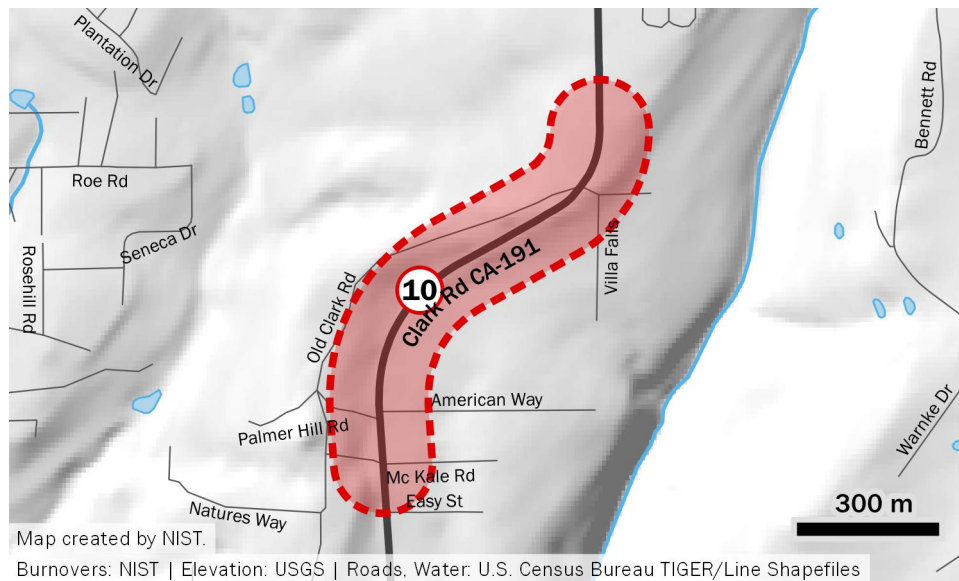
**Summary:** Fire impacted Clark Road between American Way and Lanser Drive around 10:00. Fire was burning on both sides of Clark Rd and erratic winds of 13 m/s to 18 m/s (30 mi/h to 40 mi/h) and fire tornadoes were reported in the area. Flames blocked the road and first responders redirected traffic back toward Paradise. Intense fire activity was reported intermittently until 11:30. Low hanging power lines were reported before the road was fully opened to traffic after noon. See concurrent events further south at Airport Road (page 203).

Time	Observation	Source
10:00–10:15	fire on both sides of road; wind very strong, shaking bus; saw fire tornadoes	TD-049
10:02	fire burning on west side of Clark Rd near American Way	TD-009
10:17	Clark Rd [near American Way]; fire had just hit - vehicles are burning; guardrail posts on fire; flames fully or partially blocking roadway; 13 m/s to 18 m/s (30 mi/h to 40 mi/h) erratic winds; some vehicles driving SB in NB lanes; zero visibility	TD-041
10:18	advised that conditions to south are bad; drive down to bend [Clark Rd near Lanser Dr]; bad fire across roadway	TD-065
10:21	"vehicle evacuations coming down Clark Rd are really slowing down and are going to be impacted by fire; fire is impacting line of traffic"	Radio Log
10:40–12:10	all structures are burning; dark, but visibility better than in Concow	TD-110
11:08–12:31	fire coming up from drainage [on east side of Clark Rd]; fire burning on both sides of Clark Rd; powerlines down	TD-211
11:12	turning around civilians on Clark Rd at American Way to go back north toward Paradise; [fire blocking Clark Rd]	TD-211
11:14–11:54	open up Clark Rd NB back into Paradise; send vehicles back north to parking lot at Ace Hardware to get off road	TD-100
11:14–11:54	flames blowing across Clark Rd; stuck with 50 civilian vehicles between Round Valley Ranch Rd and Lanser Dr at American Way	TD-100

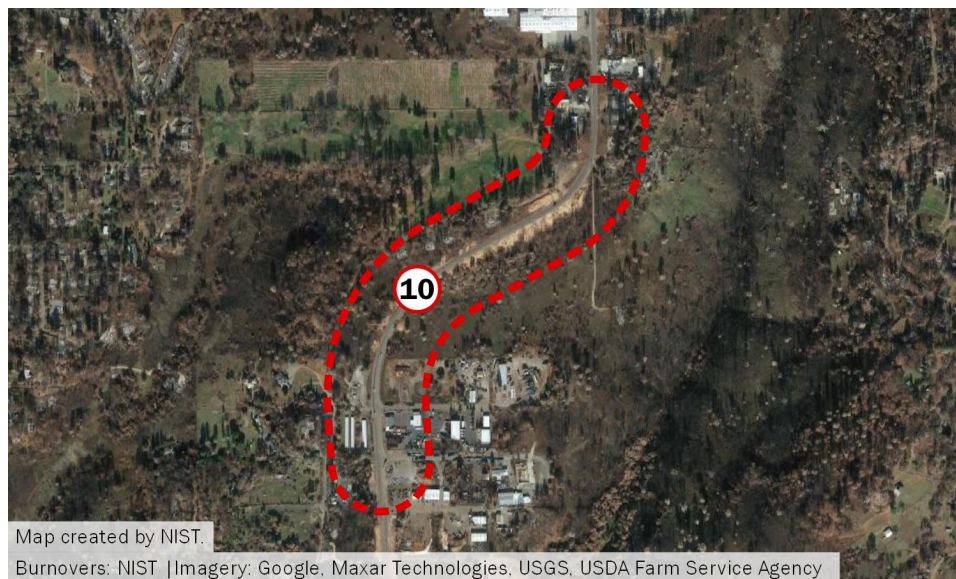
<b>Time</b>	<b>Observation</b>	<b>Source</b>
11:30–11:34	stop and wait for fire front across Clark Rd; then drive through fire; pitch black, everything on fire; foam line on engine burned up	TD-208
12:36–12:38	pitch black as night; everything burning, past peak, Clark Rd between Buschmann Rd and Old Clark Rd	VTD-15
12:54	hear that road is opened up; vehicles from Best Western can be evacuated	TD-211

<b>Topography:</b>	near the top of a ridge, east aspect slope on either side of the roadway down to canyon to east
<b>Roadway width:</b>	11 m (36 ft)
<b>Vegetation setbacks:</b>	1 m to 3 m (2 ft to 10 ft)
<b>Duration:</b>	120 min
<b>Extent of burnover (length of road affected):</b>	700 m (0.5 mi)
<b>Fire direction across road:</b>	east to west
<b>Wind intensity:</b>	13 m/s to 18 m/s (30 mi/h to 40 mi/h)
<b>Fuels:</b>	brush/trees
<b>Fire behavior:</b>	flames fully or partially blocking roadway, flames blowing across roadway, fire tornados
<b>Related TD:</b>	PPD, Radio Log, TD-009, TD-035, TD-041, TD-049, TD-065, TD-100, TD-110, TD-130, TD-208, TD-211, VTD-15
<b>Related streets or keywords:</b>	Lanser Dr, Easy St, Round Valley Ranch Rd
<b>Street-level view:</b>	Clark Rd looking southwest between Lanser Dr and American Way.
<b>Pre-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , <a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	<a href="#">Google Maps Street View</a>

### Street map:



### Satellite view:





## 11. Clark Road/Airport Road

**Date/Time:** November 8, 10:00–11:30

**Location:** Clark Rd at Airport Rd, south of Paradise

**Coordinates:** [39.715652, -121.611268]

**Related TRA:** n/a

**Summary:** Clark Road is one of the four north-south traffic arteries in Paradise. Fire was impacting Clark Road south of Round Valley Ranch Road by 10:00. Shortly after the road was closed to traffic and remained closed until 10:46 when a single lane of traffic was permitted to drive through. Fire activity intensified again and by 11:13 the road was closed again. Arriving fire engines coming from the south encountered flames blowing across Clark Road at Airport Road and waited for the flames to subside at 11:26. By 13:00 fire activity had subsided along Clark Road, however, downed powerlines/power poles restricted first responder movement until cleared.

Time	Observation	Source
10:18	"SB traffic on Clark Rd south of town limits, fire encroaching roadway; need a detour on Buschmann Rd over to Skyway; no more traffic SB on Clark Rd"	PPD
10:30–10:40	fire on Clark Rd at Airport Rd	TD-110
10:46	drove down Clark Rd toward Round Valley - [a fire fighter] says Clark Rd SB is passable with a single lane in the center and no stopping	TD-065
10:46	"I have fire both sides of roadway but we are safe to have one lane as long as they stay on the west side of the road and keep moving near Round Valley; divert Buschmann Rd and SB Clark Rd to go SB on Clark Rd out of town"	PPD
10:52	flames coming from the east towards Clark Rd between Airport Rd and Round Valley Ranch Rd	TD-210
10:53	suddenly gets very dark	TD-130
11:00–11:15	fire all around, 46 m (50 ft) flames crossing Clark Rd; traffic all SB on Clark Rd; cannot see oncoming headlights further than 1.5 m (5 ft)	TD-100
11:13	[heading NB and must] turn around due to heavy fire impacting and blocking roadway on Clark Rd	TD-208
11:14	Clark Rd is no longer a safe evacuation route; heavily impacted fire near the airport	TD-110
11:14–11:54	shut down Clark Rd; impassable with zero visibility and flames; last vehicle through is a trailer, driving through flames	TD-100

<b>Time</b>	<b>Observation</b>	<b>Source</b>
11:15–11:26	stop and wait on Clark Rd at airport for fire to die down to continue north; no traffic north of here	TD-208
11:20	turn around on Clark Rd near Meadowsong Dr; Clark Rd is impassable	TD-211
12:25	“just took Clark Rd south from Pearson Rd, I made it past the airport, it clears up, it’s barely passable”	PPD
12:43	fire burning through guardrail posts; burning branches in roadway; heavy fire on Good View Dr, structures burning; visibility poor, dark smoky	VTD-06

**Topography:** road slightly up hill, steep canyon to the east

**Roadway width:** 9 m (30 ft)

**Vegetation setbacks:** 1 m (3 ft)

**Duration:** 90 min

**Extent of burnover (length of road affected):** 1.5 km (0.9 mi)

**Fire direction across road:** east to west

**Wind intensity:** n/d

**Fuels:** brush/trees

**Fire behavior:** 15 m (50 ft) flames from canyon impacting roadway, burning guardrail posts

**Related TD:** PPD, TD-065, TD-100, TD-101, TD-110, TD-130, TD-208, TD-210, TD-211, VTD-06

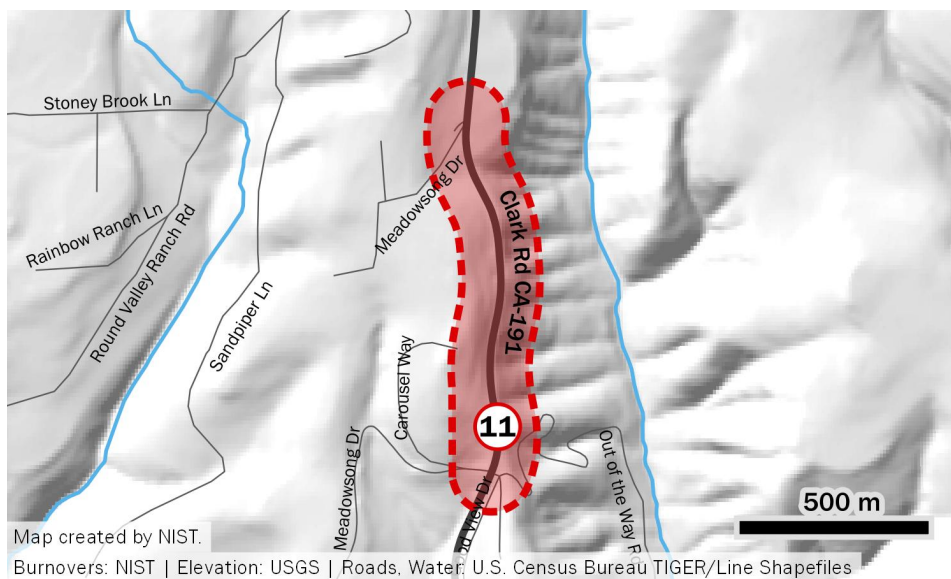
**Related streets or keywords:** Good View Rd, Round Valley Ranch Rd

**Street-level view:** Clark Rd in area of burnover, north of Airport Rd intersection looking north.

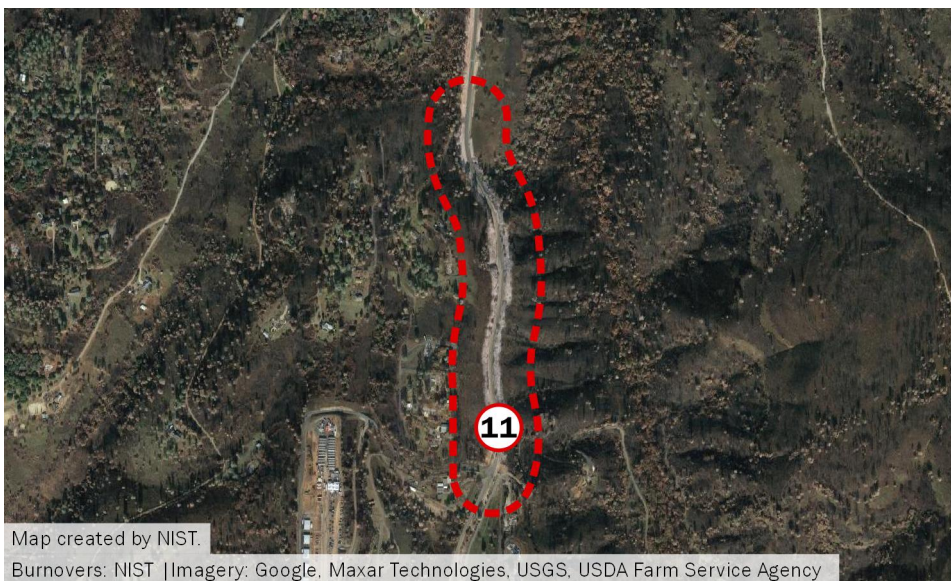
**Pre-fire imagery links:** [Bing Maps Streetside](#)

**Post-fire imagery links:** [Google Maps Street View](#)

### Street map:



### Satellite view:



## 12. Skyway (lower, west of Princeton Way)

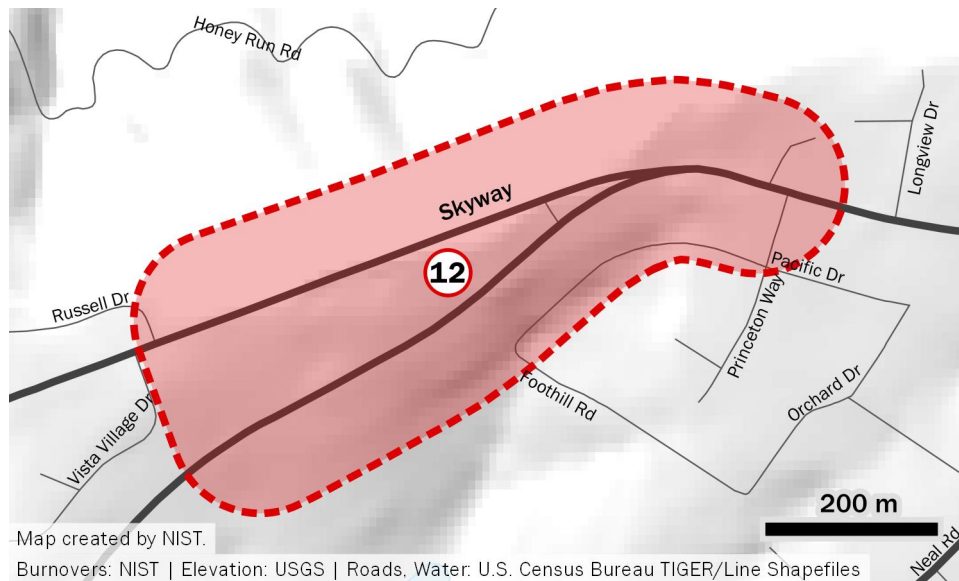
**Date/Time:** November 8, 10:15–11:45  
**Location:** Skyway, Paradise, between Skyway Crossroad and Princeton Way  
**Coordinates:** [39.745615, -121.648307]  
**Related TRA:** n/a  
**Summary:** Skyway is one of the four north-south traffic arteries in Paradise. Intense fire against the roadway was observed on lower Skyway in the vicinity of the lane divide near the town limits by 10:19. By 10:45 traffic was leaving Paradise using a single lane due to downed power poles. Fire activity in the area increased significantly impacting civilian evacuations until the early afternoon.

Time	Observation	Source
10:19	Skyway NB; traffic all lanes SB; fire burning south side Skyway, fences, structures, vegetation; visibility dark, smoky, 6 m (20 ft)	TD-155
10:22	Cannot continue NB into heavy traffic and heavy fire activity, turn around and retreat SB	TD-155
10:30–11:00	drove through fire, everything on fire Skyway	TD-025
10:44	vehicles heading single file down Skyway SB using NB lanes at the split; traffic moving 40 km/h (25 mi/h)	VTD-14
10:44	structures fully involved on south side Skyway	VTD-14
10:44	heavy intense fire burning both sides Skyway NB lanes between split and past paradise sign	VTD-22
10:45–11:12	left side skyway, heavy vegetation fire; traffic is slow/stopped, two lanes SB on SB lanes, just south of Feather River Health	VTD-13
11:12	south side Skyway heavy fire near Princeton Way; traffic moving quickly down SB lanes; unclear if all traffic heading this way or also using NB lanes	VTD-13
11:13	heavy fire, structures fully involved, both sides roadway between Skyway split and Skyway Crossroad	VTD-13
11:30	Skyway split is fully involved both sides; cars are following each other closely to get out	TD-011
11:38	structures burning in middle of Skyway split	TD-058
11:38	everything on fire; trees, cars, houses, telephone poles; power lines down	TD-058
12:45	fire on both sides, fully involved, roofs on fire; pitch black; area of Skyway and Princeton Way	TD-026

<b>Topography:</b>	roadway is along a ridge with canyons/ravines on either side
<b>Roadway width:</b>	7 m to 20 m (23 ft to 65 ft)
<b>Vegetation setbacks:</b>	1 m to 3 m (3 ft to 10 ft)
<b>Duration:</b>	90 min
<b>Extent of burnover (length of road affected):</b>	1 km (0.6 mi)
<b>Fire direction across road:</b>	northwest to southeast
<b>Wind intensity:</b>	n/d
<b>Fuels:</b>	brush / trees
<b>Fire behavior:</b>	intense exposure from vegetation fires, torching, ember showers
<b>Related TD:</b>	TD-011, TD-025, TD-026, TD-058, TD-070, TD-155, VTD-13, VTD-14, VTD-22, VTD-26
<b>Related streets or keywords:</b>	Skyway split (lane divide), Skyway Crossroad, Princeton Way

<b>Street-level view:</b>	Skyway looking southwest at the lane divide.
<b>Pre-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , <a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	<a href="#">Google Maps Street View</a>
<b>Street-level view:</b>	Skyway looking west toward the lane divide, just west of Princeton Way.
<b>Pre-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , <a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	<a href="#">Google Maps Street View</a>

### Street map:



### Satellite view:



### 13. Jordan Hill Road/Granite Ridge Road

**Date/Time:** November 8, 11:30

**Location:** Jordan Hill Rd at Granite Ridge Rd, south of Concow

**Coordinates:** [39.753223, -121.552523]

**Related TRA:** n/a

**Summary:** A fire engine responded to Granite Ridge Road at 11:18 in response to a call regarding civilian entrapment. Fire was over the ridge to the northeast of Jordan Hill Road as they arrived. The burnover occurred while first responders were evacuating the Jordan Hill area. On the drive out at 11:32, flame lengths were 30 m to 45 m (100 ft to 150 ft) near the road as the fire engine led civilian vehicles out of the fire. All vehicles drove through flames to escape and the engine suffered damage. There is insufficient data to determine the temporal extent of this burnover. The engine returned to Concow Road at 11:40.

Time	Observation	Source
11:18	ECC provides notification of entrapment Granite Ridge Rd via radio	TD-008
11:18	flames making way over the ridge	TD-062
11:32	observe 30 m to 45 m (100 ft to 150 ft) flame lengths <i>[approaching Jordan Hill Rd from north]</i>	TD-062
11:32	as driving out, fire well established in canyon below <i>[Jordan Hill Rd]</i> ; engine sustained damage driving through fire	TD-062

<b>Topography:</b>	steep slope along ravine/canyon
<b>Roadway width:</b>	5 m (16 ft)
<b>Vegetation setbacks:</b>	0 m to 4 m (0 ft to 13 ft)
<b>Duration:</b>	n/d, however impact on firefighters and civilians approximately 10 minutes
<b>Extent of burnover (length of road affected):</b>	800 m (0.5 mi)
<b>Fire direction across road:</b>	north to south
<b>Wind intensity:</b>	n/d
<b>Fuels:</b>	brush/trees
<b>Fire behavior:</b>	large flame lengths, 30 m to 45 m (100 ft to 150 ft) from overgrown vegetation in canyon
<b>Related TD:</b>	TD-008, TD-031, TD-062
<b>Related streets or keywords:</b>	n/a

**Street-level view:** Granite Ridge Rd looking east toward intersection with Jordan Hill Rd.

**Pre-fire imagery links:** [Bing Maps Streetside](#)

**Post-fire imagery links:** No imagery available.

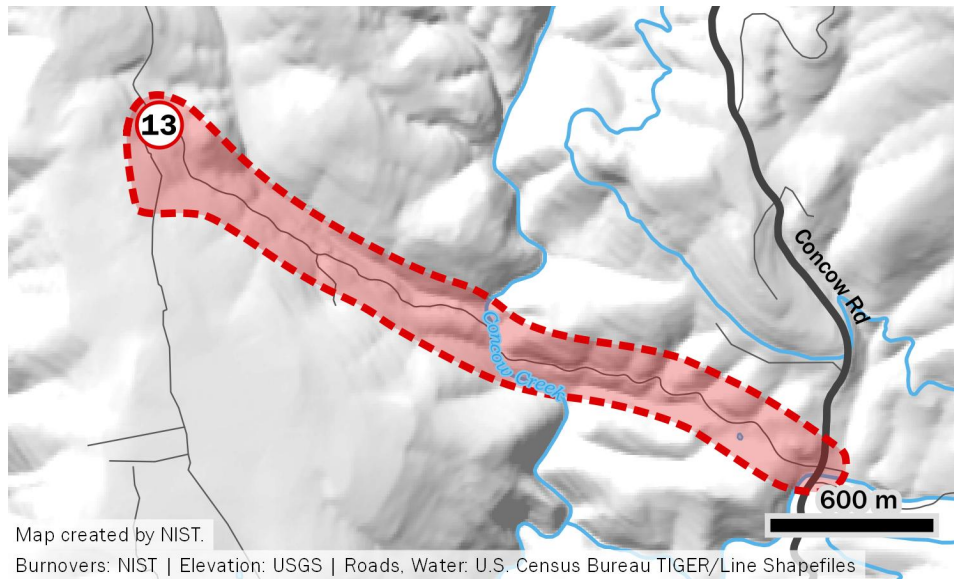
**Street-level view:** View northwest on Jordan Hill Rd, midway between Concow Rd and the ridgetop at Granite Ridge Rd.

**Pre-fire imagery links:** [Bing Maps Streetside](#)

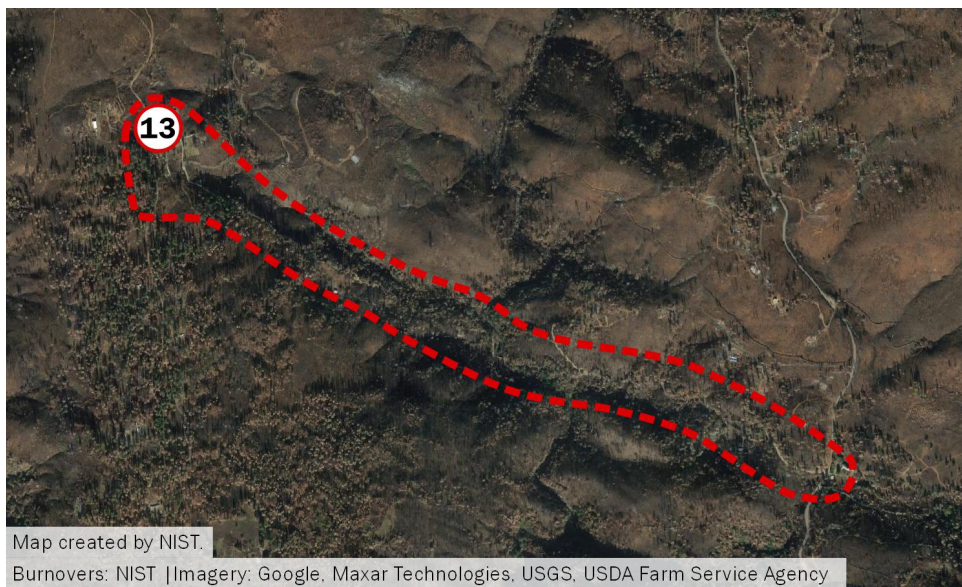
**Post-fire imagery links:** No imagery available.



### Street map:



### Satellite view:



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## 14. Clark Road/Black Bear Diner

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**Date/Time:** November 8, 13:10

**Location:** 5791 Clark Rd, Paradise, at Black Bear Diner

**Coordinates:** [39.753598, -121.607740]

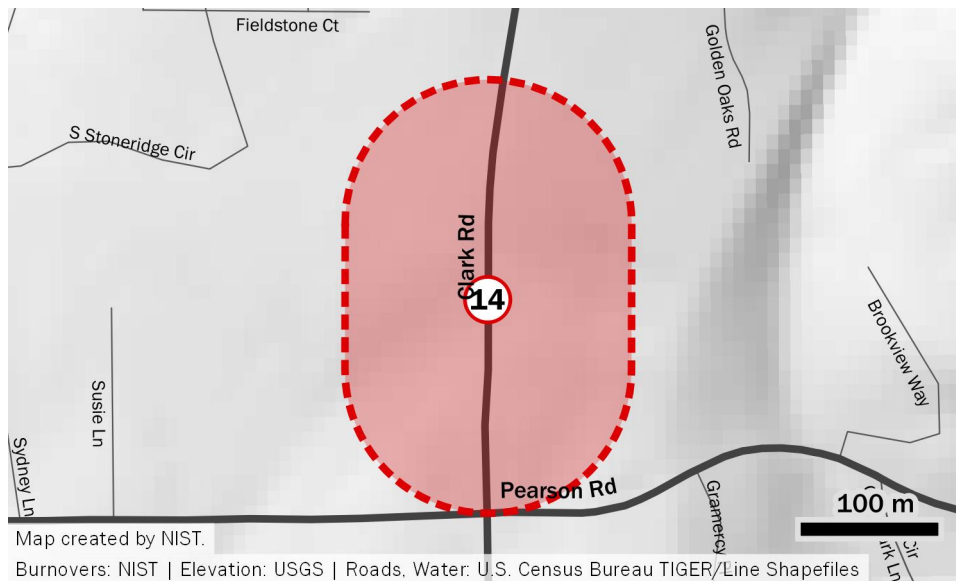
**Related TRA:** n/a

**Summary:** At approximately 12:30 there was minimal visible fire activity reported on Clark Road between Nunneley Road and Person Road, however this may be in part due to the observed heavy black smoke and reduced visibility. At 13:10, firefighters attempted to drive south on Clark Road and encountered reduced visibility and heavy fire exposure forcing them to turn around. This event does not meet the NWCG definition of burnover, as first responders were able to backtrack their way out and were not in life-threatening danger. No civilians were impacted by this incident. It is included here, however, to illustrate that even a major artery with a sidewalk to sidewalk width of 23.5 m (77 ft) can be rendered impassable by the exposures generated from one or more fully involved commercial buildings. There is insufficient data to determine the temporal extent of this burnover.

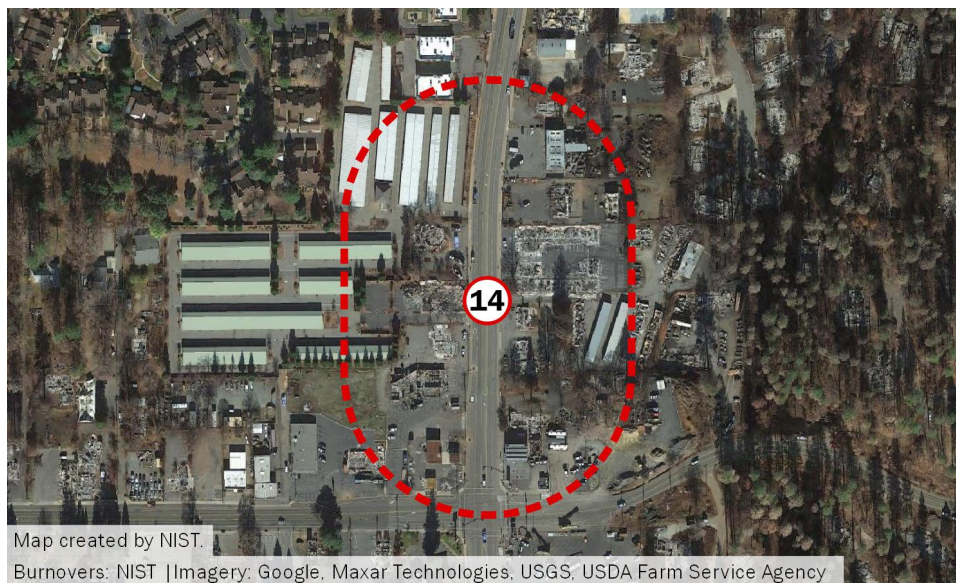
Time	Observation	Source
12:28–12:28	minimal fire visible between Nunneley Rd and Pearson Rd; visibility black, zero visibility on Clark Rd	PPD
13:10	visibility zero, can't see, heavy fire; so turn around and head back NB on Clark Rd	TD-021

<b>Topography:</b>	flat
<b>Roadway width:</b>	23 m (75 ft)
<b>Vegetation setbacks:</b>	3 m (10 ft) structure setback from sidewalk
<b>Duration:</b>	n/d
<b>Extent of burnover (length of road affected):</b>	150 m (500 ft)
<b>Fire direction across road:</b>	primary exposure from structure on west side of road
<b>Wind intensity:</b>	n/d
<b>Fuels:</b>	commercial structures, ornamental vegetation
<b>Fire behavior:</b>	burning commercial structure
<b>Related TD:</b>	PPD, TD-021
<b>Related streets or keywords:</b>	n/a
<b>Street-level view:</b>	Clark Rd at Black Bear Diner looking northwest at the diner building.
<b>Pre-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , <a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	<a href="#">Google Maps Street View</a>

### Street map:



### Satellite view:



## 15. Rattlesnake Flats Road

**Date/Time:** November 8, 15:15

**Location:** Rattlesnake Flats Rd off Clark Rd, south of Paradise

**Coordinates:** [39.679551, -121.619215]

**Related TRA:** n/a

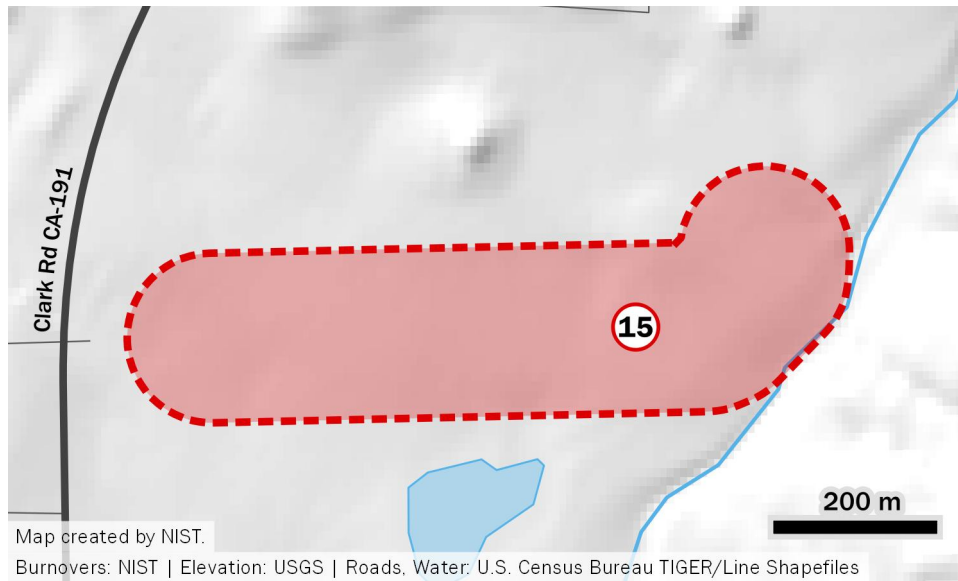
**Summary:** In the mid-afternoon, firefighters and hand crews were planning and conducting firing operations along Clark Road south of Paradise. The area surrounding the location of this burnover was dominated by grassy fuels. A wind shift in the afternoon at around 15:00 and the rapidly changing conditions resulted in accelerated fire spread leading to firefighter injuries. The event only lasted a few minutes but injured three fire fighters. This burnover is further documented in a CALFIRE Green Sheet serious injury report.<sup>23</sup>

Time	Observation	Source
15:00	wind shifted in afternoon and blew fire down canyon	TD-110
15:17–15:19	Rattlesnake Flats Rd; flames sheeting 3 m to 4.5 m (10 ft to 15 ft) in grass; fire went over engine hood; threw engine in reverse to retreat to Clark Rd; bumper line and nozzle burned up; could barely see road/grass	TD-208
15:32	"I have 2 inmate [ <i>firefighters</i> ] with minor to moderate burns at the end of Rattlesnake off Clark Rd, I need a code 3 medic unit"	Radio Log

<sup>23</sup> CAL FIRE (2018), accessed October 2020 from <https://www.firefighterclosecalls.com/wp-content/uploads/2018/12/18-CA-BTU-016737-Camp-Green-Sheet.pdf>

<b>Topography:</b>	5 % slope, SW aspect
<b>Roadway width:</b>	3 m (10 ft) (two-track dirt road with grass)
<b>Vegetation setbacks:</b>	0 m
<b>Duration:</b>	15 min
<b>Extent of burnover (length of road affected):</b>	300 m (0.2 mi)
<b>Fire direction across road:</b>	north to south
<b>Wind intensity:</b>	11 m/s (25 mi/h)
<b>Fuels:</b>	grass
<b>Fire behavior:</b>	wind-driven run through grass, flames 3 m to 4.5 m (10 ft to 15 ft)
<b>Related TD:</b>	CAL FIRE Green Sheet, Radio Log, TD-110, TD-208
<b>Related streets or keywords:</b>	Clark Rd, Dulcinea Dr
<b>Street-level view:</b>	Rattlesnake Flats Rd looking east from Clark Rd.
<b>Pre-fire imagery links:</b>	<a href="#">Google Maps Street View</a> , <a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	<a href="#">Google Maps Street View</a>

### Street map:



### Satellite view:



## 16. Coutolenc Road

**Date/Time:** November 9, 00:00–02:00

**Location:** Coutolenc Rd, Magalia, between Skyway and Ridgeway

**Coordinates:** [39.812765, -121.578400]

**Related TRA:** n/a

**Summary:** At 23:30 a spot fire was identified in the West Branch Feather River Canyon. Shortly after midnight, into November 9, the wind increased to 15 m/s to 27 m/s (35 mi/h to 60 mi/h) and the spot fire grew rapidly, pushing uphill and west towards Coutolenc Road and Magalia. A strike team working on Coutolenc Road was split up as they escaped the oncoming fire; some engines had to drive north on Coutolenc Road and return through Magalia. The area surrounding the intersection of Coutolenc Road and Skyway remained impassable until at least 01:19, when first responders took refuge in the intersection of Skyway and Coutolenc Road, and on the dam of the Magalia Reservoir. Photos taken at 01:22 indicate continued crown fire activity along Coutolenc Road.

Time	Observation	Source
23:30–00:00	spot fire down in canyon, can't see it yet	TD-126
00:07–01:13	Skyway at Coutolenc Rd; fire starting to spread to ground but not fast; fire pushing up canyon, winds 15 m/s to 27 m/s (35 mi/h to 60 mi/h) the whole time	TD-209
00:30–01:00	fire came over ridge, spotting	TD-043
00:37	fire has crossed Coutolenc Rd between Winchester Ln and Alphys Ln, burning with the wind toward Magalia Reservoir	TD-061
00:37–00:53	see fire is coming [ <i>over Coutolenc Rd</i> ] and advise engines to leave; 3 engines south toward Skyway, 2 cannot make it and must escape to north	TD-126
00:53	fire making major run across Coutolenc Rd, 13 m/s (30 mi/h) winds aligned with drainages	TD-061
00:53–01:17	fire hits [ <i>at intersection of Skyway</i> ] out of east canyon hard; quick wind increase	TD-041
00:53–01:17	main fire front blew straight across Skyway at Coutolenc Rd, estimate 22 m/s (50 mi/h) winds. Wood guardrails igniting.	TD-061
00:53–01:17	fire coming up from canyon, strong wind; softball size embers; embers igniting houses	TD-125
00:53–01:17	fire coming towards house [ <i>near intersection with Skyway</i> ], fire blows up; cut hose off engine and get out	TD-126



<b>Time</b>	<b>Observation</b>	<b>Source</b>
00:54	3 Type 3 strike teams, 1 Type 1 strike team staged; moved all engines to Skyway for safety (~ half of resources went north on Coutolenc Rd after cut-off by fire)	TD-061
01:00–02:00	staging for an hour at the dam after the initial fire front	TD-126
01:00–02:00	fire burning both sides Skyway north of Dogtown Rd; cannot get through	TD-126
01:22	photo to east from Dogtown Rd; crown fire coming from the West Branch toward Coutolenc Rd	TD-127
01:48–01:57	parked on dam with civilians in a vehicle and other engine	TD-061

**Topography:** along a ridge, canyon to either side

**Roadway width:** 7 m (22 ft)

**Vegetation setbacks:** 0 m to 2 m (0 to 6 ft)

**Duration:** 120 min

**Extent of burnover (length of road affected):** 3 km (2 mi)

**Fire direction across road:** east to west

**Wind intensity:** 15 m/s to 27 m/s (35 mi/h to 60 mi/h)

**Fuels:** brush/trees

**Fire behavior:** wind-driven increase of fire pushed up slope through heavy vegetation, crowning fire through trees

**Related TD:** TD-007, TD-040, TD-041, TD-043, TD-045, TD-061, TD-109, TD-115, TD-122, TD-123, TD-124, TD-125, TD-126, TD-127, TD-209

**Related streets or keywords:** Skyway, Dogtown Rd

**Street-level view:** View east to Coutolenc Rd at the intersection with Skyway.

**Pre-fire imagery links:** [Google Maps Street View](#), [Bing Maps Streetside](#)

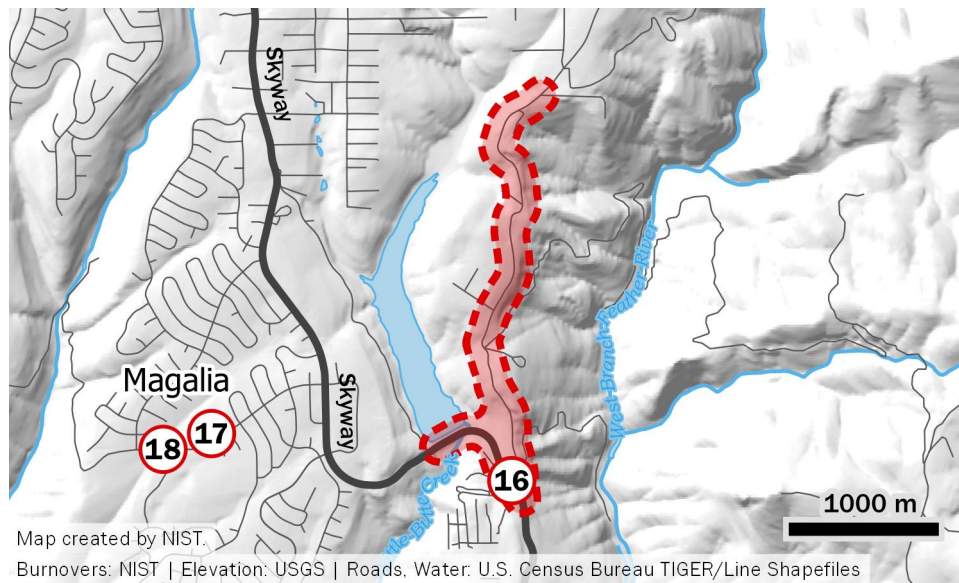
**Post-fire imagery links:** [Google Maps Street View](#)

**Street-level view:** Coutolenc Rd just north of the intersection with Skyway.

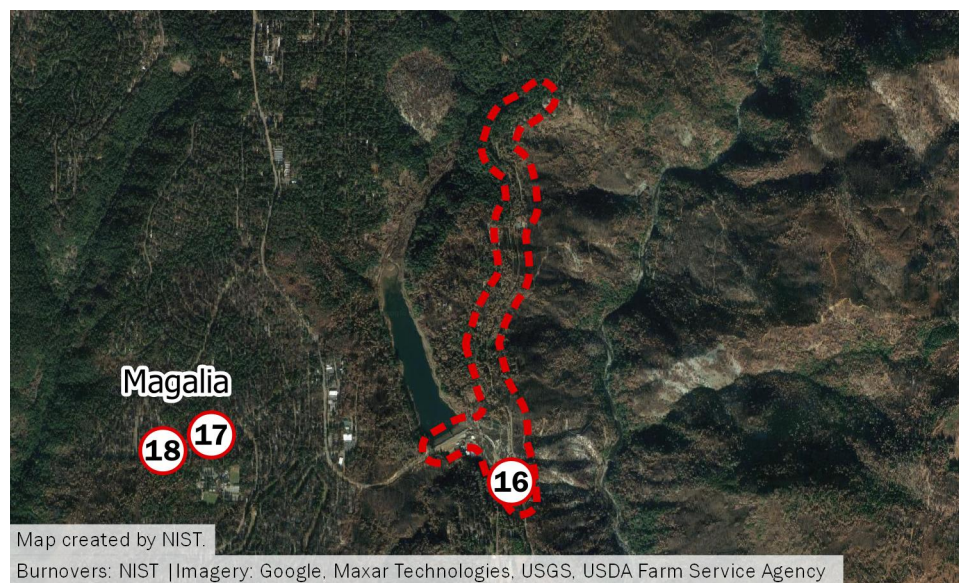
**Pre-fire imagery links:** [Google Maps Street View](#), [Bing Maps Streetside](#)

**Post-fire imagery links:** No imagery available.

### Street map:



### Satellite view:



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## 17. Chestnut Circle

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**Date/Time:** November 9, 06:00

**Location:** Chestnut Cir, Magalia

**Coordinates:** [39.815564, -121.600900]

**Related TRA:** n/a

**Summary:** On November 9, firefighters were protecting structures on Chestnut Circle in Magalia. At approximately 06:00 there was intense fire activity among structures in the area when a propane tank exploded, injuring two fire fighters. The explosion was located approximately 64 m (210 ft) east of the crew. The injury is documented in a CALFIRE Green Sheet serious injury report.<sup>24</sup> While there were still residents in Magalia at this time, this incident is not known to have impacted any civilians.

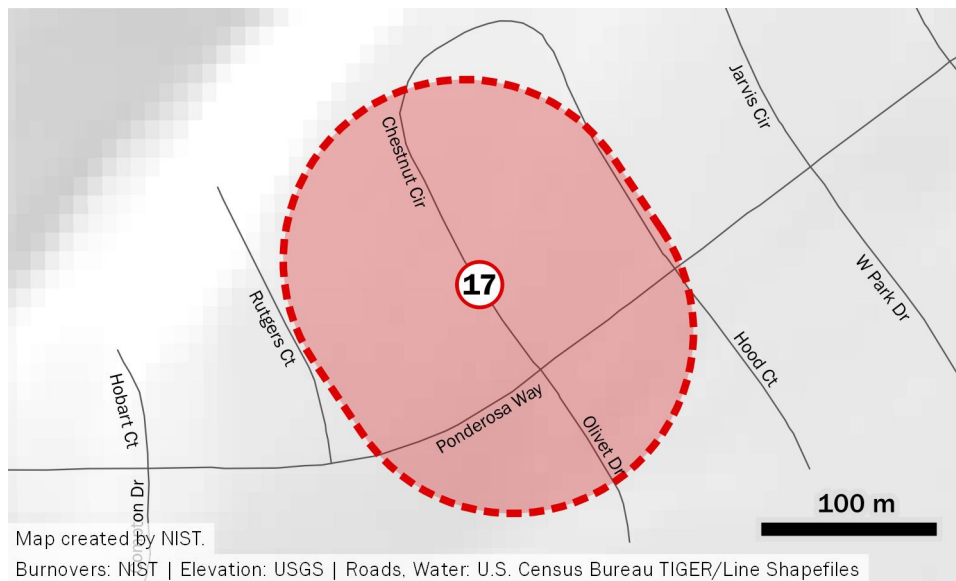
Time	Observation	Source
06:00	BLEVE with firefighters	TD-127
06:00–06:05	propane tank explodes; retreat to engine; no water	TD-209
06:00–06:05	on the left, 1.5 m × 1.5 m (5 ft × 5 ft) spot fire starting; jump out to handle spot with reel line	TD-209
06:00–06:05	houses inside Chestnut Cir loop engulfed; intense fire activity	TD-209
06:07	head around corner to put out fire on engine	TD-209

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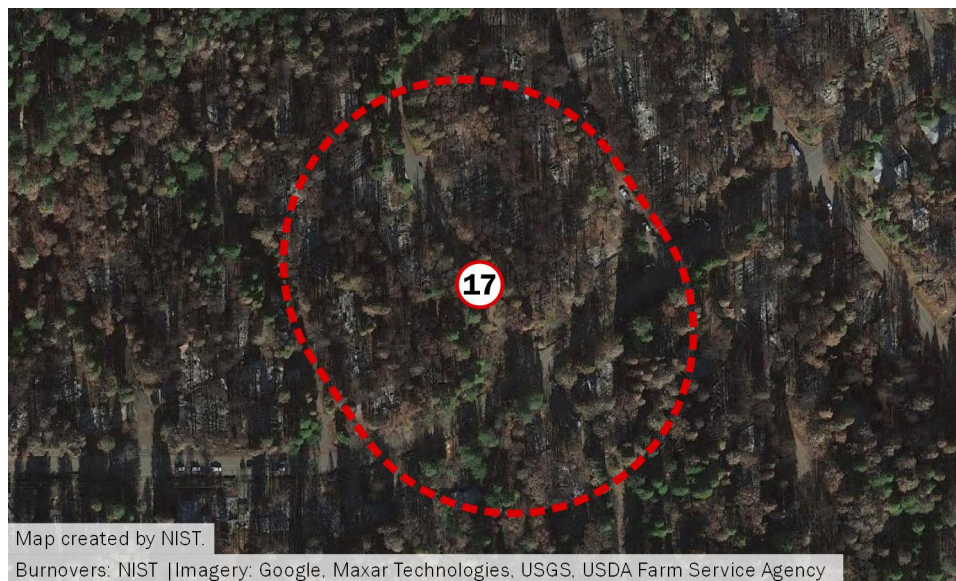
<sup>24</sup> CAL FIRE (2018), accessed October 2020 from <https://www.firefighterclosecalls.com/wp-content/uploads/2018/12/18-CA-BTU-016737-Camp-Green-Sheet.pdf>

<b>Topography:</b>	flat
<b>Roadway width:</b>	9 m (30 ft)
<b>Vegetation setbacks:</b>	0 m to 1 m (0 ft to 3 ft)
<b>Duration:</b>	n/a
<b>Extent of burnover (length of road affected):</b>	150 m (500 ft)
<b>Fire direction across road:</b>	east to west
<b>Wind intensity:</b>	n/d
<b>Fuels:</b>	residential propane tank explosion
<b>Fire behavior:</b>	surrounding structures burning, spot fires igniting in surface fuels, propane tank explosion
<b>Related TD:</b>	TD-127, TD-209
<b>Related streets or keywords:</b>	Ponderosa Way
<b>Street-level view:</b>	View north on Chestnut Cir at Ponderosa Way.
<b>Pre-fire imagery links:</b>	<a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	No imagery available.

### Street map:



### Satellite view:



## 18. Ponderosa Way

**Date/Time:** November 9, 07:15

**Location:** Ponderosa Way, Magalia, west of Compton Dr

**Coordinates:** [39.814665, -121.604539]

**Related TRA:** Pine Ridge School

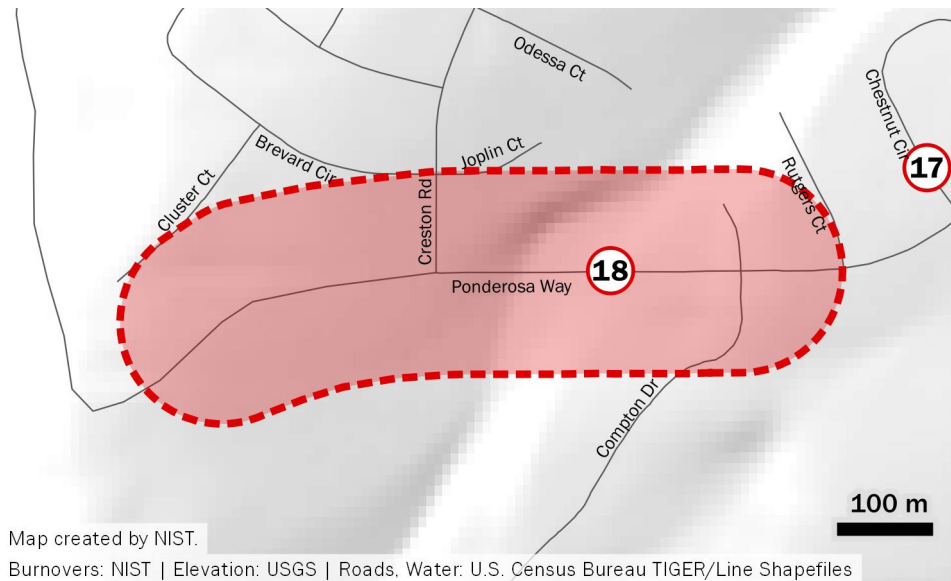
**Summary:** At approximately 07:10 on November 9, firefighters were conducting door-to-door evacuations along Ponderosa Way as some civilians were still in the area. Within 10 minutes, by 07:20, fire approached Ponderosa Way from the south and west causing a rapid deterioration of local conditions resulting in fire blowing across Ponderosa Way. Firefighters with an elderly civilian in their engine drove through fire to get to safety. Additional fire engines retreated to a safety zone at Pine Ridge School on Compton Drive. There is insufficient data to determine the temporal extent of this burnover since firefighters left the area.

Time	Observation	Source
07:10	end of Ponderosa Way is okay, not burning yet	TD-127
07:11–07:20	structures not on fire yet	TD-205
07:20	fire coming into Ponderosa Way from south	TD-127
07:20	stuck along with [ <i>several engines</i> ]; wind howling, branches falling; drove through wind-driven flames	TD-127
07:20	fire blowing across road from west	TD-128
07:20–07:24	drove through serious fire to get to safety of school	TD-202
07:24–08:44	intense fire on north side of school property; high winds pushing fire towards school	TD-205

<b>Topography:</b>	Slight southwest aspect near top of canyon/ravine
<b>Roadway width:</b>	12 m (40 ft)
<b>Vegetation setbacks:</b>	0 m to 3 m (0 ft to 10 ft)
<b>Duration:</b>	n/d
<b>Extent of burnover (length of road affected):</b>	400 m (0.25 mi)
<b>Fire direction across road:</b>	southwest to northeast
<b>Wind intensity:</b>	“wind howling”, “high winds”
<b>Fuels:</b>	brush/trees
<b>Fire behavior:</b>	rapid increase in fire activity due to high winds, wind-driven fire
<b>Related TD:</b>	TD-061, TD-127, TD-128, TD-202, TD-203, TD-205, TD-207
<b>Related streets or keywords:</b>	Compton Dr, Creston Rd, Pine Ridge School

<b>Street-level view:</b>	Ponderosa Way at Compton Dr intersection near Pine Ridge School looking west.
<b>Pre-fire imagery links:</b>	<a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	No imagery available.

### Street map:



### Satellite view:





## 19. Concow Fire Station 37

**Date/Time:** November 9, 07:15

**Location:** Concow Rd, south of Concow, between Nelson Bar Rd and Hwy 70

**Coordinates:** [39.721161, -121.523270]

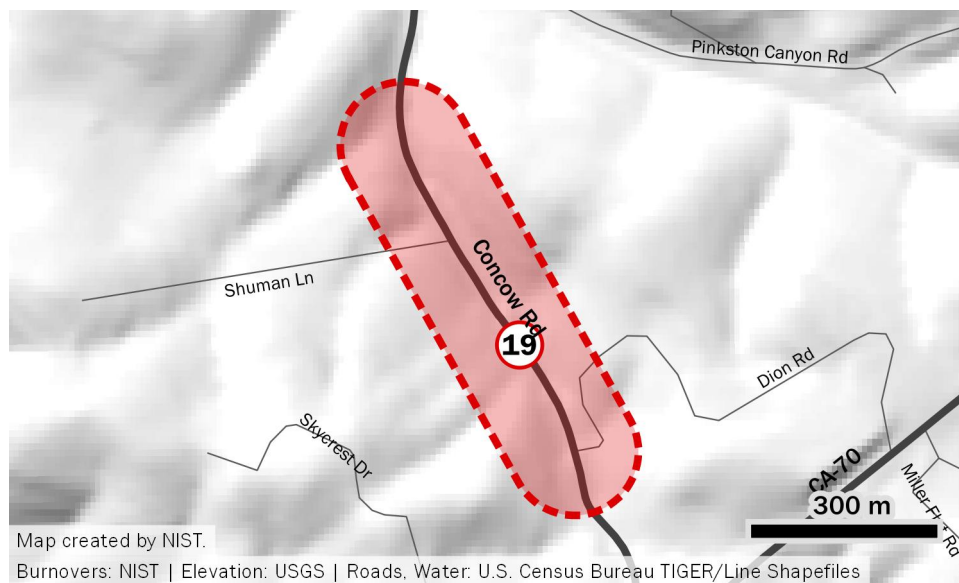
**Related TRA:** n/a

**Summary:** At 06:40 on November 9, fire was blowing southwest across Pinkston Canyon Road towards Concow Road. Firefighters in the area of Fire Station 37 on Concow Road at Shuman Lane were concerned about getting pinched by the fire. Fire was burning on Shuman Lane at around 07:09 but the activity was not intense. However, over the next 10 minutes the wind increased dramatically to 9 m/s to 13 m/s (20 mi/h to 30 mi/h), fire activity quickly intensified, and Station 37 was surrounded by fire. Concow Road became impassable and only part of the strike team was able to drive through fire to Hwy 70. Other engines in the strike team had to turn around and wait for the fire activity to subside. Concow Road remained impassable until at least 07:50. There is insufficient data to determine the temporal extent of this burnover. This burnover is not known to have impacted any civilians.

Time	Observation	Source
06:40–07:20	fire burning across Pinkston Canyon Rd towards Concow Rd; worried about getting pinched [ <i>on Concow Rd</i> ]	TD-140
07:09	Shuman Ln; fire burning in area, but not intense, piles of pine needles and slash debris	TD-137
07:20	fire approaches, wind increases, huge embers, pine needles falling	TD-139
07:20–07:27	wind increases 9 m/s to 13 m/s (20 mi/h to 30 mi/h) and fire intensifies quickly; have to leave area	TD-137
07:20–07:27	visibility drops to zero, told to retreat to pool parking lot [ <i>north on Concow Rd</i> ] but can't make it, roadway blocked by fire	TD-137
07:20–07:27	wind shift; fire starts coming down from west side, then east side; both sides of Concow Rd are burning; firehouse is hit hard	TD-140
07:27–07:48	2 fire engines drive past head toward Hwy 70, but can't make it and come back to wait	TD-137
07:50	drive out through fire across Concow Rd; engine takes slight damage	TD-136
07:50	wait at Concow Rd and Pinksnton Canyon Rd; fire intensity not as severe	TD-137
09:01	station is burned down	TD-137

<b>Topography:</b>	between ridges, up slope on both sides of roadway
<b>Roadway width:</b>	9 m (30 ft)
<b>Vegetation setbacks:</b>	0 m to 3 m (0 ft to 10 ft)
<b>Duration:</b>	n/d
<b>Extent of burnover (length of road affected):</b>	600 m (0.4 mi)
<b>Fire direction across road:</b>	n/d
<b>Wind intensity:</b>	9 m/s to 13 m/s (20 mi/h to 30 mi/h)
<b>Fuels:</b>	brush/trees
<b>Fire behavior:</b>	rapid increase in fire activity during sun rise and shifting winds.
<b>Related TD:</b>	TD-136, TD-137, TD-138, TD-139, TD-140
<b>Related streets or keywords:</b>	Concow Rd, Shuman Ln, Pinkston Canyon Rd, Concow pool
<b>Street-level view:</b>	Concow Rd looking north with fire station on the west side of Concow Rd.
<b>Pre-fire imagery links:</b>	<a href="#">Bing Maps Streetside</a>
<b>Post-fire imagery links:</b>	<a href="#">Google Maps Street View</a>

### Street map:



### Satellite view:



## Appendix C. Community WUI Fire Hazard Evaluation Framework

WUI fire spread has significant impact on communities well beyond the loss of structures, including community evacuation and incident response. Pre-fire planning and hazard mitigation impact how the fire develops, how the life safety of residents and first responders is impacted during evacuations, and the extent of structural and infrastructure losses. There is a need to document pre-fire hazard in a way that assesses the fire impact beyond potential structural losses. Instead of making a recommendation in response to *F23*, this reconstruction study elected to provide the following preliminary framework.

This appendix contains a preliminary Community WUI Fire Hazard Evaluation Framework as a suggested methodology to begin to support communities at risk in the identification of their unique hazards and to provide common metrics for comparisons between communities. This preliminary framework includes information on community size, population, and fuels; on notification and evacuation; and on the community infrastructure and firefighting response potential. Aspects of this framework may already be included in various community-level documents, such as CWPPs or evacuation plans. Development of a standard framework will consolidate relevant WUI fire hazard and planning information in one place and allow for cross-community comparisons.

The evaluation required to implement this framework will support pre-fire hazard assessment and during-fire response operations. An increased understanding of fire-evacuation, fire-structural response, and fire-defensive actions relationships is needed to assess the overall community WUI fire hazard. The quantification of these relationships will enable communities to optimize the community-level response to WUI fire hazards in a more integrated approach and result in increased life safety and reduced losses.

<b>Community WUI Fire Hazard Evaluation Framework</b>		
<b>Community</b>	<b>Data Type</b>	<b>Data Layer in MDS</b>
Community shapefile, geodatabase, or GeoPackage including topography and geographic attributes, and prevailing weather patterns (e.g., wind)	GIS layer	x
<b>Fuels</b>		
Structure Density (structure separation distances - SSD)	SSD histogram	
Age of structures	Histogram	
Vegetative Fuel Loading: - Fuel type - Fuel loading	fuel type tons/acre	
Natural and artificial fuel breaks (including fuel treatments within and around community and year built)	List, GIS layer	x
Community hazards (e.g., hazmat and high fuel load facilities)	Specify, GIS layer	x
Fire History	Frequency of, and most recent, fires in/around community	x
<b>Population</b>		
Population - Density - Permanent/transient ratio	Number, age distribution Number/acre p/t ratio	
<b>Notification</b>		
Reverse 911 - Opt-in or Opt-out - Percent of population enrolled in Reverse 911	Opt-in/Opt-out %	
Sirens or other notification with power backup - Percent of population within siren coverage range	List % population	
Notification dissemination w/out phone or internet	y/n	
<b>Evacuation</b>		
Egress Route Capacity (Minimum Throughput Time)	Time (hours)	
Vulnerability of egress arteries: - Fuel setbacks - Hazmat/high fuel load facilities affecting evacuation - Other	fuel setback data, GIS layer specify, GIS layer	x x x
Hospitals and senior care facilities	specify, number of persons	x
Community evacuation plan	y/n, specify, GIS layer	x
Safety zones and large crowd assembly areas, capacity	y/n, number, GIS layer	x
Evacuation drills	y/n	
Community in evacuation route of other communities, through-flow number	y/n, identify, number	
<b>Infrastructure / COOP / COG</b>		
Location and needs of key facilities	List	x
Public water, dependence on power, generator backup, community owned water	y/n, y/n, y/n, y/n	
Power lines around primary arteries (above ground or below)	above or below	x
Critical infrastructure that requires fuel to keep operating	specify, GIS layer	x
<b>Fire Fighting Response</b>		
Volunteer vs Career (availability of first responder resources at station)	volunteer/career/combination	
Density of firefighting (ff) responder to number of structures (ff/structure ratio)	ff/structures	
Mutual aid response (engines-hours histogram) and agreements with mutual aid	engines-hours histogram	

## ***Primary Community WUI Fire Hazard Evaluation Framework Definitions***

The Community WUI Hazard Evaluation Framework presented here is intended for communities as small as a few hundred to tens of thousands of residents. The methodology is not intended for the documentation of single residences or large cities. It is intended to provide a community with an overview of the overall WUI fire-related hazards and to enable the authority having jurisdiction (AHJ) to compare the relative hazards and preparedness levels of different communities. The information collected can be used by first responders and community and county officials to prioritize hazard mitigation within and around the community and to develop “tabletop” responses to different WUI fire scenarios. In the event of an actual WUI fire, the information collected could be used by first responders and local officials to safely evacuate civilians, to reduce the risk of first responder injuries, and to enhance fire containment. The following are definitions and uses of the different components of the Community WUI Fire Hazard Evaluation Framework. This framework may be expanded to include additional characteristics that are not specifically listed in this preliminary version.

### **Community**

In the sense of WUI fire hazard, the community should be viewed in the context of evacuation arteries rather than jurisdictional boundaries. As such, the community may have parts that are incorporated or unincorporated. Community size is reported in acres, and the community boundary selected for this hazard evaluation can be provided for use in a geographic information system (GIS) layer in a number of formats, including but not limited to shapefile, geodatabase, or GeoPackage. A topographic overview of the area (community) is used to describe the general conditions using one or more of the following key words: flat terrain, rolling hills, moderate slopes, valleys and steep slopes, and/or plateau.

Information about prevailing weather patterns, such as localized winds or significant wind events (strength and direction), should also be included in the community profile.

### **Fuels**

The fuels section is intended to provide an overview of the structural, vegetative, and other fuels present in the community. This is not a parcel-level assessment; however, if defensible space assessment data is available, it can be aggregated and utilized within this framework to provide higher resolution assessment of community fire hazard. Structure density is a simple metric to capture structure-to-structure spacing and provide insight on the potential structure-to-structure fire spread. For uniform communities a representative structure separation distance (SSD) may be sufficient, whereas nonuniform communities will be better described using a histogram of SSD. The age of structures may also be a factor in structure vulnerability due to changes in building codes associated with structure hardening. Similarly, a community that was built over a short period of time can be represented by a single value representing the decade of construction, while a community that grew and expanded over long periods will be better represented by a histogram of structure ages.

A database such as LANDFIRE<sup>25</sup> can provide the vegetative fuel type and fuel loading throughout the community. This data will be limited by the age of the last LANDFIRE overflight and the 30 m pixel spatial resolution.

Natural and artificial fuel breaks, including fuel treatments within and around the community, should be represented in a geospatial format and should include the year the vegetative fuel treatment was conducted. Fuel treatments should also include any logging activities in the area surrounding the community. Fire history in and around the community will describe the last time the community experienced direct impacts from fire. Shapefiles of the fuel treatments and fire history will allow for spatial documentation of this data. Fuel treatments and fire history should be documented at least 16 km (10 mi) out from the edge of the community. Local conditions (e.g., fuel, topography, weather, evacuation routes) may require documentation well beyond 16 km (10 mi). The last large fire in the area of the community perimeter, together with the vegetative fuel loading, will provide information on the potential energy content of the vegetative fuels in the event of a short- or long-term drought.

The documentation of other community hazards such as hazmat or high fuel load facilities (e.g., fixed propane tanks, hazardous material storage and use facilities, ammunition facilities, lumber yards, pallet storage, tire storage) is important as they can affect civilians and first responder safety during evacuations, fire containment, and mop-up activities. The information should be provided in the form of a GIS layer and may then be used by first responders to develop “tabletop” responses for emergency preparedness, and to direct response actions during a WUI fire event.

### **Population**

The population of the selected community will impact, among other factors, the minimum time required for evacuation. Population and population density, expressed as the number of residents per acre, are both important metrics that provide information that can be used for evacuation assessment. The permanent to transient population density ratio is intended to capture the fraction of the community that may be visiting for tourism and may not be aware of community evacuation and other fire related activities.

### **Notification**

The notification section of the Community WUI Hazard Evaluation is designed to capture the presence and type of mass-notification tools available to emergency managers. It should be noted that reliance on individual notification methods may result in limited notifications. If a Reverse 911 system is in place, the percentage of the community that will potentially receive the notifications from this system will estimate the number of residents that may require different notification(s). Sirens or other fixed notification systems with power backup should also be listed in this section along with the fraction of the population covered by these systems. Additional notification systems that don’t require phone or internet are also captured in this section, since WUI events frequently result in power outages or other service interruptions.

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<sup>25</sup> [www.landfire.gov](http://www.landfire.gov)

## Evacuation

This section of the Community WUI Hazard Evaluation is not intended to replace a full community evacuation study or act as a community evacuation plan. The primary purpose of this section is to compute, given a number of assumptions, a Minimum Throughput Time (MTT), to provide an initial idealized order of magnitude time to be considered in the early stages of evacuation pre-planning. This information can be of value to first responders and community emergency planning personnel, as it may potentially highlight critical evacuation bottlenecks inside or outside the community.

The MTT concept is a traffic engineering calculation of roadway capacity to provide an initial lower bound for planning community evacuation. The MTT is intended for isolated and partly isolated interface and intermix communities rather than a city setting with large populations and complex evacuation routes. A community should consider a detailed evacuation study to further enhance the community evacuation plan. There is a significant body of work associated with developing dynamic evacuation models.<sup>26</sup>

The MTT considers two significant factors: bottlenecks within and beyond town, and the total number of vehicles that must be accommodated. Bottlenecks slowing traffic throughput may be located within or outside of jurisdictional boundaries. Bottlenecks occurring well beyond the evacuating community may cause ripple effects significantly impacting community evacuation. In identifying the population for computing the MTT, consideration should be given to neighboring settlements/communities that may share the same evacuation route(s). The MTT should consider the minimum number of traffic lanes (i.e., 8 lanes merging into 2 lanes should be treated as 2 lanes) available for evacuation, the community population, and the average speed limit of the egress routes. Contraflow, the implementation of reverse direction traffic flow, may be considered here, along with provisions for first responder access to the community. The computed Minimum Throughput Time (MTT) does not account for any of the numerous potential hinderances to evacuation traffic, such as road accidents, reduced speed due to smoke obscuration, merging of traffic in town to feed the primary arteries, large vehicles that occupy more space than cars and have reduced maneuverability, or fire activity impacts, such as burnovers, causing evacuation lane(s) closures and potential slowdowns associated with traffic redirections.

The evacuation section is also used to identify vulnerabilities of egress arteries including vegetative fuel setbacks as well as any hazardous material facilities which might affect evacuation. Fuel setback information, collected in 0.25 km (0.15 mi) increments along egress routes, presented in the form of a histogram and a GIS layer, could help identify vulnerable spots that may potentially impact evacuation and identify candidate locations for fuel treatments.

The presence of a Community Evacuation Plan, the presence and capacity of safety zones and other large crowd assembly areas, and whether or not evacuation drills are performed will contribute to the community evacuation preparedness overview. The number of hospitals

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<sup>26</sup> An example of a framework which includes coupled fire and evacuation considerations, as well as background on the individual model components, is provided in Ronchi et al. (2019) "An open multi-physics framework for modelling WUI fire evacuations," *Safety Science* 118:868-880.



and senior care facilities and their total capacity will provide further information to assess overall community evacuation needs.

### **Infrastructure / COOP / COG**

The locations and needs of key facilities for maintaining continuity of operations (COOP) and continuity of government (COG), such as police, fire, EMS, hospitals, government buildings, cell towers, water sources, water provider infrastructure, electrical utility key infrastructure, and natural gas key infrastructure should be listed and incorporated in this part of the evaluation framework.

Infrastructure characteristics, particularly related to water supply and electric utilities, can impact response and potential pre-fire hazard reduction. The public water system dependence on power supply, including the availability of backup power sources (i.e., generator backup) will provide insight into the resilience of the water system. The location of power lines (i.e., above or below ground) can impact evacuation, as downed power lines can impact evacuation and mobility throughout the community.

### **Fire Fighting Response**

The type of fire department, whether volunteer, career, or combined, may impact the likely availability and response time of first responder resources. The density of firefighting (ff) responders, as a ratio of the number of personnel on shift to the number of structures (number of ffs/number of structures) will provide information on the maximum possible coverage by the local resources.

In this section, mutual aid resources should be counted only if mutual aid agreements are in place and can ensure rapid deployment. Mutual aid response is captured through a histogram in 1-, 2-, 3-, and 4-hour travel times. This may also be approximated using a geographic radius of distance from the community. The purpose of this information is to provide insight into the minimum response times by mutual aid.

## **Appendix D. National Weather Service Presentation**

The following presentation materials on the weather conditions during the Camp Fire were provided by Incident Meteorologist (IMET) Trainee Aviva Braun from the National Weather Service.

# Antecedent Conditions and Support Services on the Camp Fire: *An Incident Meteorologist's Perspective*

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Aviva Braun

January 23, 2019



# Outline



1. What does the National Weather Service look like?
2. Decision Support Services across NWS
3. The Incident Meteorologist program
4. The Camp Fire
  1. Dangerous antecedent conditions
    1. Drought, fuels, and topography
    2. A Red Flag Warning
    3. Weather conditions during the incident



The graphic features a dark blue header with the National Weather Service logo on the left and the Department of the Interior logo on the right. The main title "National Weather Service" is centered in white. Below the header, a collage of four images shows meteorologists working in a control room. A yellow banner across the middle reads "Meteorologists on site 24-hours a day / 365 days a year". The bottom section shows two meteorologists from behind, looking at multiple computer monitors displaying weather maps. The footer includes the WPN logo, the slogan "National Weather Service – Building a Weather-Ready Nation", and social media icons for Facebook, Twitter, and YouTube.

# National Weather Service

Meteorologists on site 24-hours a day / 365 days a year

National Weather Service – Building a Weather-Ready Nation

WPN

Facebook Twitter YouTube



# Decision Support Services



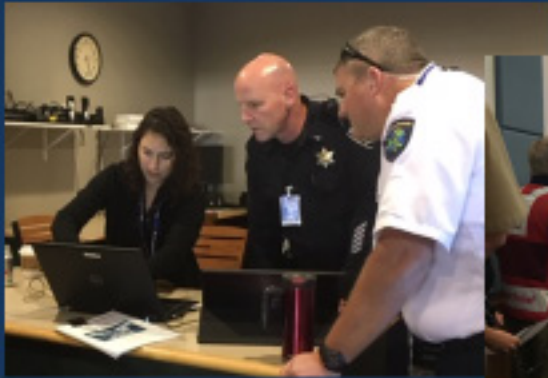
**NWS employees can be found at events and incidents across the nation, supporting local partners everywhere.**

- University Football Games and Superbowls
- Working in the State EOCs for a significant weather event – river flooding, hurricane landfall, and tornado outbreaks
- Deepwater Horizon Oil Spill
- State fairs
- Salt Lake City Olympics
- Large concerts
- Local exercises in preparation for events and to build relationships: local fire partners, Homeland Security, National Guard, State Emergency Management.





# NWS Meteorologists in Action





# The Incident Meteorologist



## An IMET is a rare bird

### *How Rare?*

There is **1 IMET** for ever **3,900 firefighters** in the US

**Less than 2%** of NWS employees are IMETs

**Only 250 people** have taken up the duty of being an IMET in it's 100 year history



National Weather Service – Building a Weather-Ready Nation







# Local Topography

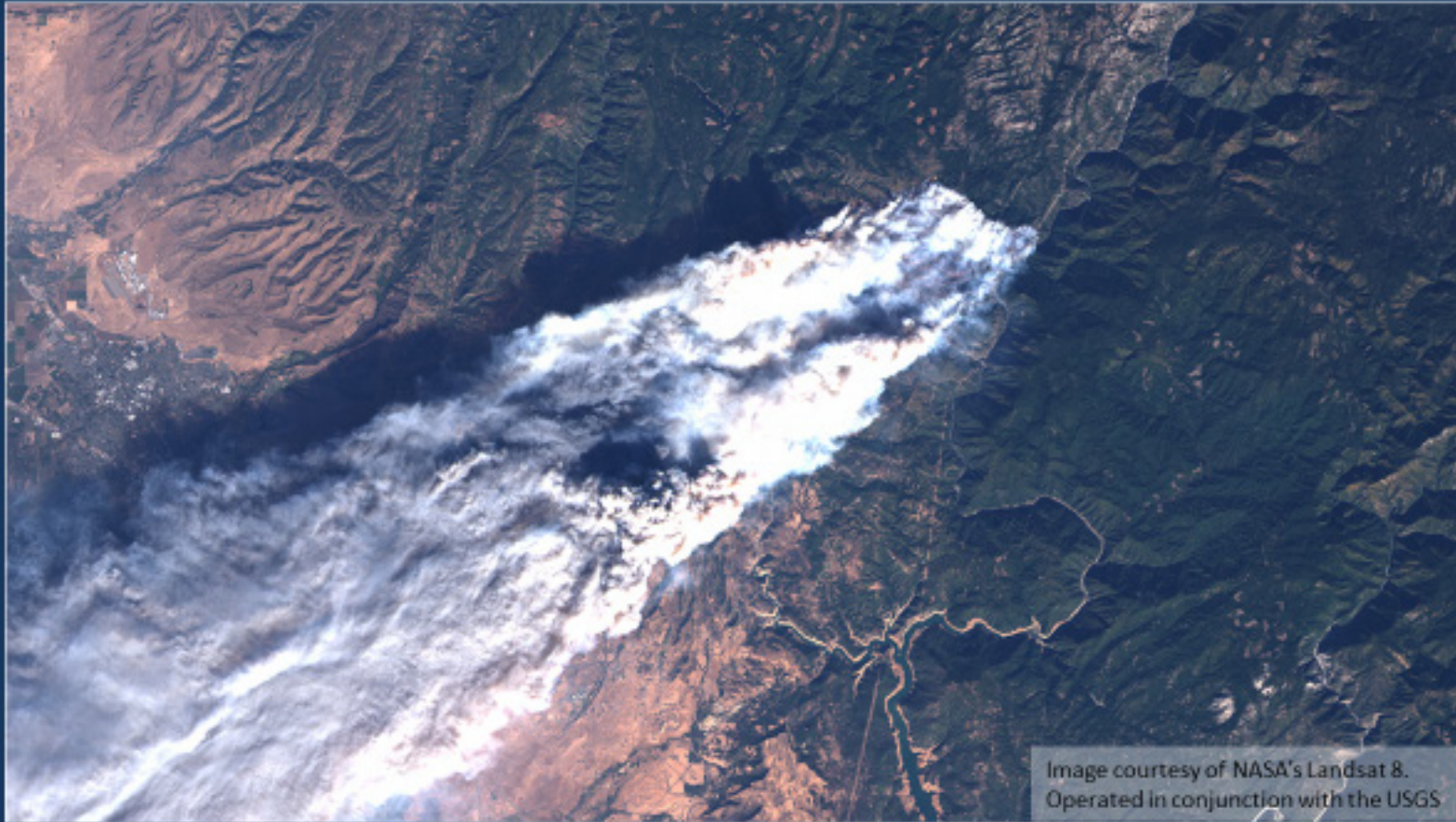


Image courtesy of NASA's Landsat 8.  
Operated in conjunction with the USGS

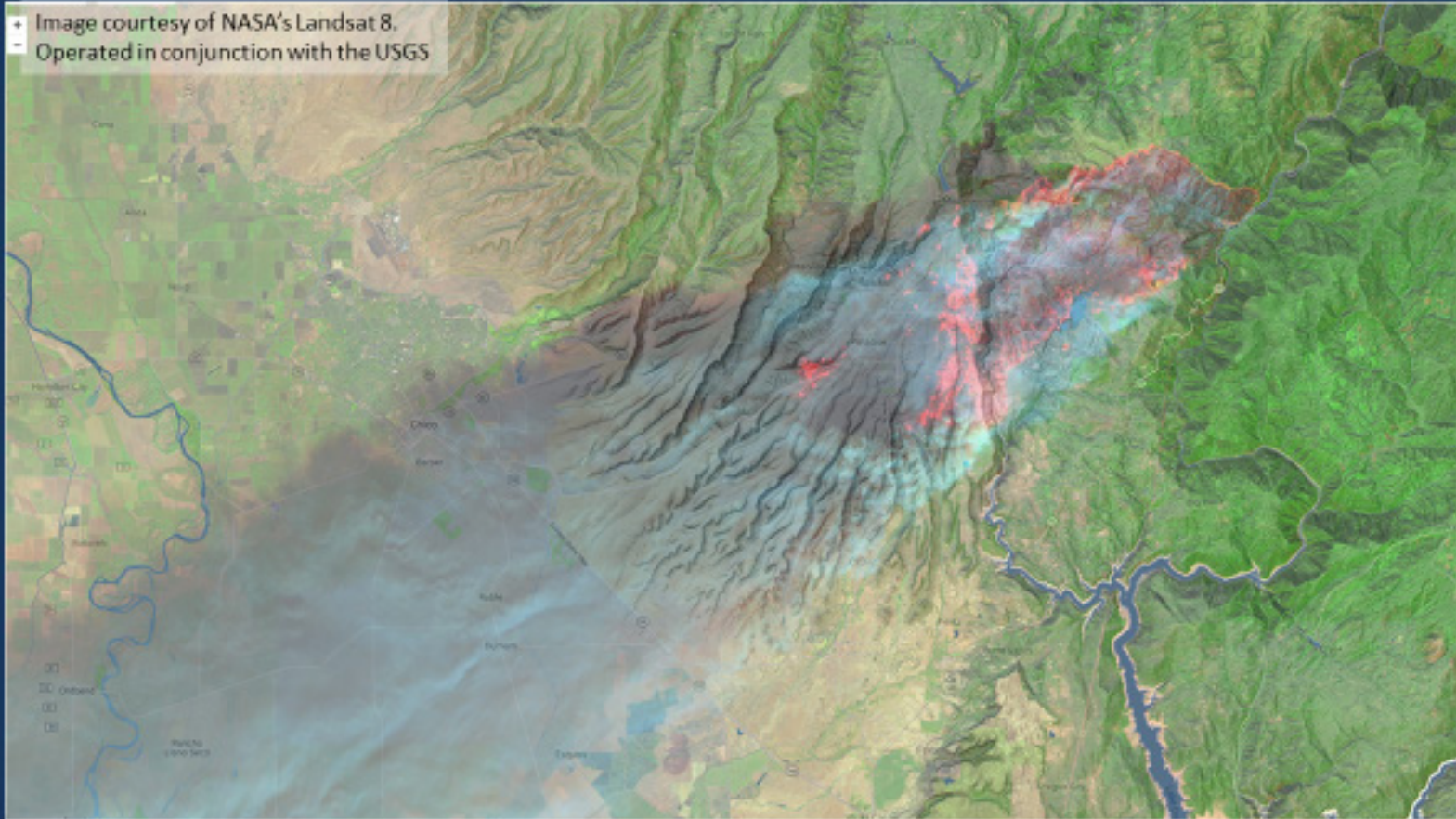




# Local Topography and Hotspots



Image courtesy of NASA's Landsat 8.  
Operated in conjunction with the USGS



National Weather Service – Building a Weather-Ready Nation



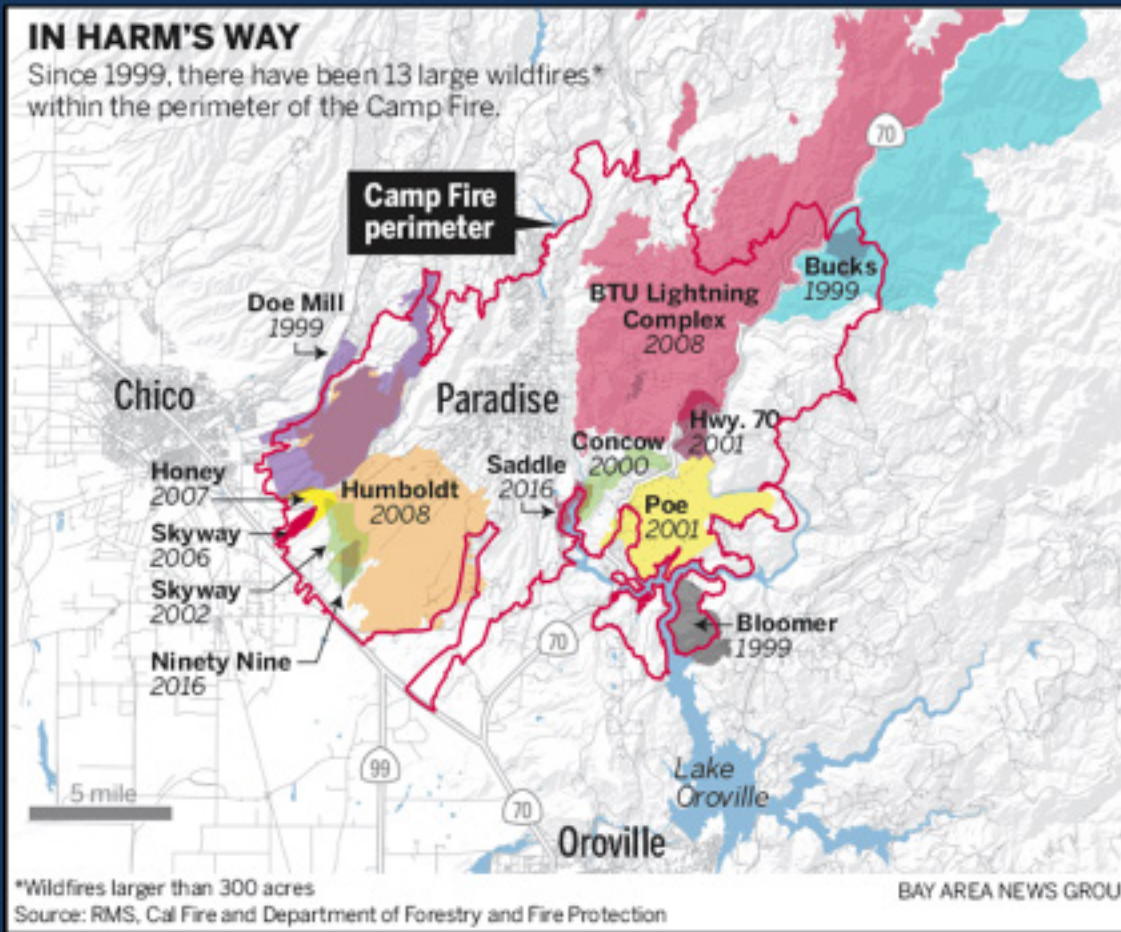


# Fire History



## IN HARM'S WAY

Since 1999, there have been 13 large wildfires\* within the perimeter of the Camp Fire.

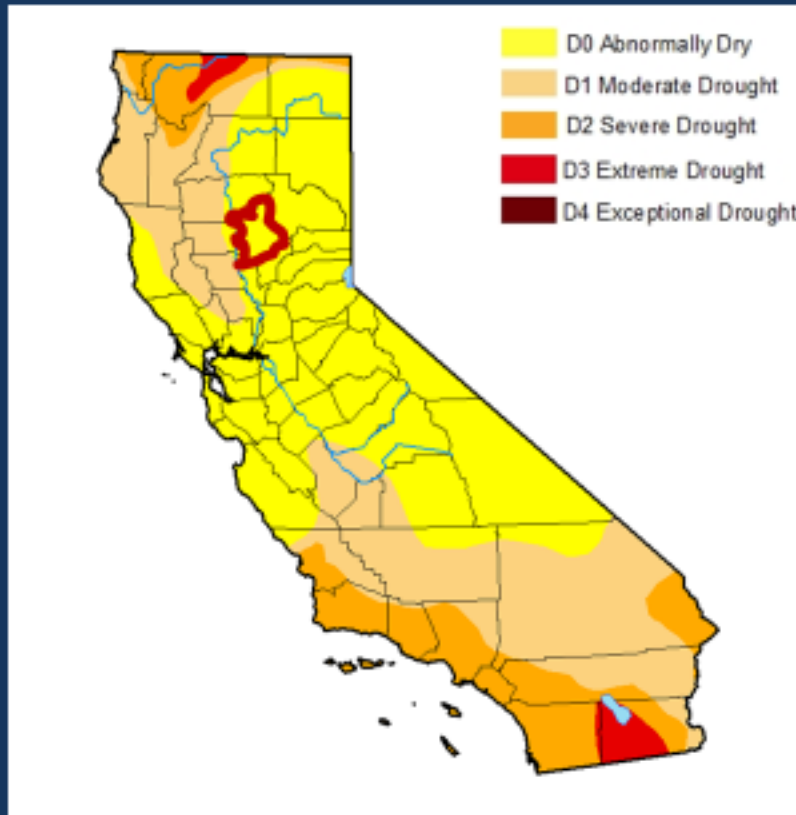


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# Drought Conditions



US Drought Monitor for California on  
November 6, 2018:

Butte County  
**Abnormally  
Dry**

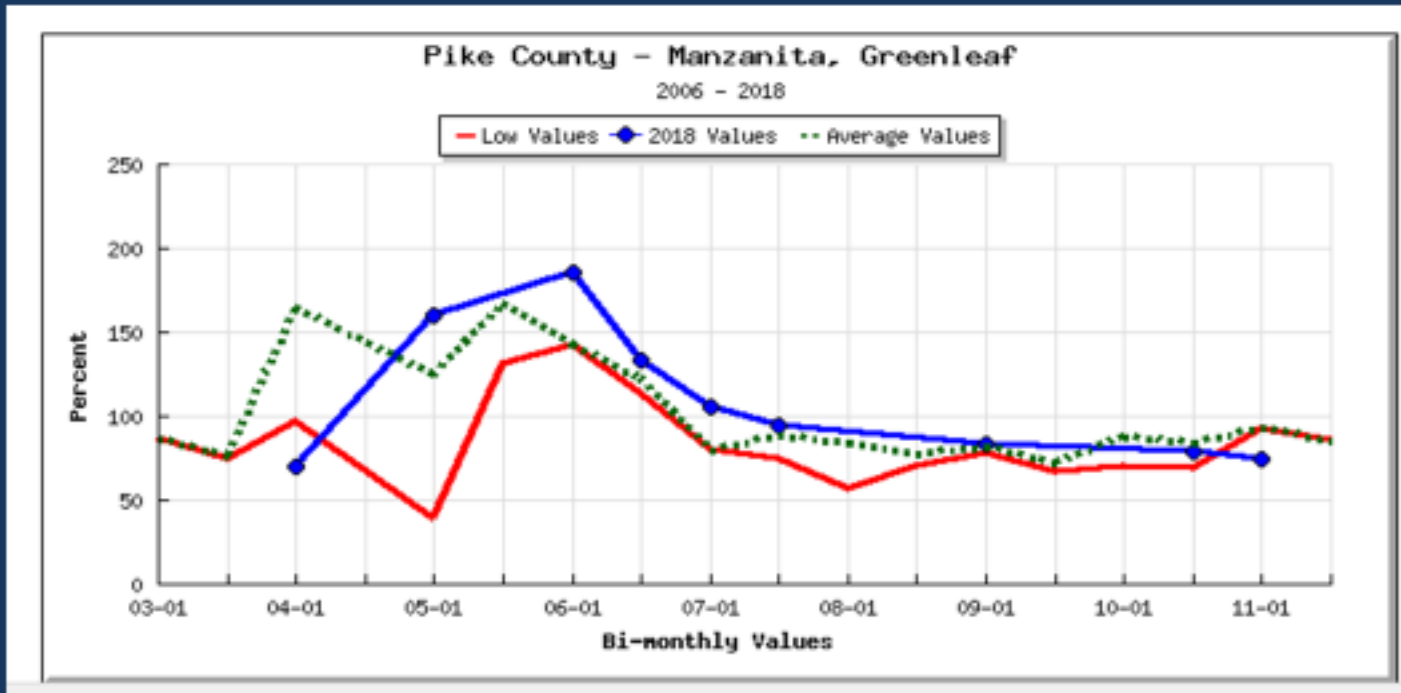


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# The Fuels



Average for November is:

**93%**

Critical level for Manzanita is:

**80%**

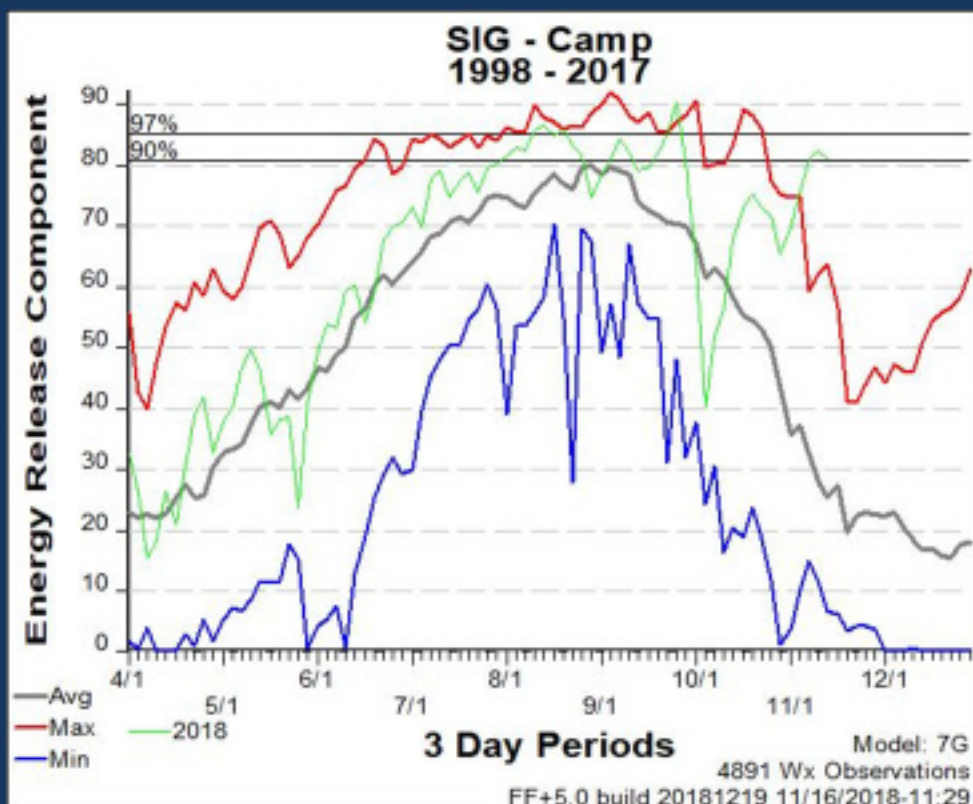
Live fuel moisture in Manzanita was:

**74%**





# The Energy Release Component



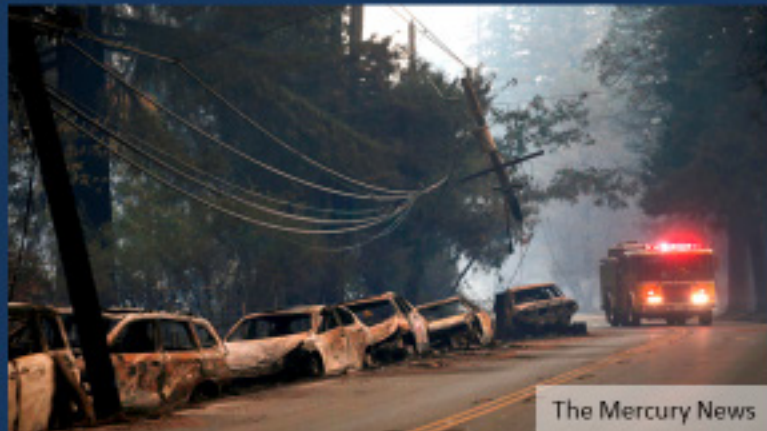
The Energy Release Component (ERC) of the National Fire Danger Rating System is a measure of *fuel dryness* and *flammability*.

The ERC was trending slightly above average all summer for the Northern Sierras, but in October it began trending well above average, and continued through to the day of the fire when it was above the historic record for the date and near the 90<sup>th</sup> percentile for all dates.





# A Structure Fire





# Jarbo Gap RAWS – The Day Before

A Red Flag Warning was issued on Wednesday night that would last through Friday morning. Wind gusts to 45 mph were predicted.

**Weather Conditions for JBG01**  
 Observations Prior to: 11/07/2018 22:00 PST  
 Weather Conditions at: 11/07/2018 22:15 PST

Geophysical Link	11:35	Max Since 06:00 PST	Min Since 06:00 PST	24 Hour Maximum	24 Hour Minimum
2.0m Temperature	56.0° F	69.0 at 14:13	46.0 at 6:13	69.0 at 14:13	46.0 at 6:13
2.0m Dew Point	9.0° F	23.5 at 17:13	9.0 at 21:13	23.5 at 17:13	9.0 at 21:13
2.0m Wet bulb temperature	38.7° F	47.2 at 14:13	33.6 at 6:13	47.2 at 14:13	33.6 at 6:13
2.0m Relative Humidity	15%	27 at 18:13	15 at 21:13	27 at 18:13	15 at 21:13
6.1m Wind Speed	25.0 mph	25.0 at 21:13	0.0 at 17:13	25.0 at 21:13	0.0 at 17:13
6.1m Wind Gust	43.0 mph	43.0 at 21:13	4.0 at 18:13	43.0 at 21:13	4.0 at 18:13
6.1m Wind Direction	NE	-	-	-	-
Solar Radiation	0.0 W/m <sup>2</sup> m	556.0 at 12:13	0.0 at 21:13	556.0 at 12:13	0.0 at 21:13
Fuel Temperature	54.0° F	78.0 at 14:13	44.0 at 6:13	78.0 at 14:13	44.0 at 6:13
Fuel Moisture	5 gm	5 at 21:13	4 at 3:13	5 at 21:13	4 at 3:13
Battery voltage	12.90 volt	14.00 at 9:13	12.70 at 6:13	14.00 at 9:13	12.70 at 6:13

\*Note: Observations above in yellow indicate that they are older than the last row of observations below.

Tabular Listing of 25 Observations from 11/06/2018 21:13:00 to 11/07/2018 22:15:00

Time (PST)	2.0m Temperature	2.0m Dew Point	2.0m Wet bulb temperature	2.0m Relative Humidity	6.1m Wind Speed	6.1m Wind Gust	6.1m Wind Direction	Solar Radiation	Fuel Temperature	Fuel Moisture	Pre-ignition acceleration	Battery Voltage	Quality Control
21:13	56.0	9.0	38.7	15	25.0	43.0	NE	0.0	54.0	5	0.70	12.90	OK
20:13	56.0	9.0	38.7	15	18.0	28.0	NE	0.0	54.0	5	0.70	13.00	OK
19:13	56.0	15.5	39.9	20	14.0	21.0	NE	0.0	53.0	5	0.70	13.00	OK
18:13	56.0	22.5	41.5	27	3.0	4.0	NE	0.0	49.0	5	0.70	13.10	OK
17:13	58.0	23.3	42.7	26	0.0	5.0		11.0	52.0	5	0.70	13.30	OK
16:13	62.0	21.6	44.2	21	4.0	7.0	SW	89.0	60.0	5	0.70	13.50	OK
15:13	64.0	20.9	44.9	19	4.0	6.0	WSW	242.0	63.0	5	0.70	13.60	OK
14:13	69.0	20.9	47.2				W	433.0	78.0	5	0.70	13.60	OK
13:13	66.0	18.5	45.3	16	3.0	6.0	SW	433.0	68.0	5	0.70	13.60	OK
12:13	65.0	16.2	44.4	15	2.0	9.0	NE	556.0	72.0	5	0.70	13.60	OK
11:13	59.0	14.3	41.2	17	6.0	10.0	NE	522.0	63.0	5	0.70	13.90	OK
10:13	55.0	13.5	39.0	19	8.0	16.0	NE	430.0	60.0	5	0.70	13.60	OK
9:13	52.0	13.3	37.4	21	10.0	16.0	NE	190.0	54.0	5	0.70	14.00	OK
8:13	48.0	12.0	35.0	23	9.0	17.0	NE	23.0	48.0	5	0.70	13.40	OK
7:13	47.0	11.3	34.3	23	11.0	16.0	NE	6.0	45.0	5	0.70	12.80	OK
6:13	46.0	10.3	33.6	23	10.0	17.0	NE	0.0	44.0	5	0.70	12.70	OK
5:13	48.0	11.0	34.8	22	11.0	19.0	NE	0.0	46.0	5	0.70	12.70	OK
4:13	49.0	10.8	35.4	21	11.0	20.0	NE	0.0	47.0	5	0.70	12.80	OK
3:13	49.0	9.7	35.2	20	10.0	19.0	NE	0.0	47.0	4	0.70	12.80	OK
2:13	50.0	10.5	35.8	20	10.0	19.0	NE	0.0	48.0	5	0.70	12.80	OK
1:13	50.0	10.5	35.8	20	10.0	19.0	NE	0.0	48.0	5	0.70	12.90	OK
0:13	52.0	11.0	37.0	19	9.0	18.0	NE	0.0	49.0	5	0.70	12.90	OK
23:13	53.0	11.9	37.7	19	10.0	20.0	NE	0.0	50.0	5	0.70	12.90	OK
22:13	54.0	12.7	38.3	19	8.0	17.0	NE	0.0	51.0	4	0.70	12.90	OK
21:13	54.0	13.9	38.6	20	8.0	14.0	NE	0.0	52.0	4	0.70	12.90	OK







# Jarbo Gap RAWS – The Day Of



## Weather Conditions for JBGCI

Observations Prior to: 11/09/2018 06:00 PST

Tabular Listing of 25 Observations from 11/08/2018 5:13 PST to 11/09/2018 5:13 PST:

Time (PST)	1.5m Temperature °F	1.5m Dew Point °F	1.5m Wet bulb temperature °F	2.5m Relative Humidity %	6.1m Wind Speed mph	6.1m Wind Gust mph	6.1m Wind Direction	Solar Radiation W/m <sup>2</sup>	Fuel Temperature °F	Fuel Moisture gm	Precipitation accumulated in	Battery voltage volt	Quality Control
5:13	50.0	6.9	35.2	17	29.0	45.0	NE	0.0	49.0	4	0.70	12.80	Caution
4:13	50.0	6.9	35.2	17	28.0	47.0	NE	0.0	49.0	4	0.70	12.80	OK
3:13	51.0	6.4	35.7	16	28.0	41.0	NE	0.0	50.0	4	0.70	12.80	OK
2:13	52.0	5.8	36.1	15	27.0	48.0	NE	0.0	51.0	4	0.70	12.80	OK
1:13	52.0	5.8	36.1	15	28.0	45.0	NE	0.0	51.0	4	0.70	12.90	OK
0:13	52.0	4.3	35.9	14	25.0	48.0	NE	0.0	51.0	4	0.70	12.90	OK
23:13	53.0	5.1	36.6	14	27.0	43.0	NE	0.0	51.0	4	0.70	12.90	OK
22:13	53.0	5.1	36.6	14	22.0	39.0	NNE	0.0	51.0	4	0.70	12.90	OK
21:13	54.0	4.3	37.0	13	22.0	36.0	NE	0.0	52.0	5	0.70	13.00	OK
20:13	55.0	3.4	37.4	12	19.0	34.0	NNE	0.0	52.0	5	0.70	13.00	OK
19:13	56.0	4.1	38.0	12	18.0	30.0	NNE	0.0	53.0	5	0.70	13.00	OK
18:13	57.0	4.9	38.6	12	15.0	27.0	NNE	0.0	54.0	5	0.70	13.10	OK
17:13	58.0	3.8	39.0	11	13.0	23.0	NNE	9.0	55.0	5	0.70	13.30	OK
16:13	60.0	7.3	40.5	12	8.0	25.0	NE	87.0	58.0	5	0.70	13.50	OK
15:13	61.0	8.0	41.1	12	10.0	28.0	NE	254.0	60.0	5	0.70	13.70	OK
14:13	63.0	7.7	42.0	11	15.0	24.0	NE	434.0	67.0	5	0.70	14.40	OK
13:13	61.0	8.0	41.1	12	12.0	32.0	NE	473.0	63.0	5	0.70	13.50	OK
12:13	60.0	9.0	40.8	13	16.0	33.0	NNE	556.0	64.0	5	0.70	13.60	OK
11:13	58.0	9.1	39.8	14	14.0	29.0	NNE	525.0	61.0	5	0.70	13.80	OK
10:13	55.0	9.7	38.3	16	18.0	30.0	NE	434.0	58.0	5	0.70	13.70	OK
9:13	53.0	9.4	37.2	17	14.0	21.0	NNE	152.0	55.0	5	0.70	13.70	OK
8:13	51.0	9.0	36.1	18	6.0	25.0	NNE	52.0	51.0	5	0.70	13.90	OK
7:13	47.0	10.0	33.4	21	14.0	28.0	NNE	7.0	46.0	5	0.70	12.80	OK
6:13	48.0	12.0	35.0	23	18.0	40.0	NNE	0.0	46.0	5	0.70	12.70	OK
5:13	48.0	12.0	35.0	23	28.0	51.0	NE	0.0	47.0	5	0.70	12.80	OK





# Jarbo Gap RAWS – Burned Over



## Weather Conditions for JBGCI Observations Prior to: 11/10/2018 04:00 PST

Tabular Listing of 25 Observations from 11/09/2018 3:13 PST to 11/10/2018 3:13 PST:

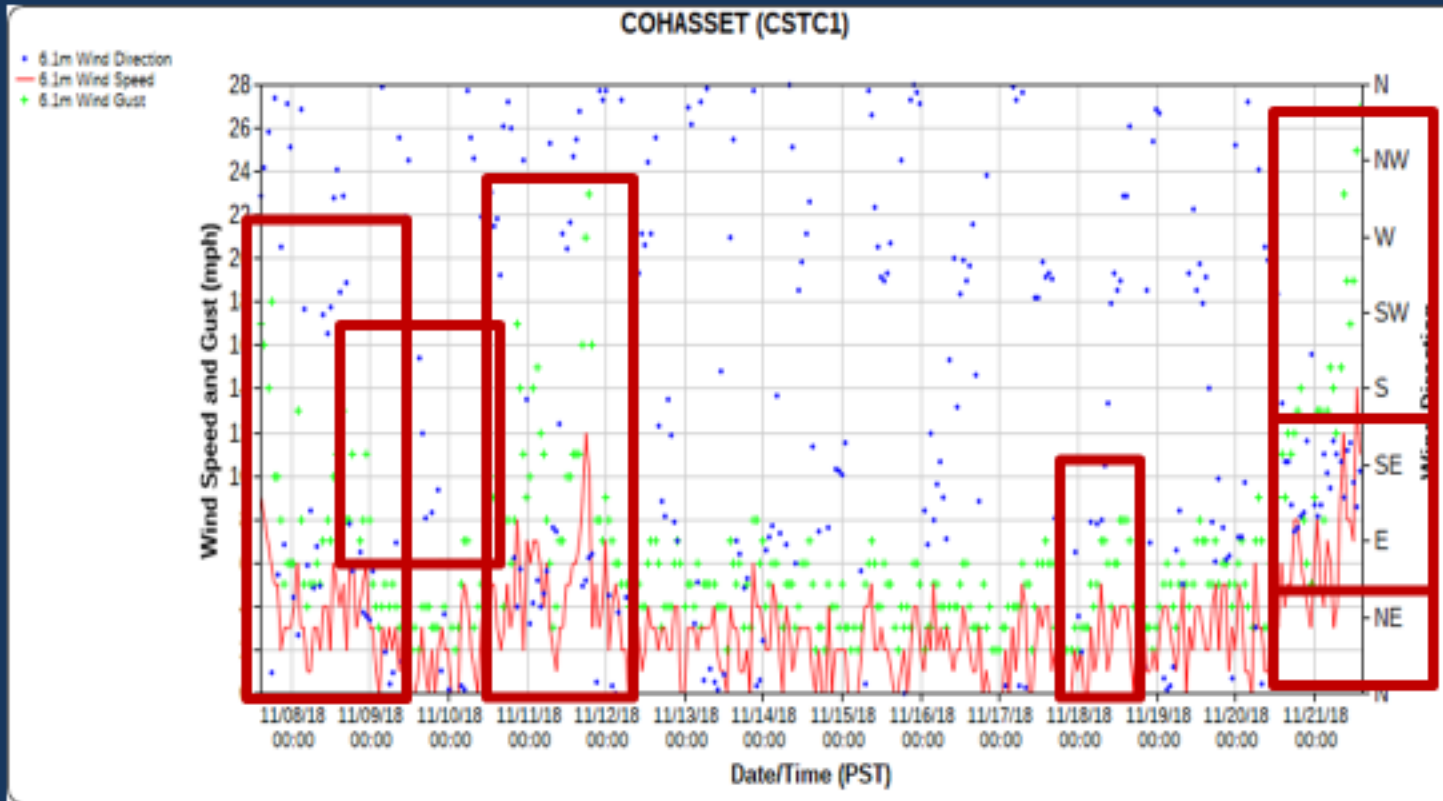
Time (PST)	1.0m Temperature °F	2.0m Dew Point °F	2.0m Wet bulb temperature °F	2.0m Relative Humidity %	6.0m Wind Speed mph	6.0m Wind Gust mph	6.0m Wind Direction	Solar Radiation W/m <sup>2</sup>	Feel Temperature °F	Feel Moisture gm	Precipitation accumulated in	Battery voltage volt	Quality Control
3:13	46.0	14.7	34.5	28	6.0	10.0	E	0.0	45.0	5	0.70	12.80	OK
2:13	47.0	14.8	35.1	27	6.0	11.0	E	0.0	46.0	5	0.70	12.80	OK
1:13	49.0	15.6	36.3	26	5.0	10.0	E	0.0	47.0	5	0.70	12.80	OK
0:13	49.0	15.6	36.3	26	5.0	9.0	ESE	0.0	48.0	5	0.70	12.90	OK
23:13	50.0	15.6	36.8	25	4.0	11.0	ESE	0.0	49.0	5	0.70	12.90	OK
22:13	51.0	17.3	37.8	26	3.0	7.0	ESE	0.0	49.0	5	0.70	12.90	OK
21:13	52.0	19.1	38.7	27	3.0	5.0	E	0.0	50.0	5	0.70	12.90	OK
20:13	54.0	19.0	39.7	25	3.0	4.0	E	0.0	52.0	5	0.70	12.90	OK
19:13	55.0	21.6	40.8	27	2.0	3.0	E	0.0	53.0	5	0.70	13.00	OK
18:13	57.0	13.9	40.1	18	0.0	2.0		0.0	53.0	5	0.70	13.10	OK
17:13	58.0	12.1	40.3	16	2.0	4.0	WSW	6.0	55.0	5	0.70	13.20	OK
16:13	59.0	9.9	40.4	14	2.0	4.0	SW	23.0	57.0	5	0.70	13.30	OK
15:13	60.0	10.7	41.0	14	3.0	6.0	WSW	65.0	59.0	5	0.70	13.60	OK
14:13	62.0	12.3	42.3	14	4.0	10.0	E	72.0	62.0	5	0.70	14.00	OK
13:13	61.0	11.5	41.6	14	6.0	12.0	E	102.0	61.0	5	0.70	13.60	OK
12:13	60.0	12.2	41.3	15	6.0	15.0	E	80.0	62.0	5	0.70	14.20	Caution
11:13	57.0	11.3	39.6	16	7.0	17.0	E	35.0	58.0	5	0.70	13.30	Caution
10:13	57.0	11.3	39.6	16	10.0	21.0	E	143.0	58.0	6	0.70	13.60	Caution
9:13	58.0	13.5	40.5	17	13.0	27.0	E	50.0	61.0	6	0.70	13.80	Caution
8:13	83.0	18.4	52.5	9	18.0	72.0	E	52.0	105.0	5	0.70	13.00	Caution
7:13	49.0	8.6	35.0	19	28.0	46.0	NE	12.0	48.0	4	0.70	12.90	Caution
6:13	49.0	7.4	34.8	18	30.0	46.0	NE	0.0	48.0	4	0.70	12.70	Caution
5:13	50.0	6.9	35.2	17	29.0	45.0	NE	0.0	49.0	4	0.70	12.80	Caution
4:13	50.0	6.9	35.2	17	28.0	45.0	NE	0.0	49.0	4	0.70	12.80	OK
3:13	51.0	6.4	35.7	16	28.0	41.0	NE	0.0	50.0	4	0.70	12.80	OK

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# The next few days





# Thank you!



Camp Fire Press Conference



Interview with the local NBC affiliate



Collaboration between IMETs, ARAs, FBAN, and Plans



Morning Pre-Ops Briefing

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National Weather Service – Building a Weather-Ready Nation



## Appendix E. Identified Successes and Future Improvements to Data Collection and Analysis Methods

### *Data Collection Successes:*

1. Rapid deployment and initiation of data collection ensured the collection of uncontaminated data (before repopulation) and enabled the completion of the technical discussions (TDs) with first responders before the onset of the next fire season.
2. Perishable data, including AVL and PPD dashboard camera recordings, provided essential details to enable the timeline reconstruction.

### *Recommendations Related to Picture Sharing during Technical Discussions:*

1. Record picture time and relevant attributes during the TDs to enable the use of the data even if the picture is not ultimately shared.
2. Obtain a letter of support from the fire chief giving permission to first responders to share images during the TDs.
3. Collect pictures/videos during the TDs, since success in obtaining the footage after the TDs was limited.
4. Confirm the capability to receive pictures and video from both Android and Apple devices during TDs.

### *Recommendations for Future Data Collection:*

1. Collect badge numbers/identifiers for law enforcement to facilitate connecting TDs to radio log data.
2. Utilize a 360° camera for post-fire drive-through. Conduct scene drive-through as soon as it is safe and does not interfere with firefighting operations.
3. Collect data from electric utility, communication, and alarm companies. Data from digital doorbells, if they can be obtained, would also be useful. Remote weather stations could help to quantify fire spread.
4. Mine social media early. Extensive photos and videos available from social media can be a valuable supplement to technical discussions, and deeper searching of this information may extend the reach of data collection.
5. Deploy experienced scribes with WUI fire backgrounds, including incident-specific backgrounds such as participation in preliminary reconnaissance. This would provide continuity for notetaking and database integration.
6. If incident size allows, collect DINS pictures of undamaged structures.

## Appendix F. Fire Spread Data

This appendix contains a line list of all fire observation data points collected in this study.<sup>27</sup> To aid the reader, data is divided into 15 focus regions, as indicated in **Figure 23**. Each region has been sorted by the time of observation. The regions are ordered in the general fire progression sequence. Column titles are defined and described in Section 7.4.1 and **Table 6**.

Concow .....	see page 257
Pentz Road .....	see page 263
Feather River Hospital .....	see page 280
Wagstaff Road .....	see page 285
Bille Road .....	see page 289
Elliott Road and Nunneley Road .....	see page 293
Pearson Road and Buschmann Road .....	see page 299
Clark Road .....	see page 308
Skyway.....	see page 324
Neal Road .....	see page 340
Butte Creek Canyon .....	see page 345
Valley View Drive .....	see page 347
Foothills .....	see page 349
Nelson Bar Road .....	see page 353
Magalia and Coutolenc Road .....	see page 358

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<sup>27</sup> Some data points appear to be duplicates. This occurs when similar observations were made by different sources and/or multiple photographs were taken at the same time or in quick succession.

Concow												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
911-001-1	11/8	06:25	911-001-1	0	39.814610	-121.434004	Origin	911-001-1	fire under transmission lines within 6 m (20 ft) of tower, estimated size 30 m × 30 m (100 ft × 100 ft).	V		
911-002-1	11/8	06:31	911-002-1	0	39.814610	-121.434004	Origin	911-002-1	wildfire in the Feather River Canyon area, Hwy 70 above Poe Dam	V		
911-004-1	11/8	06:39	911-004-1	0	39.814610	-121.434004	Origin	911-004-1	spot fire started on Hwy 70 near Pulga Caltrans yard	V		
TD-028	11/8	06:44	Radio Log	0	39.814610	-121.434004	Origin	TD	initial report of conditions	V		
VTD-28	11/8	06:45	Photo	0	39.807822	-121.482963	Photo	Photo	second power line ignition determined near intersection of Rim Rd and Concow Rd	V		
TD-029	11/8	06:46	AVL	976	39.803302	-121.449305	AVL	TD	fire threatening structures	V		
TD-028	11/8	06:47	Photo	0	39.814328	-121.434041	Photo	Photo	Initial view of fire	V		
TD-005	11/8	06:47	Photo	0	39.812603	-121.434844	Photo	Photo	first view of fire; well established spot fire, 30 m (100 ft) smoke plume	V		
TD-028	11/8	06:58	AVL	14	39.806103	-121.451330	Inferred	TD	fire already in and above Pulga	V		
911-006-1	11/8	07:03	911-006-1	0	39.807822	-121.482963	VTD-28	911-006-1	fire up slope from Concow Rd	V		
911-009-1	11/8	07:05	911-009-1	0	39.807822	-121.482963	VTD-28	911-009-1	"can see fire on the mountain from my house, looking north"	V		
TD-028	11/8	07:10	Radio Log	0	39.807060	-121.456750	Inferred	TD	80 ha to 120 ha (200 ac to 300 ac), rapid rate of spread	V		
TD-028	11/8	07:15	TD	0	39.807060	-121.456750	TD	TD	fire really got established in Flea Canyon, no vegetation left, sent embers	V		
TD-028	11/8	07:15	Photo	0	39.808530	-121.447729	Photo	Photo	can see flames up canyon from bridge	V		
TD-028	11/8	07:15	Photo	0	39.808012	-121.453297	Photo	Photo	fire has spread SW from origin into the canyon above Pulga	V		
TD-028	11/8	07:16	Photo	0	39.805433	-121.451328	Photo	Photo	fire has spread SW from origin into the canyon above Pulga	V		
TD-028	11/8	07:16	Photo	0	39.806295	-121.446234	Photo	Photo	glow of fire expanding along ridgeline; fire backing down hillside toward river and Pulga	V		
TD-028	11/8	07:16	Photo	0	39.806295	-121.446234	Photo	Photo	fire along ridgeline and backing down hillside toward river and Pulga	V		
TD-005	11/8	07:16	Photo	0	39.808024	-121.458911	Photo	Photo	massive billowing smoke cloud rising from Flea Valley area	V		
TD-005	11/8	07:20	AVL	0	39.794959	-121.473990	TD	TD	spot fires to west of Rim Rd	S		
TD-028	11/8	07:23	Photo	0	39.807797	-121.440873	Photo	Photo	active vegetation fire, wind pushing fire up slope W, WSW; fire extending up slope and well beyond ridge to W	V		
TD-013	11/8	07:24	TD	0	39.766468	-121.537037	TD	TD	multiple (5) small spot fires 3 m × 3 m (10 ft × 10 ft) visible on east facing slopes	S		
TD-005	11/8	07:24	Photo	0	39.794663	-121.473829	Photo	Photo	large, well established spot fire, 0.1 ha to 0.2 ha (0.25 ac to 0.5 ac)	S		

Concow												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-005	11/8	07:24	Photo	0	39.793910	-121.473667	Photo	Photo	spot fire	S		
TD-062	11/8	07:25	AVL	7	39.788116	-121.495713	TD	TD	see spots below down in Concow; homes start to catch fire	R		
TD-143	11/8	07:29	Photo	0	39.813105	-121.534893	Photo	Photo	flames visible on ridge top	V		
TD-143	11/8	07:29	Photo	0	39.813105	-121.534893	Photo	Photo	flames visible on ridge top	V		
TD-013	11/8	07:30	Inferred	10	39.777564	-121.508483	TD	TD	observe 6 m x 6 m (20 ft x 20 ft) spot fire at house. fire pulling upwind toward house	S		
TD-110	11/8	07:30	Inferred	15	39.761408	-121.532027	TD	TD	0.1 ha (0.25 ac) spot fires in Concow creek just before lake	S		
911-037-1	11/8	07:30	911-037-1	0	39.789147	-121.516244	911-037-1	911-037-1	fire in the yard	S		
TD-005	11/8	07:32	video	0	39.793738	-121.470504	video	video	Spot fire [240 m (800 ft)] from road to the east/northeast	S		
TD-005	11/8	07:32	video	0	39.793824	-121.474035	video	video	spot fire on west side of Rim Rd	S		
TD-005	11/8	07:32	Photo	0	39.794180	-121.473630	Photo	Photo	spot fires have grown to several ac, spreading up slope, consuming draw	V		
TD-005	11/8	07:32	Photo	0	39.794612	-121.470229	Photo	Photo	significant flames, pines torching on ridgetop	V		
911-040-1	11/8	07:33	911-040-1	0	39.787712	-121.529838	911-040-1	911-040-1	fire in the yard	S		
911-042-2	11/8	07:34	911-042-2	0	39.793533	-121.510031	911-042-2	911-042-2	fire, I think it's blocking the road	S		
TD-005	11/8	07:35	AVL	0	39.784595	-121.507358	TD	TD	spot fire 3 ha (10 ac) and growing	S		
911-046-1	11/8	07:36	911-046-1	0	39.792422	-121.510804	911-046-1	911-046-1	fire actively coming onto property	S		
TD-103	11/8	07:38	AVL	0	39.760993	-121.538608	TD	TD	spot fires on west side of Concow Rd	S		
911-048-1	11/8	07:38	911-048-1	0	39.809499	-121.554749	Inferred	911-048-1	new flames just below Sawmill Peak, it just started on the Paradise side. Smoke started coming up and I just started seeing flames.	S		
TD-013	11/8	07:40	Inferred	10	39.786661	-121.521587	TD	TD	spot fire on both sides of Hoffman Rd	S		
911-053-1	11/8	07:43	911-053-1	0	39.786513	-121.530355	911-053-1	911-053-1	fire at end of driveway, can see the flames	S		
TD-103	11/8	07:45	AVL	4	39.776592	-121.508305	AVL	TD	fire at Concow Rd	V		
TD-103	11/8	07:45	AVL	4	39.776592	-121.508305	AVL	TD	vegetation fire expanding around area	V		
911-057-1	11/8	07:45	911-057-1	0	39.785441	-121.531678	911-057-1	911-057-1	fire	S		
911-058-1	11/8	07:45	911-058-1	0	39.807461	-121.551843	Inferred	911-058-1	4 to 5 spot fires visible on Sawmill Peak	S		
TD-005	11/8	07:47	AVL	0	39.774950	-121.532180	TD	TD	3 spot fires growing very fast	S		
911-060-2	11/8	07:47	911-060-2	0	39.810031	-121.558001	Inferred	911-060-2	multiple spot fires on Paradise side of ridge	S		
TD-103	11/8	07:49	AVL	7	39.781743	-121.505542	AVL	TD	car on fire, brush on fire	O		
TD-110	11/8	07:49	Inferred	26	39.776615	-121.508305	TD	TD	edge of fire	V		
TD-013	11/8	07:50	Radio Log	0	39.796821	-121.542241	Radio Log	TD	10 to 15 large spot fires 0.8 ha to 1.2 ha (2 ac to 3 ac) each on back side of Sawmill Peak; Jordan Hill Rd	S		
911-1024-1	11/8	07:50	911-1024-1	0	39.789460	-121.560302	911-1024-1	911-1024-1	huge fire, a little above mid-range on the mountains	V		



Concow												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
911-069-1	11/8	07:50	911-069-1	0	39.786405	-121.530504	Inferred	911-069-1	big fire on Hog Ranch	V		
911-075-1	11/8	07:52	911-075-1	0	39.794115	-121.501841	911-075-1	911-075-1	completely engulfed in flames, totally on fire surrounded by flames	O		
TD-013	11/8	07:53	Inferred	7	39.804518	-121.514083	TD	TD	spots up above Concow Rd, to north	S		
TD-013	11/8	07:53	Inferred	7	39.786533	-121.521528	TD	TD	spot fires on Hoffman have merged now; fire blowing across road	S		
911-078-1	11/8	07:53	911-078-1	0	39.760673	-121.556378	911-078-1	911-078-1	can see flames, just started, spreading really fast	S		
TD-006	11/8	07:54	Photo	0	39.817593	-121.544129	Photo	Photo	northern flank	V		
TD-008	11/8	07:55	AVL	0	39.769124	-121.528701	TD	TD	several spot fires (approximately 3) across Concow reservoir, each 10 ha (25 ac) and growing fast	S		
TD-008	11/8	07:56	AVL	0	39.787362	-121.482267	TD	TD	fire coming down ridge from Concow Rd	V		
911-086-1	11/8	07:58	911-086-1	0	39.764600	-121.557414	911-086-1	911-086-1	can see spot fire	S		
TD-013	11/8	08:00	Inferred	0	39.783360	-121.510174	TD	TD	small patch of green between Hoffman Rd and the lake, fire all around	V		
TD-013	11/8	08:00	Inferred	17	39.783767	-121.510606	TD	TD	vehicles are catching fire	O		
TD-013	11/8	08:00	Inferred	25	39.784056	-121.509764	TD	TD	4 to 5 vehicles are burning	O		
TD-013	11/8	08:00	Inferred	25	39.783138	-121.507260	TD	TD	3 to 4 homes fully involved; propane tanks exploding	R		
TD-008	11/8	08:01	Inferred	168	39.776915	-121.508721	TD	TD	edge of fire	V		
TD-008	11/8	08:01	AVL	29	39.776259	-121.508022	AVL	TD	flame front too intense to pass, burning vehicles in road. Crown, timber, brush 3 m to 4.6 m (10 ft to 15 ft), 18 m to 24 m (60 ft to 80 ft) flames	O		
TD-040	11/8	08:04	Photo	0	39.811170	-121.539192	Photo	Photo	fire burning on east side of Sawmill Peak	V		
TD-040	11/8	08:04	Photo	0	39.811900	-121.547225	Photo	Photo	large fire burning on SE side of Sawmill Peak	V		
TD-058	11/8	08:05	Inferred	0	39.808726	-121.555181	TD	TD	can see fire on Sawmill Peak from the lookout on Old Skyway	V		
911-111-1	11/8	08:11	911-111-1	0	39.794030	-121.513173	911-111-1	911-111-1	surrounded by flames on top of hill	O		
911-113-1	11/8	08:12	911-113-1	0	39.788647	-121.518099	911-113-1	911-113-1	whole property in flames	O		
TD-009	11/8	08:15	AVL	0	39.787733	-121.472717	AVL	TD	fire burning across Rim Rd	V		
TD-009	11/8	08:15	AVL	0	39.770628	-121.526467	TD	TD	fire appears to be across Concow Lake - large spots, not continuous fire line	S		
TD-110	11/8	08:15	TD-062	15	39.782642	-121.505838	TD	TD	intense fire conditions; flames horizontal over Hoffman Rd; untenable conditions	V		
TD-110	11/8	08:15	Inferred	15	39.782032	-121.505655	TD	TD	embers blowing across roadway; sketchy to drive through but not crazy	V		
TD-110	11/8	08:15	Inferred	15	39.783722	-121.507093	TD	TD	trees torching down Hoffman Rd	V		
911-120-1	11/8	08:18	911-120-1	0	39.794115	-121.501841	911-120-1	911-120-1	surrounded by fire	O		

Concow												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-062	11/8	08:23	AVL	8	39.783433	-121.505417	AVL	TD	fire coming right up against road; seem to be in the middle of fire; back end of convoy from Hoffman Rd catching on fire	V		
911-132-1	11/8	08:25	911-132-1	0	39.794030	-121.513173	911-132-1	911-132-1	surrounded by fire	O		
TD-013	11/8	08:29	AVL DZ2140	26	39.783521	-121.505179	TD	TD	embers catching seats on fire	O		
TD-110	11/8	08:30	AVL TD-062	0	39.786150	-121.505993	TD	TD	house burning; vehicle on embankment fully involved; severe ember wash	R		
TD-062	11/8	08:31	AVL	0	39.787188	-121.504011	AVL	TD	multiple burning vehicles in roadway	O		
TD-110	11/8	08:31	AVL TD-062	0	39.787127	-121.504245	TD	TD	too sketchy to get to Cirby Creek Rd	O		
911-142-4	11/8	08:31	911-142-4	0	39.789348	-121.523750	911-142-4	911-142-4	surrounded by fire	O		
TD-062	11/8	08:32	AVL	3	39.785517	-121.505550	AVL	TD	vehicle on side of road on fire; most if not all structures in Camelot are already burning	R		
TD-038	11/8	08:33	TD	27	39.811834	-121.558708	TD	TD	fire running up Sawmill Peak	V		
TD-062	11/8	08:35	AVL	12	39.786300	-121.514300	AVL	TD	all houses and vegetation on fire; propane venting	R		
TD-110	11/8	08:35	AVL TD-062	0	39.786410	-121.514298	TD	TD	structures burning	R		
TD-115	11/8	08:37	Photo	0	39.761672	-121.536824	Photo	TD	spot fire	S		
TD-115	11/8	08:37	Photo		39.763227	-121.535719	Photo	Photo	southern edge of main fire or large spot fire	V		
TD-115	11/8	08:37	Photo	0	39.761672	-121.536824	Photo	Photo	spot fire, 0.1 ha (0.25 ac) in brush, 200 m (220 yd) south from larger fire	S		
TD-115	11/8	08:37	Photo	0	39.763227	-121.535719	Photo	Photo	line fire [39.763170, -121.534986 to 39.764430, -121.540302]	V		
TD-115	11/8	08:42	TD	0	39.776235	-121.508008	AVL	TD	stopped by fire; cannot access Concow Rd	V		
TD-115	11/8	08:42	TD	93	39.777117	-121.506501	TD	TD	propane tanks exploding; cannot keep up with spot fires, fire everywhere	O		
TD-115	11/8	08:42	TD	93	39.777117	-121.506501	TD	TD	houses are igniting and spreading fast	R		
TD-115	11/8	08:42	TD	93	39.776377	-121.507641	DINS	TD	fire threatening structures	O		
TD-062	11/8	08:47	AVL	5	39.789150	-121.512273	TD	TD	wall of flames	O		
TD-062	11/8	08:52	AVL	7	39.787815	-121.506426	AVL	TD	four structures burning, not fully involved	R		
TD-027	11/8	08:58	Photo	0	39.785789	-121.505907	Photo	Photo	vehicle fully involved on road embankment; surface fire has passed	O		
TD-027	11/8	08:58	Photo	0	39.786116	-121.505985	Photo	Photo	structure fully involved, past peak	R		
TD-013	11/8	09:00	AVL DZ2140	0	39.787326	-121.510098	TD	TD	fire already burned through field	V	x	
TD-031	11/8	09:02	AVL	60	39.776590	-121.508311	AVL	TD	fire ripping south into Cribbage Ln from northeast into structures	R		
TD-031	11/8	09:02	AVL	60	39.776590	-121.508311	AVL	TD	fire burning toward lake from Hoffman Rd	V		

Concow												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-031	11/8	09:02	AVL	60	39.776590	-121.508311	AVL	TD	structure fully involved	R		
TD-115	11/8	09:23	video	25	39.776235	-121.508008	video	video	active surface fire burning all around	V		
TD-115	11/8	09:23	TD	52	39.773800	-121.506914	TD	TD	head of fire is pushing south; approximately at Ishi Tr	V		
TD-115	11/8	09:23	TD	52	39.763303	-121.523410	TD	TD	spot fire (1.6 km (1 mi) ahead of front) between road and lake; bumping the road	S		
TD-110	11/8	09:30	Inferred	40	39.794773	-121.451824	TD	TD	heel/flank; light fire activity, working toward river	V		
TD-090	11/8	09:35	Photo	0	39.776624	-121.508287	Photo	Photo	numerous spot fires on ground (pine, leaf litter); widespread surface fire on west side of road toward lake	V		
TD-031	11/8	09:45	AVL	0	39.776590	-121.508311	AVL	TD	pine needles burning on ground	V		
TD-013	11/8	10:00	Inferred	0	39.773767	-121.506922	TD	TD	fire burning to the north of Ishi Trail, high intensity 1.2 m to 2.4 m (4 ft to 8 ft) flames; has not burned south of lake yet	V		
TD-027	11/8	10:00	Inferred	90	39.795309	-121.510431	TD	TD	porch on fire	R		
TD-062	11/8	10:51	AVL	5	39.767450	-121.512537	AVL	TD	fire on both sides of road, fire is intensifying	V		
TD-062	11/8	10:53	AVL	0	39.768800	-121.512917	AVL	TD	fire on both sides of road, fire is intensifying	V		
TD-062	11/8	11:18	AVL	0	39.753172	-121.545486	TD	TD	flames making their way over the ridge	V		
TD-062	11/8	11:18	AVL	0	39.753050	-121.551817	AVL	TD	spot fires nearby	S		
TD-031	11/8	11:23	AVL	22	39.753228	-121.552348	TD	TD	can see fire coming down Jordan Hill Rd near Granite Ridge Rd	V		
TD-027	11/8	11:30	Inferred	20	39.772053	-121.507509	TD	TD	flank of fire	V		
TD-062	11/8	11:32	AVL	0	39.751421	-121.548192	AVL	TD	fire well established in canyon below the road; driving through fire	V		
TD-062	11/8	11:32	AVL	0	39.754069	-121.551791	AVL	TD	observe 30 m to 46 m (100 ft to 150 ft) flame lengths from behind house	V		
TD-027	11/8	12:00	Inferred	120	39.757301	-121.529339	TD	TD	fire flank has progressed to south side of lake	V		
TD-108	11/8	12:09	Photo	0	39.815818	-121.435300	Photo	Photo	heel of the fire, backing into wind, no flames visible, but smoke emitting from forest, from river to top of ridge	V		
TD-028	11/8	12:14	video	0	39.795410	-121.451854	Photo	video	spotty fires in vegetation	V		
TD-028	11/8	12:14	Photo	0	39.795684	-121.452186	Photo	Photo	numerous small spots, rollout down the hill, minimal fire activity	V		
TD-008	11/8	12:35	Radio Log	0	39.794365	-121.452871	Radio Log	Radio Log	rollouts from slope are threatening Hwy 70 near Pulga	V		
TD-028	11/8	12:35	Radio Log	0	39.794365	-121.452871	Radio Log	Radio Log	rollout ignitions along Hwy 70	V		
TD-013	11/8	12:35	Radio Log	655	39.794365	-121.452871	Radio Log	TD	advised by [firefighter] that fire has crossed Hwy 70 up near Pulga; drive up and see 8 ha (20 ac) spot; discuss spread potential	V		
TD-140	11/8	13:00	Inferred	60	39.748685	-121.542424	TD	TD	fire up on ridge to west of Concow Rd	V		

Concow												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-028	11/8	23:10	Radio Log	0	39.787050	-121.450567	AVL	Radio Log	one slop over towards the river, starting to make runs, but hung up in rocks below the roadway	V		
TD-028	11/9	00:28	Radio Log	0	39.758168	-121.476278	AVL	Radio Log	Fire rolls below Hwy 70 (east); fire well established 1.6 km to 3.2 km (1 mi to 2 mi) below Station 36; drove through fire to return to station	V		
TD-029	11/9	00:28	AVL	0	39.761067	-121.479133	AVL	TD	[fire reached trigger point]	V		
TD-028	11/9	03:07	Photo	0	39.749792	-121.500913	Photo	Photo	fire on ridge top	V		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-063	11/8	07:49	911-064-1	0	39.754064	-121.570775	911-064-1	TD	spot fire	S		
911-064-1	11/8	07:49	911-064-1	0	39.754132	-121.570864	911-064-1	911-064-1	fire in yard	S		
TD-023	11/8	07:50	Inferred	60	39.788645	-121.576042	TD	TD	fire approached orchard from Sawmill Peak; spot fire in orchard burning 0.9 m to 1.5 m (3 ft to 5 ft) dead brown grass; flames were tree height, 3 m (10 ft)	V		
911-066-1	11/8	07:50	911-066-1	0	39.754563	-121.570015	Inferred	911-066-1	fire just started very close to us	S		
911-071-1	11/8	07:51	911-071-1	0	39.754132	-121.570864	911-071-1	911-071-1	fire in yard getting bigger by the second	S		
911-074-1	11/8	07:52	911-074-1	0	39.788694	-121.576035	Inferred	911-074-1	huge fire in orchard	S		
911-1026-1	11/8	07:52	911-1026-1	0	39.774496	-121.576350	911-1026-1	911-1026-1	little fire here, probably going to spread	S		
911-1027-4	11/8	07:52	911-1027-4	0	39.783271	-121.570245	911-1027-4	911-1027-4	spot fire starting	S		
911-077-3	11/8	07:53	911-077-3	0	39.778763	-121.577193	911-077-3	911-077-3	vegetation fire in side yard	S		
911-082-1	11/8	07:56	911-082-1	0	39.788579	-121.576068	Inferred	911-082-1	fire in Noble Orchard	S		
911-084-1	11/8	07:56	911-084-1	0	39.755072	-121.569579	Inferred	911-084-1	fire behind home on Riverview	S		
911-085-2	11/8	07:57	911-085-2	0	39.765917	-121.576704	911-085-2	911-085-2	burning sticks falling from sky	O		
TD-021	11/8	07:58	Radio Log	35	39.788734	-121.576054	TD	TD	find spot fire 6 m x 6 m (20 ft x 20 ft) in apple orchard; no other fire visible	S		
TD-023	11/8	07:58	TD-021	52	39.788316	-121.576915	TD	TD	orchard still on fire	V		
911-086-3	11/8	07:58	911-086-3	0	39.762973	-121.567732	Inferred	911-086-3	fire coming up the hill by the back cottages	V		
911-086-4	11/8	07:58	911-086-4	0	39.788622	-121.576136	Inferred	911-086-4	fire burning like mad	S		
911-088-1	11/8	07:59	911-088-1	0	39.774704	-121.569142	911-088-1	911-088-1	major flames behind house	V		
TD-061	11/8	08:00	Inferred	8	39.781375	-121.579608	TD	TD	spot fire	S		
TD-042	11/8	08:00	Inferred	40	39.789651	-121.573591	TD	TD	spot off Dean behind the orchard	S		
911-1034-2	11/8	08:00	911-1034-2	0	39.783199	-121.576113	Inferred	911-1034-2	spot fire in field behind house	S		
911-1035-1	11/8	08:00	911-1035-1	0	39.762078	-121.568099	Inferred	911-1035-1	fire within feet of structures	V		
TD-063	11/8	08:02	PPD video	15	39.755087	-121.569543	PPD video	TD, PPD video	spot fire coming up from canyon	S		
911-1040-1	11/8	08:02	911-1040-1	0	39.782604	-121.570423	911-1040-1	911-1040-1	spot fire	S		
PPD-01	11/8	08:02	PPD-01	0	39.754989	-121.569479	video	video	spot fire	S		
911-095-1	11/8	08:02	911-095-1	0	39.769079	-121.576232	Inferred	911-095-1	fire is behind the church	S		
911-098-1	11/8	08:04	911-098-1	0	39.769217	-121.576368	Inferred	911-098-1	fire in back of lot	S		
TD-024	11/8	08:05	TD	0	39.783767	-121.573596	TD	TD	spot fire	S		
911-100-1	11/8	08:06	911-100-1	0	39.769217	-121.576368	Inferred	911-100-1	fire burning in dry grass	S		
TD-022	11/8	08:08	Inferred	0	39.788320	-121.576828	TD	TD	spot fire	S		
TD-040	11/8	08:08	Inferred	28	39.788570	-121.576044	TD	TD	spot is 0.4 ha to 0.6 ha (1 ac to 1.5 ac); no embers from main fire, just from orchard	S		
911-104-1	11/8	08:09	911-104-1	0	39.754121	-121.570879	911-104-1	911-104-1	fire burning on property	S		
911-1046-4	11/8	08:09	911-1046-4	0	39.778723	-121.574071	911-1046-4	911-1046-4	fire in mobile home park storage area	O		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
911-110-1	11/8	08:10	911-110-1	0	39.781405	-121.569599	Inferred	911-110-1	fire at end of Merrill, flames in backyard	S		
911-1047-1	11/8	08:11	911-1047-1	0	39.757160	-121.571200	911-1047-1	911-1047-1	Feather River Hospital is getting spot fires on campus	S		
911-1048-2	11/8	08:12	911-1048-2	0	39.780978	-121.579068	911-1048-2	911-1048-2	embers starting fire in field	S		
911-1049-6	11/8	08:12	911-1049-6	0	39.778499	-121.573608	Inferred	911-1049-6	field behind property on fire	S		
911-1049-8	11/8	08:12	911-1049-8	0	39.783135	-121.570510	911-1049-8	911-1049-8	fire approaching 30 m (100 ft) from house	V		
TD-024	11/8	08:15	TD	0	39.783691	-121.573843	TD	TD	yard is on fire	S		
TD-061	11/8	08:16	Radio Log	0	39.780653	-121.578518	AVL	TD	0.4 ha (1 ac) fire in field	S		
TD-061	11/8	08:16	TD-022	0	39.777779	-121.572221	TD-022	TD	spot fire	S		
TD-022	11/8	08:16	TD-061	0	39.777779	-121.572221	TD	TD	spot fire 9 m × 30 m (30 ft × 100 ft) in manzanita and decorative veg	S		
TD-063	11/8	08:17	Inferred	3	39.755091	-121.571529	TD	TD	south side yards/vegetation on fire, north side has no fire	V		
911-1053-4	11/8	08:17	911-1053-4	0	39.774283	-121.570860	911-1053-4	911-1053-4	spot fire	S		
911-1054-2	11/8	08:17	911-1054-2	0	39.754421	-121.570872	Inferred	911-1054-2	big fire behind house	V		
TD-063	11/8	08:20	Inferred	30	39.757794	-121.571187	TD	TD	FRH: active fire on the hospital complex	V		
Radio Log	11/8	08:20	Radio Log	0	39.756680	-121.568253	Inferred	Radio Log	FRH: fire right on property line	V		
TD-020	11/8	08:21	Inferred	19	39.780509	-121.578370	TD	TD	about 0.2 ha (0.5 ac) spot fire in 0.6 m (2 ft) of grass, fast spreading	S		
TD-020	11/8	08:21	Inferred	19	39.776029	-121.576382	TD	TD	spot fire	S		
TD-020	11/8	08:21	Inferred	19	39.775662	-121.576423	TD	TD	spot fire	S		
TD-022	11/8	08:21	Radio Log	0	39.779100	-121.570678	TD	Radio Log	multiple spots off Shay Ln and June Way	S		
Radio Log	11/8	08:22	Radio Log	0	39.779688	-121.579113	Radio Log	Radio Log	west of Pentz Rd just north of Wagstaff Rd, fire 45 m (50 yd) from road	V		
TD-014	11/8	08:23	AVL	10	39.780506	-121.577546	TD	TD	spot fire in open field, 2 ha to 4 ha (5 ac to 10 ac), hitting back of structures; structures not burning yet [note: full field is 4 ha (10 ac)]	V		
TD-061	11/8	08:24	AVL	9	39.781015	-121.577697	AVL	TD	fire burning back fences on south side of Merrill near Pentz Rd	O		
911-131-1	11/8	08:24	911-131-1	0	39.757421	-121.570929	911-131-1	911-131-1	hospital on fire	C		
TD-021	11/8	08:25	Radio Log	0	39.788403	-121.576135	Radio Log	Radio Log	0.1 ha (0.25 ac) fire off Apple View Way	S		
TD-022	11/8	08:25	Inferred	35	39.778911	-121.572122	TD	TD	spot fire	S		
911-134-1	11/8	08:25	911-134-1	0	39.757421	-121.570929	911-134-1	911-134-1	FRH being impacted by fire	O		
911-137-1	11/8	08:27	911-137-1	0	39.757421	-121.570929	911-137-1	911-137-1	hospital is on fire	C		
TD-022	11/8	08:30	Inferred	40	39.781410	-121.575163	TD	TD	homes igniting	R		
TD-043	11/8	08:30	Radio Log	0	39.780747	-121.577646	TD	TD	fire in field moving SW	V		
TD-043	11/8	08:30	Inferred	20	39.779515	-121.578397	TD	TD	spot fire in field, slopover in SW corner	V		
TD-043	11/8	08:30	Inferred	20	39.781478	-121.570512	TD	TD	structures on fire east end of Merrill	R		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-143	11/8	08:30	Inferred	30	39.754738	-121.572356	TD	TD	fire both sides of road; propane exploding	R		
911-141-1	11/8	08:31	911-141-1	0	39.785706	-121.578449	911-141-1	911-141-1	fire in backyard	S		
TD-045	11/8	08:32	AVL	5	39.780430	-121.578750	AVL	TD	Spot fire	S		
911-144-1	11/8	08:32	911-144-1	0	39.783750	-121.573598	911-144-1	911-144-1	fire in yard	S		
TD-038	11/8	08:33	TD	27	39.797136	-121.566670	TD	TD	see spot fire down in canyon	S		
TD-021	11/8	08:33	TD	27	39.788256	-121.576047	TD	TD	spot fires igniting all over (10+) the field 1 min to 2 min after wind increase	S		
TD-143	11/8	08:33	Photo	0	39.780859	-121.578891	Photo	TD	field on fire	V		
TD-143	11/8	08:33	Photo	0	39.780316	-121.578891	Photo	Photo	grass field is burning toward Pentz Rd; 50 m (55 yd) east of roadway	V		
TD-061	11/8	08:35	AVL	13	39.779658	-121.579541	TD	TD	fire is spotting across Pentz Rd	S		
TD-040	11/8	08:36	Inferred	0	39.786979	-121.572546	TD	TD	spots starting along Dean Rd	S		
TD-040	11/8	08:36	Inferred	114	39.788598	-121.573930	TD	TD	active fire burning in grass behind Chapman Ln	S		
TD-040	11/8	08:36	Inferred	114	39.788866	-121.572862	TD	TD	propane tanks exploding, fire all around in heavy vegetation and pine needles	V		
TD-040	11/8	08:36	Inferred	114	39.787130	-121.574843	TD	TD	vegetation fire on lot; ember ignitions	V		
Radio Log	11/8	08:36	Radio Log	0	39.757060	-121.571208	Radio Log	Radio Log	fire within 3 m (10 ft) of FRH	V		
TD-005	11/8	08:37	AVL	0	39.748583	-121.572400	AVL	TD	ember storm	O		
TD-005	11/8	08:37	AVL	0	39.752744	-121.572523	AVL	TD	spot fire on west side of road	S		
TD-005	11/8	08:37	AVL	0	39.754633	-121.572426	AVL	TD	fire on east side of Pentz Rd about to hit Riverview Dr	V		
TD-014	11/8	08:37	Radio Log	0	39.756607	-121.568242	Radio Log	Radio Log	active torching behind FRH	V		
TD-005	11/8	08:38	AVL	0	39.754891	-121.571911	TD	TD	fire in front yard	S		
TD-005	11/8	08:38	AVL	65	39.755100	-121.571617	AVL	TD	spots growing bigger than backpack size in seconds, and flames blowtorching, ember shower, all yards burning. Decorative stuff in yards burning that normally doesn't burn	S		
TD-014	11/8	08:38	AVL	17	39.756387	-121.568888	TD	TD	FRH: fully involved buildings	C		
TD-014	11/8	08:38	AVL	17	39.756620	-121.571889	TD	TD	FRH: fire on patio of OB unit	O		
TD-045	11/8	08:38	AVL	11	39.779757	-121.575467	AVL	TD	spot fire	S		
911-159-1	11/8	08:38	911-159-1	0	39.782928	-121.576918	911-159-1	911-159-1	"giant" fire	S		
PPD-02	11/8	08:39	PPD-02	1	39.781406	-121.581052	video	video	spot fire; isolated smoke column rising from here	S		
TD-014	11/8	08:40	Radio Log	0	39.756195	-121.572080	AVL	TD	FRH: fire on one of the patios at the hospital	O		
TD-014	11/8	08:40	Radio Log	0	39.777786	-121.579607	Radio Log	Radio Log	multiple spot fires [in area of] Pentz Rd / Wagstaff Rd	S		
TD-084	11/8	08:40	AVL	6	39.752380	-121.572450	AVL	TD	a few spots on west side, 10 spot fires on east side of Pentz Rd	S		
TD-016	11/8	08:40	Inferred	5	39.752554	-121.572109	TD	TD	spot fires all along east side Pentz Rd	S		
TD-042	11/8	08:40	Inferred	0	39.786896	-121.574839	TD	TD	fire all along Dean Rd	O		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-042	11/8	08:40	Inferred	0	39.778477	-121.577106	TD	TD	half of mobile homes in Ridgewood mobile home park are on fire	R		
PPD-02	11/8	08:41	PPD-02	0	39.781406	-121.581052	video	video	spot fire	S		
911-170-1	11/8	08:43	911-170-1	0	39.795278	-121.574962	911-170-1	911-170-1	structure on fire	R		
PPD-02	11/8	08:43	PPD-02	0	39.779087	-121.577092	Radio	Radio	Ridgewood mobile home park; fires directly behind, homes becoming involved	R		
TD-209	11/8	08:44	AVL	2	39.745602	-121.572362	AVL	TD	glowing embers falling	O		
911-174-1	11/8	08:44	911-174-1	0	39.768492	-121.583432	911-174-1	911-174-1	fence on fire	O		
PPD-02	11/8	08:44	PPD-02	0	39.778876	-121.575801	Radio	Radio	north end of park is becoming involved (Ridgeway MHP)	R		
TD-064	11/8	08:45	Inferred	15	39.778683	-121.575499	TD	TD	fire is hitting gas mains	O		
TD-064	11/8	08:45	Inferred	15	39.778299	-121.575586	TD	TD	fire moving deeper into Ridgewood MHP down both rows	R		
TD-064	11/8	08:45	Inferred	15	39.777563	-121.576324	TD	TD	additional mobile homes in Ponderosa MHP catch on fire	R		
TD-016	11/8	08:45	TD	0	39.750708	-121.572527	TD	TD	encounter wall of fire	O		
TD-084	11/8	08:46	AVL	127	39.753868	-121.572262	AVL	TD	bumpers of cars igniting	O		
TD-084	11/8	08:46	AVL	127	39.753868	-121.572262	AVL	TD	fire threatening structures	O		
TD-084	11/8	08:46	AVL	127	39.753392	-121.572678	AVL	TD	fire threatening structures	O		
TD-209	11/8	08:46	AVL	17	39.751665	-121.570313	AVL	TD	flames coming from the canyon	V		
TD-067	11/8	08:46	Inferred	20	39.778443	-121.578823	TD	TD	Ridgewood MHP, portions are burning	R		
911-178-3	11/8	08:46	911-178-3	0	39.772408	-121.568428	911-178-3	911-178-3	residential alarm company reporting fire alarm	R		
911-179-1	11/8	08:46	911-179-1	0	39.757048	-121.571191	911-179-1	911-179-1	hospital fire alarm	C		
TD-045	11/8	08:47	AVL	0	39.779343	-121.576061	AVL	TD	two houses to south of field cannot be saved	R		
TD-103	11/8	08:47	AVL	148	39.755683	-121.571747	AVL	TD	fire approaches from east	V		
TD-103	11/8	08:47	AVL	148	39.753133	-121.572216	TD	TD	fire all around; all homes involved	R		
TD-103	11/8	08:47	AVL	148	39.756426	-121.571397	TD	TD	FRH: Cancer center catches fire	C		
TD-122	11/8	08:47	AVL	1	39.742333	-121.572883	AVL	TD	edge of fire	O		
VTD-17	11/8	08:47	TD	3	39.756884	-121.568212	video	video	smoke coming from behind hospital	V		
TD-005	11/8	08:48	AVL	0	39.755324	-121.570642	AVL	TD	house at end of street 50% involved	R		
TD-061	11/8	08:48	AVL	5	39.781479	-121.573042	AVL	TD	civilian POV igniting on seat	O		
TD-061	11/8	08:48	AVL	9	39.779620	-121.570612	TD	TD	fire impacting homes along Shay Ln	O		
TD-061	11/8	08:48	AVL	9	39.782423	-121.571996	TD	TD	multiple spot fires	S		
TD-123	11/8	08:48	AVL	0	39.747928	-121.572361	AVL	TD	can hear propane tanks exploding	O		
TD-109	11/8	08:49	AVL	26	39.752233	-121.572483	AVL	TD	fire both sides of Pentz Rd; east side of Pentz Rd more involved	O		
TD-122	11/8	08:49	AVL	48	39.751221	-121.572481	AVL	TD	flames hundreds of feet long coming out of canyon	V		
TD-123	11/8	08:49	AVL	60	39.750897	-121.572404	AVL	TD	everything is on fire	O		



Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-124	11/8	08:49	AVL	7	39.752548	-121.572516	AVL	TD	multiple spots on east side of Pentz Rd	S		
TD-116	11/8	08:50	TD	10	39.774647	-121.579606	TD	TD	ember cast; tree in yard catches fire	S		
PPD-02	11/8	08:52	PPD-02	0	39.778476	-121.579561	Radio	Radio	fire reaching Pentz Rd now (Ridgewood MHP)	O		
PPD-02	11/8	08:52	PPD-02	0	39.778476	-121.575146	Radio	Radio	east end of park is fully involved (Ridgewood MHP)	R		
TD-045	11/8	08:53	Inferred	0	39.780537	-121.575161	AVL	TD	fire impacts from southeast direction	V		
TD-045	11/8	08:53	Inferred	97	39.780491	-121.575766	TD	TD	Embers falling around	O		
TD-123	11/8	08:53	AVL	7	39.751717	-121.572767	AVL	TD	spot fires	S		
PPD-02	11/8	08:53	PPD-02	0	39.780879	-121.579537	video	video	fire reaching Pentz Rd, burning field	V		
PPD-04	11/8	08:53	PPD-04	5	39.755718	-121.569681	video	video	intense fire activity, possible structure involved	O		
PPD-02	11/8	08:53	PPD-02	0	39.781369	-121.579551	video	video	trees along east side Pentz Rd torching	V		
TD-079	11/8	08:54	AVL	0	39.731390	-121.574204	AVL	TD	very defined wall of flame and smoke, flames both sides of Pentz Rd	O		
TD-015	11/8	08:54	AVL	4	39.767067	-121.576067	AVL	TD	spot fires all around; east side heavily involved	S		
PPD-02	11/8	08:54	PPD-02	0	39.781369	-121.579551	video	video	intense fire, falling tree debris impacting Pentz Rd	V		
PPD-02	11/8	08:54	PPD-02	0	39.779573	-121.579685	video	video	intense fire burning on east side of Pentz Rd; between Merrill Rd and 6717 Pentz Rd	V		
PPD-02	11/8	08:54	PPD-02	0	39.779573	-121.579685	video	video	traffic and roadway SB blocked by fire	V		
PPD-02	11/8	08:54	PPD-02	0	39.779573	-121.579685	video	video	fire spotted to west side of Pentz Rd	S		
TD-014	11/8	08:55	AVL	7	39.752393	-121.572412	AVL	TD	structures involved on both sides of Pentz Rd	R		
TD-021	11/8	08:55	Radio Log	0	39.788403	-121.576135	Radio Log	Radio Log	spot fire	S		
TD-043	11/8	08:55	Inferred	21	39.778869	-121.578982	TD	TD	mobile homes are burning in Ridgeway MHP (NW corner)	R		
PPD-02	11/8	08:55	PPD-02	0	39.780005	-121.579643	video	video	fire actively spotting across Pentz Rd	S		
TD-061	11/8	08:56	Radio Log	0	39.781479	-121.573042	AVL	TD	house is on fire	R		
TD-045	11/8	08:57	AVL	13	39.780159	-121.576475	AVL	TD	approximately 2.4 m x 3 m (8 ft x 10 ft) wood-frame shed catches fire first, then catches eaves of house	R		x
TD-060	11/8	08:57	AVL	6	39.753124	-121.572432	AVL	TD	spot fires starting. Heavy fire.	V		
PPD-04	11/8	08:57	PPD-04	0	39.780502	-121.579592	Radio	Radio	fire has jumped the road and continuing westbound	O		
PPD-04	11/8	08:57	PPD-04	0	39.776009	-121.580137	Radio	Radio	spot fire, Ponderosa Elementary School	S		
TD-079	11/8	08:58	AVL	6	39.753821	-121.572434	AVL	TD	100 % of embers ignite spots, trees torching, vehicles on fire	O		
TD-067	11/8	08:58	PPD video	0	39.775306	-121.579700	TD	PPD video	spot fire in shrub of front parking lot at ponderosa elementary school	S		
TD-043	11/8	08:58	Inferred	18	39.778925	-121.574873	TD	TD	two end mobile homes are burning Ridgewood MHP (NE corner)	R		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-043	11/8	08:58	Inferred	18	39.778472	-121.576890	TD	TD	mobile homes burning; pass through fire twice in mobile home park to escape back to Pentz Rd (Ridgewood Mobile Home Park)	R		
PPD-02	11/8	08:58	PPD-02	0	39.776008	-121.580095	Radio	Radio	Spot fire ponderosa school, large shrub in the front parking lot	S		
TD-085	11/8	08:59	AVL	0	39.777336	-121.577799	AVL	TD	Ponderosa mobile home park burning; sending ember showers	R		
TD-085	11/8	08:59	AVL	40	39.778433	-121.578792	AVL	TD	all mobile homes on fire (Ridgewood MHP)	R		
TD-061	11/8	09:00	AVL	6	39.779389	-121.573230	TD	TD	large spot fire	S		
TD-061	11/8	09:00	AVL	22	39.781731	-121.577049	TD	TD	homes on north side of Merrill are igniting	R		
TD-015	11/8	09:00	AVL	5	39.762633	-121.574733	AVL	TD	spot fires all around	S		
TD-129	11/8	09:00	AVL	8	39.746117	-121.572233	AVL	TD	fire crossing Pentz Rd from east to west between Stearns Rd and Pearson Rd	O		
TD-016	11/8	09:00	TD	0	39.752369	-121.572747	TD	TD	fire quickly spotting to west side of Pentz Rd, many spots starting up	S		
TD-016	11/8	09:00	Inferred	120	39.750918	-121.574006	TD	TD	fire threatening structures	O		
TD-016	11/8	09:00	Inferred	120	39.753051	-121.574265	TD	TD	garage on structure igniting	R		
TD-016	11/8	09:00	Inferred	120	39.751490	-121.575348	TD	TD	spot fire in Pearson Rd drainage, chased out by fire	S		
TD-021	11/8	09:00	Inferred	18	39.774029	-121.579626	TD	TD	fire actively hitting/crossing Pentz Rd between Wagstaff Rd and Bille Rd	O		
TD-116	11/8	09:00	TD	23	39.769654	-121.580470	TD	TD	heavy ember cast	O		
TD-043	11/8	09:00	TD-085, TD-022	30	39.777779	-121.579642	TD	TD	pine trees igniting at intersection	V		
TD-023	11/8	09:00	Inferred	180	39.788541	-121.576674	TD	TD	observed fire whirl form	O		
TD-023	11/8	09:00	TD	0	39.788042	-121.577199	TD	TD	fence ignites; house and garage catch fire	R		
TD-023	11/8	09:00	Inferred	180	39.788088	-121.577237	TD	TD	concern about structure collapsing as it burns	R		
TD-103	11/8	09:00	Photo	0	39.755455	-121.571546	Photo	Photo	fence and vegetation burning, threatening structure	O		
VTD-23	11/8	09:01	Inferred	0	39.759349	-121.572781	video	video	first hot embers start landing on windshield	O		
PPD-02	11/8	09:01	PPD-02	0	39.778583	-121.579579	Radio	Radio	fire threatening vehicles	O		
TD-020	11/8	09:02	Inferred	0	39.757028	-121.571208	TD	TD	ember cast	O		
911-208-1	11/8	09:02	911-208-1	0	39.757023	-121.571290	911-208-1	911-208-1	fire alarm	C		
VTD-23	11/8	09:03	Inferred	20	39.760734	-121.573395	video	video	first spot fire	S		
VTD-23	11/8	09:03	Inferred	20	39.760734	-121.573395	video	video	multiple spot fires in area along Pentz Rd at Vineyard; both sides road	S		
TD-209	11/8	09:03	Photo	0	39.753452	-121.572392	Photo	Photo	vegetation fire, burning surface and up ladder fuels both sides of Pentz Rd	V		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-079	11/8	09:04	AVL	32	39.765269	-121.574923	AVL	TD	100 % of embers ignite spots, trees torching, vehicles on fire, people's hair igniting, dangerous fire, flames going sideways; tire on engine melting	O		
911-210-1	11/8	09:04	911-210-1	0	39.758893	-121.570887	911-210-1	911-210-1	fire alarm	C		
VTD-17	11/8	09:05	TD	0	39.758293	-121.571793	video	video	light embers start trickling down	O		
VTD-17	11/8	09:05	Inferred	9	39.755064	-121.572370	video	video	fire burning on west side Pentz Rd	V		
PPD-05	11/8	09:05	PPD-05	0	39.757758	-121.571137	video	video	light ember cast blowing from the West	O		
911-216-1	11/8	09:07	911-216-1	0	39.775077	-121.581572	911-216-1	911-216-1	fence on fire	O		
PPD-05	11/8	09:08	PPD-05	2	39.757758	-121.571137	video	video	heavy ember shower, embers exploding and skittering across pavement	O		
PPD-05	11/8	09:09	PPD-05	0	39.757834	-121.571099	video	video	multiple spot fire ignition in mulch	S		
TD-045	11/8	09:10	AVL	33	39.780190	-121.576040	AVL	TD	Fire spread from neighbor's shed to fence to shed [3 m x 4.6 m (10 ft x 15 ft) shed]	R		
PPD-02	11/8	09:10	PPD-02	0	39.787945	-121.577869	video	video	spot fire	S		
PPD-02	11/8	09:10	PPD-02	0	39.788858	-121.578773	video	video	multiple spot fires on north side of Apple View Way	S		
911-221-2	11/8	09:11	911-221-2	0	39.766771	-121.575815	911-221-2	911-221-2	roadway blocked by fire	O		
PPD-05	11/8	09:11	PPD-05	0	39.761954	-121.573972	Inferred	Radio	pretty involved fire in area	O		
TD-015	11/8	09:12	AVL	11	39.766611	-121.576095	AVL	TD	fire through east side of Pentz Rd - structures on fire	R		
TD-015	11/8	09:12	Inferred	9	39.766809	-121.575783	AVL	TD	active fire; trees torching, and spot fires on west side of Pentz Rd	V		
PPD-05	11/8	09:12	PPD-05	0	39.757892	-121.571664	video	Radio	FRH: firestorm, fire threatening all around all the buildings including gas tanks and oxygen	O		
TD-209	11/8	09:14	AVL	120	39.751393	-121.574283	AVL	TD	fire threatening structures	O		
TD-129	11/8	09:14	Inferred	36	39.752390	-121.575420	TD	TD	fire spotted behind (west) homes on Chaney Ln; spot fire getting sucked back to the main fire to the east	S		
TD-129	11/8	09:14	Inferred	36	39.751244	-121.574768	Imagery	TD	burning vegetation threatening structures	V		
TD-090	11/8	09:15	AVL	7	39.757795	-121.572302	AVL	TD	fire on the west side of Pentz Rd by the hospital	V		
TD-016	11/8	09:15	Inferred	192	39.757568	-121.570270	TD	TD	FRH: attic fire in structure	C		
VTD-17	11/8	09:15	Inferred	8	39.756180	-121.572572	video	video	surface fire burning all of west side of Pentz Rd at southern hospital driveway	V		
VTD-17	11/8	09:15	Inferred	8	39.753918	-121.572393	video	video	active fires both sides of Pentz Rd between hospital and Chaney Ln	O		
VTD-17	11/8	09:15	Inferred	8	39.750940	-121.572532	video	video	southern extent of fire	O		
TD-209	11/8	09:16	AVL	26	39.751694	-121.574025	AVL	AVL, TD	fire threatening structures	O		
911-230-5	11/8	09:16	911-230-5	0	39.766771	-121.575815	911-230-5	911-230-5	ambulances on fire	O		
TD-109	11/8	09:17	AVL	45	39.756683	-121.570967	AVL	TD	FRH: HVAC is on fire	C		
911-232-1	11/8	09:17	911-232-1	0	39.766778	-121.575835	911-232-1	911-232-1	ambulance on fire	O		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
PPD-02	11/8	09:17	PPD-02	0	39.785042	-121.579593	video	video	spot fire on west side Pentz Rd	S		
PPD-02	11/8	09:17	PPD-02	0	39.784249	-121.579387	video	video	spot fire east side Pentz Rd	S		
PPD-02	11/8	09:17	PPD-02	0	39.783437	-121.579502	video	video	spot fire east side Pentz Rd	S		
TD-060	11/8	09:18	AVL	0	39.766885	-121.575890	AVL	TD	ambulances just igniting, engine compartment fully involved	O		
TD-083	11/8	09:19	AVL	0	39.766667	-121.575717	AVL	TD	ambulance is burning	O		
911-234-1	11/8	09:19	911-234-1	0	39.763874	-121.572729	911-234-1	911-234-1	house on fire	R		
PPD-05	11/8	09:19	PPD-05	0	39.757895	-121.572366	video	Radio	fire has jumped westbound from our location	O		
PPD-05	11/8	09:19	PPD-05	0	39.757655	-121.572453	video	video	spot fire on west side Pentz Rd	S		
TD-069	11/8	09:20	Inferred	0	39.761614	-121.573449	TD	TD	structure catching fire	R		
TD-069	11/8	09:20	Inferred	0	39.762837	-121.574830	TD	TD	structure on fire	R		
PPD-05	11/8	09:20	PPD-05	0	39.756074	-121.572333	video	video	Pentz Rd is inaccessible due to fire and fire engine activity south of hospital	O		
TD-015	11/8	09:21	Radio Log	0	39.766933	-121.575940	Radio Log	TD	Two ambulances catch on fire	O		
PPD-05	11/8	09:21	PPD-05	0	39.762823	-121.574409	Radio	Radio	active flames against road	O		
TD-123	11/8	09:22	AVL	25	39.752383	-121.574300	AVL	TD	fire coming from east and west	O		
TD-086	11/8	09:23	AVL	0	39.746182	-121.572306	AVL	TD	wall of flames	O		
TD-086	11/8	09:23	AVL	14	39.746186	-121.571265	TD	TD	heavy ember cast	V		
TD-086	11/8	09:23	AVL	14	39.745893	-121.570686	TD	TD	structure on fire	R		
TD-021	11/8	09:23	Inferred	0	39.770096	-121.579294	TD	TD	fire impacting Bille Rd	O		
TD-038	11/8	09:23	Inferred	147	39.770217	-121.578590	TD	TD	homes igniting on east side Pentz Rd	R		
VTD-23	11/8	09:23	Inferred	0	39.761637	-121.573849	video	video	multiple spot fires; dark; embers blowing from west	S		
PPD-05	11/8	09:23	PPD-05	0	39.758015	-121.572137	video	video	spot fire	S		
TD-069	11/8	09:24	PPD video	0	39.762869	-121.574380	TD	TD	fire is burning on both sides of Pentz Rd; active flames both sides of road; 2 lanes Pentz Rd NB	O		
PPD-05	11/8	09:24	PPD-05	0	39.762823	-121.574409	Radio	Radio	active flames both sides of road Pentz Rd near Conifer	O		
PPD-02	11/8	09:25	PPD-02	0	39.795239	-121.579635	video	video	home on fire	R		
TD-015	11/8	09:26	AVL	64	39.766323	-121.576244	AVL	TD	fire threatening structures	O		
TD-015	11/8	09:26	Inferred	64	39.766150	-121.576884	TD	TD	house catches fire	R		
TD-015	11/8	09:26	Inferred	64	39.766743	-121.576323	TD	TD	pine needles in gutter catch fire	R		
PPD-02	11/8	09:26	PPD-02	0	39.789712	-121.579474	video	video	spot fire against roadway; Pentz Rd near Apple View	S		
VTD-23	11/8	09:27	Inferred	0	39.761773	-121.573921	video	video	active vegetation fire against roadway	V		
PPD-02	11/8	09:29	PPD-02	0	39.781369	-121.579605	video	video	fire both sides of Pentz Rd at Merrill Rd	V		
PPD-02	11/8	09:29	PPD-02	0	39.781537	-121.578928	video	video	small spots on north side Merrill Rd	S		
PPD-02	11/8	09:29	PPD-02	0	39.781334	-121.578721	video	video	fire has consumed vegetation on south side Merrill Rd	V	x	
PPD-02	11/8	09:29	PPD-02	0	39.781223	-121.577017	video	video	structure fully involved	R		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-089	11/8	09:30	Photo	0	39.767950	-121.577067	AVL	TD	structure fully involved	R		
TD-009	11/8	09:30	AVL	2	39.743570	-121.572478	AVL	TD	fire blowing across Pentz Rd	O		
PPD-02	11/8	09:30	PPD-02	0	39.782082	-121.577407	video	video	structure on fire	R		
TD-124	11/8	09:31	AVL	6	39.757258	-121.570255	AVL	TD	FRH: fire in corner in the eaves and gutters; landscaping is on fire	C		
PPD-02	11/8	09:31	PPD-02	0	39.781419	-121.580089	video	video	small spot in pine needles	S		
PPD-02	11/8	09:31	PPD-02	0	39.781101	-121.580289	video	video	spot fire in yard	S		
PPD-02	11/8	09:31	PPD-02	0	39.781414	-121.581390	video	video	spot fire at west end of Merrill Rd	S		
PPD-05	11/8	09:32	PPD-05	0	39.757756	-121.572212	video	video	spot fire	S		
TD-014	11/8	09:33	Radio Log	0	39.758933	-121.572683	AVL	Radio Log	fire has burned past hospital	O		
PPD-05	11/8	09:33	PPD-05	0	39.758749	-121.571922	video	video	detached garage burning good, past peak	R		
PPD-05	11/8	09:33	PPD-05	0	39.762858	-121.574370	Radio	Radio	fire starting to impact vehicles	O		
PPD-02	11/8	09:33	PPD-02	0	39.781575	-121.579407	video	video	vegetation burning; large spot	S		
VTD-23	11/8	09:34	Inferred	3	39.752515	-121.572429	video	video	heavy fire both sides of Pentz Rd; very hot, heavy ember wash; most structures fully involved	R		
TD-060	11/8	09:35	AVL	0	39.769717	-121.579117	AVL	TD	fire burning around intersection	O		
TD-060	11/8	09:35	AVL	17	39.769252	-121.579192	AVL	TD	mobile homes beginning to ignite (Eden Roc Estates)	R		
TD-079	11/8	09:36	AVL	18	39.769867	-121.579350	AVL	TD	fire threatening structures	O		
PPD-05	11/8	09:36	PPD-05	0	39.757860	-121.571753	video	video	multiple spot fires igniting in vegetation all around parking lot	S		
VTD-23	11/8	09:37	Inferred	0	39.749160	-121.572480	video	video	southern edge of fire	O		
PPD-05	11/8	09:37	PPD-05	0	39.757926	-121.571072	video	video	FRH: HVAC support building flames showing from second story	C		
TD-122	11/8	09:38	AVL	0	39.747796	-121.572477	AVL	TD	fire has crossed Pentz Rd at Pearson Rd	O		
TD-124	11/8	09:38	AVL	4	39.757917	-121.570564	AVL	TD	FRH: dumpsters on fire	O		
TD-020	11/8	09:38	AVL TD-124	4	39.757952	-121.570552	TD	TD	FRH: fire in dumpster	O		
VTD-21	11/8	09:38	Inferred	15	39.750413	-121.572531	video	video	heavy fire, everything burning both sides of road; debris in roadway; wind blowing to east, lots of embers; dark, smoky, visibility 0 m to 60 m (0 ft to 200 ft)	R		
VTD-21	11/8	09:38	Inferred	15	39.747756	-121.572415	video	video	intersection of Pentz Rd and Pearson Rd is fully involved	R		
PPD-05	11/8	09:39	PPD-05	0	39.761632	-121.573828	VTD-23	video	fire north of hospital on both sides of Pentz Rd	O		
TD-005	11/8	09:42	Photo	0	39.755060	-121.573043	Photo	Photo	multiple structures on Fickett Ln are fully involved, abundant spot fires on surface vegetation	R		
TD-005	11/8	09:43	Photo	34	39.756577	-121.572070	AVL	TD	FRH: One section of fence on fire; small spot fire against building in alcoves of Birth Day Place	O		
TD-045	11/8	09:43	AVL	30	39.780721	-121.576607	AVL	TD	Structure starting to catch on D side. Can see fire affecting houses on Merrill Rd	R		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-085	11/8	09:43	AVL	36	39.784150	-121.579283	AVL	TD	Beyond Fitness is igniting, Children's Community Charter School is burning	C		
TD-020	11/8	09:43	TD-005	34	39.756672	-121.571922	TD	TD	FRH: fence and patio at hospital Birth Day Place burning	O		
TD-209	11/8	09:44	AVL	50	39.751311	-121.574426	AVL	AVL, TD	fire threatening structures	O		
TD-005	11/8	09:44	Photo	0	39.756763	-121.571943	Photo	Photo	active fire in vegetation, torching juniper trees against Birth Day Place, spewing firebrands	V		
TD-090	11/8	09:45	AVL	55	39.760733	-121.573417	AVL	TD	vehicles being driven while on fire	O		
TD-090	11/8	09:45	AVL	55	39.767474	-121.576503	TD	TD	mobile home park burning; already consumed [could be either MHP between FRH and Bille Rd]	R	x	
PPD-05	11/8	09:49	PPD-05	0	39.769679	-121.583588	Radio	Radio	active flames, about 14 m (15 yd) from the roadway	V		
TD-021	11/8	09:50	PPD video	0	39.769469	-121.583071	TD	TD	fire impacting Bille Rd and vehicles abandoned/stuck on road	O		
TD-060	11/8	09:52	AVL	21	39.769467	-121.580750	AVL	TD	cars igniting on Bille Rd. Home catching fire.	R		
TD-063	11/8	09:53	PPD video	7	39.751151	-121.572527	PPD video	TD, PPD video	everything on fire on Pentz Rd between hospital and Chaney Ln	R		
TD-079	11/8	09:54	AVL	19	39.769519	-121.580796	AVL	TD	pickup on fire a few hundred yards down Bille Rd	O		
TD-103	11/8	09:55	Photo	0	39.755630	-121.571731	Photo	Photo	structure fully involved; interior fire, flames through roof; roof partially collapsed	C		
TD-086	11/8	09:57	AVL	0	39.731332	-121.574204	AVL	TD	fire is burning north of Malibu Dr	O		
PPD-05	11/8	09:57	PPD-05	0	39.756385	-121.572306	video	video	FRH: steady stream of explosions around the hospital street completely burnt on one side, dodging intense fire	O		
PPD-05	11/8	09:59	PPD-05	0	39.762860	-121.574108	Inferred	Radio		O		
TD-021	11/8	10:00	TD	30	39.769267	-121.579100	TD	TD	Eden Roc Estates mobile homes ignite and burn quickly	R		
TD-040	11/8	10:00	Inferred	60	39.778033	-121.580294	TD	TD	spot fires in grass field	S		
TD-040	11/8	10:00	Inferred	60	39.781358	-121.579556	TD	TD	car half on fire	O		
TD-020	11/8	10:05	TD-124	30	39.756420	-121.571413	TD	TD	FRH: fire at cancer center	C		
PPD-05	11/8	10:05	PPD-05	0	39.763657	-121.574109	Radio	Radio	most houses are burnt down	R	x	
TD-124	11/8	10:07	AVL	27	39.756409	-121.571416	AVL	TD	FRH: fire in attic/ceiling of cancer building	C		
TD-086	11/8	10:07	Inferred	113	39.725281	-121.564342	TD	TD	active fire	O		
TD-109	11/8	10:13	AVL	76	39.761656	-121.568042	AVL	TD	homes on south side of retirement home are involved	R		
TD-109	11/8	10:13	AVL	76	39.762085	-121.568911	AVL	TD	fire threatening structures	O		
TD-060	11/8	10:14	AVL	0	39.770350	-121.579432	AVL	TD	fire threatening structures	O		
TD-020	11/8	10:15	AVL TD-109	75	39.762061	-121.568979	TD	TD	small fire on roof of main care facility of Canyon View Dr	C		
PPD-02	11/8	10:16	PPD-02	0	39.768937	-121.578861	Radio	Radio	Eden Roc mobile home park is going up near Pentz Rd, it's not safe here	R		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-079	11/8	10:18	AVL	5	39.788367	-121.579600	AVL	TD	15 m x 15 m (50 ft x 50 ft) spot fire near Paradise Ridge Southern Baptist Church	S		
TD-005	11/8	10:20	AVL	32	39.762063	-121.568917	AVL	TD	Bark mulch against building on fire; OSB under vinyl just ignited, rapid fire growth	R		
TD-103	11/8	10:20	Photo	0	39.755630	-121.571731	Photo	Photo	building past peak, mostly collapsed; vehicle burning	C		
TD-060	11/8	10:24	AVL	6	39.793595	-121.579631	AVL	TD	spot fires on east side of Pentz Rd, spotting around structures	S		
TD-079	11/8	10:29	AVL	20	39.793604	-121.576854	AVL	TD	fire burning eastern homes down side streets towards canyon	R		
TD-060	11/8	10:30	AVL	19	39.791225	-121.579133	AVL	TD	fire threatening structures	O		
TD-015	11/8	10:30	TD-111	0	39.766467	-121.577179	TD	TD	fire threatening structures	O		
TD-015	11/8	10:30	AVL	2	39.767364	-121.576325	AVL	TD	bed of pickup truck on Pentz Rd catches fire	O		
TD-040	11/8	10:30	Inferred	108	39.788632	-121.577414	TD	TD	structure is half involved	R		
TD-040	11/8	10:30	Inferred	108	39.788626	-121.577069	TD	TD	two structures 3/4 involved	R		
TD-111	11/8	10:30	Inferred	38	39.766160	-121.576893	TD	TD	structure on fire	R		
TD-209	11/8	10:37	AVL	34	39.751171	-121.573979	AVL	AVL, TD	fire threatening structures	O		
TD-005	11/8	10:38	Photo	0	39.761630	-121.568072	Photo	Photo	all condos burned to foundation, burned down already	R	x	
TD-037	11/8	10:38	video	0	39.753660	-121.572389	TD	video	structures burning past-peak, limited active surface fire	R	x	
TD-037	11/8	10:38	Photo	0	39.750212	-121.572508	Photo	Photo	structures fully involved, some burned to framing, some burned to ground; all surface and vegetative fuels are consumed	R		
TD-005	11/8	10:38	Photo	0	39.761568	-121.567984	Photo	Photo	Canyon View Dr detached homes are all burned to foundation, some active flaming	R	x	
TD-037	11/8	10:39	video	0	39.746135	-121.572316	TD	video	Pentz Rd south of Pearson Rd; structures fully involved; active vegetation fire and sideways embers	R		
TD-037	11/8	10:39	Photo	0	39.748188	-121.572426	Photo	Photo	nearly all structures fully involved both sides of Pentz Rd; heavy fire all around, ember showers	R		
TD-005	11/8	10:39	Photo	0	39.761568	-121.567984	Photo	Photo	Canyon View Dr detached homes are all burned to foundation, some active flaming	R	x	
TD-045	11/8	10:45	AVL	50	39.781248	-121.575876	AVL	TD	structure beginning to burn in gable vent	R		
TD-037	11/8	10:47	video	0	39.733619	-121.568055	TD	video	numerous intensely burning (primarily vegetation) spot fires all around; ember cast; explosions	S		
TD-037	11/8	10:47	Photo	0	39.733931	-121.568085	Photo	Photo	numerous significant spot fires all around; burning trees, fences, plants. Possibly a few structures burning.	V		
TD-083	11/8	10:49	AVL	3	39.791450	-121.579650	AVL	TD	many spot fires along west side of Pentz Rd	S		
TD-089	11/8	10:49	AVL	22	39.788396	-121.580532	AVL	TD	0.1 ha (0.25 ac) spot in field at Paradise Ridge Southern Baptist Church	S		
TD-037	11/8	10:50	video	0	39.733619	-121.568055	TD	video	surrounded by fire	V		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-020	11/8	10:50	AVL TD-090	0	39.731352	-121.574192	TD	TD	north of Malibu Dr, fire already burned through significant vegetation fire burning up against structure,	O	x	
TD-037	11/8	10:50	Photo	0	39.733525	-121.568163	Photo	Photo	significant ember showers blowing in air and across roadway	V		
TD-005	11/8	10:52	video	3	39.760983	-121.568917	video	video	building burning out of eaves and under structure	C		
TD-079	11/8	10:52	AVL	10	39.787783	-121.580200	AVL	TD	Paradise Ridge Southern Baptist Church: new small spot at church; fire came and wrapped around church; fire established behind (to the west) of church; big fire spreading north	S		
TD-090	11/8	10:52	Photo	0	39.743611	-121.572686	Photo	Photo	vegetation fires, ember showers, most houses fully involved	R		
TD-005	11/8	10:55	Photo	0	39.760248	-121.569305	Photo	Photo	FRH: multiple auxiliary hospital buildings are burning	C		
TD-005	11/8	10:56	AVL	32	39.759968	-121.571728	TD	TD	On Del Rio Way structures all burned, skeletons collapsed. Looked like fire burned from Pentz Rd toward canyon based on burn levels on Del Rio Way (ones closer to Pentz Rd were more burned)	R	x	
TD-005	11/8	10:56	AVL	32	39.760826	-121.572071	TD	TD	fire in yards, fences on fire, burning toward homes, 1 structure involved on street so far. Trees and poles on fire. Continual spot fires and still an ember shower.	R		
TD-021	11/8	11:00	TD	0	39.769425	-121.582995	TD	TD	Bille Rd is blocked by burning vehicles	O		
TD-014	11/8	11:05	Radio Log	0	39.775552	-121.579660	AVL	Radio Log	Ponderosa Elementary School: school buildings on fire	C		
TD-060	11/8	11:06	AVL	63	39.790041	-121.580393	AVL	TD	fire wrapped around Sweetbriar (S, W, N sides)	O		
TD-060	11/8	11:06	AVL	0	39.789826	-121.579918	AVL	TD	structure 10 % to 15 % involved in eaves. Huge pine tree torching.	R		
TD-060	11/8	11:06	AVL	63	39.789825	-121.580428	AVL	TD	first house ignites second house via radiation	R		x
TD-079	11/8	11:09	AVL	0	39.789145	-121.580767	TD	TD	Mulberry Ln - already burning, unsavable	R		
TD-083	11/8	11:09	AVL	0	39.790045	-121.580482	AVL	TD	fire to south of yards, not crowning but burning good. Main fire coming from south	V		
TD-079	11/8	11:09	AVL	49	39.789919	-121.581164	AVL	TD	several structures igniting. Heavy brush and propane tanks; large propane tank exploded	R		
TD-079	11/8	11:09	AVL	49	39.790953	-121.580883	TD	TD	Blue spruce mobile estates burning and popping	R		
TD-009	11/8	11:11	AVL	22	39.784373	-121.578907	AVL	TD	Beyond Fitness gym building is on fire. Vegetation in parking lot has burned.	C		
TD-009	11/8	11:11	AVL	22	39.784157	-121.578748	AVL	TD	Children's Community Charter School building is on fire	C		
TD-209	11/8	11:13	Photo	0	39.751028	-121.572999	Photo	Photo	structure burned to foundation, minimal flaming rubble	R	x	
TD-103	11/8	11:14	Photo	0	39.755255	-121.571109	Photo	Photo	structure fully involved	R		
TD-103	11/8	11:15	Photo	0	39.755255	-121.571109	Photo	Photo	structure fully involved	R		



Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-015	11/8	11:16	AVL	6	39.770043	-121.579220	AVL	TD	fire all around. Eden Roc mobile home park had already burned	O		
TD-209	11/8	11:16	Photo	0	39.747588	-121.572049	Photo	Photo	structure fully involved	R		
TD-209	11/8	11:16	Photo	0	39.747295	-121.571934	Photo	Photo	structure fully involved	R		
TD-209	11/8	11:17	AVL	119	39.746880	-121.572846	AVL	TD	vehicle and house burning; main fire front had passed	R		
TD-209	11/8	11:17	Photo	0	39.747588	-121.572049	Photo	Photo	structure fully involved	R		
TD-111	11/8	11:19	Inferred	31	39.757874	-121.570428	TD	TD	FRH: lower portion of hospital on fire	C		
PPD-08	11/8	11:21	PPD-08	0	39.765284	-121.574279	Radio	Radio	area is a complete loss, unable to locate any structures	R	x	
TD-069	11/8	11:22	Inferred	118	39.757641	-121.570452	TD	TD	FRH: lower hospital building is on fire	C		
TD-009	11/8	11:26	Photo	0	39.784836	-121.579135	AVL	Photo	Beyond Fitness gym building is on fire	C		
TD-009	11/8	11:26	Photo	0	39.784830	-121.579112	Photo	Photo	significant fire from roof of Beyond Fitness, 30 % well involved	C		
TD-009	11/8	11:26	Photo	0	39.784830	-121.579112	Photo	Photo	significant fire from roof of Beyond Fitness, 30 % well involved	C		
TD-209	11/8	11:27	Photo	0	39.746797	-121.572834	Photo	Photo	structure fully involved, threatening neighboring structure	R		
TD-209	11/8	11:27	Photo	0	39.746797	-121.572834	Photo	Photo	structure fully involved, threatening neighboring structure	R		
TD-209	11/8	11:28	Photo	0	39.746797	-121.572834	Photo	Photo	structure fully involved, threatening neighboring structure	R		
TD-005	11/8	11:29	AVL	1036	39.757529	-121.570494	TD	TD	FRH: attic fire getting established, everything around hospital on fire now	C		
TD-015	11/8	11:30	AVL	0	39.775666	-121.579589	AVL	TD	part of Ponderosa Elementary School on fire	C		
TD-109	11/8	11:30	AVL	414	39.757557	-121.570446	AVL	TD	FRH: fire in roof of cardiology center; fire flaring up through roof trenches	C		
TD-086	11/8	11:30	Inferred	30	39.724904	-121.565004	Imagery	TD	burned over; push out quick safety zone	V		
TD-009	11/8	11:33	AVL	17	39.783334	-121.581026	AVL	TD	some structures burned	R	x	
TD-041	11/8	11:40	Inferred	0	39.797653	-121.581882	TD	TD	houses on Gate Ln are igniting, spreading south	R		
TD-103	11/8	11:43	Photo	0	39.757697	-121.570238	Photo	Photo	FRH: heavy smoke from outpatient wing of hospital	C		
TD-103	11/8	11:43	AVL	64	39.756622	-121.569851	AVL	TD	FRH: see smoke in attic; patient room on fire	C		
TD-103	11/8	11:43	Photo	0	39.757691	-121.570134	Photo	Photo	FRH: heavy smoke from cardiology wing	C		
TD-118	11/8	11:45	AVL SCK2	15	39.719126	-121.578404	TD	TD	fire both sides of the road	V		
TD-084	11/8	11:50	AVL	66	39.787853	-121.580120	AVL	TD	fire still on east side of Pentz Rd in area of Paradise Ridge Southern Baptist Church; pine needles in engine grill igniting; fire spotting overhead from south to north	V		
TD-089	11/8	11:50	AVL	55	39.787833	-121.580733	AVL	TD	pine needles and fence burning; fire established in area around Paradise Ridge Southern Baptist Church	O		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-086	11/8	11:55	AVL DZ2140	35	39.723258	-121.570702	TD	TD	fire in grass bumping and hopping dozer line	V		
TD-086	11/8	11:55	AVL DZ2140	35	39.725171	-121.569298	TD	TD	two homes on fire	R		
TD-086	11/8	11:55	AVL DZ2140	35	39.719984	-121.571226	TD	TD	6 m (20 ft) wall of fire from canyon to east	V		
TD-079	11/8	12:00	AVL	5	39.788050	-121.579683	AVL	TD	multiple structures on Sweetbriar Ln burning	R		
TD-118	11/8	12:00	Inferred	175	39.769334	-121.582557	TD	TD	vehicles burned (horse trailer, delivery truck, fifth wheel with truck)	O		
TD-103	11/8	12:01	Photo	0	39.756641	-121.569861	Photo	Photo	FRH: fire in Family Health Center is out, some damage to exam room, exterior wall	C	x	
TD-060	11/8	12:09	AVL	0	39.790041	-121.580393	AVL	TD	multiple structures on fire at this time	R		
TD-021	11/8	12:15	TD	45	39.775927	-121.580895	TD	TD	Ponderosa Elementary School; portable buildings have already burned; cafeteria is on fire	C		
PPD-08	11/8	12:16	PPD-08	0	39.711137	-121.576335	Radio	Radio	fire at this location	O		
TD-043	11/8	12:18	Inferred	2	39.778454	-121.578432	TD	TD	Ridgewood MHP is burned down	R	x	
TD-085	11/8	12:23	AVL	87	39.792706	-121.579473	AVL	TD	flame front already through	O	x	
TD-020	11/8	12:47	Radio Log	0	39.757701	-121.570451	TD	TD	FRH: fire in wing of hospital; building smoking	C		
TD-089	11/8	12:51	AVL	15	39.790200	-121.581183	AVL	TD	Blue Spruce Mobile Estates caught on fire; house caught fire from mobile home park; burning inside and deck and fence	R		x
TD-103	11/8	12:55	AVL	614	39.757525	-121.570484	AVL	TD	FRH: wind directed straight down hallway, would flare up trench cuts in roof	C		
TD-086	11/8	12:57	AVL DZ2140	46	39.719889	-121.572750	Imagery	TD	fires spotting over dozer lines	V		
TD-084	11/8	13:01	AVL	50	39.788270	-121.578327	TD	TD	houses on fire on Apple View Way, fire front already came through	R		
TD-084	11/8	13:01	AVL	50	39.788123	-121.576972	TD	TD	fire threatening structures	O		
TD-121	11/8	13:10	AVL TD-086	50	39.711107	-121.576331	Photo	TD	fire north of here	O		
TD-121	11/8	13:10	AVL TD-086	50	39.720269	-121.573876	TD	TD	large spot fire in area	S		
TD-121	11/8	13:10	AVL TD-086	50	39.724597	-121.571336	TD	TD	main fire line, fire north of here	O		
TD-089	11/8	13:12	AVL	40	39.788243	-121.578347	AVL	TD	garage on fire	R		
TD-014	11/8	13:24	Radio Log	0	39.758244	-121.571631	AVL	Radio Log	FRH: fire at the hospital threatening main building	C		
TD-009	11/8	13:29	AVL	5	39.784373	-121.578907	AVL	TD	Beyond Fitness gym and Children's Community Charter School building burned to the ground	C	x	
TD-042	11/8	13:30	TD	0	39.798129	-121.580125	TD	TD	structures around are burning	R		
TD-014	11/8	13:36	Radio Log	0	39.758244	-121.571631	AVL	Radio Log	FRH: hospital building well involved, beginning to threaten the main hospital	C		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-086	11/8	13:43	AVL DZ2140	17	39.718267	-121.576245	TD	TD	fire burning between houses and reservoir	V		
TD-130	11/8	13:46	Photo	0	39.747756	-121.572455	Photo	Photo	most structures burned to foundation, minimal active spots of fire in rubble	R	x	
TD-130	11/8	13:46	Photo	0	39.752969	-121.572436	Photo	Photo	fire has burned through; minimal spotty fires limited to stumps, power poles, and rubble	R	x	
TD-130	11/8	13:46	Photo	0	39.757240	-121.572800	Photo	Photo	structure fully involved	C		
TD-130	11/8	13:46	Photo	0	39.757959	-121.572638	Photo	Photo	active fire on parcel, collapsed structure	R		
TD-130	11/8	13:46	Photo	0	39.757709	-121.570509	Photo	Photo	FRH: significant flames from roof of cardiology building	C		
TD-130	11/8	13:46	Photo	0	39.757915	-121.569736	Photo	Photo	FRH: surface fuels, a vehicle, a dumpster already consumed; no hot spots	O	x	
TD-069	11/8	13:47	Inferred	53	39.769375	-121.582833	TD	TD	cars actively burning blocking Bille Rd	O		
TD-069	11/8	13:47	Inferred	53	39.775952	-121.580888	TD	TD	Ponderosa Elementary School cafeteria burning	C		
TD-130	11/8	13:49	video	0	39.756547	-121.572775	video	video	multiple structures fully involved west side of Pentz Rd at hospital	R		
TD-112	11/8	13:50	Inferred	370	39.757455	-121.570619	TD	TD	FRH: hospital is well involved	C		
TD-130	11/8	13:51	AVL	319	39.757572	-121.570474	TD	TD	FRH: building burning inside	C		
TD-042	11/8	13:54	Photo	0	39.784826	-121.579119	TD	TD	Beyond Fitness is burned down	C	x	
TD-103	11/8	13:55	Photo	0	39.757639	-121.570544	Photo	Photo	FRH: portion of cardiology building fully involved; flames coming from trench cuts in the roof	C		
TD-115	11/8	14:00	video	0	39.716162	-121.577602	video	TD, video	into heavy, active fire, both sides of Pentz Rd; embers	O		
TD-086	11/8	14:00	TD	0	39.714723	-121.572826	TD	TD	explore on east side of reservoir; fire wrapping to south	V		
TD-121	11/8	14:00	Inferred	60	39.720796	-121.576504	TD	TD	fire spotting across Lago Vista to west side	S		
TD-121	11/8	14:00	Inferred	180	39.711257	-121.577644	TD	TD	numerous spot fires	S		
TD-121	11/8	14:00	Inferred	180	39.704804	-121.577658	TD	TD	fire spreading south, threatening structures	V		
TD-121	11/8	14:00	Inferred	180	39.702946	-121.581588	TD	TD	fire spreading south, threatening structures	V		
TD-121	11/8	14:00	Inferred	180	39.701096	-121.580489	TD	TD	fire spreading south, threatening structures	V		
TD-115	11/8	14:00	Photo	0	39.716173	-121.577630	Photo	Photo	large spot, active vegetation fire both sides of Pentz Rd	V		
TD-115	11/8	14:00	Photo	0	39.717529	-121.577953	Photo	Photo	large spot, active vegetation fire both sides of Pentz Rd	V		
TD-103	11/8	14:00	Photo	0	39.757606	-121.570566	Photo	Photo	FRH: flames coming from roof trenches of cardiology building	C		
TD-103	11/8	14:07	Photo	0	39.757606	-121.570566	Photo	Photo	FRH: flames coming from roof trenches of cardiology building	C		
TD-103	11/8	14:08	Photo	0	39.757606	-121.570566	Photo	Photo	FRH: flames coming from roof trenches of cardiology building	C		
TD-069	11/8	14:44	Inferred	0	39.770044	-121.584035	TD	TD	cars burning on Bille Rd, but passable	O		
TD-055	11/8	15:00	TD	180	39.757641	-121.570478	TD	TD	FRH: building burning	C		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-042	11/8	15:00	Inferred	90	39.775888	-121.580945	TD	TD	cafeteria burning at Ponderosa Elementary School	C		
TD-121	11/8	15:00	TD	0	39.710573	-121.583814	TD	TD	fire moving S, SW along drainage	V		
TD-016	11/8	15:03	Radio Log	0	39.775647	-121.579575	Radio Log	Radio Log	"Ponderosa school off Pentz Rd is being impacted"	V		
TD-111	11/8	15:04	Photo	0	39.797205	-121.580949	TD	TD	a few homes burning Gate Ln / Candlewood Ct	R		
VTD-07	11/8	15:04	Inferred	66	39.712567	-121.576952	video	video	structure on fire; 3 m (10 ft) flames coming from the roof; wind 4.5 m/s to 6.7 m/s (10 mi/h to 15 mi/h) from east	R		
VTD-07	11/8	15:04	Inferred	66	39.706858	-121.584489	video	video	plume coming from canyon	V		
VTD-07	11/8	15:04	Inferred	66	39.712561	-121.577010	video	video	structure on fire; >4.6 m (15 ft) flames, second story well-involved, some surface fuels have burned through in mulch bed	R		
VTD-07	11/8	15:04	Inferred	66	39.712602	-121.577603	video	video	surface fuels, grass, on empty lot have burned	V	x	
VTD-19	11/8	15:04	Inferred	112	39.712543	-121.576949	video	video	Sierra del Sol, fully involved	R		
TD-112	11/8	15:10	Photo	0	39.757671	-121.570531	Photo	Photo	FRH: cardiology building on fire; north wing is partially collapsed	C		
TD-130	11/8	15:34	Photo	0	39.757743	-121.570617	Photo	Photo	FRH: cardiology burning	C		
TD-130	11/8	15:34	Photo	0	39.757912	-121.571109	Photo	Photo	FRH: HVAC unit on roof flaming	O		
TD-037	11/8	15:42	video	0	39.733617	-121.568052	video	video	structure completely finished burning	R	x	
TD-020	11/8	15:42	Radio Log	0	39.712526	-121.577291	Radio Log	Radio Log	fire threatening structures	O		
TD-020	11/8	15:42	Radio Log	0	39.775980	-121.580433	Radio Log	Radio Log	fire threatening structures	O		
TD-037	11/8	15:42	Photo	0	39.733705	-121.567769	Photo	Photo	structures in area destroyed, burned to foundation	R	x	
VTD-27	11/8	15:52	Inferred	40	39.717451	-121.578455	video	video	structure fully involved	R		
VTD-27	11/8	15:52	Inferred	40	39.718178	-121.579263	video	video	structure past peak fully involved, collapsing	R	x	
VTD-27	11/8	15:52	Inferred	40	39.718012	-121.578557	video	video	vegetation already burned; trees torched	V	x	
VTD-27	11/8	15:52	Inferred	40	39.717826	-121.578984	video	video	garden vegetation burned and smoking	V	x	
VTD-27	11/8	15:52	Inferred	40	39.718286	-121.578636	video	video	structure burned, collapsed, light flames remaining	R	x	
VTD-27	11/8	15:52	Inferred	40	39.716415	-121.577987	video	video	detached garage 9 m x 15 m (30 ft x 50 ft) burned to foundation	O	x	
VTD-27	11/8	15:52	Inferred	40	39.713107	-121.576374	video	video	active flames in dense vegetation, torching trees; big burst of energy, flaming debris and embers	V		
VTD-27	11/8	15:52	Inferred	40	39.712557	-121.576959	video	video	structure fire; past peak, roof collapsed, walls standing, still burning	R		
VTD-27	11/8	15:52	Inferred	40	39.712217	-121.576982	video	video	active vegetation fire	S		
TD-023	11/8	16:00	TD	0	39.788612	-121.577937	TD	TD	ground fire creeping to structure and deck post on fire	R		
TD-023	11/8	16:00	TD	0	39.790936	-121.578637	TD	TD	shed building at orchard caught fire and burned down	O		
TD-087	11/8	16:16	AVL	41	39.711083	-121.576217	AVL	TD	fire both sides of Pentz Rd	V		
VTD-27	11/8	16:17	Inferred	15	39.711696	-121.571141	video	video	increase in fire activity to east	O		

Pentz Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-209	11/8	16:22	AVL	52	39.741773	-121.568128	AVL	TD	some houses damaged	R	x	
TD-209	11/8	16:22	AVL	38	39.743583	-121.569417	AVL	TD	hot spots around structures	O	x	
TD-209	11/8	16:30	Photo	0	39.743515	-121.570061	Photo	Photo	shed is burned to ground, no active flames	O	x	
TD-209	11/8	16:30	Photo	0	39.743562	-121.569871	Photo	Photo	fence has burned	O	x	
TD-005	11/8	16:44	Photo	0	39.757705	-121.570434	Photo	Photo	FRH: north portion of cardiology mostly burnt down, reduced fire activity	C		
TD-209	11/8	16:45	Photo	0	39.743543	-121.569951	Photo	Photo	few smoking hot spots, no active flames	O	x	
TD-209	11/8	16:45	Photo	0	39.743558	-121.569830	Photo	Photo	wood retaining wall, mulch, vegetation; burned	O	x	
TD-209	11/8	16:45	Photo	0	39.743666	-121.569786	Photo	Photo	structure burned to foundation	R	x	
TD-209	11/8	16:45	Photo	0	39.743485	-121.569201	Photo	Photo	structure burned to foundation, surface fuels on parcel burned	R	x	
TD-209	11/8	16:45	Photo	0	39.743750	-121.568824	Photo	Photo	structure fully involved	R		
TD-209	11/8	16:45	Photo	0	39.743471	-121.568726	Photo	Photo	structure burned to foundation	R	x	
TD-209	11/8	16:45	Photo	0	39.743250	-121.569726	Photo	Photo	structure burned to foundation	R	x	
TD-005	11/8	16:57	Photo	0	39.757302	-121.570408	Photo	Photo	FRH: cardiology, most fire activity on NW corner, burning in rubble	C		
TD-087	11/8	16:59	AVL	53	39.720333	-121.577045	AVL	TD	spot fires everywhere	S		
TD-043	11/8	17:00	TD	90	39.774975	-121.580130	TD	TD	Fire, Ponderosa Elementary School	C		
TD-121	11/8	17:00	TD	30	39.711122	-121.576252	TD	TD	fire blows across Pentz Rd at the reservoir	V		
TD-121	11/8	17:00	Inferred	30	39.709784	-121.576015	TD	TD	fuels are black, but fire catches a house and spreads to other structures	R		
TD-055	11/8	17:49	Photo	0	39.757746	-121.570627	Photo	Photo	FRH: cardiology partially collapsed, still flaming	C	x	
TD-055	11/8	17:50	Photo	0	39.757641	-121.570478	Photo	TD	FRH: lower hospital building is still burning, burned down in sections	C		
TD-043	11/8	18:10	Photo	0	39.776017	-121.580848	TD	TD	Ponderosa Elementary School cafeteria on fire	C		
TD-014	11/8	18:23	AVL	40	39.786946	-121.574589	AVL	TD	houses on Dean Rd are pretty much gone	R	x	
TD-109	11/8	18:26	AVL	1	39.769673	-121.583495	AVL	TD	cars still burning on Bille Rd	O		
TD-103	11/8	18:26	Photo	0	39.757728	-121.570570	Photo	Photo	FRH: cardiology portion is flaming rubble	C	x	
TD-055	11/8	18:30	TD	0	39.783865	-121.578938	TD	TD	Children's Community Charter School: main building burned; office building is not burned	C	x	
TD-103	11/8	23:40	AVL	440	39.757995	-121.571050	AVL	TD	FRH: maintenance shed roof on fire	C		
TD-103	11/8	23:40	AVL	440	39.757525	-121.570484	AVL	TD	FRH: interior fire threatening main building	C		
TD-103	11/9	00:21	Photo	0	39.757891	-121.571183	Photo	Photo	FRH: hot spots inside cardiology building	C	x	
TD-103	11/9	07:10	AVL	257	39.757995	-121.571050	AVL	TD	FRH: maintenance shed roof on fire	C		

Feather River Hospital												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-063	11/8	07:49	911-064-1	0	39.754064	-121.570775	911-064-1	TD	spot fire	S		
911-064-1	11/8	07:49	911-064-1	0	39.754132	-121.570864	911-064-1	911-064-1	fire in yard	S		
911-066-1	11/8	07:50	911-066-1	0	39.754563	-121.570015	Inferred	911-066-1	fire just started very close to us	S		
911-071-1	11/8	07:51	911-071-1	0	39.754132	-121.570864	911-071-1	911-071-1	fire in yard getting bigger by the second	S		
911-084-1	11/8	07:56	911-084-1	0	39.755072	-121.569579	Inferred	911-084-1	fire behind home on Riverview Dr	S		
911-086-3	11/8	07:58	911-086-3	0	39.762973	-121.567732	Inferred	911-086-3	fire coming up the hill by the back cottages	V		
911-1035-1	11/8	08:00	911-1035-1	0	39.762078	-121.568099	Inferred	911-1035-1	fire within feet of structures	V		
TD-063	11/8	08:02	PPD video	15	39.755087	-121.569543	PPD video	TD, PPD video	spot fire coming up from canyon	S		
PPD-01	11/8	08:02	PPD-01	0	39.754989	-121.569479	video	video	spot fire	S		
911-104-1	11/8	08:09	911-104-1	0	39.754121	-121.570879	911-104-1	911-104-1	fire burning on property	S		
911-1047-1	11/8	08:11	911-1047-1	0	39.757160	-121.571200	911-1047-1	911-1047-1	Feather River Hospital is getting spot fires on campus	S		
TD-063	11/8	08:17	Inferred	3	39.755091	-121.571529	TD	TD	south side yards/vegetation on fire, north side has no fire	V		
911-1054-2	11/8	08:17	911-1054-2	0	39.754421	-121.570872	Inferred	911-1054-2	big fire behind house	V		
TD-063	11/8	08:20	Inferred	30	39.757794	-121.571187	TD	TD	FRH: active fire on the hospital complex	V		
Radio Log	11/8	08:20	Radio Log	0	39.756680	-121.568253	Inferred	Radio Log	FRH: fire right on property line	V		
911-131-1	11/8	08:24	911-131-1	0	39.757421	-121.570929	911-131-1	911-131-1	hospital on fire	C		
911-134-1	11/8	08:25	911-134-1	0	39.757421	-121.570929	911-134-1	911-134-1	FRH being impacted by fire	O		
911-137-1	11/8	08:27	911-137-1	0	39.757421	-121.570929	911-137-1	911-137-1	hospital is on fire	C		
TD-143	11/8	08:30	Inferred	30	39.754738	-121.572356	TD	TD	fire both sides of road; propane exploding	R		
Radio Log	11/8	08:36	Radio Log	0	39.757060	-121.571208	Radio Log	Radio Log	fire within 3 m (10 ft) of FRH	V		
TD-005	11/8	08:37	AVL	0	39.754633	-121.572426	AVL	TD	fire on east side of Pentz Rd about to hit Riverview Dr	V		
TD-014	11/8	08:37	Radio Log	0	39.756607	-121.568242	Radio Log	Radio Log	active torching behind FRH	V		
TD-005	11/8	08:38	AVL	0	39.754891	-121.571911	TD	TD	fire in front yard	S		
TD-005	11/8	08:38	AVL	65	39.755100	-121.571617	AVL	TD	Spots growing bigger than backpump size in seconds, and flames blowtorching, ember shower, all yards burning. Decorative stuff in yards burning that normally doesn't burn	S		
TD-014	11/8	08:38	AVL	17	39.756387	-121.568888	TD	TD	FRH: fully involved buildings	C		
TD-014	11/8	08:38	AVL	17	39.756620	-121.571889	TD	TD	FRH: fire on patio of OB unit	O		
TD-014	11/8	08:40	Radio Log	0	39.756195	-121.572080	AVL	TD	FRH: fire on one of the patios at the hospital	O		
911-179-1	11/8	08:46	911-179-1	0	39.757048	-121.571191	911-179-1	911-179-1	hospital fire alarm	C		
TD-103	11/8	08:47	AVL	148	39.755683	-121.571747	AVL	TD	fire approaches from east	V		
TD-103	11/8	08:47	AVL	148	39.756426	-121.571397	TD	TD	FRH: Cancer center catches fire	C		
VTD-17	11/8	08:47	TD	3	39.756884	-121.568212	video	video	smoke coming from behind hospital	V		
TD-005	11/8	08:48	AVL	0	39.755324	-121.570642	AVL	TD	house at end of street 50 % involved	R		

Feather River Hospital												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
PPD-04	11/8	08:53	PPD-04	5	39.755718	-121.569681	video	video	intense fire activity, possible structure involved	O		
TD-103	11/8	09:00	Photo	0	39.755455	-121.571546	Photo	Photo	fence and vegetation burning, threatening structure	O		
TD-020	11/8	09:02	Inferred	0	39.757028	-121.571208	TD	TD	ember cast	O		
911-208-1	11/8	09:02	911-208-1	0	39.757023	-121.571290	911-208-1	911-208-1	fire alarm	C		
911-210-1	11/8	09:04	911-210-1	0	39.758893	-121.570887	911-210-1	911-210-1	fire alarm	C		
VTD-17	11/8	09:05	TD	0	39.758293	-121.571793	video	video	light embers start trickling down	O		
VTD-17	11/8	09:05	Inferred	9	39.755064	-121.572370	video	video	fire burning on west side Pentz Rd	V		
PPD-05	11/8	09:05	PPD-05	0	39.757758	-121.571137	video	video	light ember cast blowing from the west	O		
PPD-05	11/8	09:08	PPD-05	2	39.757758	-121.571137	video	video	heavy ember shower, embers exploding and skittering across pavement	O		
PPD-05	11/8	09:09	PPD-05	0	39.757834	-121.571099	video	video	multiple spot fire ignition in mulch	S		
PPD-05	11/8	09:12	PPD-05	0	39.757892	-121.571664	video	Radio	FRH: firestorm, fire threatening all around all the buildings including gas tanks and oxygen	O		
TD-090	11/8	09:15	AVL	7	39.757795	-121.572302	AVL	TD	fire on the west side of Pentz Rd by the hospital	V		
TD-016	11/8	09:15	Inferred	192	39.757568	-121.570270	TD	TD	FRH: attic fire in structure	C		
VTD-17	11/8	09:15	Inferred	8	39.756180	-121.572572	video	video	surface fire burning all of west side of Pentz Rd at southern hospital driveway	V		
TD-109	11/8	09:17	AVL	45	39.756683	-121.570967	AVL	TD	FRH: HVAC is on fire	C		
PPD-05	11/8	09:19	PPD-05	0	39.757895	-121.572366	video	Radio	fire has jumped westbound from our location	O		
PPD-05	11/8	09:19	PPD-05	0	39.757655	-121.572453	video	video	spot fire on west side Pentz Rd	S		
PPD-05	11/8	09:20	PPD-05	0	39.756074	-121.572333	video	video	Pentz Rd is inaccessible due to fire and fire engine activity south of hospital	O		
TD-124	11/8	09:22	AVL	81	39.757193	-121.570698	AVL	TD	FRH: passage connecting two buildings is 1/4 involved	C		
PPD-05	11/8	09:23	PPD-05	0	39.758015	-121.572137	video	video	spot fire	S		
TD-124	11/8	09:31	AVL	6	39.757258	-121.570255	AVL	TD	FRH: fire in corner in the eaves and gutters; landscaping is on fire	C		
PPD-05	11/8	09:32	PPD-05	0	39.757756	-121.572212	video	video	spot fire	S		
TD-014	11/8	09:33	Radio Log	0	39.758933	-121.572683	AVL	Radio Log	fire has burned past hospital	O		
PPD-05	11/8	09:33	PPD-05	0	39.758749	-121.571922	video	video	detached garage burning good, past peak	R		
PPD-05	11/8	09:36	PPD-05	0	39.757860	-121.571753	video	video	multiple spot fires igniting in vegetation all around parking lot	S		
PPD-05	11/8	09:37	PPD-05	0	39.757926	-121.571072	video	video	FRH: HVAC support building flames showing from second story	C		
TD-124	11/8	09:38	AVL	4	39.757917	-121.570564	AVL	TD	FRH: dumpsters on fire	O		
TD-020	11/8	09:38	AVL TD-124	4	39.757952	-121.570552	TD	TD	FRH: fire in dumpster	O		
TD-005	11/8	09:43	Photo	34	39.756577	-121.572070	AVL	TD	FRH: One section of fence on fire; small spot fire against building in alcoves of Birth Day Place	O		

Feather River Hospital												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-020	11/8	09:43	TD-005	34	39.756672	-121.571922	TD	TD	FRH: fence and patio at hospital Birth Day Place burning	O		
TD-005	11/8	09:44	Photo	0	39.756763	-121.571943	Photo	Photo	active fire in vegetation, torching juniper trees against Birth Day Place, spewing firebrands	V		
TD-103	11/8	09:55	Photo	0	39.755630	-121.571731	Photo	Photo	structure fully involved; interior fire, flames through roof; roof partially collapsed	C		
PPD-05	11/8	09:57	PPD-05	0	39.756385	-121.572306	video	video	FRH: steady stream of explosions around the hospital	O		
TD-020	11/8	10:05	TD-124	30	39.756420	-121.571413	TD	TD	FRH: fire at cancer center	C		
TD-124	11/8	10:07	AVL	27	39.756409	-121.571416	AVL	TD	FRH: fire in attic/ceiling of cancer building	C		
TD-109	11/8	10:13	AVL	76	39.761656	-121.568042	AVL	TD	homes on south side of retirement home are involved	R		
TD-109	11/8	10:13	AVL	76	39.762085	-121.568911	AVL	TD	fire threatening structures	O		
TD-020	11/8	10:15	AVL TD-109	75	39.762061	-121.568979	TD	TD	small fire on roof of main care facility of Canyon View Dr	C		
TD-005	11/8	10:20	AVL	32	39.762063	-121.568917	AVL	TD	Bark mulch against building on fire; OSB under vinyl just ignited, rapid fire growth	R		
TD-103	11/8	10:20	Photo	0	39.755630	-121.571731	Photo	Photo	building past peak, mostly collapsed; vehicle burning	C		
TD-005	11/8	10:38	Photo	0	39.761630	-121.568072	Photo	Photo	all condos burned to foundation, burned down already	R	x	
TD-005	11/8	10:38	Photo	0	39.761568	-121.567984	Photo	Photo	Canyon View Dr detached homes are all burned to foundation, some active flaming	R	x	
TD-005	11/8	10:39	Photo	0	39.761568	-121.567984	Photo	Photo	Canyon View Dr detached homes are all burned to foundation, some active flaming	R	x	
TD-005	11/8	10:52	video	3	39.760983	-121.568917	video	video	building burning out of eaves and under structure	C		
TD-005	11/8	10:55	Photo	0	39.760248	-121.569305	Photo	Photo	FRH: multiple auxiliary hospital buildings are burning	C		
TD-103	11/8	11:14	Photo	0	39.755255	-121.571109	Photo	Photo	structure fully involved	R		
TD-103	11/8	11:15	Photo	0	39.755255	-121.571109	Photo	Photo	structure fully involved	R		
TD-111	11/8	11:19	Inferred	31	39.757874	-121.570428	TD	TD	FRH: lower portion of hospital on fire	C		
TD-069	11/8	11:22	Inferred	118	39.757641	-121.570452	TD	TD	FRH: lower hospital building is on fire	C		
TD-005	11/8	11:29	AVL	1036	39.757529	-121.570494	TD	TD	FRH: attic fire getting established, everything around hospital on fire now	C		
TD-109	11/8	11:30	AVL	414	39.757557	-121.570446	AVL	TD	FRH: fire in roof of cardiology center; fire flaring up through roof trenches	C		
TD-103	11/8	11:43	Photo	0	39.757697	-121.570238	Photo	Photo	FRH: heavy smoke from outpatient wing of hospital	C		
TD-103	11/8	11:43	AVL	64	39.756622	-121.569851	AVL	TD	FRH: see smoke in attic; patient room on fire	C		
TD-103	11/8	11:43	Photo	0	39.757691	-121.570134	Photo	Photo	FRH: heavy smoke from cardiology wing	C		
TD-103	11/8	12:01	Photo	0	39.756641	-121.569861	Photo	Photo	FRH: fire in Family Health Center is out, some damage to exam room, exterior wall	C	x	
TD-020	11/8	12:47	Radio Log	0	39.757701	-121.570451	TD	TD	FRH: fire in wing of hospital; building smoking	C		



Feather River Hospital												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-103	11/8	12:55	AVL	614	39.757525	-121.570484	AVL	TD	FRH: wind directed straight down hallway, would flare up trench cuts in roof	C		
TD-014	11/8	13:24	Radio Log	0	39.758244	-121.571631	AVL	Radio Log	FRH: fire at the hospital threatening main building	C		
TD-014	11/8	13:36	Radio Log	0	39.758244	-121.571631	AVL	Radio Log	FRH: hospital building well involved, beginning to threaten the main hospital	C		
TD-130	11/8	13:46	Photo	0	39.757240	-121.572800	Photo	Photo	structure fully involved	C		
TD-130	11/8	13:46	Photo	0	39.757959	-121.572638	Photo	Photo	active fire on parcel, collapsed structure	R		
TD-130	11/8	13:46	Photo	0	39.757709	-121.570509	Photo	Photo	FRH: significant flames from roof of cardiology building	C		
TD-130	11/8	13:46	Photo	0	39.757915	-121.569736	Photo	Photo	FRH: surface fuels, a vehicle, a dumpster already consumed; no hot spots	O	x	
TD-130	11/8	13:49	video	0	39.756547	-121.572775	video	video	multiple structures fully involved west side of Pentz Rd at hospital	R		
TD-112	11/8	13:50	Inferred	370	39.757455	-121.570619	TD	TD	FRH: hospital is well involved	C		
TD-130	11/8	13:51	AVL	319	39.757572	-121.570474	TD	TD	FRH: building burning inside	C		
TD-103	11/8	13:55	Photo	0	39.757639	-121.570544	Photo	Photo	FRH: portion of cardiology building fully involved; flames coming from trench cuts in the roof	C		
TD-103	11/8	14:00	Photo	0	39.757606	-121.570566	Photo	Photo	FRH: flames coming from roof trenches of cardiology building	C		
TD-103	11/8	14:07	Photo	0	39.757606	-121.570566	Photo	Photo	FRH: flames coming from roof trenches of cardiology building	C		
TD-103	11/8	14:08	Photo	0	39.757606	-121.570566	Photo	Photo	FRH: flames coming from roof trenches of cardiology building	C		
TD-055	11/8	15:00	TD	180	39.757641	-121.570478	TD	TD	FRH: building burning	C		
TD-112	11/8	15:10	Photo	0	39.757671	-121.570531	Photo	Photo	FRH: cardiology building on fire; north wing is partially collapsed	C		
TD-130	11/8	15:34	Photo	0	39.757743	-121.570617	Photo	Photo	FRH: cardiology burning	C		
TD-130	11/8	15:34	Photo	0	39.757912	-121.571109	Photo	Photo	FRH: HVAC unit on roof flaming	O		
TD-005	11/8	16:44	Photo	0	39.757705	-121.570434	Photo	Photo	FRH: north portion of cardiology mostly burnt down, reduced fire activity	C		
TD-005	11/8	16:57	Photo	0	39.757302	-121.570408	Photo	Photo	FRH: cardiology, most fire activity on NW corner, burning in rubble	C		
TD-055	11/8	17:49	Photo	0	39.757746	-121.570627	Photo	Photo	FRH: cardiology partially collapsed, still flaming	C	x	
TD-055	11/8	17:50	Photo	0	39.757641	-121.570478	Photo	TD	FRH: lower hospital building is still burning, burned down in sections	C		
TD-103	11/8	18:26	Photo	0	39.757728	-121.570570	Photo	Photo	FRH: cardiology portion is flaming rubble	C	x	
TD-103	11/8	23:40	AVL	440	39.757995	-121.571050	AVL	TD	FRH: maintenance shed roof on fire	C		
TD-103	11/8	23:40	AVL	440	39.757525	-121.570484	AVL	TD	FRH: interior fire threatening main building	C		

Feather River Hospital												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-103	11/9	00:21	Photo	0	39.757891	-121.571183	Photo	Photo	FRH: hot spots inside cardiology building	C	x	
TD-103	11/9	07:10	AVL	257	39.757995	-121.571050	AVL	TD	FRH: maintenance shed roof on fire	C		

Wagstaff Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
911-077-3	11/8	07:53	911-077-3	0	39.778763	-121.577193	911-077-3	911-077-3	vegetation fire in side yard	S		
911-129-1	11/8	08:24	911-129-1	0	39.777911	-121.598330	911-129-1	911-129-1	fire	S		
TD-064	11/8	08:30	Inferred	14	39.778184	-121.585895	TD	TD	notice spot fires on north side of Wagstaff Rd between Clark Rd and Pentz Rd	S		
911-141-2	11/8	08:31	911-141-2	0	39.775971	-121.600466	911-141-2	911-141-2	house on fire	R		
911-157-1	11/8	08:37	911-157-1	0	39.776591	-121.588145	911-157-1	911-157-1	field behind Kmart on fire	S		
TD-067	11/8	08:38	911-158-1	0	39.779476	-121.587807	TD	TD, 911-158-1	spot fire	S		
911-158-1	11/8	08:38	911-158-1	0	39.779450	-121.587721	911-158-1	911-158-1	spot fire in grass, just started, small but still burning	S		
911-162-1	11/8	08:39	911-162-1	0	39.778220	-121.604211	Inferred	911-162-1	flames on bike path	S		
911-163-1	11/8	08:39	911-163-1	0	39.784007	-121.612384	Inferred	911-163-1	smoke coming out of Little Butte Creek Canyon, just started, somewhere about Lucky Ln	S		
TD-014	11/8	08:40	Radio Log	0	39.777786	-121.579607	Radio Log	Radio Log	multiple spot fires [in area of] Pentz Rd / Wagstaff Rd	S		
TD-075	11/8	08:40	Inferred	6	39.777730	-121.590638	TD	TD	noticed embers flying through air	O		
TD-067	11/8	08:40	Inferred	6	39.779476	-121.587807	TD	TD	smaller spot fire in grass behind church	S		
TD-042	11/8	08:40	Inferred	0	39.778477	-121.577106	TD	TD	half of mobile homes in Ridgewood mobile home park are on fire	R		
911-169-1	11/8	08:43	911-169-1	0	39.777959	-121.603210	911-169-1	911-169-1	fire behind the house	S		
PPD-02	11/8	08:43	PPD-02	0	39.778604	-121.588499	Radio	Radio	large tree on fire between Wagstaff Rd and Della Ln by the school district office	S		
PPD-02	11/8	08:43	PPD-02	0	39.779087	-121.577092	Radio	Radio	Ridgewood mobile home park; fires directly behind, homes becoming involved	R		
TD-067	11/8	08:46	PPD video	0	39.776799	-121.588842	TD	TD	observed fully involved pine tree on south side Wagstaff Rd	S		
TD-067	11/8	08:46	Inferred	20	39.778443	-121.578823	TD	TD	Ridgewood MHP, portions are burning	R		
PPD-02	11/8	08:46	PPD-02	0	39.777473	-121.588112	Radio	Radio	spot fire; large tree and field involved	S		
911-178-2	11/8	08:46	911-178-2	0	39.778331	-121.603978	Inferred	911-178-2	fire on the bike path behind house	S		
TD-053	11/8	08:50	Inferred	10	39.777706	-121.594897	TD	TD	houses burning, trees burning on north side	R		
PPD-02	11/8	08:52	PPD-02	0	39.778476	-121.579561	Radio	Radio	fire reaching Pentz Rd now (Ridgewood MHP)	O		
TD-043	11/8	08:55	Inferred	21	39.778869	-121.578982	TD	TD	mobile homes are burning in Ridgeway MHP (NW corner)	R		
TD-043	11/8	08:58	Inferred	18	39.778472	-121.576890	TD	TD	mobile homes burning; pass through fire twice in mobile home park to escape back to Pentz Rd (Ridgewood Mobile Home Park)	R		
TD-085	11/8	08:59	AVL	0	39.777336	-121.577799	AVL	TD	Ponderosa mobile home park burning; sending ember showers	R		
TD-085	11/8	08:59	AVL	40	39.778433	-121.578792	AVL	TD	all mobile homes on fire (Ridgewood MHP)	R		

Wagstaff Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-043	11/8	09:00	TD-085, TD-022	30	39.777779	-121.579642	TD	TD	pine trees igniting at intersection	V		
TD-053	11/8	09:00	Inferred	0	39.776337	-121.588374	TD	TD	fire east of Kmart	R		
PPD-02	11/8	09:01	PPD-02	0	39.778583	-121.579579	Radio	Radio	fire threatening vehicles	O		
TD-042	11/8	09:15	Inferred	68	39.777646	-121.603153	TD	TD	numerous spot fires closer to Skyway	S		
TD-017	11/8	09:17	AVL	103	39.777667	-121.598330	TD	TD	Fire now spotting, pinching Wagstaff Rd between Clark Rd and Skyway	S		
TD-111	11/8	09:21	Radio Log	0	39.777657	-121.606241	TD	Radio Log	Skyway at Wagstaff about to be threatened, multiple cars on fire in the area	O		
TD-111	11/8	09:21	Inferred	0	39.777667	-121.604621	TD	TD	well-established spot fire off Wagstaff Rd near the bike path	S		
VTD-18	11/8	09:28	TD	0	39.776810	-121.588771	video	video	tall pine tree bark burning along the entire trunk	V		
TD-052	11/8	09:28	Photo	0	39.778000	-121.590473	Photo	Photo	fire has burned up bark of tall pine tree behind (east) Savemart	V	x	
TD-017	11/8	09:30	Radio Log	0	39.777731	-121.590543	Radio Log	Radio Log	fire is well established [in area around] Clark Rd and Wagstaff Rd	O		
TD-127	11/8	09:30	Inferred	30	39.777987	-121.598007	TD	TD	fire is burning from the NE into area of Rocky Ln and Wagstaff Rd	O		
VTD-18	11/8	09:30	TD	0	39.777301	-121.587854	video	video	smoke plume rising from east of commercial buildings (estimated source location)	O		
VTD-18	11/8	09:32	TD	0	39.776068	-121.588136	video	video	orange glow coming from east of commercial buildings (estimated source location)	O		
TD-127	11/8	09:37	Radio Log	0	39.777659	-121.604169	Radio Log	Radio Log	structures burning; vehicles about to get overrun	R		
TD-055	11/8	09:40	Radio Log	0	39.777682	-121.602032	Radio Log	Radio Log	several structures threatened/involved	R		
VTD-18	11/8	09:43	TD	0	39.775481	-121.588899	video	video	30 m (100 ft) tall pine tree torches in 22 s; starts off major fire behind buildings	O		
TD-058	11/8	09:44	video	0	39.775481	-121.588899	video	TD, video	trees torching	V		
TD-052	11/8	09:44	Photo	0	39.775554	-121.588966	Photo	Photo	very tall pine torching tree behind Savemart (Paradise Plaza)	V		
TD-127	11/8	09:47	Radio Log	0	39.777659	-121.604169	Radio Log	Radio Log	fire coming across Wagstaff Rd	O		
TD-127	11/8	09:57	Photo	0	39.778025	-121.602808	Photo	Photo	structure, surface fuels, vehicle all fully involved on single parcel	R		
TD-040	11/8	10:00	Inferred	60	39.778033	-121.580294	TD	TD	spot fires in grass field	S		
TD-014	11/8	10:15	AVL	2	39.777724	-121.598370	AVL	TD	lots of fire, structures burning both sides of Wagstaff Rd	R		
TD-022	11/8	10:15	TD	0	39.775663	-121.605361	TD	TD	area fully involved in fire; fire coming from N and E	O		
TD-022	11/8	10:15	Inferred	45	39.775663	-121.605361	TD	TD	heavy vegetation is burning	V		
TD-127	11/8	10:17	Photo	0	39.777662	-121.603050	Photo	Photo	all structures fully involved around Wagstaff Rd/Oak Way; everything burning, swirling ember showers	R		

Wagstaff Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-055	11/8	10:22	Photo	0	39.776884	-121.588480	Photo	Photo	structure burning well in garage	R		
TD-055	11/8	10:22	Photo	0	39.776875	-121.588445	Photo	Photo	attached garage of duplex fully involved, burning through roof	R		
TD-127	11/8	10:40	Photo	0	39.777289	-121.603059	Photo	Photo	fire burning up against roadway, both sides of road	O		
VTD-26	11/8	10:43	Inferred	0	39.778228	-121.601723	video	video	structure fully involved	R		
VTD-26	11/8	10:43	Inferred	0	39.778058	-121.602160	video	video	structures burned to foundation	R	x	
VTD-13	11/8	10:44	video	0	39.777680	-121.603036	video	video	multiple structures fully involved; homes to the west on north side, some have collapsed	R		
VTD-13	11/8	10:44	video	0	39.777680	-121.603036	video	video	1212 Wagstaff Rd and west on south side are burning	R		
VTD-26	11/8	10:44	Inferred	0	39.783304	-121.612575	video, LANDSAT	video	large plume rising from canyon to west	S		
VTD-26	11/8	10:46	Inferred	0	39.777369	-121.604218	video	video	structures burning on Berkshire Ave near Wagstaff Rd	R		
TD-127	11/8	10:57	Radio Log	0	39.776749	-121.603057	Inferred	Radio Log	fire heavily impacting Oak Way and towards Bille Rd	O		
TD-017	11/8	11:03	AVL	3	39.780343	-121.609252	AVL	TD	Heavy fire and embers, embers entering vehicle door. Everything burning all around	O		
TD-127	11/8	11:30	Inferred	30	39.778239	-121.608737	TD	TD	heavy fire	O		
TD-017	11/8	11:34	AVL	116	39.776363	-121.589966	AVL	TD	Kmart threatened, front side of Kmart shrubs catching fire.	S		
TD-015	11/8	11:35	AVL	123	39.776164	-121.587283	TD	TD	fire around Kmart shopping center	O		
PPD-08	11/8	11:44	PPD-08	0	39.778894	-121.589724	video	video	spot fire on both sides of Clark Rd	S		
PPD-08	11/8	11:44	PPD-08	0	39.779241	-121.589570	video	video	spot fire on east side Clark Rd	S		
PPD-08	11/8	11:58	PPD-08	0	39.779241	-121.589570	video	video	spot fire on both sides Clark Rd	S		
PPD-08	11/8	11:58	PPD-08	0	39.778648	-121.590200	video	video	spot fire west side Clark Rd	S		
TD-127	11/8	12:00	Radio Log	0	39.777628	-121.606319	Radio Log	Radio Log	multiple gas stations being impacted by fire	C		
PPD-08	11/8	12:00	PPD-08	0	39.777640	-121.589221	video	video	spot fire	S		
TD-043	11/8	12:18	Inferred	2	39.778454	-121.578432	TD	TD	Ridgewood MHP is burned down	R	x	
VTD-18	11/8	12:22	TD	0	39.776348	-121.591675	video	video	fully involved bushes spot fire, 3 m to 4.6 m (10 ft to 15 ft) flames	S		
TD-127	11/8	12:24	Radio Log	0	39.777646	-121.606300	Radio Log	Radio Log	fire on Skyway at Bille Rd and Wagstaff Rd	O		
TD-127	11/8	12:30	Radio Log	0	39.777627	-121.606305	Radio Log	Radio Log	heavy fire impacting Skyway at Wagstaff Rd	O		
TD-100	11/8	12:30	Inferred	0	39.778919	-121.613265	TD	TD	Waggoner Rd, Wagstaff Rd impacted with fire	O		
VTD-18	11/8	12:30	TD	0	39.778248	-121.590467	Photo	Photo	spot fire, bushes/vegetation	S		
VTD-18	11/8	12:30	TD	0	39.778062	-121.591908	Photo	Photo	heavy fire, multiple structures burning	R		
VTD-18	11/8	12:47	TD	0	39.776198	-121.591813	Photo	video	juniper bush spot fire	S		
VTD-18	11/8	13:13	TD	0	39.777167	-121.588813	video	video	all structures behind Savemart are past peak, fully involved, partially collapsed	R	x	
TD-065	11/8	14:25	Inferred	31	39.778005	-121.590758	TD	TD	fire threatening structure; fire into siding	C		

Wagstaff Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-043	11/8	14:30	TD	150	39.776522	-121.590402	TD	TD	fire around Kmart	O		
TD-205	11/8	16:45	AVL	4	39.777534	-121.604897	AVL	TD	a few hot spots	O		
TD-207	11/8	16:49	AVL	0	39.777648	-121.596977	AVL	TD	all burnt up	O	x	
TD-207	11/8	16:52	AVL	76	39.779170	-121.585533	AVL	TD	fire threatening structure	O		
TD-065	11/8	16:52	AVL TD-207	173	39.779150	-121.585548	AVL TD-207	TD	fire threatening structure	O		
TD-205	11/8	16:54	AVL	31	39.777383	-121.612533	AVL	TD	Fire getting under floor	R		
TD-114	11/8	17:14	AVL Bus1403	0	39.776164	-121.590290	TD	TD	fire behind the Kmart	O		
TD-108	11/8	17:56	Inferred	81	39.777827	-121.595673	TD	TD	scouting on foot Wagstaff Rd between Moss Ln and Apollo Ln; fire growing very fast	V		
TD-207	11/8	18:09	AVL	96	39.780415	-121.585751	AVL	TD	fire threatening structure	O		
TD-108	11/8	18:34	Photo	0	39.777827	-121.595673	Photo	Photo	1359 Wagstaff Rd standing; structures on south side Wagstaff Rd are burned down	R	x	
TD-108	11/8	18:34	Photo	0	39.777303	-121.595404	Photo	Photo	structure burned to foundation, flaming	R	x	
TD-014	11/8	19:14	Radio Log	0	39.780941	-121.627902	Radio Log	Radio Log	fire in the wall of structure	R		
TD-127	11/8	19:19	Radio Log	0	39.780959	-121.627915	TD	Radio Log	fire in wall of structure	R		
TD-200	11/8	21:52	AVL	20	39.776750	-121.626883	AVL	TD	thought there was attic fire, siding on fire	R		
TD-202	11/8	21:52	AVL	20	39.776462	-121.626754	TD	TD	siding of structure burning	R		

Bille Road

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-069	11/8	08:00	TD	0	39.767481	-121.588974	TD	TD	15 cm (6 in) chunk of bark glowing	S		
911-143-1	11/8	08:32	911-143-1	0	39.773011	-121.614879	911-143-1	911-143-1	fire behind house	S		
TD-105	11/8	08:40	Inferred	20	39.770416	-121.602386	TD	TD	spot fires on Bille Rd	S		
911-170-2	11/8	08:43	911-170-2	0	39.768924	-121.602999	Inferred	911-170-2	fire started somewhere north of Elks lodge	S		
911-174-1	11/8	08:44	911-174-1	0	39.768492	-121.583432	911-174-1	911-174-1	fence on fire	O		
911-183-4	11/8	08:48	911-183-4	0	39.767435	-121.596977	911-183-4	911-183-4	fire behind house	S		
TD-077	11/8	08:52	Photo	0	39.768403	-121.597561	TD	TD	fire started in field behind PID office	S		
911-195-4	11/8	08:56	911-195-4	0	39.770306	-121.609809	911-195-4	911-195-4	fire at bike path	S		
TD-116	11/8	09:00	TD	23	39.769654	-121.580470	TD	TD	heavy ember cast	O		
TD-116	11/8	09:00	TD	23	39.770288	-121.586277	TD	TD	two structures fully involved, fire front not here yet; ember ignition	R		
TD-111	11/8	09:00	Radio Log	0	39.769875	-121.596369	TD	TD	spot fire	S		
PPD-02	11/8	09:04	PPD-02	0	39.772396	-121.600205	Radio	Radio	fully involved structure [estimated position]	R		
TD-111	11/8	09:10	Inferred	0	39.770400	-121.601397	TD	TD	spot fires	S		
TD-021	11/8	09:23	Inferred	0	39.770096	-121.579294	TD	TD	fire impacting Bille Rd	O		
TD-038	11/8	09:23	Inferred	147	39.770217	-121.578590	TD	TD	homes igniting on east side Pentz Rd	R		
TD-060	11/8	09:35	AVL	0	39.769717	-121.579117	AVL	TD	fire burning around intersection	O		
TD-060	11/8	09:35	AVL	17	39.769252	-121.579192	AVL	TD	mobile homes beginning to ignite (Eden Roc Estates)	R		
TD-079	11/8	09:36	AVL	18	39.769867	-121.579350	AVL	TD	fire threatening structures	O		
PPD-05	11/8	09:49	PPD-05	0	39.769679	-121.583588	Radio	Radio	active flames, about 14 m (15 yd) from the roadway	V		
TD-021	11/8	09:50	PPD video	0	39.769469	-121.583071	TD	TD	fire impacting Bille Rd and vehicles abandoned/stuck on road	O		
TD-060	11/8	09:52	AVL	21	39.769467	-121.580750	AVL	TD	cars igniting on Bille Rd. Home catching fire.	R		
TD-064	11/8	09:53	Inferred	9	39.772362	-121.608049	TD	TD	fire on east side of bike path around Berkshire Ave	R		
TD-079	11/8	09:54	AVL	19	39.769519	-121.580796	AVL	TD	pickup on fire a few hundred yards down Bille Rd	O		
TD-021	11/8	10:00	TD	30	39.769267	-121.579100	TD	TD	Eden Roc Estates mobile homes ignite and burn quickly	R		
TD-127	11/8	10:12	Radio Log	0	39.773833	-121.603071	Radio Log	Radio Log	fire progressing toward Bille Rd and Skyway	O		
TD-060	11/8	10:14	AVL	0	39.770350	-121.579432	AVL	TD	fire threatening structures	O		
PPD-02	11/8	10:16	PPD-02	0	39.768937	-121.578861	Radio	Radio	Eden Roc mobile home park is going up near Pentz Rd, it's not safe here	R		
TD-014	11/8	10:30	Inferred	30	39.773950	-121.606051	TD	TD	Lots of fire and structures burning. Fire pushing south on both sides of Skyway	R		
PPD-02	11/8	10:31	PPD-02	0	39.770152	-121.600853	Radio	Radio	active house fire	R		
VTD-18	11/8	10:42	TD	0	39.774950	-121.591186	video	video	vegetation fire in hedges behind Kmart	V		
VTD-26	11/8	10:48	Inferred	0	39.771396	-121.598318	video	video	spot fire, shed fully involved	S		
VTD-26	11/8	10:48	Inferred	0	39.770545	-121.598027	video	video	spot fires in parking lot vegetation	S		

**Bille Road**

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
VTD-26	11/8	10:48	Inferred	0	39.770194	-121.598241	video	video	spot fires in parking lot vegetation	S		
VTD-18	11/8	10:50	TD	6	39.774477	-121.591098	video	video	structures burning behind Kmart	R		
TD-055	11/8	11:00	TD	60	39.770362	-121.616972	TD	TD	vehicles burning	O		
TD-021	11/8	11:00	TD	0	39.769425	-121.582995	TD	TD	Bille Rd is blocked by burning vehicles	O		
TD-116	11/8	11:00	TD	0	39.773798	-121.607057	TD	TD	fire is to the north of Hillside	O		
TD-022	11/8	11:00	Inferred	180	39.772204	-121.607837	TD	TD	fire threatening structures	O		
TD-116	11/8	11:00	Inferred	180	39.772664	-121.606622	TD	TD	surface fire burning from the north	V		
TD-116	11/8	11:00	Inferred	180	39.771587	-121.609279	TD	TD	surface fire burning through mobile home park; structures in Skyway Villa mobile home park starts burning structure to structure	R		
TD-116	11/8	11:00	Inferred	180	39.772187	-121.607813	TD	TD	fire front igniting houses on Berkshire Ave	R		
TD-116	11/8	11:00	Inferred	180	39.771677	-121.607502	TD	TD	compost pile ignites, spreads to house	R		
VTD-18	11/8	11:01	TD	0	39.774769	-121.591008	video	video	structure fully involved	R		
VTD-18	11/8	11:01	TD	0	39.774814	-121.589873	video	video	structure fully involved, past peak, roof collapsed	R		
VTD-18	11/8	11:02	TD	0	39.774640	-121.589197	video	video	structure is burning	R		
VTD-18	11/8	11:02	TD	0	39.774832	-121.588512	video	video	structure is fully involved	R		
TD-030	11/8	11:10	AVL	0	39.770435	-121.612785	AVL	TD	Fire progressing over hill	O		
TD-030	11/8	11:10	AVL	130	39.769578	-121.626656	AVL	TD	Fire burning north of Bille Rd	O		
TD-030	11/8	11:10	AVL	130	39.770377	-121.616499	AVL	TD	Fire on both sides of Bille Rd	O		
TD-015	11/8	11:16	AVL	6	39.770043	-121.579220	AVL	TD	fire all around. Eden Roc mobile home park had already burned	O		
PPD-08	11/8	11:22	PPD-08	0	39.770543	-121.597851	video	video	spot fire	S		
PPD-08	11/8	11:24	PPD-08	0	39.770537	-121.598265	video	video	numerous small spots in mulch or other ground cover	S		
TD-127	11/8	11:30	Inferred	30	39.770367	-121.612346	TD	TD	fire is approaching	O		
TD-127	11/8	11:30	Inferred	30	39.769914	-121.612077	TD	TD	bushes igniting around building	V		
PPD-08	11/8	11:43	PPD-08	0	39.769994	-121.598432	video	video	vegetation spot fire on west side Clark Rd at KFC	S		
TD-118	11/8	12:00	Inferred	175	39.769334	-121.582557	TD	TD	vehicles burned (horse trailer, delivery truck, fifth wheel with truck)	O		
TD-118	11/8	12:00	Inferred	175	39.770471	-121.589817	TD	TD	burning vehicles; can hear another fire push coming	O		
PPD-08	11/8	12:05	PPD-08	0	39.770740	-121.598374	video	video	small spot fire	S		
PPD-08	11/8	12:05	PPD-08	0	39.770353	-121.598169	video	video	small spot fire	S		
PPD-08	11/8	12:05	PPD-08	0	39.769997	-121.598438	video	video	bushes burning at KFC	S		
PPD-08	11/8	12:07	PPD-08	0	39.768665	-121.597308	video	video	spot fire	S		
TD-101	11/8	12:22	Photo	0	39.769947	-121.600011	Photo	Photo	detached garage and other objects burning on parcel	O		
TD-101	11/8	12:22	Photo	0	39.770146	-121.600553	Photo	Photo	structure fully involved	R		
TD-101	11/8	12:22	Photo	0	39.769552	-121.601258	Photo	Photo	fire	O		



**Bille Road**

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-101	11/8	12:23	video	0	39.770397	-121.599512	TD	video	multiple structures fully involved near Clark Rd	R		
PPD-08	11/8	12:26	PPD-08	0	39.769760	-121.599110	video	video	vegetation on fire	V		
TD-011	11/8	13:15	TD	0	39.770381	-121.609678	TD	TD	structures fully involved (Bille Rd at Berkshire Ave)	R		
TD-011	11/8	13:15	TD	0	39.772207	-121.607835	TD	TD	downed tree/utility pole on fire blocking roadway	O		
TD-030	11/8	13:21	AVL	147	39.771439	-121.611925	AVL	TD	fire threatening structures	O		
TD-030	11/8	13:21	Inferred	147	39.769908	-121.611789	TD	TD	fire threatening structures	O		
VTD-18	11/8	13:23	TD	0	39.774450	-121.591091	video	video	multiple structures burned to foundation	R	x	
VTD-18	11/8	13:23	TD	0	39.774694	-121.591381	video	video	structure fire; north half house fully involved	R		
VTD-18	11/8	13:23	TD	0	39.774275	-121.590787	video	video	structure past peak fully involved	R		
VTD-18	11/8	13:24	TD	0	39.774497	-121.589959	video	video	structures burned to foundations	R	x	
VTD-18	11/8	13:40	TD	0	39.774694	-121.591381	video	video	house fully involved	R		
VTD-18	11/8	13:40	TD	0	39.773954	-121.590229	video	video	structure burning	R		
VTD-18	11/8	13:41	TD	0	39.774138	-121.591190	video	video	small spot fires in garden vegetation	S		
TD-055	11/8	13:41	Photo	0	39.771784	-121.612587	Photo	Photo	multiple structures fully involved	R		
TD-055	11/8	13:43	Photo	0	39.770175	-121.611861	Photo	Photo	structures burning	R		
TD-069	11/8	13:47	Inferred	53	39.769375	-121.582833	TD	TD	cars actively burning blocking Bille Rd	O		
TD-116	11/8	13:51	Photo	0	39.772500	-121.606995	TD	TD	north side of Hillside Dr is all involved in fire	O		
VTD-18	11/8	13:52	TD	0	39.773965	-121.591377	video	video	structure fire; 3 m (10 ft) flames coming from the roof	R		
VTD-18	11/8	13:52	TD	0	39.774330	-121.591394	video	video	structure recently ignited; heavy smoke coming from rear of house	R		
TD-022	11/8	14:00	Inferred	30	39.770427	-121.603032	TD	TD	vegetation spot fire	S		
TD-065	11/8	14:25	Inferred	31	39.771218	-121.611917	TD	TD	Skyway north of Bille Rd is on fire and impassable	R		
VTD-18	11/8	14:31	TD	0	39.774522	-121.592507	video	video	structure fire; heavy smoke coming from second story; heavy fire in less than 8 min	R		
TD-069	11/8	14:44	Inferred	0	39.770044	-121.584035	TD	TD	cars burning on Bille Rd, but passable	O		
VTD-18	11/8	14:45	TD	0	39.773468	-121.591889	video	video	structure fully involved	R		
PPD-15	11/8	14:51	PPD-15	0	39.771457	-121.611786	video	video	fire both sides of Skyway; structures have burned down	C	x	
PPD-15	11/8	14:52	PPD-15	0	39.770872	-121.613580	video	video	structure fully involved	R		
PPD-15	11/8	14:52	PPD-15	0	39.770555	-121.613774	video	video	structure and parcel fully involved	R		
PPD-15	11/8	14:52	PPD-15	0	39.770361	-121.616718	video	video	Bille Rd is blocked by burning vehicle	O		
TD-066	11/8	14:53	PPD video	0	39.770343	-121.617319	PPD video	TD	burning vehicle blocking Bille Rd at Lucky John Rd	O		
PPD-15	11/8	14:53	PPD-15	0	39.770597	-121.615228	video	video	structure fully involved	R		
PPD-15	11/8	14:53	PPD-15	0	39.770873	-121.615253	video	video	structure fully involved	R		
PPD-15	11/8	14:53	PPD-15	0	39.770129	-121.615897	video	video	structure fully involved	R		
TD-059	11/8	16:30	video	6	39.770271	-121.612336	TD	TD	huge fire to east of Walgreens	O		
VTD-18	11/8	16:35	TD	0	39.771103	-121.596582	video	video	structure burned to foundation	C	x	

Bille Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
VTD-18	11/8	16:36	TD	0	39.770643	-121.597097	video	video	structure past-peak fully involved	C		
VTD-18	11/8	16:36	TD	0	39.770225	-121.597559	video	video	structure burned to foundation	C	x	
VTD-18	11/8	16:36	TD	0	39.769903	-121.597894	video	video	structure unburned, small vegetation spot fires against building	S		
TD-014	11/8	16:47	AVL	6	39.769445	-121.635538	AVL	TD	Fire well established in canyon, 90 m (300 ft) flame lengths	V		
TD-014	11/8	16:47	AVL	6	39.767688	-121.630753	TD	TD	structures burning	R		
TD-127	11/8	17:14	Photo	0	39.770370	-121.616153	Photo	Photo	most structures around are fully involved, some burned down, two standing; light breeze blowing embers	R		
TD-127	11/8	17:26	Radio Log	0	39.770442	-121.612302	Radio Log	Radio Log	commercial structures all along Skyway are threatened	O		
TD-044	11/8	17:30	TD	30	39.768639	-121.634940	TD	TD	everything on fire, trees crowning	R		
TD-111	11/8	18:00	TD	60	39.768675	-121.631355	TD	TD	ember blizzard, wind blow torching flames	O		
TD-111	11/8	18:00	TD	60	39.768736	-121.636156	TD	TD	Cliff Dr homes are all burned down	R	x	
TD-109	11/8	18:26	AVL	1	39.769673	-121.583495	AVL	TD	cars still burning on Bille Rd	O		
TD-205	11/8	18:58	AVL	17	39.770053	-121.614600	AVL	TD	Fire in eaves of structure	R		
TD-015	11/8	22:40	AVL	24	39.769117	-121.627217	AVL	TD	area already burned	O	x	
TD-008	11/8	23:27	AVL	0	39.770467	-121.590317	AVL	Radio Log	fire threatening structures	O		

Elliott Road and Nunneley Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
911-1030-10	11/8	07:57	911-1030-10	0	39.756975	-121.601220	911-1030-10	911-1030-10	spot fire	S		
TD-074	11/8	08:00	TD	0	39.759491	-121.606635	TD	TD	embers as large as a matchbox landing	O		
TD-069	11/8	08:00	TD	15	39.762326	-121.588917	TD	TD	structure burning on east side Sawmill Rd	R		
TD-035	11/8	08:02	PPD video	0	39.755929	-121.604485	TD	TD	spot fire 1100 block Nunneley Rd	S		
TD-067	11/8	08:02	PPD video	0	39.756710	-121.600997	TD	TD, PPD video	spot fire	S		
PPD-01	11/8	08:02	PPD-01	1	39.756866	-121.601153	Radio	Radio	spot fire on Nunneley Rd near Jubilee Ln	S		
911-1041-1	11/8	08:03	911-1041-1	0	39.757744	-121.598390	Inferred	911-1041-1	spot fire	S		
TD-067	11/8	08:10	TD	0	39.756710	-121.600997	TD	TD	spot fire, large tree burning, flames >1.8 m (6 ft); pine needles built up around vacant house	S		
911-1051-1	11/8	08:14	911-1051-1	0	39.757744	-121.598390	Inferred	911-1051-1	spot fire off Ingalls between Elliott Rd and Nunneley Rd	S		
TD-065	11/8	08:15	Inferred	0	39.759502	-121.606653	TD	TD	ember showers	O		
911-127-1	11/8	08:23	911-127-1	0	39.756904	-121.579291	911-127-1	911-127-1	flames at the end of the road	S		
911-148-1	11/8	08:33	911-148-1	0	39.756937	-121.585673	911-148-1	911-148-1	fire	S		
911-156-1	11/8	08:37	911-156-1	0	39.761662	-121.585077	911-156-1	911-156-1	spot fire	S		
TD-013	11/8	08:40	TD	0	39.762184	-121.588998	TD	TD	fire burning on Sawmill Rd; civilian report of "trees on fire"	V		
TD-015	11/8	08:44	AVL	0	39.760739	-121.586951	AVL	TD	0.2 ha to 0.4 ha (0.5 ac to 1.0 ac) spot fire in grass field behind houses	S		
911-186-1	11/8	08:49	911-186-1	0	39.759977	-121.581872	911-186-1	911-186-1	fire	S		
PPD-04	11/8	08:55	PPD-04	0	39.755913	-121.589026	Radio	Radio	spot fire	S		
911-195-1	11/8	08:56	911-195-1	0	39.755966	-121.588986	911-195-1	911-195-1	spot fire	S		
911-230-2	11/8	09:16	911-230-2	0	39.755942	-121.599648	911-230-2	911-230-2	fire in the yard	S		
911-230-4	11/8	09:16	911-230-4	0	39.761000	-121.588637	911-230-4	911-230-4	residential fire alarm	R		
TD-070	11/8	10:08	PPD video	0	39.756933	-121.589059	TD	TD	Sawmill Rd impassable north of Nunneley Rd; fire crossing roadway	O		
TD-070	11/8	10:08	PPD video	0	39.757517	-121.588760	TD	TD	structures on east side Sawmill Rd burning	R		
PPD-05	11/8	10:08	PPD-05	0	39.755929	-121.589011	Radio	Radio	active fire Sawmill Rd and Nunneley Rd on the NE corner	O		
PPD-02	11/8	10:22	PPD-02	0	39.757446	-121.606495	Radio	Radio	north of Nunneley Rd east of Clark Rd is catching on fire	O		
TD-112	11/8	10:25	Inferred	54	39.757000	-121.594773	TD	TD	spot fire	S		
TD-112	11/8	10:25	Inferred	54	39.755915	-121.593703	TD	TD	encounter spot fire at Middle Libby Rd and Nunneley Rd	S		
TD-123	11/8	10:44	AVL	0	39.757417	-121.589000	AVL	TD	fire on Sawmill Rd at Sir Ct	O		
TD-068	11/8	10:50	PPD video	0	39.761569	-121.603057	TD	TD	fire behind (east) of Safeway	O		
PPD-02	11/8	10:50	PPD-02	0	39.760515	-121.603216	Radio	Radio	fire is right behind Safeway	O		
VTD-26	11/8	10:55	Inferred	0	39.762665	-121.605019	video	video	spot fire	S		

Elliott Road and Nunneley Road

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-035	11/8	11:00	Inferred	30	39.759231	-121.606861	TD	TD	blanket caught in powerlines; burning; blanket fell and ignited bushes at Arco gas station	O		
TD-035	11/8	11:00	Inferred	30	39.759231	-121.606861	TD	TD	bushes burning, fire approaches from west behind Arco gas station	S		
TD-037	11/8	11:09	Inferred	21	39.761416	-121.603138	TD	TD	fire is right behind Safeway	O		
TD-070	11/8	11:16	Inferred	24	39.759330	-121.606715	TD	TD	fire is on both sides of Clark Rd; ampm gas station on fire	C		
TD-112	11/8	11:19	Inferred	8	39.754256	-121.595247	TD	TD	house caught fire; back deck and wall involved	R		
TD-112	11/8	11:19	Photo	0	39.754511	-121.595106	Photo	Photo	structure fully involved	R		
PPD-08	11/8	11:21	PPD-08	0	39.761717	-121.604836	video	video	spot fire on east side of Clark Rd	S		
TD-112	11/8	11:27	Inferred	26	39.754423	-121.595763	TD	TD	fire is blowing out eaves of structure	R		
TD-112	11/8	11:27	Photo	0	39.756039	-121.592573	Photo	Photo	significant vegetation fire, possible structure burning	O		
TD-037	11/8	11:30	TD	40	39.755005	-121.605692	TD	TD	glow of fire east of Clark Rd near Nunneley Rd	O		
TD-034	11/8	11:36	Photo	0	39.759236	-121.606715	Photo	TD	vegetation on fire at Arco gas station	S		
TD-034	11/8	11:36	Photo	0	39.759105	-121.606886	Photo	Photo	shrubs on fire at Arco gas station	V		
TD-034	11/8	11:36	Photo	0	39.759105	-121.606886	Photo	Photo	shrubs on fire at Arco gas station	V		
TD-034	11/8	11:36	Photo	0	39.758695	-121.607074	Photo	Photo	surface vegetation (grass), ladder fuels have burned, light flaming	V	x	
TD-034	11/8	11:36	Photo	0	39.756540	-121.607102	Photo	Photo	spot fire, vegetation	S		
TD-034	11/8	11:37	Photo	0	39.756540	-121.607102	Photo	Photo	spot fire, vegetation	S		
PPD-08	11/8	11:42	PPD-08	0	39.759119	-121.606887	video	video	bushes on fire at am/pm gas station	S		
PPD-08	11/8	11:42	PPD-08	0	39.761647	-121.605168	video	video	light surface fire activity between here and 6166 Clark Rd	V		
TD-112	11/8	11:53	Photo	0	39.754503	-121.595463	Photo	Photo	surface vegetation, pine trees, intense fire	V		
TD-112	11/8	11:53	Photo	0	39.754350	-121.595508	Photo	Photo	surface vegetation, pine trees, intense fire	V		
PPD-08	11/8	11:54	PPD-08	0	39.755908	-121.607380	Radio	Radio	multiple structures on fire, on Clark Rd and Nunneley Rd and east of there	R		
TD-076	11/8	12:15	Inferred	55	39.759509	-121.623908	TD	TD	see flames coming	O		
PPD-08	11/8	12:27	PPD-08	0	39.762878	-121.604324	video	video	majority of structures fully involved, past peak surface fire still burning between Central Park and Elliott Rd	C		
PPD-08	11/8	12:28	PPD-08	0	39.757804	-121.606980	video	video	limited structures burning close to roadway (fewer structures here, mostly parking lots along road), moderate surface fires between Elliott Rd and Nunneley Rd on Clark Rd	C		
PPD-08	11/8	12:28	PPD-08	0	39.754219	-121.607751	video	video	minimal fire visible between Nunneley Rd and Pearson Rd	O	x	

Elliott Road and Nunneley Road

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-026	11/8	12:45	Inferred	61	39.755650	-121.624132	TD	TD	structures burning south and east of Skyway in area of Almond St and Fir St	R		
TD-112	11/8	12:53	Photo	0	39.754517	-121.595978	Photo	Photo	structure well involved	R		
TD-021	11/8	13:10	Inferred	0	39.753690	-121.607734	TD	TD	heavy fire	O		
TD-210	11/8	13:12	AVL	0	39.759517	-121.604150	AVL	TD	structures in area had burned	R	x	
TD-021	11/8	13:15	TD	0	39.755817	-121.617097	TD	TD	active structure fires	R		
TD-130	11/8	13:17	AVL	2	39.755365	-121.607103	AVL	TD	commercial building on fire	C		
TD-125	11/8	14:03	Inferred	0	39.760532	-121.604579	TD	TD	Safeway burning	C		
TD-108	11/8	14:21	Inferred	69	39.759481	-121.615921	TD	TD	everything is on fire	R		
TD-141	11/8	14:21	Photo	0	39.753623	-121.608063	Photo	Photo	structure fully involved	C		
TD-141	11/8	14:30	Photo	0	39.756988	-121.606624	TD	Photo	structure fully involved	C		
TD-141	11/8	14:30	Photo	0	39.756993	-121.606623	Photo	Photo	structure past peak, partially collapsed	C		
TD-141	11/8	14:33	Photo	0	39.760511	-121.604494	TD	Photo	Safeway is burned down	C		
TD-141	11/8	14:33	Photo	0	39.760606	-121.604488	Photo	Photo	structure past peak, partially collapsed, burning rubble; spot fires in parking lot vegetation	C	x	
TD-141	11/8	14:33	Photo	0	39.760953	-121.604166	Photo	Photo	structure past peak, partially collapsed, burning rubble	C	x	
TD-141	11/8	14:34	Photo	0	39.762417	-121.604150	Photo	Photo	apartment building structures, fully involved, partially collapsed	R		
TD-133	11/8	14:41	Photo	0	39.757584	-121.611538	Photo	Photo	structures burning, past peak	R	x	
TD-141	11/8	14:43	Photo	0	39.753631	-121.608082	TD	Photo	black bear diner is fully involved	C		
TD-141	11/8	14:43	Photo	0	39.753624	-121.608081	Photo	Photo	Black Bear Diner fully involved, past peak	C		
TD-066	11/8	14:45	PPD video	3	39.761934	-121.617456	TD	TD	fire approaching Holiday Market from the bike path	V		
TD-069	11/8	14:49	Inferred	10	39.760491	-121.604624	TD	TD	Safeway is burned down	C	x	
TD-069	11/8	14:49	Inferred	10	39.762499	-121.604050	TD	TD	apartments north of Safeway are fully involved	R		
TD-055	11/8	14:52	Photo	0	39.753628	-121.608071	Photo	Photo	Black Bear Diner burning, fully involved	C		
TD-133	11/8	14:52	Photo	0	39.756522	-121.612151	Photo	Photo	gazebo structure igniting	O		
TD-133	11/8	14:53	Photo	0	39.756563	-121.612187	Photo	Photo	gazebo structure fully involved	O		
TD-133	11/8	14:54	Photo	0	39.755684	-121.614857	Photo	Photo	heavy fire activity on parcel; structure fully involved, past peak; multiple vehicles other materials in yard, pine trees burning	R		
PPD-15	11/8	14:57	PPD-15	0	39.759468	-121.617745	video	video	vegetation and structure fires east of James Dr on Elliott Rd	R		
PPD-15	11/8	14:57	PPD-15	0	39.759522	-121.600884	Radio	Radio	apartment buildings are a complete loss	R		
PPD-15	11/8	14:58	PPD-15	0	39.759507	-121.612456	video	video	Elliott Rd at cemetery; vegetation has burned through	V	x	
PPD-15	11/8	14:58	PPD-15	1	39.759752	-121.612093	video	video	structures completely burned down	R		
TD-074	11/8	14:59	PPD video	0	39.759854	-121.612410	PPD video	TD	fire, trees, powerlines on Elliott Rd blocking access to Maxwell	O		

Elliott Road and Nunneley Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-069	11/8	14:59	Inferred	9	39.756274	-121.608330	TD	TD	commercial structure burning	C		
TD-069	11/8	14:59	Inferred	9	39.756825	-121.608287	TD	TD	mulch fire up against structure	S		
TD-066	11/8	15:01	PPD video	1	39.759464	-121.617161	PPD video	TD	intense fire on Elliott Rd at James Dr and Camino Ln	R		
PPD-15	11/8	15:02	PPD-15	0	39.755688	-121.624108	video	video	most structures fully involved on Almond St and Fir St east of Almond St (5800 Almond St to Cedar St and Fir St east toward Black Olive Dr)	R		
TD-074	11/8	15:03	PPD video	0	39.759934	-121.611901	PPD video	TD	all structures on east side of Maxwell Dr on fire	R		
TD-132	11/8	15:04	Photo	0	39.755740	-121.623420	Photo	Photo	significant widespread flames and glow; numerous structures burning	R		
TD-015	11/8	15:14	AVL	0	39.761600	-121.612471	AVL	TD	Paradise HS; fire threatening school	V		
TD-132	11/8	15:27	Inferred	333	39.762794	-121.613079	TD	TD	Paradise HS: mobile classrooms are burning	C		
TD-132	11/8	15:27	Inferred	333	39.762356	-121.613341	TD	TD	fire spreading crown to crown and along surface fuels	V		
TD-132	11/8	15:27	Inferred	333	39.762288	-121.612969	TD	TD	Paradise HS: roof fire on auto shop	C		
TD-132	11/8	15:27	Inferred	333	39.761014	-121.613212	TD	TD	Paradise HS: put out fire on roof of main building	C		
TD-141	11/8	15:27	Inferred	303	39.762787	-121.613067	TD	TD	Paradise HS: all but one portable classroom is burning	C		
TD-141	11/8	15:27	Inferred	303	39.762342	-121.612973	TD	TD	Paradise HS: fire on the roof	C		
TD-135	11/8	15:30	Inferred	930	39.757657	-121.624599	TD	TD	Starbucks; fire 15 m to 18 m (50 ft to 60 ft) away from structure, spotting into mulch	C		
TD-135	11/8	15:30	Inferred	930	39.756602	-121.625067	TD	TD	structures burning, flames coming from house vents; exposure to other buildings	R		
TD-135	11/8	15:30	Inferred	930	39.757657	-121.624599	TD	TD	shed and fence on fire near Starbucks	O		
TD-209	11/8	15:37	Photo	0	39.753610	-121.608070	Photo	Photo	Black Bear Diner collapsed, flaming rubble	C	x	
TD-124	11/8	15:39	AVL	67	39.759717	-121.607450	AVL	TD	roof of Rite Aid on fire	C		
TD-132	11/8	15:51	Photo	0	39.762335	-121.612969	TD	TD	Paradise HS: air vent on roof is on fire	C		
TD-133	11/8	15:51	Photo	0	39.762512	-121.611997	Photo	Photo	structure burned to foundation, flaming rubble	R	x	
TD-133	11/8	15:51	Photo	0	39.762723	-121.612058	Photo	Photo	multiple structures burned to foundation; east side Maxwell Dr	R	x	
TD-014	11/8	15:52	AVL	0	39.758205	-121.624762	AVL	TD	fire everywhere, downtown beginning to burn	C		
TD-122	11/8	15:53	AVL	53	39.759783	-121.606883	AVL	TD	fire on roof of Rite Aid	C		
TD-142	11/8	16:00	TD	0	39.758900	-121.624674	TD	TD	tree is burning	V		
TD-141	11/8	16:02	Photo	0	39.762976	-121.613469	Photo	Photo	wooded areas are burning around field; structures are burned to ground	R		
TD-141	11/8	16:03	Photo	0	39.762275	-121.613743	Photo	Photo	spot fires in pine litter	S		
TD-141	11/8	16:04	Photo	0	39.762758	-121.613054	Photo	Photo	Paradise High School portable classrooms (6) are fully involved	C		
TD-141	11/8	16:05	Photo	0	39.762758	-121.613054	Photo	Photo	Paradise High School portable classrooms (6) are fully involved	C		

Elliott Road and Nunneley Road

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-141	11/8	16:05	Photo	0	39.762496	-121.611981	Photo	Photo	collapsed structure, burning	R		
TD-142	11/8	16:22	video	0	39.756073	-121.626177	TD	video	commercial structures burning downtown	C		
TD-142	11/8	16:30	Inferred	1020	39.758900	-121.624674	TD	TD	fire moving toward building from west and north	O		
TD-142	11/8	16:30	Inferred	1020	39.757057	-121.625073	TD	TD	fire threatening structures	O		
TD-142	11/8	16:30	Inferred	1020	39.757666	-121.624595	TD	TD	fire threatening structures	O		
TD-142	11/8	16:30	Inferred	1020	39.759241	-121.624497	TD	TD	pine needles burning in garden bed	V		
TD-142	11/8	16:30	Inferred	1020	39.759449	-121.623921	TD	TD	fire threatening structures	O		
TD-141	11/8	16:33	Photo	0	39.760608	-121.612078	Photo	Photo	structures burned to foundation on Maxwell Dr, minimal flames	R	x	
TD-141	11/8	16:33	Photo	0	39.760068	-121.612153	Photo	Photo	structures burned to foundation on Maxwell Dr, minimal flames	R	x	
TD-141	11/8	16:33	Photo	0	39.760382	-121.611976	Photo	Photo	structures on east side Maxwell, Pleasant to Elliott Rd, are burned to foundation, minimal active flames in rubble	R	x	
VTD-18	11/8	16:36	TD	0	39.755914	-121.607415	video	video	structures on east side Clark Rd (west side unknown can't see in video) south of Elk Ln through town basically all burned to foundations; very little active burning	C	x	
VTD-18	11/8	16:37	TD	0	39.762073	-121.604368	video	video	a few structures collapsed and still burning	C	x	
VTD-18	11/8	16:37	TD	0	39.760879	-121.604259	video	video	Safeway et al.; post-peak burning	C	x	
TD-142	11/8	16:48	Photo	0	39.755732	-121.626176	Photo	Photo	commercial structures burning	C		
TD-141	11/8	16:51	Photo	0	39.760266	-121.612498	Photo	Photo	all structures east side of Maxwell Dr between Elliott Rd and Pleasant Ln are burned to foundation, minimal flaming rubble	R	x	
TD-201	11/8	16:54	Photo	0	39.760367	-121.605250	Photo	Photo	Safeway is burned down	C	x	
TD-201	11/8	16:54	Photo	0	39.760190	-121.605599	Photo	Photo	commercial structure collapsed, flaming rubble and structure	C	x	
TD-030	11/8	17:07	AVL	0	39.760827	-121.604738	AVL	TD	Safeway burned	C		
TD-142	11/8	17:21	Photo	0	39.759080	-121.624529	Photo	Photo	Building fully involved	C		
TD-142	11/8	17:25	Photo	0	39.759087	-121.624545	Photo	Photo	structure fully involved	C		
TD-142	11/8	17:26	Photo	0	39.758735	-121.624156	Photo	Photo	fire coming from roof of structure; brands blowing down street	C		
TD-142	11/8	17:26	Photo	0	39.759188	-121.623589	Photo	Photo	Valero gas station fully involved	C		
TD-141	11/8	17:28	Photo	0	39.763318	-121.612705	Photo	Photo	structure burned to foundation, still flaming; small spots around; power pole burning	R	x	
TD-141	11/8	17:28	Photo	0	39.762870	-121.613055	Photo	Photo	portable classrooms are burned down, flaming rubble	C	x	
TD-141	11/8	17:28	Photo	0	39.763862	-121.612147	Photo	Photo	structure burning	R		

Elliott Road and Nunneley Road

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-142	11/8	17:34	Photo	0	39.758725	-121.624129	Photo	Photo	Building fully involved; parked vehicle igniting from exposure; brands blow down street to the south	C		
TD-209	11/8	17:39	AVL	0	39.760711	-121.604421	AVL	TD	Safeway is already burned	C	x	
TD-015	11/8	17:50	AVL	0	39.760851	-121.605862	AVL	TD	Safeway is all burned down	C	x	
TD-014	11/8	17:52	Radio Log	0	39.757515	-121.625300	Radio Log	Radio Log	heavy fire in downtown area	C		
TD-127	11/8	17:55	AVL TD-015	4	39.761883	-121.612383	AVL TD-015	TD	fire at Paradise HS	C		
TD-142	11/8	17:56	Photo	0	39.757734	-121.625757	Photo	Photo	flames against building	O		
TD-201	11/8	18:15	Photo	0	39.759188	-121.623566	Photo	Photo	structure burned to foundation, flaming rubble	C	x	
TD-201	11/8	18:15	Photo	0	39.758726	-121.624034	Photo	Photo	structures fully involved	C		
TD-124	11/8	18:42	AVL	57	39.760281	-121.621220	AVL	TD	Achieve Charter School behind St Thomas More Church is on fire	C		
TD-030	11/8	20:01	AVL	13	39.756650	-121.625883	AVL	TD	fire threatening structures	O		
TD-124	11/8	20:03	AVL	0	39.760281	-121.621220	AVL	TD	Achieve Charter School is burned down	C		
TD-141	11/8	20:30	TD	0	39.759965	-121.613029	TD	TD	First Assembly of God church ignites; outbuilding catches first	C		
TD-132	11/8	21:00	Inferred	0	39.760017	-121.613065	TD	TD	light smoke from eaves of First Assembly of God church	C		
TD-141	11/8	21:09	Photo	0	39.759965	-121.613029	TD	Photo	First Assembly of God building well involved	C		
TD-141	11/8	21:09	Photo	0	39.760018	-121.613041	Photo	Photo	First Assembly of God Church, structure fully involved, collapsed	C		
TD-132	11/8	22:30	TD	0	39.759267	-121.608170	TD	TD	spot fires and burning fences	O		
TD-132	11/8	22:30	TD	0	39.759261	-121.608486	TD	TD	spot fires and burning fences	O		
TD-014	11/9	01:42	Radio Log	0	39.759915	-121.587527	Radio Log	Radio Log	structure just igniting	R		
TD-030	11/9	09:54	AVL	59	39.758167	-121.608467	AVL	TD	Shadowbrook Apartments complex on fire	R		
TD-111	11/9	09:54	AVL TD-030	59	39.758166	-121.608866	AVL TD-030	TD	Shadowbrook Apartments on fire	R		



Pearson Road and Buschmann Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-054	11/8	08:15	Inferred	15	39.751620	-121.611114	TD	TD	report of flames visible in the area of Paradise Elementary School	O		
TD-100	11/8	08:30	TD	0	39.735180	-121.604409	TD	TD	spot fire too big to engage, est. about 12 ha (30 ac); established in drainage	S		
TD-005	11/8	08:37	AVL	0	39.748583	-121.572400	AVL	TD	ember storm	O		
TD-123	11/8	08:48	AVL	0	39.747928	-121.572361	AVL	TD	can hear propane tanks exploding	O		
TD-034	11/8	08:56	video	0	39.750277	-121.577827	video	video	can hear ammunition and propane tank explosions	O		
TD-036	11/8	08:56	Inferred	0	39.750614	-121.577492	TD	TD	can hear propane tanks exploding	O		
TD-129	11/8	09:00	AVL	8	39.746117	-121.572233	AVL	TD	fire crossing Pentz Rd from east to west between Stearns Rd and Pearson Rd	O		
TD-037	11/8	09:00	Inferred	20	39.748922	-121.576071	TD	TD	spot fire just becoming established in drainage	S		
TD-037	11/8	09:00	Inferred	20	39.748218	-121.578745	TD	TD	can see spot fire on south side Pearson Rd at Stearns Rd	S		
TD-100	11/8	09:00	TD	0	39.749657	-121.576802	TD	TD	spot fires down in Pearson Rd drainage	S		
TD-100	11/8	09:00	Inferred	30	39.732782	-121.606831	TD	TD	growing spot fire, well established in canyon	S		
TD-068	11/8	09:15	Inferred	15	39.750791	-121.576813	TD	TD	6 m to 9 m (20 ft to 30 ft) flames in Pearson Rd drainage	V		
TD-087	11/8	09:20	AVL	9	39.748617	-121.585400	AVL	TD	spot fire, 6 m × 6 m (20 ft × 20 ft), in pine needles and litter; in a draw with green ivy	S		
TD-077	11/8	09:20	Inferred	0	39.733280	-121.604288	TD	TD	see flames on ridge to east of Clark Rd	V		
TD-086	11/8	09:23	AVL	0	39.746182	-121.572306	AVL	TD	wall of flames	O		
TD-037	11/8	09:26	Radio Log	0	39.750215	-121.576830	Radio Log	Radio Log	fire established on Pentz Rd at the curves down in the drainage	V		
TD-037	11/8	09:30	Inferred	0	39.748658	-121.585273	TD	TD	well-involved spot fire	S		
TD-087	11/8	09:32	AVL	0	39.748633	-121.583300	AVL	TD	spot fires	S		
TD-111	11/8	09:36	Inferred	14	39.751269	-121.585639	TD	TD	several homes burning along Henson Rd	R		
VTD-23	11/8	09:37	Inferred	0	39.749160	-121.572480	video	video	southern edge of fire	O		
TD-122	11/8	09:38	AVL	0	39.747796	-121.572477	AVL	TD	fire has crossed Pentz Rd at Pearson Rd	O		
VTD-21	11/8	09:38	Inferred	15	39.747756	-121.572415	video	video	intersection of Pentz Rd and Pearson Rd is fully involved	R		
VTD-23	11/8	09:38	Inferred	0	39.748730	-121.574785	video	video	large active spot, estimated 0.1 ha (0.25 ac)	S		
VTD-23	11/8	09:38	Inferred	0	39.750825	-121.576730	video	video	moderate to heavy surface fire, single tree torching, heavy ember shower through the curve	V		
TD-037	11/8	09:38	Photo	0	39.748730	-121.579461	Photo	Photo	spot fire in vegetation	S		
VTD-24	11/8	09:40	AVL TD-122	0	39.750715	-121.576335	video	video	heavy fire in Pearson Rd drainage	V		
VTD-24	11/8	09:40	AVL TD-122	0	39.750233	-121.577845	video	video	heavy fire both sides of roadway	V		
TD-122	11/8	09:41	AVL	19	39.749679	-121.578103	AVL	TD	fire had cleaned ground fuels; fire overtakes engine; engine is torched, blew diesel tank vents	V		

Pearson Road and Buschmann Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-122	11/8	09:41	AVL	19	39.749679	-121.578103	AVL	TD	debris in back of pickup truck catches fire; ember shower across window	O		
TD-122	11/8	09:41	AVL	19	39.749679	-121.578103	AVL	TD	cars in front of engine are on fire	O		
TD-122	11/8	09:41	AVL	19	39.749679	-121.578103	AVL	TD	ground fuels are being totally consumed, torched to limbs	V		
VTD-23	11/8	09:41	Inferred	0	39.750100	-121.577967	video	video	heavy surface fire, torching trees, ember showers sound like pebbles	V		
VTD-23	11/8	09:43	Inferred	0	39.750100	-121.577967	video	video	heavy ember shower pelting vehicle	O		
TD-087	11/8	09:45	AVL	19	39.748651	-121.580080	AVL	TD	Structures begin igniting from pine needles. Propane explosions. Vehicles melting. Large spot fire, 9 m x 12 m (30 ft x 40 ft), in grass.	R		
VTD-16	11/8	09:51	video	0	39.749496	-121.575422	AVL E2362	video	heavy vegetation fire, heavy ember shower	V		
TD-129	11/8	09:53	Inferred	0	39.750425	-121.575918	TD	TD	some cars next to CHP vehicle are burning	O		
TD-129	11/8	09:53	video	0	39.748000	-121.574350	video	video	everything on fire, extensive ember cast	O		
PPD-05	11/8	09:53	PPD-05	0	39.749656	-121.575513	Radio	Radio	CHP and SO units have disabled vehicles surrounded by fire	O		
TD-129	11/8	10:00	Inferred	0	39.749487	-121.578186	Imagery	TD	yellow VW burning	O		
TD-129	11/8	10:00	Inferred	0	39.748639	-121.579731	Imagery	TD	vehicles burning	O		
TD-037	11/8	10:00	Inferred	15	39.748578	-121.579618	TD	TD	white car coming from Stearns Rd catches fire	O		
TD-070	11/8	10:00	Inferred	0	39.748619	-121.588873	TD	TD	Pearson Rd blocked by fire across roadway at Sawmill Rd	O		
VTD-02	11/8	10:00	TD	600	39.747395	-121.615048	TD	TD	numerous spot fires around property; ember showers	S		
PPD-05	11/8	10:00	PPD-05	0	39.751719	-121.597887	Radio	Radio	fire on Angel Dr south of Pearson Rd	R		
TD-123	11/8	10:04	AVL	14	39.748583	-121.581067	AVL	TD	area on fire	O		
VTD-23	11/8	10:05	Inferred	8	39.748943	-121.580613	video	video	structure fully involved	R		
TD-087	11/8	10:06	AVL	16	39.748321	-121.581274	AVL	TD	all structures nearby are burning. Quarter-sized ember showers.	R		
TD-087	11/8	10:18	AVL	0	39.748650	-121.581250	AVL	TD	fire front is passed	O		
TD-064	11/8	10:18	Inferred	162	39.748575	-121.621579	TD	TD	can hear propane tanks exploding	O		
TD-020	11/8	10:25	TD-087	10	39.748635	-121.579991	TD	TD	fire everywhere; visibility 30 m to 60 m (100 ft to 200 ft) (Pearson Rd east of Edgewood Ln)	O		
TD-020	11/8	10:25	TD-087	10	39.744923	-121.593080	TD	TD	scattered structure fires and woodpiles burning	R		
TD-087	11/8	10:26	AVL	0	39.750733	-121.576833	AVL	TD	area was already destroyed by push of fire. Burned law enforcement vehicle in roadway	V	x	
PPD-02	11/8	10:32	PPD-02	0	39.748595	-121.607750	Radio	Radio	fire is overtaking vehicles on Clark Rd	O		
TD-037	11/8	10:39	video	0	39.746135	-121.572316	TD	video	Pentz Rd south of Pearson Rd; structures fully involved; active vegetation fire and sideways embers	R		

Pearson Road and Buschmann Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-037	11/8	10:39	Photo	0	39.748188	-121.572426	Photo	Photo	nearly all structures fully involved both sides of Pentz Rd; heavy fire all around, ember showers	R		
TD-034	11/8	10:45	TD	0	39.749521	-121.606715	TD	TD	conditions deteriorate; field caught fire, wind blowing flames like blowtorch; spot fires and trees igniting; embers blowing across street	O		
TD-065	11/8	10:46	Inferred	100	39.748784	-121.607914	TD	TD	fire has jumped to west side of Clark Rd at Buschmann Rd	V		
TD-065	11/8	10:46	Inferred	100	39.750525	-121.614713	TD	TD	spot fires and structures burning in general area of Pearson Rd and Buschmann Rd between Scottwood Rd and Clark Rd	C		
TD-015	11/8	10:50	AVL	0	39.747100	-121.574617	AVL	TD	houses fully involved, 50 % to the ground	R		
TD-015	11/8	10:52	AVL	0	39.750807	-121.576820	AVL	TD	fire had previously consumed Dry Creek drainage	V	x	
TD-037	11/8	10:56	Photo	0	39.750824	-121.576556	Photo	Photo	vegetative fuels have been consumed; spot fires and structure still burning	R	x	
TD-015	11/8	10:57	AVL	0	39.748617	-121.587000	AVL	TD	burning vehicle and trailer	O		
TD-124	11/8	11:02	AVL	206	39.748107	-121.592907	AVL	TD	structures on fire	R		
TD-124	11/8	11:02	AVL	206	39.749410	-121.592821	AVL	TD	structures on fire	R		
TD-037	11/8	11:02	Inferred	5	39.748626	-121.587423	Photo	TD	fully involved pickup and trailer	O		
TD-020	11/8	11:02	Inferred	63	39.752255	-121.598279	TD	TD	spot fires, various structures involved, along Pearson Rd in area of Angel Dr	R		
TD-130	11/8	11:10	Photo	0	39.748794	-121.593510	Photo	Photo	multiple small spot fires in needles/leaf litter	S		
TD-130	11/8	11:10	Photo	0	39.750899	-121.593249	Photo	Photo	significant fire; everything burning; vegetation, fences, structures	R		
TD-130	11/8	11:12	video	0	39.748799	-121.593244	video	video	surface fire in pine needles at S Libby Rd and Pearson Rd	V		
TD-130	11/8	11:12	video	0	39.750824	-121.593269	video	video	heavy fire on Stonehurst Dr; structure, fence, power pole fully involved	R		
TD-130	11/8	11:12	AVL	10	39.752286	-121.598100	AVL	TD	Pearson Rd between Station 82 and Ace Hardware; not fully involved yet, but fire present	R		
TD-209	11/8	11:16	Photo	0	39.747588	-121.572049	Photo	Photo	structure fully involved	R		
TD-209	11/8	11:16	Photo	0	39.747295	-121.571934	Photo	Photo	structure fully involved	R		
TD-124	11/8	11:17	AVL	191	39.748567	-121.594117	AVL	TD	fire all around; propane tanks exploding approximately 1 per min	O		
TD-209	11/8	11:17	AVL	119	39.746880	-121.572846	AVL	TD	vehicle and house burning; main fire front had passed	R		
TD-209	11/8	11:17	Photo	0	39.747588	-121.572049	Photo	Photo	structure fully involved	R		
TD-209	11/8	11:27	Photo	0	39.746797	-121.572834	Photo	Photo	structure fully involved, threatening neighboring structure	R		

Pearson Road and Buschmann Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-209	11/8	11:27	Photo	0	39.746797	-121.572834	Photo	Photo	structure fully involved, threatening neighboring structure	R		
TD-209	11/8	11:28	Photo	0	39.746797	-121.572834	Photo	Photo	structure fully involved, threatening neighboring structure	R		
TD-035	11/8	11:30	Inferred	90	39.749298	-121.607732	TD	TD	PGE yard bush pile: blow torching the road at Buschmann Rd; Clark Rd impassable	O		
TD-037	11/8	11:30	TD	40	39.747360	-121.593116	TD	TD	houses on east side of Pearson Rd /S Libby Rd are burning	R		
PPD-08	11/8	11:32	PPD-08	0	39.748590	-121.607695	Radio	Radio	fire getting really close to the roadway	O		
TD-123	11/8	11:34	Inferred	15	39.749543	-121.594237	TD	TD	Enchanted Forest mobile home park on fire; moving towards west	R		
TD-123	11/8	11:34	Inferred	15	39.748534	-121.593692	TD	TD	power pole on fire	O		
PPD-08	11/8	11:39	PPD-08	0	39.751943	-121.607344	Radio	Radio	fire coming up to Pearson Rd and Clark Rd	O		
TD-130	11/8	11:45	video	0	39.752808	-121.605317	video	video	spot fires on north side of Pearson Rd at Brookview Way	S		
TD-130	11/8	11:45	Photo	0	39.752761	-121.605406	Photo	Photo	area of ground fire in heavy brush; blowing brands; flames up to 4.6 m (15 ft)	V		
TD-130	11/8	11:45	Photo	0	39.750398	-121.607079	Photo	Photo	field and vegetation south of Ace Hardware is burning up to fence and Clark Rd	V		
TD-130	11/8	11:45	Photo	0	39.749080	-121.608090	Photo	Photo	mulch/slash piles at Buschmann Rd and Clark Rd are burning	O		
TD-130	11/8	11:45	Photo	0	39.748598	-121.607111	Photo	Photo	widespread heavy fire; surface vegetation, trees	V		
TD-130	11/8	11:49	video	0	39.748638	-121.607720	video	video	fire still burning on both sides of Clark Rd at Buschmann Rd, fire past peak	V	x	
TD-111	11/8	11:50	Inferred	30	39.748592	-121.588628	TD	TD	Pearson burning	O		
TD-130	11/8	11:52	AVL	24	39.751002	-121.606774	AVL	TD	storage units burning at Ace Hardware	C		
TD-123	11/8	11:53	AVL	0	39.747467	-121.584433	AVL	TD	fire all around	O		
PPD-08	11/8	11:53	PPD-08	0	39.748594	-121.607721	Radio	Radio	Clark Rd SB south of Buschmann Rd is engulfed in fire	O		
TD-037	11/8	12:00	Inferred	60	39.752251	-121.599985	TD	TD	fire has burned through Pearson Rd between Middle Libby Rd and Clark Rd	R	x	
TD-037	11/8	12:00	Inferred	60	39.752978	-121.607091	TD	TD	mobile homes on east side Clark Rd at Black Bear Diner are burning	R		
TD-037	11/8	12:00	Inferred	60	39.752603	-121.607241	TD	TD	fire getting established at Mobil gas station	C		
TD-037	11/8	12:00	Inferred	60	39.749580	-121.594577	TD	TD	fire is approaching from west	O		
TD-074	11/8	12:00	TD	0	39.749511	-121.607724	TD	TD	flames across Clark Rd between Pearson Rd and Buschmann Rd	O		
TD-130	11/8	12:00	Photo	0	39.751054	-121.606542	Photo	Photo	heavy vegetation fire, trees torching, ember showers after trees torch	V		

Pearson Road and Buschmann Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-014	11/8	12:03	AVL	0	39.749694	-121.594513	TD	TD	Enchanted Forest mobile home park fully involved	R		
TD-014	11/8	12:05	Radio Log	0	39.752283	-121.595019	Radio Log	Radio Log	significant fire activity both sides of road; barely passable	O		
TD-020	11/8	12:05	Inferred	43	39.733797	-121.593789	TD	TD	fire burning at end of S Libby Rd	R		
TD-014	11/8	12:11	AVL	5	39.736441	-121.593781	AVL	TD	Timber still burning good. Structure already burned to ground. One structure collapsed in road.	R		
TD-210	11/8	12:11	AVL	9	39.751967	-121.606617	AVL	TD	fire threatening Ace Hardware	O		
TD-210	11/8	12:14	Photo	0	39.751996	-121.606674	Photo	Photo	fire to NE corner of Ace Hardware; vegetation, fence, and power poles burning	O		
TD-210	11/8	12:14	Photo	0	39.752052	-121.606484	Photo	Photo	vegetation fire, flaring up, torching	V		
TD-123	11/8	12:18	AVL	7	39.733267	-121.593917	AVL	TD	structures burned in open area	R		
TD-111	11/8	12:26	Inferred	7	39.752229	-121.593818	TD	TD	structures burning at Pearson Rd and Middle Libby Rd	R		
TD-123	11/8	12:27	AVL	37	39.724088	-121.594940	TD	TD	trees on fire	V		
PPD-08	11/8	12:29	PPD-08	0	39.751950	-121.609656	video	video	spot fire south side of Pearson Rd	S		
PPD-08	11/8	12:29	PPD-08	0	39.752580	-121.610136	video	video	spot fire north side of Pearson Rd	S		
PPD-08	11/8	12:29	PPD-08	0	39.752078	-121.610783	video	video	spot fire south side of Pearson Rd	S		
TD-111	11/8	12:33	AVL TD-123	32	39.737834	-121.593800	TD	TD	all structures on fire in area	R		
TD-130	11/8	12:35	AVL	0	39.749694	-121.593762	AVL	TD	everything on fire	O		
TD-130	11/8	12:36	video	0	39.751277	-121.600907	video	video	between Garden View Ln and Glen Cir at Pearson Rd; all but 1 structure fully involved; heavy vegetation fire; visibility zero	R		
TD-130	11/8	12:36	Photo	0	39.749859	-121.600915	Photo	Photo	Newland Rd is a furnace - very intense fire; everything burning; all structures and vegetation intense flames, fully involved, burning debris in roadway; dark, windy, heavy ember showers	R		
TD-130	11/8	12:36	Photo	0	39.752266	-121.602376	Photo	Photo	all structures fully involved, parcels completely burning	R		
TD-130	11/8	12:36	Photo	0	39.752223	-121.605562	Photo	Photo	vegetation past peak, still burning; consumed throughout drainage, burning right up to roadway and Ace Hardware parking lot	V		
TD-130	11/8	12:39	video	0	39.749956	-121.607664	video	video	Clark Rd between Pearson Rd and Village Pkwy; fire on east side of Clark Rd [video does not show west side]	O		
TD-020	11/8	12:48	Inferred	0	39.747683	-121.593784	Inferred	TD	all structures burning	R		
TD-210	11/8	12:53	video	0	39.752278	-121.599278	video	video	everything both sides fully involved on Pearson Rd at Tamarack Way	R		
TD-210	11/8	12:53	Photo	0	39.752265	-121.597610	Photo	Photo	structures fully involved, surface fuels, trees burning; one structure standing with no fire visible	R		
TD-210	11/8	12:53	Photo	0	39.750401	-121.593744	Photo	Photo	surface fuels past peak, still active flaming, everything burning; structures fully involved	R		

Pearson Road and Buschmann Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-210	11/8	12:54	video	0	39.750778	-121.593731	video	video	everything both sides fully involved on Pearson Rd at Stonehurst Dr	R		
TD-064	11/8	13:10	Inferred	50	39.753717	-121.623441	TD	TD	park across street from PPD is burning; 10 cm to 13 cm (4 in to 5 in) diameter embers falling	V		
TD-014	11/8	13:15	AVL	0	39.750721	-121.576646	AVL	TD	areas burning a second time	V		
TD-130	11/8	13:21	AVL	0	39.752601	-121.607492	AVL	TD	Mobil gas station on fire	C		
TD-014	11/8	13:23	Radio Log	0	39.748125	-121.609620	Radio Log	Radio Log	fire in the building	R		
TD-112	11/8	13:23	Radio Log	0	39.748140	-121.609663	Radio Log	Radio Log	structure on fire	R		
TD-112	11/8	13:25	Radio Log	0	39.748140	-121.609663	Radio Log	Radio Log	apartments: 3 complexes well involved	R		
TD-112	11/8	13:25	Inferred	8	39.747739	-121.609668	Radio Log	TD	Half of apartment complex fully involved	R		
TD-021	11/8	13:30	Inferred	0	39.753746	-121.624623	TD	TD	fire has already burned around area of Station 81	O	x	
TD-209	11/8	13:41	Photo	0	39.748519	-121.582307	Photo	Photo	minimal fire activity limited to burning rubble; surface fuels and abandoned vehicles have finished burning	R	x	
TD-123	11/8	13:46	AVL	42	39.751025	-121.607178	AVL	TD	back of Ace Hardware on fire; PVC stacks on fire	C		
TD-130	11/8	13:46	Photo	0	39.750527	-121.576059	Photo	Photo	all surface fuels and vegetation and abandoned vehicles finished burning	O	x	
TD-130	11/8	13:46	Photo	0	39.747756	-121.572455	Photo	Photo	most structures burned to foundation, minimal active spots of fire in rubble	R	x	
TD-209	11/8	13:59	AVL	4	39.748595	-121.589830	AVL	TD	houses are already burned down; nothing to protect	R	x	
TD-064	11/8	14:00	Inferred	0	39.753933	-121.623996	TD	TD	fire threatening structures	O		
TD-209	11/8	14:03	AVL	7	39.749643	-121.594508	AVL	TD	fire had already gone through Enchanted Forest mobile home park	R	x	
TD-009	11/8	14:10	AVL	0	39.749867	-121.602550	AVL	TD	house is burned down	R	x	
TD-209	11/8	14:12	Photo	0	39.749421	-121.593324	Photo	Photo	structures burned to foundation; flaming rubble	R	x	
TD-209	11/8	14:12	Photo	0	39.749148	-121.594168	Photo	Photo	structures burned to foundation; flaming rubble	R	x	
TD-209	11/8	14:13	Photo	0	39.752306	-121.595087	Photo	Photo	structure burned down, fire out, surface vegetation consumed	R	x	
TD-209	11/8	14:13	Photo	0	39.752011	-121.595371	Photo	Photo	structure burned to foundation, minimal flaming rubble	R	x	
TD-209	11/8	14:13	Photo	0	39.752004	-121.596833	Photo	Photo	structure post peak, collapsed, still burning	R	x	
TD-209	11/8	14:13	Photo	0	39.752034	-121.596325	Photo	Photo	structure burned to foundation	R	x	
TD-209	11/8	14:13	Photo	0	39.752635	-121.596030	Photo	Photo	structure burned to foundation	R	x	
TD-209	11/8	14:13	Photo	0	39.752261	-121.602313	Photo	Photo	structures in area burned to foundation along Pearson Rd; minimal fire, burning rubble	R	x	
TD-209	11/8	14:14	AVL	0	39.751829	-121.607361	AVL	TD	everything around Ace Hardware is burned	O	x	
TD-209	11/8	14:14	Photo	0	39.752486	-121.608038	Photo	Photo	widespread surface fires (burning rubble from new sheds for sale), power pole burning	O		
TD-142	11/8	14:19	Inferred	0	39.749320	-121.607702	TD	TD	fire on both sides of Clark Rd	O		

Pearson Road and Buschmann Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-142	11/8	14:20	Inferred	0	39.753164	-121.607778	TD	TD	black wall of smoke north of Pearson Rd; commercial structures fully involved	C		
TD-141	11/8	14:20	Photo	0	39.751104	-121.608198	Photo	Photo	Casa de Paradiso restaurant, structure past peak burning, partially collapsed	C		
TD-132	11/8	14:21	Photo	0	39.752690	-121.607365	Photo	Photo	Mobil gas station burning	C		
TD-108	11/8	14:21	Photo	0	39.752709	-121.607343	Photo	TD	Mobil gas station heavily involved in fire	C		
TD-141	11/8	14:21	Photo	0	39.752691	-121.607351	Photo	Photo	structure past peak, partially collapsed	C		
TD-141	11/8	14:21	Photo	0	39.752468	-121.608046	Photo	Photo	widespread surface fires (burning rubble from new sheds for sale), power pole burning; NW corner Pearson Rd and Clark Rd	O		
TD-141	11/8	14:21	Photo	0	39.750671	-121.608187	Photo	Photo	west side of structure is fully involved; east half still standing, no fire showing	C		
TD-141	11/8	14:21	Photo	0	39.751092	-121.608198	Photo	Photo	structure past peak, partially collapsed	C		
TD-141	11/8	14:21	Photo	0	39.750618	-121.607868	Photo	Photo	spot fire in vegetation, burned through power pole; power pole is leaning at 45° angle	S		
TD-108	11/8	14:21	Photo	0	39.753316	-121.608084	Photo	Photo	structure fully involved	C		
TD-041	11/8	14:22	Inferred	36	39.748767	-121.593975	TD	TD	fire front had passed	O	x	
TD-133	11/8	14:25	Photo	0	39.751696	-121.607936	Photo	Photo	spot fire; power pole active flaming from ground up 3 m (10 ft); surrounding landscape veg unburned	O		
TD-133	11/8	14:26	Photo	0	39.753324	-121.608071	Photo	Photo	structure fully involved	C		
TD-133	11/8	14:26	Photo	0	39.751104	-121.608198	Photo	Photo	structure past peak, partially collapsed	C		
TD-133	11/8	14:26	Photo	0	39.750652	-121.608182	Photo	Photo	structure fully involved	C		
TD-123	11/8	14:29	AVL	0	39.748943	-121.608952	AVL	TD	LDS church is on fire	C		
TD-123	11/8	14:30	AVL	37	39.749783	-121.610367	AVL	TD	fence and small houses on fire	R		
PPD-15	11/8	14:40	PPD-15	0	39.754176	-121.624097	video	video	fire close to Paradise Police station	R		
PPD-15	11/8	14:41	PPD-15	0	39.753787	-121.623590	video	video	glowing vegetation fire in area of park at PPD	O		
TD-141	11/8	14:43	Photo	0	39.753326	-121.608075	Photo	Photo	structure burned to foundation, still flaming	C		
TD-141	11/8	14:49	Photo	0	39.750651	-121.608079	Photo	Photo	entire multi-commercial structure now fully involved	C		
TD-141	11/8	14:51	Photo	0	39.752593	-121.608743	Photo	Photo	structure burning	C		
TD-055	11/8	14:52	Photo	0	39.752239	-121.603179	Photo	Photo	most structures burned down and out; a few still burning	R	x	
TD-055	11/8	14:52	Photo	0	39.752599	-121.608736	Photo	Photo	flames and heavy smoke coming from structure	C		
TD-055	11/8	14:52	Photo	0	39.752499	-121.610994	Photo	Photo	structure fully involved	C		
TD-055	11/8	14:52	Photo	0	39.751662	-121.611191	Photo	Photo	structure fully involved	C		
TD-055	11/8	14:52	Photo	0	39.752482	-121.612035	Photo	Photo	structure fully involved, collapsed	C		
TD-055	11/8	14:52	Photo	0	39.752016	-121.613826	Photo	Photo	portable classrooms burning; heavy fire, trees torching	C		
TD-055	11/8	14:52	Photo	0	39.751979	-121.615076	Photo	Photo	Gold Nugget Museum building engulfed in flames	C		

Pearson Road and Buschmann Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-055	11/8	14:52	Photo	0	39.752370	-121.616212	Photo	Photo	vehicle in carport fully involved	O		
TD-055	11/8	14:52	Photo	0	39.752372	-121.618063	Photo	Photo	entire hillside of vegetation burning, intense heat	V		
TD-055	11/8	14:52	Photo	0	39.752084	-121.622065	Photo	Photo	multiple structures fully involved both sides of Pearson Rd; fire burning everywhere; significant ember wash	R		
TD-055	11/8	14:52	Photo	0	39.752878	-121.625259	Photo	Photo	heavy fire on roof/facade of structure	C		
PPD-15	11/8	14:52	PPD-15	0	39.752085	-121.621935	Radio	Radio	area is all engulfed	O		
TD-101	11/8	14:53	Photo	0	39.752820	-121.625090	Photo	Photo	wood shake roof fully involved on commercial structure, spewing firebrands; spaced 0.6 m (2 ft) from neighboring commercial structure	C		
TD-101	11/8	14:53	Photo	0	39.752579	-121.625413	Photo	Photo	vegetation spot fire	S		
TD-069	11/8	14:59	Inferred	9	39.751606	-121.611468	TD	TD	Paradise Elementary School actively burning	C		
TD-069	11/8	14:59	Inferred	9	39.752026	-121.613836	TD	TD	Intermediate school portables are on fire	C		
TD-069	11/8	14:59	Inferred	9	39.751978	-121.615056	TD	TD	museum is on fire	C		
TD-069	11/8	14:59	Inferred	9	39.752176	-121.619057	TD	TD	wall of flames across Pearson Rd	O		
TD-141	11/8	15:02	Photo	0	39.752185	-121.619487	Photo	Photo	vegetation fire both sides of Pearson Rd; ember shower	V		
TD-141	11/8	15:02	Photo	0	39.752439	-121.621501	Photo	Photo	structure fully involved; parcel vegetation burning	R		
TD-141	11/8	15:02	Photo	0	39.751853	-121.622340	Photo	Photo	structure fully involved; parcel vegetation burning	C		
TD-141	11/8	15:02	Photo	0	39.752401	-121.622137	Photo	Photo	Craig Memorial Congregational Church burning, fully involved	C		
TD-141	11/8	15:02	Photo	0	39.752367	-121.622944	Photo	Photo	structure fully involved; parcel vegetation burning	R		
TD-141	11/8	15:02	Photo	0	39.752359	-121.622703	Photo	Photo	structure fully involved	R		
TD-141	11/8	15:02	Photo	0	39.752329	-121.623198	Photo	Photo	structure fully involved, pickup truck burning, all vegetation burning, tree limbs torched and glowing	R		
TD-132	11/8	15:03	video	0	39.752108	-121.622341	Photo	video	structures fully involved, ember showers bouncing down street, spot fires	R		
PPD-15	11/8	15:03	PPD-15	0	39.753279	-121.624885	video	video	spot fire	S		
PPD-15	11/8	15:03	PPD-15	0	39.752810	-121.625117	video	video	commercial structures on fire	C		
TD-132	11/8	15:03	Photo	0	39.751917	-121.625193	Photo	Photo	area burning, possible structures involved	O		
TD-132	11/8	15:03	Photo	0	39.752086	-121.622581	Photo	Photo	all structures fully involved and widespread vegetation fire (flaming, past peak), both sides of Pearson Rd between College Hill Rd and Black Olive Dr	R		
TD-132	11/8	15:03	Photo	0	39.752816	-121.625085	Photo	Photo	structure fully involved	R		
TD-132	11/8	15:03	Photo	0	39.752877	-121.625252	Photo	Photo	structure igniting in eaves and roof due to neighboring structure on fire	R		x
TD-132	11/8	15:04	Photo	0	39.755875	-121.626673	Photo	Photo	smoke coming from commercial structure; small spot fire in vegetation also burning against structure	C		
TD-123	11/8	15:07	AVL	0	39.748943	-121.608952	AVL	TD	LDS church is fully involved	C		



Pearson Road and Buschmann Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-101	11/8	15:07	Photo	0	39.748625	-121.585894	Photo	Photo	area burned over, buildings destroyed, few spots of fire remaining	R	x	
PPD-15	11/8	15:20	PPD-15	0	39.755830	-121.626766	video	video	fully involved commercial building; no other fire around	C		
TD-101	11/8	15:28	Photo	0	39.748721	-121.583197	Photo	Photo	Pearson Rd: Butte View Ter to Sawmill Rd, area burned over, buildings destroyed, few spots of fire remaining	R	x	
TD-101	11/8	15:31	Photo	0	39.751795	-121.593330	Photo	Photo	structure burned to foundation, minimal flames in rubble; parcel vegetation burnt, no flames	R	x	
TD-209	11/8	15:38	AVL	23	39.746537	-121.611519	TD	TD	fire coming from first floor	R		
TD-209	11/8	15:38	AVL	23	39.746313	-121.611514	TD	TD	column of building ignites	R		
PPD-15	11/8	15:40	PPD-15	0	39.755102	-121.627327	video	video	waves of embers blowing along roadway, both sides, large, golf ball-sized and bouncing	O		
PPD-15	11/8	15:41	PPD-15	0	39.753501	-121.627061	video	video	vegetation on entire lot is burning intense	V		
PPD-15	11/8	15:41	PPD-15	0	39.752964	-121.626219	video	video	multiple small spots along south side of Pearson Rd between Skyway and Black Olive Dr	S		
PPD-15	11/8	15:41	PPD-15	0	39.752847	-121.625119	video	video	fully involved structures on north side Pearson Rd; no fire on south side of street	C		
PPD-15	11/8	15:41	PPD-15	2	39.752202	-121.615930	video	video	fire has burned through everything on Pearson Rd east of Black Olive Dr; 33 % each of burned to foundation, fully involved, and still standing; Black Olive Dr to Clark Rd	C		
VTD-18	11/8	16:40	TD	0	39.748948	-121.608932	video	video	church past-peak fully involved, not collapsed yet	C	x	
TD-142	11/8	16:48	Photo	0	39.755732	-121.626176	Photo	Photo	commercial structures burning	C		
TD-111	11/8	16:50	TD	0	39.753842	-121.624697	TD	TD	fire around Station 81	O		
TD-065	11/8	17:38	TD	0	39.752202	-121.612108	TD	TD	Paradise Elementary is burned down	C		
TD-209	11/8	17:50	AVL	53	39.746050	-121.611217	AVL	TD	Paradise Community Village Apartments burned down / fully involved	R		
TD-209	11/8	17:55	Photo	0	39.746214	-121.611519	Photo	Photo	structure fully involved, past peak, partially collapsed; other apartment structures beginning to burn	R		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-035	11/8	07:45	Inferred	0	39.735414	-121.610263	TD	TD	hot embers falling	O		
TD-074	11/8	08:00	TD	0	39.759491	-121.606635	TD	TD	embers as large as a matchbox landing	O		
TD-015	11/8	08:15	TD	0	39.784464	-121.587998	TD	TD	spot fire	S		
TD-065	11/8	08:15	Inferred	0	39.759502	-121.606653	TD	TD	ember showers	O		
TD-100	11/8	08:30	TD	0	39.735180	-121.604409	TD	TD	spot fire too big to engage, est. about 12 ha (30 ac); established in drainage	S		
VTD-09	11/8	08:30	TD	0	39.784384	-121.589144	video	video	spot fire in Apple Tree Village mobile home park	S		
VTD-09	11/8	08:30	TD	0	39.783043	-121.588983	video	video	spot fire in Apple Tree Village mobile home park	S		
VTD-09	11/8	08:30	TD	0	39.784803	-121.590610	video	video	spot fire in Apple Tree Village mobile home park	S		
911-142-1	11/8	08:31	911-142-1	0	39.796563	-121.585649	911-142-1	911-142-1	spot fire	S		
911-142-2	11/8	08:31	911-142-2	0	39.796563	-121.585649	911-142-2	911-142-2	spot fire	S		
TD-058	11/8	08:35	Inferred	26	39.793050	-121.584948	TD	TD	trees on fire	V		
911-152-1	11/8	08:35	911-152-1	0	39.796563	-121.585649	911-152-1	911-152-1	spot fire	S		
911-153-1	11/8	08:35	911-153-1	0	39.796563	-121.585649	911-153-1	911-153-1	spot fire	S		
911-155-1	11/8	08:36	911-155-1	0	39.796563	-121.585649	911-155-1	911-155-1	fire	S		
911-157-1	11/8	08:37	911-157-1	0	39.776591	-121.588145	911-157-1	911-157-1	field behind Kmart on fire	S		
TD-067	11/8	08:38	911-158-1	0	39.779476	-121.587807	TD	TD, 911-158-1	spot fire	S		
911-158-1	11/8	08:38	911-158-1	0	39.779450	-121.587721	911-158-1	911-158-1	spot fire in grass, just started, small but still burning	S		
911-161-2	11/8	08:39	911-161-2	0	39.784800	-121.587090	911-161-2	911-161-2	fire is right next door	O		
TD-075	11/8	08:40	Inferred	6	39.777730	-121.590638	TD	TD	noticed embers flying through air	O		
TD-067	11/8	08:40	Inferred	6	39.779476	-121.587807	TD	TD	smaller spot fire in grass behind church	S		
TD-105	11/8	08:40	Inferred	20	39.733599	-121.612989	TD	TD	fire spotting across Clark Rd	S		
TD-105	11/8	08:40	Inferred	20	39.733599	-121.612989	TD	TD	structure burning	R		
911-164-1	11/8	08:40	911-164-1	0	39.797065	-121.585487	911-164-1	911-164-1	fire	S		
PPD-02	11/8	08:43	PPD-02	0	39.778604	-121.588499	Radio	Radio	large tree on fire between Wagstaff Rd and Della Ln by the school district office	S		
TD-067	11/8	08:46	PPD video	0	39.776799	-121.588842	TD	TD	observed fully involved pine tree on south side Wagstaff Rd	S		
PPD-02	11/8	08:46	PPD-02	0	39.777473	-121.588112	Radio	Radio	spot fire; large tree and field involved	S		
TD-077	11/8	08:52	Photo	0	39.768403	-121.597561	TD	TD	fire started in field behind PID office	S		
911-188-2	11/8	08:52	911-188-2	0	39.773441	-121.597718	911-188-2	911-188-2	fire in playground? Trees at school behind church	S		
911-201-1	11/8	08:59	911-201-1	0	39.742037	-121.603353	Inferred	911-201-1	fire behind house	S		
TD-111	11/8	09:00	Radio Log	0	39.769875	-121.596369	TD	TD	spot fire	S		
TD-100	11/8	09:00	Inferred	30	39.732782	-121.606831	TD	TD	growing spot fire, well established in canyon	S		
TD-053	11/8	09:00	Inferred	0	39.776337	-121.588374	TD	TD	fire east of Kmart	R		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-017	11/8	09:17	AVL	8	39.773662	-121.598186	Radio Log	TD	Fire spotting on west side of Clark Rd, about 0.4 ha (1 ac), timber/litter fuel	S		
TD-077	11/8	09:20	Inferred	0	39.733280	-121.604288	TD	TD	see flames on ridge to east of Clark Rd	V		
VTD-18	11/8	09:28	TD	0	39.776810	-121.588771	video	video	tall pine tree bark burning along the entire trunk	V		
TD-052	11/8	09:28	Photo	0	39.778000	-121.590473	Photo	Photo	fire has burned up bark of tall pine tree behind (east) Savemart	V	x	
TD-017	11/8	09:30	Radio Log	0	39.777731	-121.590543	Radio Log	Radio Log	fire is well established [in area around] Clark Rd and Wagstaff Rd	O		
TD-017	11/8	09:30	Radio Log	0	39.773662	-121.598186	Radio Log	Radio Log	fire [in area of] Clark Rd and Bille Rd from the Paradise Alliance Church working its way south	O		
TD-034	11/8	09:30	TD	120	39.739841	-121.605311	TD	TD	fire coming from S and SE into Lanser Dr area	V		
VTD-18	11/8	09:30	TD	0	39.777301	-121.587854	video	video	smoke plume rising from east of commercial buildings (estimated source location)	O		
VTD-18	11/8	09:32	TD	0	39.776068	-121.588136	video	video	orange glow coming from east of commercial buildings (estimated source location)	O		
VTD-18	11/8	09:43	TD	0	39.775481	-121.588899	video	video	30 m (100 ft) tall pine tree torches in 22 s; starts off major fire behind buildings	O		
TD-058	11/8	09:44	video	0	39.775481	-121.588899	video	TD, video	trees torching	V		
TD-052	11/8	09:44	Photo	0	39.775554	-121.588966	Photo	Photo	very tall pine torching tree behind Savemart (Paradise Plaza)	V		
PPD-05	11/8	09:52	PPD-05	0	39.767647	-121.602779	Radio	Radio	fire in the area of the medical complex	S		
TD-014	11/8	10:00	AVL	0	39.722754	-121.612149	AVL	Radio Log	approximate fire edge	O		
TD-049	11/8	10:00	Inferred	15	39.742633	-121.607625	TD	TD	fire on both sides of road; saw fire tornadoes	V		
TD-009	11/8	10:02	AVL	0	39.738600	-121.612133	AVL	TD	fire burning on west side of Clark Rd	V		
TD-009	11/8	10:04	AVL	6	39.765638	-121.602173	PPD video	TD	fire on both sides of Clark Rd, buildings and vegetation	C		
TD-041	11/8	10:17	Inferred	0	39.736709	-121.612867	Inferred	TD	fire just hit; vehicles are burning; flames fully or partially blocking roadway	O		
TD-043	11/8	10:17	Photo	0	39.785498	-121.590364	TD	TD	fire is burning around Station 35	V		
TD-065	11/8	10:18	PPD video	0	39.737657	-121.612787	TD	TD	bad fire across roadway	O		
PPD-02	11/8	10:18	PPD-02	0	39.725403	-121.611852	Radio	Radio	fire encroaching roadway	O		
ST9220C	11/8	10:21	Radio Log	0	39.742008	-121.607632	Radio Log, TD-041	Radio Log	fire is impacting line of traffic on Clark Rd	O		
TD-055	11/8	10:22	Photo	0	39.776884	-121.588480	Photo	Photo	structure burning well in garage	R		
TD-055	11/8	10:22	Photo	0	39.776875	-121.588445	Photo	Photo	attached garage of duplex fully involved, burning through roof	R		
PPD-02	11/8	10:22	PPD-02	0	39.757446	-121.606495	Radio	Radio	north of Nunneley Rd east of Clark Rd is catching on fire	O		
TD-110	11/8	10:30	Inferred	10	39.721618	-121.612018	TD-130	TD	fire on Clark Rd at Airport Rd	V		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-100	11/8	10:30	TD	0	39.729041	-121.613179	TD	TD	spot fires starting on west side of Clark Rd	S		
PPD-02	11/8	10:32	PPD-02	0	39.748595	-121.607750	Radio	Radio	fire is overtaking vehicles on Clark Rd	O		
TD-041	11/8	10:35	TD	0	39.764877	-121.602483	TD	TD	fire is hitting roadway from east; McDonalds just caught fire	C		
TD-058	11/8	10:35	Inferred	0	39.765523	-121.602372	TD	TD	everything beginning to burn, house on fire	R		
TD-110	11/8	10:40	Inferred	90	39.742807	-121.607651	TD	TD	all structures are burning	R		
TD-100	11/8	10:40	Inferred	80	39.725062	-121.617719	TD	TD	area being impacted by spot fires	S		
VTD-18	11/8	10:42	TD	0	39.774950	-121.591186	video	video	vegetation fire in hedges behind Kmart	V		
VTD-13	11/8	10:43	Inferred	0	39.783425	-121.588258	video	video	spot fire; RV fully involved in storage lot; Kilcrease Cir	O		
VTD-13	11/8	10:43	Inferred	0	39.781345	-121.589181	video	video	spot fire	S		
VTD-13	11/8	10:43	Inferred	0	39.780446	-121.589681	video	video	spot fire	S		
TD-061	11/8	10:45	Radio Log	0	39.785487	-121.586511	Radio Log	Radio Log	fire is on the [west] side of Clark Rd; Station 35 and Pine Springs Mobile Home Park are being impacted	O		
TD-034	11/8	10:45	TD	0	39.749521	-121.606715	TD	TD	conditions deteriorate; field caught fire, wind blowing flames like blowtorch; spot fires and trees igniting; embers blowing across street	O		
TD-065	11/8	10:46	Inferred	100	39.748784	-121.607914	TD	TD	fire has jumped to west side of Clark Rd at Buschmann Rd	V		
PPD-02	11/8	10:46	PPD-02	0	39.728219	-121.612847	Radio	Radio	fire both sides of roadway, more intense on east side; roadway is passable one lane	V		
VTD-26	11/8	10:48	Inferred	0	39.771396	-121.598318	video	video	spot fire, shed fully involved	S		
VTD-26	11/8	10:48	Inferred	0	39.770545	-121.598027	video	video	spot fires in parking lot vegetation	S		
VTD-26	11/8	10:48	Inferred	0	39.770194	-121.598241	video	video	spot fires in parking lot vegetation	S		
TD-068	11/8	10:50	PPD video	0	39.761569	-121.603057	TD	TD	fire behind (east) of Safeway	O		
VTD-18	11/8	10:50	TD	6	39.774477	-121.591098	video	video	structures burning behind Kmart	R		
VTD-26	11/8	10:50	Inferred	0	39.766707	-121.601342	video	video	spot fires burning 0.1 ha (0.25 ac), light fire activity fine fuels have already burned	S		
PPD-02	11/8	10:50	PPD-02	0	39.760515	-121.603216	Radio	Radio	fire is right behind Safeway	O		
VTD-26	11/8	10:51	Inferred	0	39.766295	-121.602245	video	video	structure burned to foundation, active flames	R	x	
VTD-26	11/8	10:51	Inferred	0	39.766089	-121.601953	video	video	landscape timbers flaming	O		
TD-130	11/8	10:51	Photo	0	39.722505	-121.611752	Photo	Photo	grass field on east side Clark Rd already burned	V	x	
TD-130	11/8	10:51	Photo	0	39.724433	-121.612262	Photo	Photo	southern edge of fire burning in brush and grass, west side of Clark Rd; past peak, still active fire; fire burning up against road	V		
TD-130	11/8	10:51	Photo	0	39.726234	-121.612631	Photo	Photo	finger of fire burning on west side of Clark Rd between Meadowsong and Round Valley Ranch Rd	V		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-130	11/8	10:51	Photo	0	39.727207	-121.611371	Photo	Photo	field on east side Clark Rd, past peak burning, still active spot fires on heavier fuels	V	x	
PPD-02	11/8	10:51	PPD-02	0	39.728219	-121.612847	Radio	Radio	fire both sides, but is good enough to get through	O		
TD-210	11/8	10:52	AVL	0	39.717203	-121.607983	TD-130	TD	flames coming from the east towards Clark Rd between Airport Rd and Round Valley Ranch Rd	V		
VTD-26	11/8	10:52	Inferred	0	39.765300	-121.601231	video	video	well established fire	O		
VTD-26	11/8	10:52	Inferred	0	39.766009	-121.603098	video	video	well established fire	O		
TD-130	11/8	10:53	video	0	39.722405	-121.612190	video	video	fire on east side of Clark Rd north of Meadow Song Dr; nothing really active	V		
TD-130	11/8	10:53	video	0	39.723850	-121.612007	video	video	fire on west side of Clark Rd north of Meadow Song Dr; not really active	V		
VTD-26	11/8	10:53	Inferred	0	39.765221	-121.603485	video	video	structure burning	R		
VTD-26	11/8	10:53	Inferred	0	39.764829	-121.603491	video	video	structure early stages of burning from roof, heavy fire on parcel	R		
VTD-26	11/8	10:54	Inferred	0	39.764186	-121.603065	video	video	structure past peak fully involved	C		
TD-041	11/8	10:55	Inferred	0	39.785506	-121.590472	TD	TD	ground fuels already burned	V	x	
TD-041	11/8	10:55	Inferred	0	39.784688	-121.592314	TD	TD	one mobile home on fire in Apple Tree Village mobile homes	R		
VTD-26	11/8	10:55	Inferred	0	39.762665	-121.605019	video	video	spot fire	S		
TD-034	11/8	10:57	TD-130	15	39.733372	-121.612600	TD	TD	fire burned over Clark Rd	O		
TD-009	11/8	10:59	AVL	4	39.785387	-121.590390	AVL	TD	fire already burned around Station 35	V	x	
TD-009	11/8	10:59	AVL	4	39.783878	-121.590787	TD	TD	Apple Tree Village Mobile Home Park actively burning	R		
TD-035	11/8	11:00	Inferred	30	39.759231	-121.606861	TD	TD	blanket caught in powerlines; burning; blanket fell and ignited bushes at Arco gas station	O		
TD-035	11/8	11:00	Inferred	30	39.759231	-121.606861	TD	TD	bushes burning, fire approaches from west behind Arco gas station	S		
TD-041	11/8	11:00	Inferred	0	39.784688	-121.592314	TD	TD	10 mobile homes are burning	R		
TD-100	11/8	11:00	Inferred	15	39.728204	-121.612917	TD	TD	fire all around, 15 m (50 ft) flames crossing Clark Rd	O		
VTD-18	11/8	11:01	TD	0	39.774769	-121.591008	video	video	structure fully involved	R		
VTD-18	11/8	11:01	TD	0	39.774814	-121.589873	video	video	structure fully involved, past peak, roof collapsed	R		
VTD-18	11/8	11:02	TD	0	39.774640	-121.589197	video	video	structure is burning	R		
VTD-18	11/8	11:02	TD	0	39.774832	-121.588512	video	video	structure is fully involved	R		
TD-211	11/8	11:08	AVL	83	39.739484	-121.610608	AVL	TD	fire coming up from drainage; fire both sides of Clark Rd	V		
TD-037	11/8	11:09	Inferred	21	39.761416	-121.603138	TD	TD	fire is right behind Safeway	O		
TD-037	11/8	11:09	Inferred	21	39.766955	-121.600744	TD	TD	spotty fire along Clark Rd between Safeway and CMA Church	S		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-037	11/8	11:09	Inferred	21	39.781419	-121.590096	TD	TD	spot fire south of Apple Tree Village mobile homes; spotting to W side of Clark Rd	S		
TD-037	11/8	11:09	Inferred	21	39.783399	-121.588222	TD	TD	RV storage at Kilcrease and Clark Rd is on fire	O		
TD-043	11/8	11:10	Photo	0	39.784791	-121.589420	TD	TD	Apple Tree Village mobile home park burning in NE corner	R		
TD-043	11/8	11:10	Photo	0	39.782427	-121.590664	TD	TD	Apple Tree Village mobile home park burning on south side	R		
TD-211	11/8	11:12	video	0	39.736402	-121.612846	AVL	video TD-130	fire blocking Clark Rd	O		
TD-208	11/8	11:13	AVL	0	39.720883	-121.611550	AVL	TD	heavy fire impacting/blocking Clark Rd from canyon to east	V		
TD-110	11/8	11:14	TD-208	0	39.713314	-121.611004	TD	TD	fire burning at back of homes	V		
TD-110	11/8	11:14	Radio Log	0	39.717900	-121.611316	Radio Log	Radio Log	Clark Rd heavily impacted fire near the airport	V		
TD-100	11/8	11:14	Inferred	40	39.739463	-121.610688	TD	TD	flames blowing across Clark Rd between Round Valley Ranch Rd and Lanser Dr	O		
TD-100	11/8	11:14	Inferred	40	39.729083	-121.614047	TD	TD	fire threatening structure; structure burned	R		
TD-208	11/8	11:15	AVL	11	39.714651	-121.611433	AVL	TD	stop and wait on Clark Rd at airport for fire to die down to continue north	V		
TD-110	11/8	11:15	Inferred	55	39.722988	-121.619710	TD	TD	finger of fire burning through Round Valley Ranch Rd	V		
TD-110	11/8	11:15	Inferred	55	39.725806	-121.618294	TD	TD	barn burning sending large ember cast	R		
TD-070	11/8	11:16	Inferred	24	39.763345	-121.603993	TD	TD	fire burning on Clark Rd north of Lovely Ln	R		
TD-070	11/8	11:16	Inferred	24	39.759330	-121.606715	TD	TD	fire is on both sides of Clark Rd; ampm gas station on fire	C		
TD-208	11/8	11:20	Photo	0	39.715388	-121.611152	Photo	Photo	intense vegetation fire burning up against east side of roadway	V		
PPD-02	11/8	11:20	PPD-02	0	39.796459	-121.586142	video	video	fire has already burned through the surface grass	V	x	
PPD-08	11/8	11:21	PPD-08	0	39.765063	-121.602847	video	video	buildings igniting, early stages of burning, both sides of Clark Rd	C		
PPD-08	11/8	11:21	PPD-08	0	39.761717	-121.604836	video	video	spot fire on east side of Clark Rd	S		
PPD-08	11/8	11:21	PPD-08	0	39.764988	-121.602940	video	video	scattered vegetation and structure fires on both sides of Clark Rd from Ginmal Way to driveway of 6283 Clark Rd	C		
PPD-08	11/8	11:21	PPD-08	0	39.764200	-121.603082	video	video	structure fully involved	R		
PPD-08	11/8	11:22	PPD-08	0	39.770543	-121.597851	video	video	spot fire	S		
PPD-08	11/8	11:24	PPD-08	0	39.770537	-121.598265	video	video	numerous small spots in mulch or other ground cover	S		
TD-211	11/8	11:29	AVL	31	39.746837	-121.608961	Inferred	TD	fire in back of Best Western	O		
TD-017	11/8	11:30	AVL	120	39.772933	-121.596188	AVL	TD	Juniper trees/bushes igniting	S		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-208	11/8	11:30	AVL	4	39.738883	-121.611750	AVL	TD	stop and wait for fire front to cross Clark Rd; drive through fire; fire everywhere; foam line on engine burned up	V		
TD-035	11/8	11:30	Inferred	90	39.749298	-121.607732	TD	TD	PGE yard bush pile: blow torching the road at Buschmann Rd; Clark Rd impassable	O		
TD-035	11/8	11:30	Inferred	90	39.743165	-121.607652	TD	TD	fire across roadway	O		
TD-037	11/8	11:30	TD	40	39.785750	-121.589174	TD	TD	vegetation fire near the Station 35 (east)	V		
TD-037	11/8	11:30	TD	40	39.755005	-121.605692	TD	TD	glow of fire east of Clark Rd near Nunneley Rd	O		
PPD-08	11/8	11:32	PPD-08	0	39.748590	-121.607695	Radio	Radio	fire getting really close to the roadway	O		
TD-017	11/8	11:34	AVL	116	39.776363	-121.589966	AVL	TD	Kmart threatened, front side of Kmart shrubs catching fire.	S		
TD-015	11/8	11:35	AVL	123	39.776164	-121.587283	TD	TD	fire around Kmart shopping center	O		
TD-034	11/8	11:36	Photo	0	39.759236	-121.606715	Photo	TD	vegetation on fire at Arco gas station	S		
TD-034	11/8	11:36	Photo	0	39.759105	-121.606886	Photo	Photo	shrubs on fire at Arco gas station	V		
TD-034	11/8	11:36	Photo	0	39.759105	-121.606886	Photo	Photo	shrubs on fire at Arco gas station	V		
TD-034	11/8	11:36	Photo	0	39.758695	-121.607074	Photo	Photo	surface vegetation (grass), ladder fuels have burned, light flaming	V	x	
TD-034	11/8	11:36	Photo	0	39.756540	-121.607102	Photo	Photo	spot fire, vegetation	S		
TD-208	11/8	11:37	AVL	63	39.746617	-121.608183	AVL	TD	vegetation and structures nearby are burning	R		
TD-034	11/8	11:37	Photo	0	39.756540	-121.607102	Photo	Photo	spot fire, vegetation	S		
PPD-08	11/8	11:39	PPD-08	0	39.751943	-121.607344	Radio	Radio	fire coming up to Pearson Rd and Clark Rd	O		
TD-041	11/8	11:40	Inferred	0	39.797653	-121.581882	TD	TD	houses on Gate Ln are igniting, spreading south	R		
PPD-08	11/8	11:42	PPD-08	0	39.759119	-121.606887	video	video	bushes on fire at am/pm gas station	S		
PPD-08	11/8	11:42	PPD-08	0	39.761647	-121.605168	video	video	light surface fire activity between here and 6166 Clark Rd	V		
PPD-08	11/8	11:42	PPD-08	0	39.764169	-121.603084	video	video	structure fully involved	R		
PPD-08	11/8	11:42	PPD-08	0	39.764624	-121.603185	video	video	heavy fire activity, both sides of Clark Rd	C		
PPD-08	11/8	11:43	PPD-08	0	39.765112	-121.602815	video	video	structures both sides Clark Rd fully involved at Central Park Dr	C		
PPD-08	11/8	11:43	PPD-08	0	39.769994	-121.598432	video	video	vegetation spot fire on west side Clark Rd at KFC	S		
PPD-08	11/8	11:44	PPD-08	0	39.778894	-121.589724	video	video	spot fire on both sides of Clark Rd	S		
PPD-08	11/8	11:44	PPD-08	0	39.779241	-121.589570	video	video	spot fire on east side Clark Rd	S		
PPD-08	11/8	11:44	PPD-08	0	39.781161	-121.588972	video	video	moderate fire west side of Clark Rd between Jones Ln and Mayhew Ln	O		
TD-130	11/8	11:45	video	0	39.752808	-121.605317	video	video	spot fires on north side of Pearson Rd at Brookview Way	S		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-130	11/8	11:45	Photo	0	39.752761	-121.605406	Photo	Photo	area of ground fire in heavy brush; blowing brands; flames up to 4.6 m (15 ft)	V		
TD-130	11/8	11:45	Photo	0	39.750398	-121.607079	Photo	Photo	field and vegetation south of Ace Hardware is burning up to fence and Clark Rd	V		
TD-130	11/8	11:45	Photo	0	39.749080	-121.608090	Photo	Photo	mulch/slash piles at Buschmann Rd and Clark Rd are burning	O		
TD-130	11/8	11:45	Photo	0	39.748598	-121.607111	Photo	Photo	widespread heavy fire; surface vegetation, trees	V		
PPD-08	11/8	11:45	PPD-08	0	39.783211	-121.587706	video	video	fire both sides of Clark Rd at Kilcrease Cir	O		
PPD-08	11/8	11:45	PPD-08	0	39.787001	-121.585706	video	video	spot fire; fence burning east side of Clark Rd	S		
PPD-08	11/8	11:45	PPD-08	0	39.789105	-121.585285	video	video	spot fire east side Clark Rd	S		
PPD-08	11/8	11:45	PPD-08	0	39.789631	-121.585398	video	video	spot fire east side Clark Rd	S		
PPD-08	11/8	11:45	PPD-08	0	39.790221	-121.585838	video	video	yard and fence on west side Clark Rd lots of fire	O		
PPD-08	11/8	11:45	PPD-08	0	39.790549	-121.585444	video	video	spot fire on fence east side Clark Rd at Frankie	S		
PPD-08	11/8	11:45	PPD-08	0	39.792145	-121.585029	video	video	fire on east side of Clark Rd	O		
PPD-08	11/8	11:46	PPD-08	0	39.795540	-121.584477	video	video	surface spot fire east side Clark Rd	S		
TD-130	11/8	11:49	video	0	39.748638	-121.607720	video	video	fire still burning on both sides of Clark Rd at Buschmann Rd, fire past peak	V	x	
TD-130	11/8	11:52	AVL	24	39.751002	-121.606774	AVL	TD	storage units burning at Ace Hardware	C		
PPD-10	11/8	11:53	PPD-10	0	39.799650	-121.584492	video	video	spot fire	S		
PPD-08	11/8	11:53	PPD-08	0	39.748594	-121.607721	Radio	Radio	Clark Rd SB south of Buschmann Rd is engulfed in fire	O		
TD-100	11/8	11:54	Photo	7	39.733511	-121.612977	TD	Photo	structure, past peak, fully involved	R		
TD-101	11/8	11:54	Photo	0	39.733162	-121.612876	Photo	Photo	past peak, post-fire front vegetation fire, heavy fuels still burning; structures fully involved, outbuildings collapsed and burning	R		
PPD-08	11/8	11:54	PPD-08	0	39.755908	-121.607380	Radio	Radio	multiple structures on fire, on Clark Rd and Nunneley Rd and east of there	R		
PPD-12	11/8	11:56	PPD-12	0	39.799928	-121.585323	video	video	fire behind storage facility	O		
PPD-12	11/8	11:56	PPD-12	0	39.799126	-121.586712	video	video	spot fire	S		
PPD-08	11/8	11:56	PPD-08	0	39.792757	-121.585194	video	video	fire spotted to west side of Clark Rd	S		
PPD-08	11/8	11:57	PPD-08	0	39.790782	-121.585722	video	video	fire on west side of Clark Rd has spread to north side of Pheasant Ridge Dr	O		
PPD-08	11/8	11:57	PPD-08	0	39.789676	-121.585782	video	video	heavy vegetation fire both sides Clark Rd between Franke Ln and Eaglet Way	V		
PPD-08	11/8	11:57	PPD-08	1	39.784281	-121.586722	video	video	heavy fire both sides of Clark Rd between Kimberly Ln and Adams Rd	O		
PPD-08	11/8	11:57	PPD-08	1	39.781323	-121.589097	video	video	heavy fire on west side Clark Rd between Adams Rd and Jones Ln	O		



Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
PPD-08	11/8	11:58	PPD-08	0	39.779241	-121.589570	video	video	spot fire on both sides Clark Rd	S		
PPD-08	11/8	11:58	PPD-08	0	39.778648	-121.590200	video	video	spot fire west side Clark Rd	S		
TD-037	11/8	12:00	Inferred	60	39.752978	-121.607091	TD	TD	mobile homes on east side Clark Rd at Black Bear Diner are burning	R		
TD-037	11/8	12:00	Inferred	60	39.752603	-121.607241	TD	TD	fire getting established at Mobil gas station	C		
TD-074	11/8	12:00	TD	0	39.749511	-121.607724	TD	TD	flames across Clark Rd between Pearson Rd and Buschmann Rd	O		
TD-118	11/8	12:00	Inferred	175	39.769080	-121.600326	TD	TD	Tahoe Ln area is on fire SW of Clark Rd and Bille Rd	R		
TD-118	11/8	12:00	Inferred	175	39.764784	-121.606890	TD	TD	fire burning in field	V		
TD-130	11/8	12:00	Photo	0	39.751054	-121.606542	Photo	Photo	heavy vegetation fire, trees torching, ember showers after trees torch	V		
PPD-08	11/8	12:00	PPD-08	0	39.777640	-121.589221	video	video	spot fire	S		
TD-075	11/8	12:03	Photo	0	39.799849	-121.585315	Photo	Photo	edge of fire north of storage facility; burning in surface vegetation and crawling up pine bark	V		
PPD-08	11/8	12:05	PPD-08	0	39.770740	-121.598374	video	video	small spot fire	S		
PPD-08	11/8	12:05	PPD-08	0	39.770353	-121.598169	video	video	small spot fire	S		
PPD-08	11/8	12:05	PPD-08	0	39.769997	-121.598438	video	video	bushes burning at KFC	S		
PPD-08	11/8	12:06	PPD-08	0	39.769490	-121.600065	video	video	heavy fire activity up into trees behind structure	V		
TD-041	11/8	12:07	Photo	0	39.799915	-121.585640	TD	Photo	fire behind storage facility	V		
PPD-08	11/8	12:07	PPD-08	0	39.768307	-121.598391	video	video	spot fire	S		
PPD-08	11/8	12:07	PPD-08	0	39.768665	-121.597308	video	video	spot fire	S		
TD-041	11/8	12:07	Photo	0	39.799849	-121.585315	Photo	Photo	edge of fire north of storage facility; burning in surface vegetation and crawling up pine bark	V		
TD-210	11/8	12:11	AVL	9	39.751967	-121.606617	AVL	TD	fire threatening Ace Hardware	O		
TD-210	11/8	12:14	Photo	0	39.751996	-121.606674	Photo	Photo	fire to NE corner of Ace; vegetation, fence, and power poles burning	O		
TD-210	11/8	12:14	Photo	0	39.752052	-121.606484	Photo	Photo	vegetation fire, flaring up, torching	V		
TD-101	11/8	12:21	video	0	39.764989	-121.602979	TD	video	Clark Rd NB at Central Park; surface fire has burned through; some structures still burning	C	x	
TD-101	11/8	12:21	Photo	0	39.765580	-121.602820	Photo	Photo	multiple structures fully involved and partially collapsed; some structures more recently ignited	C		
TD-101	11/8	12:21	Photo	0	39.766294	-121.602234	Photo	Photo	surface fire has burned through, scattered spot fires remain; structure destroyed and done burning	R	x	
VTD-18	11/8	12:22	TD	0	39.776348	-121.591675	video	video	fully involved bushes spot fire, 3 m to 4.6 m (10 ft to 15 ft) flames	S		
TD-101	11/8	12:22	Photo	0	39.769947	-121.600011	Photo	Photo	detached garage and other objects burning on parcel	O		
TD-101	11/8	12:23	video	0	39.770397	-121.599512	TD	video	multiple structures fully involved near Clark Rd	R		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
PPD-08	11/8	12:25	PPD-08	0	39.714572	-121.611551	Radio	Radio	Clark Rd past the airport, it clears up, its barely passable	V		
PPD-08	11/8	12:26	PPD-08	0	39.769760	-121.599110	video	video	vegetation on fire	V		
PPD-08	11/8	12:27	PPD-08	0	39.762878	-121.604324	video	video	majority of structures fully involved, past peak surface fire still burning between Central Park and Elliott Rd	C		
PPD-08	11/8	12:28	PPD-08	0	39.757804	-121.606980	video	video	limited structures burning close to roadway (fewer structures here, mostly parking lots along road), moderate surface fires between Elliott Rd and Nunneley Rd on Clark Rd	C		
PPD-08	11/8	12:28	PPD-08	0	39.754219	-121.607751	video	video	minimal fire visible between Nunneley Rd and Pearson Rd	O	x	
PPD-08	11/8	12:29	PPD-08	0	39.751950	-121.609656	video	video	spot fire south side of Pearson Rd	S		
PPD-08	11/8	12:29	PPD-08	0	39.752580	-121.610136	video	video	spot fire north side of Pearson Rd	S		
VTD-18	11/8	12:30	TD	0	39.778248	-121.590467	Photo	Photo	spot fire, bushes/vegetation	S		
VTD-18	11/8	12:30	TD	0	39.778062	-121.591908	Photo	Photo	heavy fire, multiple structures burning	R		
TD-211	11/8	12:31	AVL	80	39.725607	-121.617260	AVL	TD	fire coming from both sides Round Valley Ranch Rd	V		
TD-211	11/8	12:31	AVL	80	39.725129	-121.617635	TD	TD	fire threatening structures	O		
TD-208	11/8	12:32	Photo	0	39.746996	-121.608046	Photo	Photo	structure fully involved	R		
TD-208	11/8	12:32	Photo	0	39.746174	-121.608155	Photo	Photo	spot fire	S		
TD-208	11/8	12:32	Photo	0	39.746861	-121.608476	Photo	Photo	heavy vegetation fire; numerous spot fires north side of Best Western; wind gusty from east, blowing embers	V		
VTD-15	11/8	12:36	video	2	39.740809	-121.608013	video	video	everything burning, past peak, Clark Rd between Buschmann Rd and Old Clark Rd (South)	O	x	
TD-130	11/8	12:36	Photo	0	39.752223	-121.605562	Photo	Photo	vegetation past peak, still burning; consumed throughout drainage, burning right up to roadway and Ace Hardware parking lot	V		
TD-130	11/8	12:39	video	0	39.749956	-121.607664	video	video	Clark Rd between Pearson Rd and Village Pkwy; fire on east side of Clark Rd [video does not show west side]	O		
VTD-06	11/8	12:43	video	0	39.716547	-121.611489	video	video	fire burning through guardrail posts; burning branches in roadway	O		
VTD-06	11/8	12:44	video	0	39.714643	-121.611293	video	video	heavy fire on Good View Dr, structures burning	R		
VTD-06	11/8	12:44	video	0	39.713455	-121.610877	video	video	structures fully involved	R		
VTD-06	11/8	12:45	Inferred	0	39.712525	-121.614676	video	video	heavy vegetation fire near airport, 30 m (100 ft) flames, across canyon from Clark Rd	V		
VTD-18	11/8	12:47	TD	0	39.776198	-121.591813	Photo	video	juniper bush spot fire	S		
TD-015	11/8	12:53	AVL	0	39.780467	-121.589150	AVL	TD	fire all around	O		
TD-130	11/8	12:57	AVL	3	39.741383	-121.606783	AVL	TD	house is gone	R	x	
TD-208	11/8	12:57	AVL	2	39.741283	-121.607000	AVL	TD	structure 1/2 involved	R		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-035	11/8	13:00	Inferred	60	39.717701	-121.611365	TD	TD	fire activity made evacuation route dicey near the airport	V		
TD-038	11/8	13:00	Inferred	10	39.768540	-121.599650	TD	TD	fire blowing across Clark Rd; driving through flames	O		
TD-041	11/8	13:10	Inferred	0	39.798287	-121.585027	TD	TD	fire in tree	V		
TD-041	11/8	13:10	Inferred	50	39.798494	-121.585064	TD	TD	spotty fires around area	S		
TD-021	11/8	13:10	Inferred	0	39.753690	-121.607734	TD	TD	heavy fire	O		
TD-210	11/8	13:12	AVL	0	39.759517	-121.604150	AVL	TD	structures in area had burned	R	x	
VTD-18	11/8	13:13	TD	0	39.777167	-121.588813	video	video	all structures behind Savemart are past peak, fully involved, partially collapsed	R	x	
TD-011	11/8	13:15	TD	15	39.764868	-121.603000	TD	TD	structures on Clark Rd are burning	R		
TD-130	11/8	13:17	AVL	2	39.755365	-121.607103	AVL	TD	commercial building on fire	C		
TD-208	11/8	13:20	AVL	0	39.714651	-121.611433	AVL	TD	fire edge	V		
TD-130	11/8	13:21	AVL	0	39.752601	-121.607492	AVL	TD	Mobil gas station on fire	C		
TD-067	11/8	13:22	PPD video	0	39.799159	-121.586737	TD	TD	fire coming up Bader Mine Rd from canyon	V		
PPD-13	11/8	13:22	PPD-13	0	39.798207	-121.586070	video	video	spot fire	S		
PPD-13	11/8	13:22	PPD-13	0	39.799188	-121.583946	video	video	main fire north of here	O		
PPD-13	11/8	13:22	PPD-13	0	39.799765	-121.586140	video	video	spot fire	S		
TD-014	11/8	13:23	Radio Log	0	39.748125	-121.609620	Radio Log	Radio Log	fire in the building	R		
TD-112	11/8	13:23	Radio Log	0	39.748140	-121.609663	Radio Log	Radio Log	structure on fire	R		
TD-041	11/8	13:23	Photo	23	39.798089	-121.585145	TD	TD	Optimo restaurant has just caught fire	C		
VTD-18	11/8	13:23	TD	0	39.774450	-121.591091	video	video	multiple structures burned to foundation	R	x	
VTD-18	11/8	13:23	TD	0	39.774694	-121.591381	video	video	structure fire; north half house fully involved	R		
VTD-18	11/8	13:23	TD	0	39.774275	-121.590787	video	video	structure past peak fully involved	R		
VTD-18	11/8	13:24	TD	0	39.774497	-121.589959	video	video	structures burned to foundations	R	x	
TD-112	11/8	13:25	Radio Log	0	39.748140	-121.609663	Radio Log	Radio Log	apartments: 3 complexes well involved	R		
TD-112	11/8	13:25	Inferred	8	39.747739	-121.609668	Radio Log	TD	half of apartment complex fully involved	R		
TD-127	11/8	13:27	Radio Log	0	39.798250	-121.585384	Radio Log	Radio Log	heavy fire conditions	O		
TD-127	11/8	13:36	Photo	0	39.799451	-121.584237	Photo	Photo	heavy fire, fully involved structure and vegetation	R		
TD-127	11/8	13:36	Photo	0	39.799247	-121.584012	Photo	Photo	vegetation and structure fully involved	R		
VTD-18	11/8	13:40	TD	0	39.774694	-121.591381	video	video	house fully involved	R		
VTD-18	11/8	13:40	TD	0	39.773954	-121.590229	video	video	structure burning	R		
VTD-18	11/8	13:41	TD	0	39.774138	-121.591190	video	video	small spot fires in garden vegetation	S		
TD-123	11/8	13:46	AVL	42	39.751025	-121.607178	AVL	TD	back of Ace Hardware on fire; PVC stacks on fire	C		
TD-127	11/8	13:46	Photo	0	39.799357	-121.584105	Photo	Photo	structure past peak, fully involved	R		
TD-127	11/8	13:46	Photo	0	39.798653	-121.584304	Photo	Photo	pine tree; trunk/bark burning to the top	V		
TD-041	11/8	13:50	Photo	0	39.799357	-121.584105	Photo	Photo	structure past peak, fully involved	R		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-041	11/8	13:50	Photo	0	39.798653	-121.584304	Photo	Photo	light fire activity in multiple pine trees	V		
TD-211	11/8	13:51	AVL	72	39.724017	-121.620450	AVL	TD	house is burning under the siding	R		
VTD-18	11/8	13:52	TD	0	39.773965	-121.591377	video	video	structure fire; 3 m (10 ft) flames coming from the roof	R		
VTD-18	11/8	13:52	TD	0	39.774330	-121.591394	video	video	structure recently ignited; heavy smoke coming from rear of house	R		
TD-128	11/8	13:59	AVL	0	39.796729	-121.585667	AVL	TD	tire shop is on fire; fire blowing across road	C		
TD-128	11/8	13:59	AVL	112	39.799571	-121.586259	Imagery	TD	storage units behind Optimo restaurant are on fire	C		
TD-127	11/8	14:00	Inferred	0	39.797975	-121.584993	TD	TD	flames arrive around and across the street about an hour after embers	R		
TD-127	11/8	14:00	Inferred	154	39.800012	-121.583775	TD	TD	explosion at propane facility shook ground	C		
TD-126	11/8	14:00	Inferred	0	39.727340	-121.612487	TD	TD	fire on both sides of Clark Rd in area of Round Valley Ranch Rd	V		
TD-126	11/8	14:01	Inferred	0	39.742636	-121.607649	TD	TD	fire burning on both sides of Clark Rd south of Buschmann Rd	O		
TD-125	11/8	14:03	Inferred	0	39.760532	-121.604579	TD	TD	Safeway burning	C		
VTD-18	11/8	14:03	TD	0	39.774701	-121.592725	video	video	structure burning	R		
TD-111	11/8	14:05	Inferred	0	39.796037	-121.585030	TD	TD	lot of homes on fire around Cabernet	R		
TD-200	11/8	14:07	AVL	155	39.799040	-121.583598	AVL	TD	all on fire, east side Skyway north of Optimo	R		
TD-207	11/8	14:07	AVL	103	39.797909	-121.584712	AVL	TD	structure on fire	R		
TD-122	11/8	14:09	AVL	22	39.746233	-121.608267	AVL	TD	fire on roof of Best Western	C		
TD-020	11/8	14:09	Inferred	7	39.746507	-121.608400	TD	TD	Best Western has fire on roof	C		
TD-041	11/8	14:12	Photo	0	39.798164	-121.584751	Photo	Photo	spot fire in vegetation	S		
TD-041	11/8	14:13	Photo	0	39.798287	-121.585117	TD	TD	Optimo building burning	C		
TD-209	11/8	14:14	AVL	0	39.751829	-121.607361	AVL	TD	everything around Ace is burned	O	x	
TD-200	11/8	14:14	AVL	10	39.796800	-121.585750	AVL	TD	fire threatening structure	O		
TD-118	11/8	14:14	Inferred	86	39.765822	-121.606208	TD	TD	fence burning	O		
TD-118	11/8	14:14	Inferred	86	39.765707	-121.603839	TD	TD	houses are on fire	R		
TD-209	11/8	14:14	Photo	0	39.752486	-121.608038	Photo	Photo	widespread surface fires (burning rubble from new sheds for sale), power pole burning	O		
TD-133	11/8	14:14	Photo	0	39.712660	-121.612620	Photo	Photo	power pole burning; no active vegetation fire, already passed through	O	x	
TD-133	11/8	14:14	Photo	0	39.719887	-121.611197	Photo	Photo	Clark Rd from Good View Dr to Lanser Dr, sporadic spot fires and burned over areas, occasional completely burned structures	R	x	
TD-142	11/8	14:16	video	0	39.732111	-121.612498	video	video	fire already well past	O	x	
TD-209	11/8	14:17	AVL	78	39.746333	-121.608200	AVL	TD	fire threatening Best Western	C		
TD-041	11/8	14:17	Photo	0	39.797912	-121.584712	Photo	Photo	structure fully involved, partially collapsed	R		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-041	11/8	14:18	Photo	0	39.797912	-121.584712	Photo	Photo	structure fully involved, partially collapsed	R		
TD-127	11/8	14:19	Radio Log	0	39.797981	-121.585241	Radio Log	Radio Log	commercial buildings involved	C		
TD-142	11/8	14:19	Inferred	0	39.749320	-121.607702	TD	TD	fire on both sides of Clark Rd	O		
TD-142	11/8	14:19	video	0	39.744349	-121.607623	TD	TD, video	east side Clark Rd in town south of Buschmann Rd is burned, well past peak	O	x	
TD-041	11/8	14:19	Photo	0	39.797912	-121.584712	Photo	Photo	structure fully involved, partially collapsed	R		
TD-075	11/8	14:19	Photo	0	39.798262	-121.584524	Photo	Photo	multiple structures and vegetation fires east side Skyway	R		
TD-142	11/8	14:20	Inferred	0	39.753164	-121.607778	TD	TD	black wall of smoke north of Pearson Rd; commercial structures fully involved	C		
TD-108	11/8	14:20	Inferred	0	39.736734	-121.612874	TD	TD	fire burning at Clark Rd curve, American Way	O		
TD-108	11/8	14:20	Inferred	0	39.746271	-121.607681	TD	TD	overhead powerlines are burning	O		
TD-141	11/8	14:20	Photo	0	39.751104	-121.608198	Photo	Photo	Casa de Paradiso restaurant, structure past peak burning, partially collapsed	C		
TD-132	11/8	14:21	Photo	0	39.752690	-121.607365	Photo	Photo	Mobil gas station burning	C		
TD-108	11/8	14:21	Photo	0	39.752709	-121.607343	Photo	TD	Mobil gas station heavily involved in fire	C		
TD-075	11/8	14:21	Photo	0	39.797918	-121.584708	Photo	Photo	structure fully involved, significant fire on parcel	R		
TD-075	11/8	14:21	Photo	0	39.797411	-121.586287	Photo	Photo	structure burned to foundation	R	x	
TD-075	11/8	14:21	Photo	0	39.797959	-121.586085	Photo	Photo	surface fire has recently burned this area; almost no flames left, smoking	V	x	
TD-141	11/8	14:21	Photo	0	39.752691	-121.607351	Photo	Photo	structure past peak, partially collapsed	C		
TD-141	11/8	14:21	Photo	0	39.753623	-121.608063	Photo	Photo	structure fully involved	C		
TD-141	11/8	14:21	Photo	0	39.752468	-121.608046	Photo	Photo	widespread surface fires (burning rubble from new sheds for sale), power pole burning; NW corner Pearson Rd and Clark Rd	O		
TD-141	11/8	14:21	Photo	0	39.750671	-121.608187	Photo	Photo	west side of structure is fully involved; east half still standing, no fire showing	C		
TD-141	11/8	14:21	Photo	0	39.751092	-121.608198	Photo	Photo	structure past peak, partially collapsed	C		
TD-141	11/8	14:21	Photo	0	39.750618	-121.607868	Photo	Photo	spot fire in vegetation, burned through power pole; power pole is leaning at 45° angle	S		
TD-108	11/8	14:21	Photo	0	39.753316	-121.608084	Photo	Photo	structure fully involved	C		
TD-075	11/8	14:22	Photo	0	39.797979	-121.584814	Photo	Photo	structure fully involved, partially collapsed; tall pine trees torching	R		
PPD-14	11/8	14:22	PPD-14	0	39.798122	-121.584588	video	video	multiple structures fully involved, trees torching on east side Skyway	R		
PPD-14	11/8	14:22	PPD-14	0	39.798308	-121.584984	video	video	spot fire at Optimo building on Skyway side	S		
TD-127	11/8	14:23	Photo	0	39.798009	-121.585061	Photo	Photo	structure is burning	R		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-127	11/8	14:23	Photo	0	39.797873	-121.584944	Photo	Photo	heavy vegetation fire on parcel burning up against roadway	V		
TD-075	11/8	14:24	Photo	0	39.798138	-121.584515	Photo	Photo	structures fully involved; trees torching, vegetation burning	R		
TD-075	11/8	14:24	Photo	0	39.797816	-121.586193	Photo	Photo	surface fire has burned through	V	x	
TD-065	11/8	14:25	Inferred	31	39.778005	-121.590758	TD	TD	fire threatening structure; fire into siding	C		
TD-127	11/8	14:25	Inferred	20	39.798456	-121.585038	TD	TD	Optimo restaurant ignites	C		
TD-133	11/8	14:25	Photo	0	39.751696	-121.607936	Photo	Photo	spot fire; power pole active flaming from ground up 3 m (10 ft); surrounding landscape vegetation unburned	O		
TD-133	11/8	14:26	Photo	0	39.753324	-121.608071	Photo	Photo	structure fully involved	C		
TD-133	11/8	14:26	Photo	0	39.751104	-121.608198	Photo	Photo	structure past peak, partially collapsed	C		
TD-133	11/8	14:26	Photo	0	39.750652	-121.608182	Photo	Photo	structure fully involved	C		
TD-205	11/8	14:27	AVL	88	39.797901	-121.584693	Photo	TD	residential structure across street fully involved	R		
TD-205	11/8	14:27	AVL	88	39.799208	-121.585744	AVL	TD	storage units had started igniting	C		
TD-205	11/8	14:27	AVL	0	39.797868	-121.584951	AVL	TD	trees near Fastrip are on fire	V		
TD-205	11/8	14:27	AVL	88	39.796726	-121.585672	TD	TD	structure burning	C		
TD-067	11/8	14:27	AVL TD-205	88	39.798196	-121.585269	TD	TD	fires threatening structures	O		
TD-200	11/8	14:28	AVL	16	39.796750	-121.585817	AVL	TD	fire threatening structure	O		
TD-123	11/8	14:29	AVL	0	39.748943	-121.608952	AVL	TD	LDS church is on fire	C		
TD-123	11/8	14:30	AVL	37	39.749783	-121.610367	AVL	TD	fence and small houses on fire	R		
TD-043	11/8	14:30	TD	150	39.776522	-121.590402	TD	TD	fire around Kmart	O		
TD-141	11/8	14:30	Photo	0	39.756988	-121.606624	TD	Photo	structure fully involved	C		
TD-141	11/8	14:30	Photo	0	39.756993	-121.606623	Photo	Photo	structure past peak, partially collapsed	C		
VTD-18	11/8	14:31	TD	0	39.774522	-121.592507	video	video	structure fire; heavy smoke coming from second story; heavy fire in less than 8 minutes	R		
TD-141	11/8	14:33	Photo	0	39.760511	-121.604494	TD	Photo	Safeway is burned down	C		
TD-141	11/8	14:33	Photo	0	39.760606	-121.604488	Photo	Photo	structure past peak, partially collapsed, burning rubble; spot fires in parking lot vegetation	C	x	
TD-141	11/8	14:33	Photo	0	39.760953	-121.604166	Photo	Photo	structure past peak, partially collapsed, burning rubble	C	x	
TD-141	11/8	14:34	Photo	0	39.762417	-121.604150	Photo	Photo	apartment building structures, fully involved, partially collapsed	R		
TD-141	11/8	14:34	Photo	0	39.764867	-121.602481	Photo	Photo	McDonalds, burned to foundation	C	x	
TD-141	11/8	14:35	Photo	0	39.767142	-121.600256	TD	Photo	Jubilee Church is burning	C		
TD-141	11/8	14:35	Photo	0	39.765360	-121.602022	Photo	Photo	structure, burned to foundation	C	x	
TD-141	11/8	14:35	Photo	0	39.765053	-121.602491	Photo	Photo	structure, burned to foundation	C	x	
TD-141	11/8	14:35	Photo	0	39.765974	-121.601237	Photo	Photo	structure past peak, fully involved, roof collapsed	C		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-141	11/8	14:35	Photo	0	39.767153	-121.600135	Photo	Photo	Jubilee Church building burning, fully involved; surrounding surface vegetation already burned	C		
TD-141	11/8	14:43	Photo	0	39.753631	-121.608082	TD	Photo	black bear diner is fully involved	C		
TD-141	11/8	14:43	Photo	0	39.753624	-121.608081	Photo	Photo	Black Bear Diner fully involved, past peak	C		
TD-141	11/8	14:43	Photo	0	39.753326	-121.608075	Photo	Photo	structure burned to foundation, still flaming	C		
VTD-18	11/8	14:45	TD	0	39.773468	-121.591889	video	video	structure fully involved	R		
TD-069	11/8	14:49	Inferred	10	39.764875	-121.602490	TD	TD	McDonalds is burned down	C	x	
TD-069	11/8	14:49	Inferred	10	39.760491	-121.604624	TD	TD	Safeway is burned down	C	x	
TD-069	11/8	14:49	Inferred	10	39.762499	-121.604050	TD	TD	apartments north of Safeway are fully involved	R		
TD-141	11/8	14:49	Photo	0	39.750651	-121.608079	Photo	Photo	entire multi-commercial structure now fully involved	C		
PPD-15	11/8	14:49	PPD-15	0	39.768977	-121.600275	Radio	Radio	on Tahoe, it appears that every building is fully engulfed	R		
TD-141	11/8	14:51	Photo	0	39.752593	-121.608743	Photo	Photo	structure burning	C		
TD-124	11/8	14:52	AVL	39	39.746233	-121.608133	AVL	TD	fire at Best Western	C		
TD-055	11/8	14:52	Photo	0	39.753628	-121.608071	Photo	Photo	Black Bear Diner burning, fully involved	C		
TD-055	11/8	14:52	Photo	0	39.752599	-121.608736	Photo	Photo	flames and heavy smoke coming from structure	C		
TD-069	11/8	14:59	Inferred	9	39.756274	-121.608330	TD	TD	commercial structure burning	C		
TD-069	11/8	14:59	Inferred	9	39.756825	-121.608287	TD	TD	mulch fire up against structure	S		
TD-111	11/8	15:04	Photo	0	39.797205	-121.580949	TD	TD	a few homes burning Gate Ln / Candlewood Ct	R		
TD-123	11/8	15:07	AVL	0	39.748943	-121.608952	AVL	TD	LDS church is fully involved	C		
PPD-15	11/8	15:07	PPD-15	0	39.798280	-121.585311	Radio	Radio	one building left burning, everything else is pretty much [done]	C		
TD-123	11/8	15:08	AVL	23	39.746100	-121.608350	AVL	TD	fire in Best Western is out	C	x	
TD-108	11/8	15:30	Inferred	64	39.798040	-121.585150	TD	TD	trees torching	V		
TD-108	11/8	15:30	Inferred	64	39.796703	-121.585658	TD	TD	structures just igniting; shop getting involved	C		
TD-108	11/8	15:30	Inferred	64	39.799029	-121.582605	TD	TD	fire eating houses on cul-de-sac; explosion	R		
TD-209	11/8	15:37	Photo	0	39.753610	-121.608070	Photo	Photo	Black Bear Diner collapsed, flaming rubble	C	x	
TD-209	11/8	15:38	AVL	23	39.746537	-121.611519	TD	TD	fire coming from first floor	R		
TD-209	11/8	15:38	AVL	23	39.746313	-121.611514	TD	TD	column of building ignites	R		
TD-124	11/8	15:39	AVL	67	39.759717	-121.607450	AVL	TD	roof of Rite Aid on fire	C		
TD-122	11/8	15:53	AVL	53	39.759783	-121.606883	AVL	TD	fire on roof of Rite Aid	C		
VTD-18	11/8	16:15	TD	10	39.774559	-121.593863	video	video	spot fire in vegetation on west side of Clark Rd; ignites wood fence and climbs tree a bit	O		
TD-108	11/8	16:34	TD-127	37	39.797974	-121.585148	TD	TD	fire activity picking up	R		
TD-108	11/8	16:34	video	37	39.798868	-121.584743	video	TD	house blew up in eaves	R		
VTD-18	11/8	16:35	TD	0	39.774781	-121.593211	video	video	multiple structures, Clark Rd between Juniper Ct and Dollar General, fully involved	R		

Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
VTD-18	11/8	16:35	TD	0	39.771103	-121.596582	video	video	structure burned to foundation	C	x	
VTD-18	11/8	16:36	TD	0	39.770643	-121.597097	video	video	structure past-peak fully involved	C		
VTD-18	11/8	16:36	TD	0	39.770225	-121.597559	video	video	structure burned to foundation	C	x	
VTD-18	11/8	16:36	TD	0	39.769903	-121.597894	video	video	structure unburned, small vegetation spot fires against building	S		
VTD-18	11/8	16:36	TD	0	39.767846	-121.599714	video	video	building finished burning	C	x	
VTD-18	11/8	16:36	TD	0	39.767383	-121.600143	video	video	structure burned to foundation	C	x	
VTD-18	11/8	16:36	TD	0	39.755914	-121.607415	video	video	structures on east side Clark Rd (west side unknown can't see in video) south of Elk Ln through town basically all burned to foundations; very little active burning	C	x	
VTD-18	11/8	16:37	TD	0	39.762073	-121.604368	video	video	a few structures collapsed and still burning	C	x	
VTD-18	11/8	16:37	TD	0	39.760879	-121.604259	video	video	Safeway et al; post-peak burning	C	x	
VTD-18	11/8	16:40	TD	0	39.748948	-121.608932	video	video	church past-peak fully involved, not collapsed yet	C	x	
TD-114	11/8	16:51	AVL Bus1403	0	39.797079	-121.585528	TD	TD	fire on both sides at Clark Rd and Skyway; propane explosions	O		
TD-201	11/8	16:54	Photo	0	39.760367	-121.605250	0	Photo	Safeway is burned down	C	x	
TD-201	11/8	16:54	Photo	0	39.760190	-121.605599	Photo	Photo	commercial structure collapsed, flaming rubble and structure	C	x	
TD-108	11/8	17:01	Photo	0	39.795766	-121.584706	Photo	Photo	heavy vegetation fire, shrubs, intense flames 4.6 m (15 ft), very near structure; windows on structure breaking	V		
TD-030	11/8	17:07	AVL	0	39.760827	-121.604738	AVL	TD	Safeway burned	C		
TD-108	11/8	17:11	Photo	0	39.784877	-121.585930	Photo	Photo	structure burning; surface and vegetative fuels in area have burned through	C	x	
TD-114	11/8	17:14	AVL Bus1403	0	39.776164	-121.590290	TD	TD	fire behind the Kmart	O		
TD-108	11/8	17:15	Inferred	30	39.795279	-121.583882	TD	TD	houses burning, explosions on Walnut Ln	R		
TD-108	11/8	17:25	Photo	0	39.796000	-121.584873	Photo	Photo	active surface fire burning in area of Cabernet Ln and Clark Rd	V		
TD-108	11/8	17:25	Photo	0	39.795830	-121.585126	Photo	Photo	moderate fire activity, vegetation	V		
TD-209	11/8	17:39	AVL	0	39.760711	-121.604421	AVL	TD	Safeway is already burned	C	x	
TD-015	11/8	17:50	AVL	0	39.760851	-121.605862	AVL	TD	Safeway is all burned down	C	x	
TD-209	11/8	17:50	AVL	53	39.746050	-121.611217	AVL	TD	Paradise Community Village Apartments burned down / fully involved	R		
TD-209	11/8	17:55	Photo	0	39.746214	-121.611519	Photo	Photo	structure fully involved, past peak, partially collapsed; other apartment structures beginning to burn	R		
TD-108	11/8	18:34	Inferred	43	39.774904	-121.595726	TD	TD	two trailers on fire in Pine Grove Mobile Home Park	R		



Clark Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-108	11/8	18:34	Inferred	43	39.774688	-121.595782	TD	TD	shed on fire	O		
TD-114	11/8	19:00	TD-108	0	39.775446	-121.595472	TD	TD	Pine Grove mobile home park started to burn, then really got going	R		
TD-108	11/8	19:17	video	0	39.775905	-121.595636	video	TD	mobile homes burning structure to structure; very hot; propane exploding (Pine Grove mobile home park)	R		x
TD-108	11/8	19:17	Photo	0	39.776002	-121.595330	Photo	Photo	multiple mobile homes are fully involved (N and W of here); Pine Grove Mobile Home Park	R		
TD-014	11/8	19:20	Radio Log	0	39.785083	-121.588100	AVL	Radio Log	power pole burning	O		
TD-014	11/8	19:56	Radio Log	0	39.785014	-121.586988	Radio Log	Radio Log	tree burning at Clark Rd and Forest Service Rd that is going to burn up and fall	V		
TD-108	11/8	20:00	Inferred	720	39.774725	-121.594158	TD	TD	fire threatening structures	V		
TD-205	11/8	20:12	AVL	21	39.774510	-121.594461	AVL	TD	boat on fire next to house, fire into eaves of house	R		
TD-205	11/8	20:35	AVL	28	39.773648	-121.596940	AVL	TD	shed smoldering behind Paradise Alliance Church	O		
TD-108	11/8	20:43	Photo	0	39.774774	-121.593208	Photo	Photo	structure fully involved	R		
TD-108	11/8	20:43	Photo	0	39.774780	-121.593192	Photo	Photo	structure fully involved	R		
TD-108	11/8	20:44	video	0	39.775374	-121.594823	video	video	Pine Grove mobile home park fully involved	R		
TD-108	11/8	20:44	Photo	0	39.775512	-121.595483	Photo	Photo	majority of mobile homes are fully involved in Pine Grove Mobile Home Park	R		
TD-207	11/8	20:50	AVL	29	39.774495	-121.594446	AVL	TD	shed engulfed	O		
TD-132	11/8	22:30	TD	0	39.759267	-121.608170	TD	TD	spot fires and burning fences	O		
TD-132	11/8	22:30	TD	0	39.759261	-121.608486	TD	TD	spot fires and burning fences	O		
TD-022	11/9	01:47	Radio Log	0	39.758799	-121.606396	TD	TD	fire threatening Masonic Lodge	C		
TD-110	11/9	01:47	Radio Log	0	39.759056	-121.606371	Radio Log	TD	Lisa's family pharmacy, smoke from attic; one engine, worried about Masonic Lodge	C		
TD-030	11/9	09:54	AVL	59	39.758167	-121.608467	AVL	TD	Shadowbrook Apartments complex on fire	R		
TD-111	11/9	09:54	AVL TD-030	59	39.758166	-121.608866	AVL TD-030	TD	Shadowbrook apartments on fire	R		
TD-041	11/9	10:21	Photo	0	39.785029	-121.586608	Photo	Photo	multiple structures burned and destroyed, Clark Rd and Forest Service Rd	C	x	

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
911-092-1	11/8	08:01	911-092-1	0	39.804374	-121.578145	Inferred	911-092-1	spot fires on west side of canyon by Sawmill Peak	S		
911-128-1	11/8	08:24	911-128-1	0	39.781580	-121.598282	911-128-1	911-128-1	fire started on bike path	S		
TD-113	11/8	08:30	TD	30	39.785046	-121.606910	TD	TD	3 to 4 spot fires down in canyon	S		
911-142-1	11/8	08:31	911-142-1	0	39.796563	-121.585649	911-142-1	911-142-1	spot fire	S		
911-142-2	11/8	08:31	911-142-2	0	39.796563	-121.585649	911-142-2	911-142-2	spot fire	S		
VTD-12	11/8	08:35	911-152-1	84	39.794571	-121.586945	video	video	large spot fires	S		
VTD-12	11/8	08:35	Inferred	84	39.790099	-121.591535	Inferred	TD	fire everywhere	O		
911-152-1	11/8	08:35	911-152-1	0	39.796563	-121.585649	911-152-1	911-152-1	spot fire	S		
911-153-1	11/8	08:35	911-153-1	0	39.796563	-121.585649	911-153-1	911-153-1	spot fire	S		
911-154-1	11/8	08:35	911-154-1	0	39.795122	-121.587174	911-154-1	911-154-1	fire; it's huge	S		
911-155-1	11/8	08:36	911-155-1	0	39.796563	-121.585649	911-155-1	911-155-1	fire	S		
911-162-1	11/8	08:39	911-162-1	0	39.778220	-121.604211	Inferred	911-162-1	flames on bike path	S		
911-164-1	11/8	08:40	911-164-1	0	39.797065	-121.585487	911-164-1	911-164-1	fire	S		
TD-006	11/8	08:41	Radio Log	0	39.804814	-121.578638	TD	TD	spot fires in Old Magalia	S		
TD-111	11/8	08:41	Inferred	4	39.749885	-121.653210	TD	TD	fire had clearly spotted over Paradise, can see smoke in canyon	S		
911-165-1	11/8	08:42	911-165-1	0	39.795419	-121.586980	911-165-1	911-165-1	0.1 ha (0.25 ac) spot fire	S		
911-167-1	11/8	08:42	911-167-1	0	39.796045	-121.586709	Inferred	911-167-1	fire across the street getting big	S		
911-171-1	11/8	08:43	911-171-1	0	39.796239	-121.586660	911-171-1	911-171-1	fire burning on west side of Skyway	S		
911-178-2	11/8	08:46	911-178-2	0	39.778331	-121.603978	Inferred	911-178-2	fire on the bike path behind house	S		
911-182-1	11/8	08:48	911-182-1	0	39.749224	-121.653849	911-182-1	911-182-1	spot fire started near creek, white smoke coming from the canyon right now	S		
911-183-2	11/8	08:48	911-183-2	0	39.784771	-121.604407	911-183-2	911-183-2	fire is next door	S		
911-186-2	11/8	08:49	911-186-2	0	39.772120	-121.611882	911-186-2	911-186-2	spot fire right up to road	O		
TD-006	11/8	08:51	AVL	0	39.751079	-121.655498	AVL H901	TD	spot fire in Butte Creek Canyon	S		
911-188-1	11/8	08:52	911-188-1	0	39.787740	-121.591175	Inferred	911-188-1	0.1 ha (0.25 ac) spot fire	S		
911-195-4	11/8	08:56	911-195-4	0	39.770306	-121.609809	911-195-4	911-195-4	fire at bike path	S		
911-200-1	11/8	08:57	911-200-1	0	39.751090	-121.652243	Inferred	911-200-1	spot fire kind of by Valley View Dr	S		
911-202-1	11/8	08:59	911-202-1	0	39.750171	-121.651946	Inferred	911-202-1	spot fire visible, just started, rapid spread	S		
TD-064	11/8	09:00	Inferred	30	39.795743	-121.586371	TD	TD	bike path and Skyway fully involved in fire, both sides of Skyway	V		
TD-064	11/8	09:00	Inferred	30	39.788627	-121.591629	TD	TD	fire still to east of bike path south of Bel Air Dr, north of Station 35	O		
TD-038	11/8	09:00	TD	0	39.746843	-121.653427	TD	TD	fire in backyard on Russell Dr	S		
911-204-1	11/8	09:00	911-204-1	0	39.750408	-121.652292	Inferred	911-204-1	spot fire just started	S		
911-205-1	11/8	09:01	911-205-1	0	39.783018	-121.604111	911-205-1	911-205-1	fire	S		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
911-207-1	11/8	09:02	911-207-1	0	39.804374	-121.578145	Inferred	911-207-1	new fire starting	S		
911-217-1	11/8	09:07	911-217-1	0	39.804374	-121.578145	Inferred	911-217-1	fire both sides of road	S		
911-218-1	11/8	09:08	911-218-1	0	39.748911	-121.653470	Inferred	911-218-1	can see fire in the canyon	S		
911-221-1	11/8	09:11	911-221-1	0	39.750934	-121.653271	Inferred	911-221-1	fire in the canyon off of Point West Dr	S		
911-225-1	11/8	09:12	911-225-1	0	39.748218	-121.654093	911-225-1	911-225-1	fire in canyon, not too big yet	S		
TD-055	11/8	09:14	Radio Log	0	39.749567	-121.652485	TD	TD	well seated fire seen down in Butte Creek Canyon, moving good, multiple ac	S		
TD-015	11/8	09:15	TD	0	39.779312	-121.603898	TD	TD	spot fires between Skyway and bike path	S		
911-230-1	11/8	09:16	911-230-1	0	39.804374	-121.578145	Inferred	911-230-1	structures are burning	R		
TD-067	11/8	09:20	Inferred	0	39.795551	-121.585929	TD	TD	area already burned through; underground powerlines arcing through power box	V	x	
TD-111	11/8	09:21	Radio Log	0	39.777657	-121.606241	TD	Radio Log	Skyway at Wagstaff Rd about to be threatened, multiple cars on fire in the area	O		
TD-111	11/8	09:21	Inferred	0	39.777667	-121.604621	TD	TD	well-established spot fire off Wagstaff Rd near the bike path	S		
TD-064	11/8	09:30	TD	0	39.783553	-121.600035	TD	TD	fire in area	O		
TD-064	11/8	09:30	TD	0	39.783221	-121.601084	TD	TD	fire to SW of Skyway at Quail Way	R		
TD-127	11/8	09:37	Radio Log	0	39.777659	-121.604169	Radio Log	Radio Log	structures burning; vehicles about to get overrun	R		
PPD-02	11/8	09:46	PPD-02	1	39.802526	-121.578640	video	video	spot fire in veg on both sides of Skyway up against roadway	S		
TD-127	11/8	09:47	Radio Log	0	39.777659	-121.604169	Radio Log	Radio Log	fire coming across Wagstaff Rd	O		
TD-022	11/8	09:52	Inferred	0	39.790719	-121.588557	TD	TD	vegetation fire at end of Pheasant Ridge Dr, both sides	S		
TD-022	11/8	10:00	Inferred	15	39.793035	-121.588428	TD	TD	high heat impacting stuck vehicles in area; flames are sheeting	O		
TD-007	11/8	10:10	Radio Log	0	39.748925	-121.652728	TD	TD	established spot fire in Butte Creek Canyon	V		
Radio Log	11/8	10:10	Radio Log	0	39.748447	-121.651678	Radio Log	Radio Log	fire is well established in Honey Run Canyon just below Canyon View Dr, multiple spots running back up towards Canyon View Dr	V		
TD-011	11/8	10:15	TD	105	39.746192	-121.646979	TD	TD	Skyway burned over at some point when traffic was heaviest	O		
TD-155	11/8	10:19	Photo	0	39.745867	-121.645279	Photo	Photo	fire burning south side Skyway, fences, structures, vegetation	R		
TD-155	11/8	10:19	Photo	0	39.745158	-121.648392	Photo	Photo	vegetation fire along south/east edge of roadway	V		
TD-155	11/8	10:19	Photo	0	39.745403	-121.647986	Photo	Photo	vegetation fire along south/east edge of roadway, sending off embers	V		
TD-155	11/8	10:21	Photo	0	39.746317	-121.646081	Photo	Photo	fence and vegetation burning	O		
TD-155	11/8	10:21	Photo	0	39.746317	-121.646081	Photo	Photo	fence and vegetation burning	O		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-155	11/8	10:22	Photo	0	39.746317	-121.646081	Photo	Photo	fence and vegetation burning	O		
TD-155	11/8	10:22	Photo	0	39.746317	-121.646081	Photo	Photo	fence and vegetation burning	O		
TD-155	11/8	10:22	Photo	0	39.746631	-121.646184	Photo	Photo	surface fire, N side of Skyway	O		
TD-155	11/8	10:24	Inferred	0	39.746115	-121.646905	Photo	TD	heavy fire south side Skyway	R		
TD-155	11/8	10:24	Photo	0	39.745712	-121.647121	Photo	Photo	structure fully involved, heavy vegetation fire	R		
TD-155	11/8	10:24	Photo	0	39.745793	-121.647202	Photo	Photo	fence, vegetation, power poles; all flaming	O		
TD-155	11/8	10:24	Photo	0	39.745793	-121.647202	Photo	Photo	fence, vegetation, power poles; all flaming	O		
TD-155	11/8	10:24	Photo	0	39.745793	-121.647202	Photo	Photo	fence, vegetation, power poles; all flaming	O		
TD-014	11/8	10:28	AVL	0	39.778983	-121.605017	AVL	TD	fire, structures burning	R		
TD-113	11/8	10:30	TD	210	39.782400	-121.606294	TD	TD	spot fire--too big to handle; dried grass, litter, pine needles, and scotch broom; fire is spreading, but still somewhat sheltered from wind	S		
TD-113	11/8	10:30	TD	210	39.782538	-121.605195	TD	TD	more spot fires igniting in 0.5 m (1.5 ft) thick bed of ivy and pine needles, burning like crazy	S		
TD-113	11/8	10:30	TD	210	39.784214	-121.606191	TD	TD	spot fires in canyon are picking up	S		
TD-113	11/8	10:30	TD	210	39.782179	-121.605383	TD	TD	glowing fall out is increasing	O		
TD-113	11/8	10:30	Photo	210	39.782179	-121.605383	TD	TD	first wave of fire coming up out of draw hitting property hard; group torching and dangerous rate of spread; structures start igniting	R		
TD-113	11/8	10:30	TD	0	39.782735	-121.605550	TD	TD	fire threatening structures, fences and vegetation burning	O		
TD-113	11/8	10:30	TD	210	39.782331	-121.605322	TD	TD	fence burns down; spot fires in yard	O		
TD-025	11/8	10:30	TD	30	39.746685	-121.645328	TD	TD	drove through fire, everything on fire Skyway	O		
VTD-14	11/8	10:44	video	0	39.745940	-121.647186	video	video	surface fuels have burned, still active fire	V		
VTD-14	11/8	10:44	video	0	39.745286	-121.647424	video	video	structures fully involved, south side Skyway	R		
VTD-22	11/8	10:44	video	0	39.743129	-121.652540	video	video	heavy intense fire burning both sides Skyway NB lanes between split and past paradise sign	O		
VTD-22	11/8	10:44	video	0	39.741193	-121.659311	video	video	edge of the fire	V		
VTD-13	11/8	10:45	Inferred	27	39.746034	-121.641740	video	video	heavy vegetation fire	V		
VTD-26	11/8	10:46	Inferred	0	39.777369	-121.604218	video	video	structures burning on Berkshire Ave near Wagstaff Rd	R		
TD-030	11/8	11:00	Inferred	240	39.768270	-121.613385	Inferred	TD	fire threatening structures	O		
TD-068	11/8	11:00	Inferred	60	39.732229	-121.663044	TD	TD	glow coming from drainage between Neal Rd and Skyway; cannot tell if structures burning	O		
TD-116	11/8	11:00	Inferred	180	39.771587	-121.609279	TD	TD	surface fire burning through mobile home park; structures in Skyway Villa mobile home park starts burning structure to structure	R		
TD-041	11/8	11:05	Inferred	0	39.806386	-121.577594	TD	TD	fire is up to edge of Skyway; northern flank of fire	V		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-030	11/8	11:10	AVL	0	39.770435	-121.612785	AVL	TD	Fire progressing over hill	O		
VTD-13	11/8	11:12	video	0	39.746378	-121.644063	video	video	south side Skyway heavy fire	V		
VTD-13	11/8	11:13	video	0	39.744576	-121.651387	video	video	heavy fire, structures fully involved, both sides roadway between Skyway split and Skyway Crossroad	R		
VTD-26	11/8	11:15	Inferred	125	39.747108	-121.642189	video	video	area north of Skyway and west of health center is burning, vegetation and structures	R		
VTD-26	11/8	11:15	Inferred	125	39.745380	-121.648033	video	video	vegetation south of split is past peak; most structures fully involved; traffic flowing	R		
VTD-26	11/8	11:15	Inferred	125	39.740964	-121.656543	video	video	Welcome to Paradise sign is half on fire, still standing	O		
VTD-26	11/8	11:15	Inferred	125	39.741140	-121.664146	video	video	western extent of fire; traffic full speed SB in NB lanes	V		
PPD-02	11/8	11:20	PPD-02	0	39.796459	-121.586142	video	video	fire has already burned through the surface grass	V	x	
PPD-02	11/8	11:20	PPD-02	0	39.795864	-121.586268	video	video	surface fire	V		
TD-041	11/8	11:25	PPD video	0	39.795367	-121.586539	PPD video	TD	heavy fire on Skyway to the south of Clark Rd	O		
TD-011	11/8	11:30	TD	0	39.746172	-121.647081	TD	TD	Skyway split is fully involved both sides	O		
TD-127	11/8	11:30	Inferred	30	39.770367	-121.612346	TD	TD	fire is approaching	O		
TD-127	11/8	11:30	Inferred	30	39.769914	-121.612077	TD	TD	bushes igniting around building	V		
PPD-08	11/8	11:37	PPD-08	0	39.790076	-121.591541	Radio	Radio	trapped by fire, Skyway at Coldren Rd	O		
TD-058	11/8	11:38	video	0	39.746616	-121.645514	TD	TD, video	everything on fire; trees, cars, houses, telephone poles	R		
TD-058	11/8	11:38	video	0	39.746579	-121.645738	video	video	scattered small surface fires both sides Skyway	S		
TD-058	11/8	11:38	video	0	39.746530	-121.647086	video	video	active vegetation fire north side Skyway	V		
TD-058	11/8	11:38	video	0	39.745815	-121.646890	video	video	heavy active vegetation fire in drainage on east side Skyway	V		
TD-058	11/8	11:38	video	0	39.744497	-121.651252	video	video	structures burning in middle of Skyway split	R		
TD-058	11/8	11:38	video	0	39.741067	-121.655847	video	video	scattered small surface fires both sides Skyway at Crossroad and welcome sign	V		
TD-058	11/8	11:40	AVL	0	39.740969	-121.656546	TD	TD	welcome to paradise sign is on fire	O		
PPD-08	11/8	11:46	PPD-08	0	39.775576	-121.608944	Radio	Radio	8000 block Skyway about 90 m (100 yd) from being overtaken [by fire]	O		
PPD-10	11/8	11:53	PPD-10	0	39.801315	-121.582699	video	video	large flames	O		
PPD-10	11/8	11:53	PPD-10	0	39.799650	-121.584492	video	video	spot fire	S		
PPD-12	11/8	11:56	PPD-12	0	39.799928	-121.585323	video	video	fire behind storage facility	O		
PPD-12	11/8	11:56	PPD-12	0	39.799126	-121.586712	video	video	spot fire	S		
TD-127	11/8	12:00	Inferred	0	39.773464	-121.610827	TD	TD	intense heat, fire; everything burning between Bille Rd and Wagstaff Rd	R		
TD-127	11/8	12:00	Radio Log	0	39.777628	-121.606319	Radio Log	Radio Log	multiple gas stations being impacted by fire	C		
TD-075	11/8	12:03	Photo	0	39.799849	-121.585315	Photo	Photo	edge of fire north of storage facility; burning in surface vegetation and crawling up pine bark	V		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-041	11/8	12:07	Photo	0	39.799915	-121.585640	TD	Photo	fire behind storage facility	V		
TD-041	11/8	12:07	Photo	0	39.799849	-121.585315	Photo	Photo	edge of fire north of storage facility; burning in surface vegetation and crawling up pine bark	V		
TD-079	11/8	12:10	AVL	0	39.804683	-121.577867	AVL	TD	everything on fire driving up Skyway - both sides of road	O		
TD-070	11/8	12:12	Inferred	112	39.745699	-121.643270	TD	TD	structures burning on south side of Skyway; huge flames	R		
TD-070	11/8	12:12	Inferred	112	39.749073	-121.639910	TD	TD	fire increasing from the north from the canyon behind buildings	V		
TD-076	11/8	12:15	Inferred	55	39.759509	-121.623908	TD	TD	see flames coming	O		
TD-060	11/8	12:18	AVL	0	39.812633	-121.575716	AVL	TD	spot fire down in canyon	S		
TD-009	11/8	12:18	AVL	0	39.810739	-121.577389	AVL	TD	estimated flank of the fire	O		
TD-083	11/8	12:21	AVL	0	39.803900	-121.581867	AVL	TD	fire on south side of Ishi, only one fire on north side (detached garage on fire, mobile home burning under floor)	R		
PPD-08	11/8	12:22	PPD-08	0	39.781516	-121.602519	Radio	Radio	crowning fire activity all to the west side	V		
TD-127	11/8	12:24	Radio Log	0	39.777646	-121.606300	Radio Log	Radio Log	fire on Skyway at Bille Rd and Wagstaff Rd	O		
TD-060	11/8	12:27	AVL	14	39.808500	-121.579350	AVL	TD	Fire hit old fire station in Old Magalia and trees pretty hard. Pine needles on metal roof ignite.	V		
TD-079	11/8	12:28	AVL	16	39.803254	-121.583125	AVL	TD	side panel of house on fire, houses igniting by ember ignitions	R		
TD-066	11/8	12:30	Inferred	15	39.750780	-121.631565	TD	TD	spot fires along Skyway between Neal Rd and Pearson Rd	S		
TD-127	11/8	12:30	Radio Log	0	39.777627	-121.606305	Radio Log	Radio Log	heavy fire impacting Skyway at Wagstaff Rd	O		
TD-127	11/8	12:30	Inferred	30	39.783505	-121.600093	TD	TD	fire closing in, both sides of roadway	O		
TD-127	11/8	12:45	Inferred	15	39.788929	-121.592443	TD	TD	intense fire between Wagstaff Rd and Clark Rd	O		
TD-026	11/8	12:45	Inferred	61	39.755650	-121.624132	TD	TD	structures burning south and east of Skyway in area of Almond St and Fir St	R		
TD-026	11/8	12:45	Inferred	61	39.746394	-121.643901	TD	TD	fire on both sides, fully involved, roofs on fire; pitch black; area of Skyway and Princeton	R		
TD-026	11/8	12:45	Inferred	61	39.744031	-121.652480	TD	TD	fire burning between the Skyway split, Skyway Crossroad	O		
TD-026	11/8	12:45	Inferred	15	39.740962	-121.656543	TD	TD	"Welcome to Paradise" sign was burning	O		
TD-079	11/8	12:46	AVL	20	39.802787	-121.585373	AVL	TD	grass fires, not all homes burning yet	V		
TD-012	11/8	12:52	Radio Log	0	39.785725	-121.607162	TD	Radio Log	fire	O		
TD-200	11/8	12:55	AVL	6	39.781840	-121.602229	AVL	TD	Both sides of Skyway on fire (vehicles and houses burning); between Wagstaff Rd and Quail Way	R		
TD-205	11/8	13:00	AVL	19	39.783058	-121.600700	AVL	TD	Fire on both sides of Skyway	O		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-079	11/8	13:09	AVL	3	39.803661	-121.582198	AVL	TD	all structures burning	R		
TD-041	11/8	13:10	Inferred	0	39.798287	-121.585027	TD	TD	fire in tree	V		
TD-041	11/8	13:10	Inferred	50	39.798494	-121.585064	TD	TD	spotty fires around area	S		
TD-064	11/8	13:10	Inferred	50	39.753717	-121.623441	TD	TD	park across street from PPD is burning; 10 cm to 13 cm (4 in to 5 in) diameter embers falling	V		
TD-205	11/8	13:14	Photo	0	39.786952	-121.595085	Photo	Photo	vegetation fire on west side of Skyway at Towhee Ln	V		
TD-205	11/8	13:14	Photo	0	39.787404	-121.594648	Photo	Photo	surface fire	V		
TD-205	11/8	13:14	Photo	0	39.787205	-121.595139	Photo	Photo	surface fire	V		
TD-205	11/8	13:15	AVL	4	39.787133	-121.594650	AVL	TD	cars beginning to burn - very hot	O		
TD-011	11/8	13:15	TD	0	39.770381	-121.609678	TD	TD	structures fully involved (Bille Rd at Berkshire Ave)	R		
TD-207	11/8	13:16	AVL	0	39.787283	-121.594467	AVL	TD	fire activity intense on both sides of Skyway, vehicles burning	R		
TD-128	11/8	13:16	AVL	0	39.787117	-121.594800	AVL	TD	Both sides on fire; uncontrollable fires, on way up Skyway	R		
TD-205	11/8	13:16	Photo	0	39.787202	-121.594958	Photo	Photo	vegetation fire	V		
TD-030	11/8	13:20	AVL	0	39.771670	-121.610604	AVL	TD	Skyway Villa mobile home park fully involved	R		
TD-030	11/8	13:21	AVL	147	39.771439	-121.611925	AVL	TD	fire threatening structures	O		
TD-030	11/8	13:21	Inferred	147	39.769908	-121.611789	TD	TD	fire threatening structures	O		
TD-205	11/8	13:21	Photo	0	39.786164	-121.597312	Photo	Photo	multiple structures fully involved	R		
TD-067	11/8	13:22	PPD video	0	39.799159	-121.586737	TD	TD	fire coming up Bader Mine Rd from canyon	V		
PPD-13	11/8	13:22	PPD-13	0	39.798207	-121.586070	video	video	spot fire	S		
PPD-13	11/8	13:22	PPD-13	0	39.799188	-121.583946	video	video	main fire north of here	O		
PPD-13	11/8	13:22	PPD-13	0	39.799765	-121.586140	video	video	spot fire	S		
TD-041	11/8	13:23	Photo	23	39.798089	-121.585145	TD	TD	Optimo has just caught fire	C		
TD-205	11/8	13:23	Photo	0	39.785389	-121.597540	Photo	Photo	intense vegetation fire both sides of Skyway; surface and ladder fuels burning	V		
TD-034	11/8	13:24	video	0	39.745780	-121.644098	video	TD	structures along Pacific Dr are all burned down few standing	R	x	
TD-034	11/8	13:24	Photo	0	39.744994	-121.650014	Photo	Photo	numerous structures fully involved in Skyway median, others no fire visible	C		
TD-034	11/8	13:24	Photo	0	39.745935	-121.645137	Photo	Photo	foundations are flaming rubble, vegetative fuels have burned through, minimal fire activity; two or three standing homes; south side Skyway, Longview Dr to Crossroads several blocks deep	R	x	
TD-205	11/8	13:26	Photo	0	39.785548	-121.597951	Photo	Photo	structures fully involved	R		
TD-127	11/8	13:27	Radio Log	0	39.798250	-121.585384	Radio Log	Radio Log	heavy fire conditions	O		
TD-127	11/8	13:27	Radio Log	0	39.786185	-121.596367	Radio Log	Radio Log	vehicles burning	O		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-205	11/8	13:27	Photo	0	39.785428	-121.597341	Photo	Photo	heavy surface fire; vegetation, fence	O		
TD-012	11/8	13:28	Photo	0	39.753186	-121.657372	Photo	Photo	fire burning on ridge at end of Point West Dr	V		
TD-205	11/8	13:29	Photo	0	39.785302	-121.597692	Photo	Photo	vegetation, all surface fuels, fences, burning both sides of roadway; structures likely burning	O		
TD-021	11/8	13:30	Inferred	0	39.753746	-121.624623	TD	TD	fire has already burned around area of Station 81	O	x	
TD-012	11/8	13:30	Photo	0	39.753186	-121.657372	Photo	Photo	flames on west side of paradise, view from Doe Mill; fire burning on ridge at end of Point West Dr (Valley Ridge Dr)	V		
TD-205	11/8	13:34	AVL	24	39.782470	-121.601489	AVL	TD	Intense fire in area. Multiple structures fully involved	R		
TD-127	11/8	13:36	Photo	0	39.799451	-121.584237	Photo	Photo	heavy fire, fully involved structure and vegetation	R		
TD-205	11/8	13:36	Photo	0	39.782542	-121.601862	Photo	Photo	structures burning	C		
TD-127	11/8	13:36	Photo	0	39.799247	-121.584012	Photo	Photo	vegetation and structure fully involved	R		
TD-205	11/8	13:36	Photo	0	39.782501	-121.601952	Photo	Photo	parcel well involved, vegetation and structure; pine tree torching	C		
TD-205	11/8	13:37	Photo	0	39.782501	-121.601952	Photo	Photo	large ember shower from burning tree and structures	C		
TD-113	11/8	13:39	Photo	0	39.782179	-121.605383	TD	Photo	neighboring structures burning or already burned down; fence around property burned or knocked down; spot fires in yard	R		
TD-113	11/8	13:39	Photo	0	39.782227	-121.605426	Photo	Photo	spot fires have burned on parcel, and fences	O		
TD-113	11/8	13:39	Photo	0	39.782249	-121.606185	Photo	Photo	structure fully involved	R		
TD-113	11/8	13:39	Photo	0	39.782419	-121.605748	Photo	Photo	structure burned down	R		
TD-034	11/8	13:40	Inferred	0	39.744499	-121.649934	TD	TD	both sides Skyway are burning	O		
TD-055	11/8	13:41	Photo	0	39.771784	-121.612587	Photo	Photo	multiple structures fully involved	R		
TD-055	11/8	13:43	Photo	0	39.770175	-121.611861	Photo	Photo	structures burning	R		
TD-127	11/8	13:46	Photo	0	39.799357	-121.584105	Photo	Photo	structure past peak, fully involved	R		
TD-127	11/8	13:46	Photo	0	39.798653	-121.584304	Photo	Photo	pine tree; trunk/bark burning to the top	V		
TD-111	11/8	13:47	Inferred	12	39.782449	-121.601488	TD	TD	lots of structures burning, wind pushing hard; wall of flames, cars on fire	R		
TD-205	11/8	13:48	Photo	0	39.782524	-121.601889	Photo	Photo	structure nearly fully involved; flames and heavy smoke from structure; parcel vegetation is fully involved	C		
TD-015	11/8	13:50	AVL	0	39.782116	-121.603137	TD	TD	residential structure, 80 % burned down	R		
TD-041	11/8	13:50	Photo	0	39.799357	-121.584105	Photo	Photo	structure past peak, fully involved	R		
TD-041	11/8	13:50	Photo	0	39.798653	-121.584304	Photo	Photo	light fire activity in multiple pine trees	V		
TD-205	11/8	13:54	Photo	0	39.782469	-121.600840	Photo	Photo	structure fully involved	R		
TD-205	11/8	13:58	Photo	0	39.783546	-121.600095	Photo	Photo	Flames encroaching on bus.	O		
TD-205	11/8	13:58	Photo	0	39.783368	-121.599740	Photo	Photo	structure fully involved	R		
TD-205	11/8	13:58	Photo	0	39.783842	-121.599953	Photo	Photo	fire approaching bus, other vehicles on Skyway	O		



Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-205	11/8	13:58	Photo	0	39.783366	-121.599697	Photo	Photo	structure and parcel fully involved	R		
TD-128	11/8	13:59	AVL	0	39.796729	-121.585667	AVL	TD	tire shop is on fire; fire blowing across road	C		
TD-128	11/8	13:59	AVL	112	39.799571	-121.586259	Imagery	TD	storage units behind Optimo are on fire	C		
TD-128	11/8	14:00	video	0	39.782943	-121.600878	video	video	heavy fire along Skyway, visibility 3 m (10 ft), abandoned vehicles burning	O		
TD-064	11/8	14:00	Inferred	0	39.753933	-121.623996	TD	TD	fire threatening structures	O		
TD-064	11/8	14:00	Inferred	0	39.749477	-121.633848	TD	TD	back of town hall (woodpile) on fire	O		
TD-127	11/8	14:00	Inferred	0	39.797975	-121.584993	TD	TD	flames arrive around and across the street about an hour after embers	R		
TD-127	11/8	14:00	Inferred	154	39.800012	-121.583775	TD	TD	explosion at propane facility shook ground	C		
TD-113	11/8	14:00	TD	300	39.782179	-121.605383	TD	TD	fire kicked back up; second wave of fire came along Skyway from NE; definitely more intense	V		
TD-113	11/8	14:00	TD	300	39.782235	-121.605061	TD	TD	homes burning, embers flying all around	R		
TD-113	11/8	14:00	TD	300	39.781855	-121.605058	TD	TD	vegetation fires, fences burning	O		
TD-113	11/8	14:00	TD	300	39.782053	-121.604395	TD	TD	neighborhood burning	R		
TD-117	11/8	14:00	TD	0	39.742833	-121.673188	TD	TD	fire in backyard of two homes, moderate rate of spread, flames 1.8 m to 3 m (6 ft to 10 ft) flames	V		
TD-117	11/8	14:00	Inferred	120	39.739125	-121.670044	TD	TD	fire on ridge up at Skyway; est. 30 m to 60 m (100 ft to 200 ft) flames	V		
TD-128	11/8	14:00	Photo	0	39.783378	-121.600301	Photo	Photo	intense wind driven fires in trees, ground, buildings, vehicles, brands blowing	R		
TD-205	11/8	14:01	Photo	0	39.788443	-121.592501	Photo	Photo	structure fully involved	R		
TD-205	11/8	14:01	Photo	0	39.788485	-121.592362	Photo	Photo	structure fully involved	R		
TD-111	11/8	14:05	Inferred	0	39.796037	-121.585030	TD	TD	lot of homes on fire around Cabernet	R		
TD-200	11/8	14:07	AVL	155	39.799040	-121.583598	AVL	TD	all on fire, east side Skyway north of Optimo	R		
TD-207	11/8	14:07	AVL	103	39.797909	-121.584712	AVL	TD	structure on fire	R		
TD-017	11/8	14:08	AVL	36	39.768554	-121.612910	AVL	TD	Very patchy fire spots west side of Skyway	S		
VTD-20	11/8	14:10	TD	0	39.730506	-121.671658	video	video	spot fires along ridge	V		
VTD-20	11/8	14:11	TD	0	39.744807	-121.650901	video	video	past-peak, but still active fires within the Skyway split	O		
TD-041	11/8	14:12	Photo	0	39.798164	-121.584751	Photo	Photo	spot fire in vegetation	S		
TD-041	11/8	14:13	Photo	0	39.798287	-121.585117	TD	TD	Optimo building burning	C		
TD-200	11/8	14:14	AVL	10	39.796800	-121.585750	AVL	TD	fire threatening structure	O		
TD-118	11/8	14:14	Inferred	86	39.745187	-121.650915	TD	TD	fire on both sides; buildings burning	R		
TD-205	11/8	14:17	AVL	4	39.786539	-121.596865	AVL	TD	Wing of Heritage Assisted Living building on fire. Cars on fire.	C		
TD-041	11/8	14:17	Photo	0	39.797912	-121.584712	Photo	Photo	structure fully involved, partially collapsed	R		
TD-128	11/8	14:18	Photo	0	39.797912	-121.584712	Photo	Photo	structure fully involved, partially collapsed	R		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-127	11/8	14:19	Radio Log	0	39.797981	-121.585241	Radio Log	Radio Log	commercial buildings involved	C		
TD-041	11/8	14:19	Photo	0	39.797912	-121.584712	Photo	Photo	structure fully involved, partially collapsed	R		
TD-075	11/8	14:19	Photo	0	39.798262	-121.584524	Photo	Photo	multiple structures and vegetation fires east side Skyway	R		
TD-075	11/8	14:21	Photo	0	39.797918	-121.584708	Photo	Photo	structure fully involved, significant fire on parcel	R		
TD-075	11/8	14:21	Photo	0	39.797411	-121.586287	Photo	Photo	structure burned to foundation	R	x	
TD-075	11/8	14:21	Photo	0	39.797959	-121.586085	Photo	Photo	surface fire has recently burned this area; almost no flames left, smoking	V	x	
TD-075	11/8	14:22	Photo	0	39.797979	-121.584814	Photo	Photo	structure fully involved, partially collapsed; tall pine trees torching	R		
PPD-14	11/8	14:22	PPD-14	0	39.798122	-121.584588	video	video	multiple structures fully involved, trees torching on east side Skyway	R		
PPD-14	11/8	14:22	PPD-14	0	39.798308	-121.584984	video	video	spot fire at Optimo building on Skyway side	S		
TD-127	11/8	14:23	Photo	0	39.798009	-121.585061	Photo	Photo	structure is burning	R		
TD-127	11/8	14:23	Photo	0	39.797873	-121.584944	Photo	Photo	heavy vegetation fire on parcel burning up against roadway	V		
TD-055	11/8	14:24	video	0	39.775836	-121.608634	TD	TD	area has burned through	V	x	
TD-075	11/8	14:24	Photo	0	39.798138	-121.584515	Photo	Photo	structures fully involved; trees torching, vegetation burning	R		
TD-075	11/8	14:24	Photo	0	39.797816	-121.586193	Photo	Photo	surface fire has burned through	V	x	
TD-055	11/8	14:24	Photo	0	39.775296	-121.609345	Photo	Photo	all structures burned to foundation, still flaming; virtually all fine surface fuels consumed	R	x	
TD-055	11/8	14:24	Photo	0	39.776049	-121.608272	Photo	Photo	all structures burned to foundation, still flaming	R	x	
TD-011	11/8	14:25	TD	0	39.750641	-121.635344	TD	TD	structures behind town hall, and fence, are on fire	R		
TD-011	11/8	14:25	TD	5	39.739506	-121.667166	TD	TD	drive down Skyway; it has burned over already and is safe	V	x	
TD-065	11/8	14:25	Inferred	31	39.771218	-121.611917	TD	TD	Skyway north of Bille Rd is on fire and impassable	R		
TD-127	11/8	14:25	Inferred	20	39.798456	-121.585038	TD	TD	Optimo restaurant ignites	C		
TD-055	11/8	14:25	Photo	0	39.779039	-121.604930	Photo	Photo	widespread, active vegetation fire; fine fuels are mostly gone, larger fuels burning including up in trees, power poles; flames 0.6 m (2 ft), past peak	V		
TD-055	11/8	14:26	video	0	39.782367	-121.601552	TD	TD	motorhome in roadway, fully engulfed; exploded when trying to get past	O		
TD-055	11/8	14:26	Photo	0	39.780294	-121.603733	Photo	Photo	vegetation is burned through; structures still fully involved	R		
TD-205	11/8	14:27	AVL	88	39.797901	-121.584693	Photo	TD	residential structure across street fully involved	R		
TD-205	11/8	14:27	AVL	88	39.799208	-121.585744	AVL	TD	Storage units had started igniting	C		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-205	11/8	14:27	AVL	0	39.797868	-121.584951	AVL	TD	Trees near Fastrip are on fire	V		
TD-205	11/8	14:27	AVL	88	39.796726	-121.585672	TD	TD	structure burning	C		
TD-067	11/8	14:27	AVL TD-205	88	39.798196	-121.585269	TD	TD	fires threatening structures	O		
TD-200	11/8	14:28	AVL	16	39.796750	-121.585817	AVL	TD	fire threatening structure	O		
TD-055	11/8	14:29	Photo	0	39.781634	-121.602452	Photo	Photo	all structures fully involved; vegetation past peak, still burning	R		
TD-064	11/8	14:30	TD	120	39.763003	-121.620340	TD	TD	spot fires	S		
PPD-15	11/8	14:37	PPD-15	0	39.749428	-121.633775	Radio	Radio	town hall looks like it's about to catch on fire now; fence is catching the west side of the building	O		
TD-015	11/8	14:39	AVL, PPD video	0	39.749517	-121.634467	AVL	TD	Town Hall; fence on fire	O		
TD-071	11/8	14:40	PPD video	0	39.762973	-121.620371	TD	TD	fire near Holiday Market, trees ignited	V		
PPD-15	11/8	14:40	PPD-15	0	39.754176	-121.624097	video	video	fire close to Paradise Police station	R		
PPD-15	11/8	14:41	PPD-15	0	39.753787	-121.623590	video	video	glowing vegetation fire in area of park at PPD	O		
TD-076	11/8	14:43	Photo	0	39.745718	-121.638429	Photo	Photo	structure fully involved	C		
TD-076	11/8	14:43	Photo	0	39.745798	-121.638920	Photo	Photo	active vegetation fire, surface fuels and pine trees torching	V		
TD-127	11/8	14:44	video	0	39.791231	-121.591078	video	video	Skyway at Bel Air Dr; structure fully involved	R		
TD-076	11/8	14:44	Photo	0	39.745625	-121.639440	Photo	Photo	structure fully involved	R		
TD-127	11/8	14:44	Photo	0	39.791224	-121.591043	Photo	Photo	structure fully involved, ignited and torched pine tree up against building	C		
TD-066	11/8	14:45	PPD video	3	39.761934	-121.617456	TD	TD	fire approaching Holiday Market from the bike path	V		
TD-127	11/8	14:45	Radio Log	0	39.788747	-121.592689	Radio Log	Radio Log	abandoned vehicles on Skyway between Clark Rd and Wagstaff Rd are all burning	O		
TD-113	11/8	14:45	Photo	0	39.781975	-121.605559	Photo	Photo	shed/outbuilding fully involved	O		
TD-127	11/8	14:46	Photo	0	39.784795	-121.598416	Photo	Photo	numerous residential and commercial structures all around fully involved, past peak but active burning	C		
PPD-15	11/8	14:49	PPD-15	0	39.767912	-121.613218	video	video	fire approaching the building	O		
PPD-15	11/8	14:51	PPD-15	0	39.771457	-121.611786	video	video	fire both sides of Skyway; structures have burned down	C	x	
TD-055	11/8	14:52	Photo	0	39.752878	-121.625259	Photo	Photo	heavy fire on roof/facade of structure	C		
TD-101	11/8	14:53	Photo	0	39.752820	-121.625090	Photo	Photo	wood shake roof fully involved on commercial structure, spewing firebrands; spaced 0.6 m (2 ft) from neighboring commercial structure	C		
TD-101	11/8	14:53	Photo	0	39.752579	-121.625413	Photo	Photo	vegetation spot fire	S		
TD-015	11/8	14:54	AVL	13	39.749203	-121.634276	AVL	AVL	Town Hall; woodpile on fire approximately 18 m <sup>3</sup> (5 cords) of firewood, debris around. Shrubs and junipers are torching.	O		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-041	11/8	14:55	Inferred	0	39.808416	-121.576810	TD	TD	edge of fire	V		
VTD-20	11/8	14:56	TD	0	39.751208	-121.632170	video	video	heavy fire activity, everything on fire, burning west side Skyway between Black Olive Dr and Jewell Rd	R		
VTD-20	11/8	14:56	TD	0	39.749071	-121.633976	video	video	juniper torching	S		
VTD-20	11/8	14:57	TD	0	39.745712	-121.638434	video	video	structure fully involved	C		
VTD-20	11/8	14:57	TD	0	39.746116	-121.640210	video	video	large spot fire in vegetation and mulch bed	S		
VTD-20	11/8	14:57	TD	0	39.747094	-121.641178	video	video	fire behind health facility	O		
TD-036	11/8	14:58	video	0	39.750433	-121.632558	video	video	well involved structures; vegetation	C		
TD-036	11/8	14:58	video	0	39.749021	-121.634053	video	video	vegetation fully involved	V		
TD-036	11/8	14:58	Photo	0	39.750499	-121.632435	Photo	Photo	surface fire, vegetation, fence	O		
TD-036	11/8	14:58	Photo	0	39.750065	-121.633265	Photo	Photo	structure burning	R		
TD-036	11/8	14:58	Photo	0	39.749066	-121.633963	Photo	Photo	active vegetation fire, 4.6 m (15 ft) flames, in shrub against structure	V		
TD-036	11/8	14:59	video	0	39.745721	-121.638431	video	video	structure fully involved	R		
TD-036	11/8	14:59	video	0	39.746221	-121.642880	video	video	fire has burned through this area along Skyway already	O	x	
PPD-15	11/8	15:02	PPD-15	0	39.755688	-121.624108	video	video	most structures fully involved on Almond St and Fir St east of Almond St (5800 Almond St to Cedar St and Fir St east toward Black Olive Dr)	R		
PPD-15	11/8	15:03	PPD-15	0	39.753279	-121.624885	video	video	spot fire	S		
PPD-15	11/8	15:03	PPD-15	0	39.752810	-121.625117	video	video	commercial structures on fire	C		
TD-132	11/8	15:03	Photo	0	39.751917	-121.625193	Photo	Photo	area burning, possible structures involved	O		
TD-132	11/8	15:03	Photo	0	39.752816	-121.625085	Photo	Photo	structure fully involved	R		
TD-132	11/8	15:03	Photo	0	39.752877	-121.625252	Photo	Photo	structure igniting in eaves and roof due to neighboring structure on fire	R		x
PPD-15	11/8	15:04	PPD-15	0	39.752410	-121.632368	video	video	structures and vegetation burning from Skyway, including along Skyway west side, back west to Horseshoe Hill Dr from just north of Udovich Ln down to Jewell Rd; no fire on east side	C		
TD-132	11/8	15:04	Photo	0	39.755740	-121.623420	Photo	Photo	significant widespread flames and glow; numerous structures burning	R		
TD-132	11/8	15:04	Photo	0	39.755875	-121.626673	Photo	Photo	smoke coming from commercial structure; small spot fire in vegetation also burning against structure	C		
TD-061	11/8	15:05	AVL	7	39.791967	-121.589983	AVL	TD-127	fire threatening structures	O		
TD-066	11/8	15:05	PPD video	3	39.746205	-121.638181	PPD video	TD	very hot at Neal Rd and Skyway	C		
TD-127	11/8	15:05	AVL TD-061	7	39.791785	-121.589840	AVL TD-061	TD	fire threatening structure	O		
PPD-15	11/8	15:05	PPD-15	0	39.745711	-121.638441	video	video	structure fully involved	C		
TD-133	11/8	15:06	Photo	0	39.766244	-121.615391	Photo	Photo	0.1 ha (0.25 ac) spot fire in grass field	V		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
PPD-15	11/8	15:07	PPD-15	0	39.798280	-121.585311	Radio	Radio	one building left burning, everything else is pretty much [done]	C		
PPD-15	11/8	15:10	PPD-15	6	39.743591	-121.651852	video	video	fire has burned through Skyway split area; small spot fires still burning; Paradise sign burning	R	x	
TD-074	11/8	15:15	Inferred	0	39.741179	-121.655208	TD	TD	fire burning good both sides Skyway in crossroads area	O		
TD-017	11/8	15:18	AVL	0	39.749541	-121.633858	TD	TD	Wood piles next to Town Hall are burning	O		
PPD-15	11/8	15:19	PPD-15	0	39.745949	-121.640596	video	video	active fire, fully involved structures/burned down foundations, north/east of this line to Neal Rd; south/west of this line is no active fire, but burned through	R		
PPD-15	11/8	15:20	PPD-15	0	39.755830	-121.626766	video	video	fully involved commercial building; no other fire around	C		
TD-135	11/8	15:30	Inferred	930	39.757657	-121.624599	TD	TD	Starbucks; fire 15 m to 18 m (50 ft to 60 ft) away from structure, spotting into mulch	C		
TD-135	11/8	15:30	Inferred	930	39.756602	-121.625067	TD	TD	structures burning, flames coming from house vents; exposure to other buildings	R		
TD-135	11/8	15:30	Inferred	930	39.757657	-121.624599	TD	TD	shed and fence on fire near Starbucks	O		
TD-108	11/8	15:30	Inferred	64	39.780035	-121.603990	TD	TD	everything has burned	R	x	
TD-108	11/8	15:30	Inferred	64	39.798040	-121.585150	TD	TD	trees torching	V		
TD-108	11/8	15:30	Inferred	64	39.796703	-121.585658	TD	TD	structures just igniting; shop getting involved	C		
TD-108	11/8	15:30	Inferred	64	39.799029	-121.582605	TD	TD	fire eating houses on cul-de-sac; explosion	R		
PPD-15	11/8	15:40	PPD-15	0	39.755102	-121.627327	video	video	waves of embers blowing along roadway, both sides, large, golf ball-sized and bouncing	O		
PPD-15	11/8	15:41	PPD-15	0	39.753501	-121.627061	video	video	vegetation on entire lot is burning intense	V		
PPD-15	11/8	15:41	PPD-15	0	39.752964	-121.626219	video	video	multiple small spots along south side of Pearson Rd between Skyway and Black Olive Dr	S		
PPD-15	11/8	15:41	PPD-15	0	39.752847	-121.625119	video	video	fully involved structures on north side Pearson Rd; no fire on south side of street	C		
PPD-15	11/8	15:44	PPD-15	0	39.751639	-121.630699	Radio	Radio	Both sides of Skyway, Black Olive Dr are fully involved	C		
PPD-15	11/8	15:49	PPD-15	1	39.750374	-121.631949	video	video	intense fire, structures and vegetation, both sides of Skyway from Pearson Rd to Neal Rd; heavy ember showers	C		
TD-014	11/8	15:52	AVL	0	39.758205	-121.624762	AVL	TD	Fire everywhere, downtown beginning to burn	C		
TD-056	11/8	15:53	AVL	30	39.732912	-121.674766	TD	TD	Skyway burning both sides on drive up	V		
TD-123	11/8	15:54	AVL	15	39.762050	-121.622783	AVL	TD	small propane tank blows	O		
TD-123	11/8	15:54	AVL	15	39.762409	-121.622805	AVL	TD	Jack in the Box restaurant building on fire	C		
TD-123	11/8	15:54	AVL	15	39.762244	-121.622885	AVL	TD	commercial building on fire	C		
TD-142	11/8	16:00	TD	0	39.758900	-121.624674	TD	TD	tree is burning	V		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-114	11/8	16:00	Inferred	30	39.752385	-121.630037	TD	TD	fire both sides Skyway with embers flying	O		
TD-014	11/8	16:01	AVL	0	39.766814	-121.614102	AVL	TD	Big 5 and Burger King burning	C	x	
TD-205	11/8	16:03	AVL	10	39.792131	-121.590460	AVL	TD	Some damage to deck	R		
TD-069	11/8	16:10	Inferred	0	39.744163	-121.654621	Inferred	TD	north of lookout point, fire both sides of road	O		
TD-142	11/8	16:22	video	0	39.756073	-121.626177	TD	video	commercial structures burning downtown	C		
TD-049	11/8	16:22	video	0	39.766915	-121.613956	video	TD	heavy ember showers blowing around	O		
TD-049	11/8	16:22	Photo	0	39.767532	-121.613417	Photo	Photo	heavy ember shower, blowing and skittering across Skyway from east	O		
TD-142	11/8	16:30	Inferred	1020	39.758900	-121.624674	TD	TD	fire moving toward building from west and north	O		
TD-142	11/8	16:30	Inferred	1020	39.757057	-121.625073	TD	TD	fire threatening structures	O		
TD-142	11/8	16:30	Inferred	1020	39.757666	-121.624595	TD	TD	fire threatening structures	O		
TD-142	11/8	16:30	Inferred	1020	39.759241	-121.624497	TD	TD	pine needles burning in garden bed	V		
TD-142	11/8	16:30	Inferred	1020	39.759449	-121.623921	TD	TD	fire threatening structures	O		
TD-059	11/8	16:30	video	6	39.770271	-121.612336	TD	TD	huge fire to east of Walgreens	O		
TD-108	11/8	16:34	TD-127	37	39.797974	-121.585148	TD	TD	fire activity picking up	R		
TD-108	11/8	16:34	video	37	39.798868	-121.584743	video	TD	house blew up in eaves	R		
TD-116	11/8	16:37	video	0	39.760932	-121.622977	TD	TD	everything on fire along Skyway; Big 5, Calico Kitchen, Juice and Jane, steakhouse, mobile home park, Salvation Army, Pelicans Roost; Skyway Bille Rd to Birch St, is burning	C		
TD-114	11/8	16:37	AVL Bus1403	14	39.780162	-121.603885	TD	TD	cars on fire	O		
TD-205	11/8	16:45	AVL	4	39.777534	-121.604897	AVL	TD	a few hot spots	O		
TD-142	11/8	16:48	Photo	0	39.755732	-121.626176	Photo	Photo	commercial structures burning	C		
TD-111	11/8	16:50	TD	0	39.753842	-121.624697	TD	TD	fire around Station 81	O		
TD-114	11/8	16:51	AVL Bus1403	0	39.797079	-121.585528	TD	TD	fire on both sides at Clark Rd and Skyway; propane explosions	O		
TD-014	11/8	16:55	AVL	0	39.765405	-121.626297	AVL	TD	Fire all around	O		
TD-108	11/8	17:01	Photo	0	39.795766	-121.584706	Photo	Photo	heavy vegetation fire, shrubs, intense flames 4.6 m (15 ft), very near structure; windows on structure breaking	V		
TD-142	11/8	17:05	Photo	0	39.764729	-121.612415	Photo	Photo	houses are burned down	R	x	
TD-200	11/8	17:15	AVL	86	39.776117	-121.606617	AVL	TD	storage unit fire	C		
TD-128	11/8	17:18	Photo	0	39.776489	-121.606325	Photo	Photo	storage unit burning	C		
TD-127	11/8	17:21	video	0	39.767215	-121.614429	video	video	Big 5 fully involved	C		
TD-127	11/8	17:21	Photo	0	39.766518	-121.613644	Photo	Photo	structure fully involved	C		
TD-127	11/8	17:21	Photo	0	39.766850	-121.615016	Photo	Photo	structure fully involved	C		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-127	11/8	17:21	Photo	0	39.767247	-121.614411	Photo	Photo	structure fully involved	C		
TD-142	11/8	17:21	Photo	0	39.759080	-121.624529	Photo	Photo	Building fully involved	C		
TD-127	11/8	17:23	Photo	0	39.765146	-121.618438	Photo	Photo	structure fully involved	C		
TD-127	11/8	17:23	Photo	0	39.765591	-121.617992	Photo	Photo	structure burned to foundation, glowing rubble	C	x	
TD-127	11/8	17:23	Photo	0	39.765814	-121.617348	Photo	Photo	structure fully involved	C		
TD-127	11/8	17:23	Photo	0	39.765429	-121.617552	Photo	Photo	numerous spot fires in roadside vegetation, garden beds; embers skittering and blowing around	S		
TD-108	11/8	17:25	Photo	0	39.796000	-121.584873	Photo	Photo	active surface fire burning in area of Cabernet Ln and Clark Rd	V		
TD-108	11/8	17:25	Photo	0	39.795830	-121.585126	Photo	Photo	moderate fire activity, vegetation	V		
TD-142	11/8	17:25	Photo	0	39.759087	-121.624545	Photo	Photo	structure fully involved	C		
TD-127	11/8	17:26	Radio Log	0	39.770442	-121.612302	Radio Log	Radio Log	commercial structures all along Skyway are threatened	O		
TD-142	11/8	17:26	Photo	0	39.758735	-121.624156	Photo	Photo	fire coming from roof of structure; brands blowing down street	C		
TD-142	11/8	17:26	Photo	0	39.759188	-121.623589	Photo	Photo	Valero gas station fully involved	C		
TD-030	11/8	17:30	AVL	11	39.763750	-121.620917	AVL	TD	fire threatening structures	O		
TD-201	11/8	17:33	Photo	0	39.784355	-121.598993	Photo	Photo	Skyway from Rocky Ln to Kemen Ln, burned over, spot fires, most houses burning rubble or nearly out	R	x	
TD-127	11/8	17:34	Photo	0	39.765037	-121.618873	Photo	Photo	Salvation Army, neighboring structures, fully involved; embers lofting and blowing down road	C		
TD-142	11/8	17:34	Photo	0	39.758725	-121.624129	Photo	Photo	building fully involved; parked vehicle igniting from exposure; brands blow down street to the South	C		
TD-030	11/8	17:42	AVL	30	39.762550	-121.620517	AVL	TD	fire threatening structures	O		
TD-201	11/8	17:45	AVL	40	39.762561	-121.622127	AVL	TD	downtown commercial buildings are burning or catching	C		
TD-108	11/8	17:49	video	0	39.780637	-121.603462	TD	video	all structures burned down, still flaming	R	x	
TD-108	11/8	17:49	Inferred	7	39.772367	-121.611390	TD	TD	Skyway Wagstaff Rd to Bille Rd nothing to be saved, most structures gone	C	x	
TD-108	11/8	17:49	Photo	0	39.779683	-121.604313	Photo	Photo	Skyway from Montna Dr to Wagstaff Rd, burned over, spot fires, most houses burning rubble or nearly out	R	x	
TD-014	11/8	17:52	Radio Log	0	39.757515	-121.625300	Radio Log	Radio Log	heavy fire in downtown area	C		
TD-201	11/8	17:54	Photo	0	39.765542	-121.616143	Photo	Photo	structure fully involved, partially collapsed	R		
TD-201	11/8	17:54	Photo	0	39.766063	-121.616652	Photo	Photo	multiple structures on north side of Skyway burned to foundation	R	x	
TD-201	11/8	17:55	Photo	0	39.765104	-121.617327	Photo	Photo	structure fully involved	C		
TD-108	11/8	17:56	Photo	0	39.767139	-121.613792	Photo	Photo	Skyway at Maxwell; structures past peak, fully involved	C	x	
TD-142	11/8	17:56	Photo	0	39.757734	-121.625757	Photo	Photo	flames against building	O		

Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-108	11/8	17:56	Photo	0	39.766952	-121.613410	Photo	Photo	structure fully involved, partially collapsed	C		
TD-108	11/8	17:56	Photo	0	39.766507	-121.613651	Photo	Photo	Burger King burned to foundation, flaming	C	x	
TD-015	11/8	18:14	AVL	22	39.749269	-121.634104	AVL	TD	Town Hall; fire all around	O		
TD-201	11/8	18:15	Photo	0	39.759188	-121.623566	Photo	Photo	structure burned to foundation, flaming rubble	C	x	
TD-201	11/8	18:15	Photo	0	39.758726	-121.624034	Photo	Photo	structures fully involved	C		
TD-030	11/8	18:17	AVL	28	39.765067	-121.614805	AVL	TD	inside of Beyond Fitness gym burning	C		
TD-123	11/8	18:23	AVL	44	39.763283	-121.622533	AVL	TD	fire threatening structures	O		
TD-085	11/8	18:32	AVL	82	39.806330	-121.583206	AVL	TD	many structures already burned	R	x	
TD-087	11/8	18:33	AVL	0	39.783717	-121.599683	AVL	TD	buses and vehicles and structures all burned	O	x	
TD-079	11/8	18:34	AVL	119	39.806217	-121.583424	AVL	TD	fire threatening structures	O		
TD-089	11/8	18:38	AVL	412	39.805960	-121.585905	TD	TD	fire in drainage in heavy brush pushing uphill toward Ishi Dr	V		
TD-089	11/8	18:38	AVL	101	39.805642	-121.584355	AVL	TD	several homes in area already burned	R	x	
TD-124	11/8	18:42	AVL	57	39.760281	-121.621220	AVL	TD	Achieve Charter School behind St Thomas More Church is on fire	C		
TD-087	11/8	19:27	AVL	66	39.805977	-121.583638	AVL	TD	fire threatening structures	V		
TD-123	11/8	19:41	AVL	10	39.763317	-121.622567	AVL	TD	fire threatening structures	O		
TD-030	11/8	20:01	AVL	13	39.756650	-121.625883	AVL	TD	fire threatening structures	O		
TD-124	11/8	20:03	AVL	0	39.760281	-121.621220	AVL	TD	Achieve Charter School is burned down	C		
TD-089	11/8	20:20	AVL	202	39.805642	-121.584355	AVL	TD	fire threatening structures	V		
TD-087	11/8	20:37	AVL	41	39.805625	-121.584345	AVL	TD	fire threatening structures	V		
TD-043	11/8	21:00	Inferred	210	39.804939	-121.577902	TD	TD	approximate fire edge; burning south of Indian Dr	O		
TD-045	11/8	21:03	AVL	255	39.808034	-121.576487	AVL	TD	Fire bumping driveway. Low-intensity fire. Fire burning south of here	V		
TD-087	11/8	21:51	AVL	41	39.805625	-121.584345	AVL	TD	fire threatening structures	V		
TD-122	11/8	21:56	AVL	7	39.762700	-121.622300	AVL	TD	fire threatening structures	O		
TD-122	11/8	22:35	AVL	31	39.763083	-121.622817	AVL	TD	fire threatening structures	O		
TD-017	11/8	22:51	Radio Log	0	39.748906	-121.636474	Radio Log	Radio Log	fire threatening homes	O		
TD-087	11/8	22:55	AVL	156	39.805625	-121.584345	AVL	TD	fire threatening structures	V		
TD-111	11/8	23:00	Inferred	0	39.792486	-121.588203	TD	TD	hot spots around structures	O	x	
TD-007	11/9	00:00	TD	120	39.812419	-121.573191	TD	TD	fire ran up canyon into Magalia	V		
TD-209	11/9	00:07	AVL	66	39.812305	-121.575998	AVL	TD	fire starting to spread to ground but not fast; fire pushing up canyon	V		
TD-089	11/9	00:09	AVL	81	39.805642	-121.584355	AVL	TD	fire threatening structures	V		
TD-205	11/9	00:10	AVL	74	39.776454	-121.606298	AVL	TD	storage units burning	C		
TD-207	11/9	00:21	AVL	51	39.776500	-121.606717	AVL	TD	storage units on fire; 3 units burned	C		



Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-061	11/9	00:53	AVL	24	39.812883	-121.578283	AVL	TD	main fire front blew straight across Skyway at Coutolenc, estimated 22 m/s (50 mi/h). Wood guardrails igniting.	V		
TD-125	11/9	00:53	TD-061	24	39.812793	-121.578158	TD	TD	fire coming up from canyon, strong wind; softball size embers; embers igniting houses	R		
TD-115	11/9	01:00	Inferred	60	39.812751	-121.578417	TD	TD	hit wall of fire on Coutolenc Rd	O		
TD-115	11/9	01:00	Inferred	60	39.812152	-121.578021	TD	TD	structure burning	C		
TD-126	11/9	01:00	TD	59.999999	39.812768	-121.578424	TD	TD	fire spreads west and north of Skyway	V		
TD-045	11/9	01:19	AVL	120	39.812594	-121.578472	AVL	TD	Lots of spots. Tree stands torching. Fire came roaring up from the canyon. Spotting below Skyway and into Old Magalia	V		
TD-043	11/9	01:30	Inferred	0	39.807558	-121.579823	TD	TD	lots of scattered spot fires	S		
TD-087	11/9	01:33	AVL	113	39.808001	-121.578911	AVL	TD	fire hits crazy from water station. Fire pushed from the dam	V		
TD-089	11/9	01:44	AVL	102	39.809900	-121.583985	TD	TD	big push of fire from east; fire also came up drainage from west	V		
TD-207	11/9	01:49	AVL	266	39.776500	-121.606917	AVL	TD	storage units on fire; 3 units burned	C		
TD-089	11/9	03:29	AVL	97	39.805642	-121.584355	AVL	TD	fire threatening structures	V		
TD-087	11/9	03:34	AVL	181	39.805625	-121.584345	AVL	TD	fire threatening structures	V		
TD-079	11/9	05:14	AVL	209	39.805047	-121.584566	AVL	TD	fire creeping up from canyon. Fire behavior had reduced; just residual fire from before	V		
TD-132	11/9	08:35	TD	45	39.773699	-121.609622	Photo	TD	3 storage units fully involved	C		
TD-132	11/9	09:20	Photo	0	39.773532	-121.610107	Photo	Photo	storage units, smoking, but no fire showing	C	x	

Neal Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-104	11/8	08:30	TD	0	39.734419	-121.628216	TD	TD	fire in canyon burning westward into backyards at end of Eldridge Dr	V		
TD-104	11/8	09:00	TD	0	39.732695	-121.631406	TD	TD	backyard igniting; embers and ash falling	V		
TD-106	11/8	10:30	Inferred	0	39.728016	-121.655837	TD	TD	fire front not here yet, just spots	S		
TD-106	11/8	10:30	Inferred	420	39.727639	-121.657419	TD	TD	spot fires	S		
PPD-02	11/8	10:57	PPD-02	0	39.727458	-121.655529	Radio	Radio	flames coming up Red Sky Ln	O		
TD-068	11/8	11:00	Inferred	60	39.732229	-121.663044	TD	TD	glow coming from drainage between Neal Rd and Skyway; cannot tell if structures burning	O		
TD-078	11/8	11:00	Inferred	30	39.727544	-121.655506	TD	TD	small spot fires on Neal Rd	S		
TD-053	11/8	11:00	Inferred	30	39.727514	-121.655504	TD	TD	fire coming over Neal Rd	O		
TD-053	11/8	11:00	Inferred	30	39.728220	-121.656609	TD	TD	fire on NW side of Neal Rd	O		
PPD-08	11/8	11:28	PPD-08	0	39.727459	-121.655531	Radio	Radio	flames are getting much closer to Neal Rd now up from big sky	V		
PPD-08	11/8	11:29	PPD-08	0	39.727459	-121.655531	Radio	Radio	flames are getting really close to Neal Rd	V		
TD-066	11/8	11:30	TD	0	39.729972	-121.652711	TD	TD	fire activity both sides of Neal Rd north of Wayland Rd	O		
TD-073	11/8	11:30	Inferred	60	39.727998	-121.655696	TD	TD	fire west side of Neal Rd; in area of Red Sky Ln and Bayleaf Ln	O		
TD-205	11/8	11:42	Photo	0	39.726142	-121.666917	Photo	Photo	can see fire on ridge	V		
TD-205	11/8	11:42	Photo	0	39.729143	-121.661931	Photo	Photo	extensive line of fire burning on ridge	V		
TD-205	11/8	11:42	Photo	0	39.729143	-121.661931	Photo	Photo	extensive line of fire burning on ridge	V		
PPD-08	11/8	11:48	PPD-08	0	39.737026	-121.648791	Radio	Radio	Neal Rd at Roe Rd, fire about 14 m to 18 m (15 yd to 20 yd) from the road	O		
TD-091	11/8	11:53	AVL	30	39.728161	-121.656972	AVL	TD	fire is bumping behind these structures; fire in drainage	V		
TD-066	11/8	12:00	TD	10	39.737919	-121.647952	TD	TD	fire all around	O		
TD-106	11/8	12:00	TD-205, PPD video	0	39.727586	-121.655546	TD	TD	fire front came all around	O		
TD-073	11/8	12:04	PPD video	0	39.727499	-121.655527	TD	TD	fire at Wayland and Neal Rd	V		
TD-128	11/8	12:07	AVL	0	39.732850	-121.651417	AVL	TD	fire is backing up hill toward subdivision (from SW)	V		
TD-014	11/8	12:08	Radio Log	0	39.736998	-121.648789	Radio Log	Radio Log	multiple vehicles being overrun by fire on Neal Rd and Roe Rd area	O		
TD-205	11/8	12:09	AVL	18	39.732763	-121.653864	AVL	TD	fire to south of street - getting into back yards; intense fire activity	V		
TD-205	11/8	12:09	Photo	4	39.732763	-121.653864	Photo	Photo	fire in backyard	V		
TD-207	11/8	12:09	AVL	13	39.732783	-121.654217	AVL	TD	fire behind structures	V		
TD-205	11/8	12:09	Photo	0	39.732369	-121.654058	Photo	Photo	fire burning behind structures, 12 m (40 ft) flames	V		
TD-205	11/8	12:13	Photo	0	39.732492	-121.654469	Photo	Photo	vegetation fire, trees torching; possible structure burning	O		

Neal Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
PPD-08	11/8	12:13	PPD-08	0	39.730861	-121.652047	Radio	Radio	lower Neal Rd north of Wayland Rd, fires crossing the road	O		
PPD-08	11/8	12:17	PPD-08	0	39.736913	-121.648907	Radio	Radio	[3000 blk] flames almost to road	O		
TD-050	11/8	12:20	Inferred	0	39.738122	-121.647717	TD	TD	burning both sides of road; truck and utility trailer on fire	O		
TD-091	11/8	12:23	AVL	96	39.729684	-121.654360	AVL	TD	fire jumping dozer lines	V		
TD-205	11/8	12:23	Photo	0	39.731907	-121.655013	Photo	Photo	fire approaching homes, threatening structures	O		
TD-092	11/8	12:25	AVL	8	39.728496	-121.657367	AVL	TD	fire burning east towards Neal Rd	O		
TD-200	11/8	12:28	AVL	0	39.741621	-121.643231	AVL	TD	fire everywhere on Neal Rd	O		
PPD-08	11/8	12:29	PPD-08	0	39.729943	-121.652728	Radio	Radio	fire was right up against the road just inside the town limits	O		
PPD-08	11/8	12:31	PPD-08	0	39.738838	-121.646886	Radio	Radio	fire is now crossing Neal Rd eastbound south of Jay Ln	O		
TD-092	11/8	12:36	AVL	42	39.729796	-121.658576	AVL	TD	fire was bumping up to barn, tree on fire	V		
VTD-05	11/8	13:00	Inferred	60	39.723699	-121.660086	video	video	fire burning up out of canyon spreading south	V		
VTD-05	11/8	13:00	Inferred	60	39.723281	-121.660694	video	video	fire burning in canyon	V		
VTD-05	11/8	13:00	Inferred	60	39.723386	-121.661749	video	video	past peak veg fire in canyon	V		
VTD-05	11/8	13:00	Inferred	60	39.722642	-121.662549	video	video	fire in canyon	V		
TD-091	11/8	13:27	AVL	32	39.729774	-121.653727	TD	TD	burning vehicle threatening structure	O		
TD-104	11/8	13:43	Photo	0	39.732815	-121.632743	Photo	Photo	significant fire at end of Eldridge Dr; vegetation, possibly structures burning	O		
TD-104	11/8	13:44	Photo	0	39.732592	-121.632862	Photo	Photo	structure fully involved	R		
TD-104	11/8	13:44	Photo	0	39.732596	-121.633190	Photo	TD, Photo	huge propane tank, deck engulfed, too far gone; propane fell through deck and relief valve blew and deck exploded; structures on fire	R		
TD-104	11/8	13:44	Photo	0	39.732596	-121.632857	Photo	TD, Photo	structure fully involved	R		
TD-104	11/8	13:44	Photo	0	39.732592	-121.632862	Photo	Photo	structure fully involved	R		
TD-104	11/8	13:44	Photo	0	39.732577	-121.633146	Photo	Photo	structure burning	R		
TD-104	11/8	13:45	Photo	0	39.732815	-121.632743	Photo	Photo	fire down end of Eldridge Dr	V		
TD-092	11/8	13:52	AVL	9	39.730500	-121.651600	AVL	TD	burning vehicle threatening structure	O		
TD-104	11/8	14:00	Inferred	120	39.732707	-121.636506	TD	TD	fire approaching from west	V		
TD-104	11/8	14:00	Inferred	120	39.732579	-121.636446	TD	TD	180 mm x 25 mm x 6 mm (7 in x 1 in x 0.25 in) flaming bark ember	O		
TD-104	11/8	14:00	Inferred	120	39.732524	-121.640887	TD	TD	fire in canyon	V		
TD-104	11/8	14:00	Inferred	120	39.732902	-121.640698	TD	TD	hearing rumble of a freight train, rumbling of jet engine; severe fire activity from canyon	V		

Neal Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-002	11/8	14:00	TD	120	39.745004	-121.633488	TD	TD	embers and fire front arrived; structure ignited at roof-wall intersection; embers size of golf balls; retaining wall burned; shake roof on shed ignited first	R		
TD-091	11/8	14:02	Photo	13	39.731788	-121.651833	Photo	TD	burning car was igniting siding of house	R		
TD-091	11/8	14:02	AVL	13	39.731536	-121.652034	AVL	TD	decorative bark burning; igniting garage	R		
TD-092	11/8	14:04	AVL	10	39.731388	-121.650904	AVL	TD	bamboo area burning right up against house	V		
TD-091	11/8	14:07	Photo	0	39.731660	-121.651819	Photo	Photo	vehicle fully involved, igniting exterior of structure	O		
TD-091	11/8	14:07	Photo	0	39.732541	-121.651772	Photo	Photo	multiple structures past peak, fully involved on Grinding Rock Rd	R		
VTD-20	11/8	14:09	TD	0	39.724416	-121.672744	video	video	spotty fire activity up on ridge	V		
TD-092	11/8	14:16	AVL	196	39.733034	-121.650847	TD	TD	eaves of structure on fire	R		
TD-092	11/8	14:28	AVL	0	39.730000	-121.648983	AVL	TD	fire burning towards the north; burning is spotty, not pushing hard	V		
TD-076	11/8	14:43	Photo	0	39.745718	-121.638429	Photo	Photo	structure fully involved	C		
VTD-20	11/8	14:57	TD	0	39.745712	-121.638434	video	video	structure fully involved	C		
TD-036	11/8	14:59	video	0	39.745721	-121.638431	video	video	structure fully involved	R		
TD-066	11/8	15:05	PPD video	3	39.746205	-121.638181	PPD video	TD	very hot at Neal Rd and Skyway	C		
PPD-15	11/8	15:05	PPD-15	0	39.745711	-121.638441	video	video	structure fully involved	C		
TD-104	11/8	15:31	Photo	0	39.733131	-121.636453	Photo	TD, Photo	fire in overgrown tall grass, fire burning up to fence line	V		
TD-104	11/8	15:31	Photo	0	39.733127	-121.636448	Photo	Photo	significant vegetation fire very close to structure	V		
TD-104	11/8	15:42	Photo	0	39.733127	-121.636448	Photo	Photo	structure fully involved	R		
TD-104	11/8	15:43	Photo	0	39.733131	-121.636453	Photo	TD, Photo	house fully involved; trailer ignites, propane exploded; fence on fire	R		
TD-104	11/8	15:43	Photo	0	39.731749	-121.636035	Photo	TD, Photo	fire burning on parcel	V		
TD-104	11/8	15:43	Photo	0	39.731801	-121.635998	Photo	Photo	flames and smoke	O		
TD-104	11/8	16:09	Photo	0	39.732950	-121.636268	Photo	TD, Photo	RV and structure fully involved	R		
TD-104	11/8	16:09	Photo	0	39.733027	-121.636384	Photo	Photo	RV and structure are fully involved	R		
TD-104	11/8	16:13	Photo	0	39.732720	-121.636905	Photo	TD, Photo	yard igniting/burning; fire coming up the grass hill; surface fire, flames 0.3 m to 0.6 m (1 ft to 2 ft)	V		
TD-104	11/8	16:13	Photo	0	39.732694	-121.636942	Photo	Photo	surface fire burning in the backyard, flames 0.9 m (3 ft)	V		
TD-104	11/8	16:19	Photo	0	39.732336	-121.637359	Photo	TD, Photo	fire burning west to east into backyards of Foster; larger flame heights	V		
TD-104	11/8	16:19	Photo	0	39.731942	-121.638297	Photo	TD, Photo	structure is burning; larger flame heights	R		
TD-104	11/8	16:19	Photo	0	39.731988	-121.638285	Photo	Photo	structure fully involved	R		
TD-104	11/8	16:19	Photo	0	39.732567	-121.636942	Photo	Photo	surface fire in backyard	V		
TD-091	11/8	16:33	AVL	20	39.733577	-121.650989	AVL	TD	decorative landscaping on fire	O		
TD-091	11/8	16:47	video	0	39.733246	-121.651026	video	TD	structure fully involved	R		

Neal Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-091	11/8	16:47	Photo	0	39.733241	-121.651070	Photo	Photo	structure fully involved	R		
TD-091	11/8	16:47	Photo	0	39.733571	-121.651349	Photo	Photo	structure fully involved	R		
TD-091	11/8	16:55	AVL	6	39.733933	-121.651551	AVL	TD	fire threatening structure	V		
TD-091	11/8	17:09	AVL	5	39.734971	-121.650106	AVL	TD	landscape bark burned into subfloor vents	R		
TD-091	11/8	17:18	AVL	0	39.735367	-121.650817	AVL	TD	landscaping on fire; igniting structures	R		
TD-091	11/8	17:21	video	4	39.735417	-121.650183	AVL	TD	garage fully involved; ground fuels igniting	R		
TD-091	11/8	17:23	Photo	0	39.735602	-121.650187	Photo	Photo	detached garage fully involved, significant exposure to main structure	O		x
TD-091	11/8	17:23	Photo	0	39.735428	-121.650086	Photo	Photo	numerous small vegetation spot fires on parcel	S		
TD-091	11/8	17:25	Photo	0	39.735602	-121.650187	Photo	Photo	detached garage fully involved, significant exposure to main structure; eaves smoking	O		
TD-106	11/8	17:30	Inferred	15	39.727616	-121.654990	TD	TD	surrounded by fire, both sides of Neal Rd; miserable trying to make it out of area	R		
TD-091	11/8	17:39	AVL	35	39.727008	-121.654899	AVL	TD	heavy fire activity	O		
TD-091	11/8	17:39	AVL	35	39.727703	-121.655095	AVL	TD	fire pushing in from the north east	O		
TD-104	11/8	18:09	Photo	0	39.731620	-121.636002	Photo	TD, Photo	fire burning primarily on east side Foster Rd one small spot on west side	O		
TD-104	11/8	18:09	Photo	0	39.731741	-121.635985	Photo	Photo	possible structure burning	O		
TD-104	11/8	19:00		60	39.732574	-121.635377	Photo	Inferred	two structures burning	R		
TD-104	11/8	19:25	Photo	0	39.732616	-121.634653	Photo	TD, Photo	structure fully involved	R		
TD-104	11/8	19:25	Photo	0	39.732559	-121.634654	Photo	Photo	structure fully involved	R		
TD-104	11/8	20:20	Photo	0	39.732556	-121.635578	Photo	Photo	Structure on Eldridge Dr burning	R		
TD-104	11/8	21:29	Photo	0	39.732184	-121.636817	Photo	TD, Photo	structure igniting	R		
TD-104	11/8	23:17	Photo	0	39.732284	-121.636929	Photo	TD, Photo	garage is well involved; wood roof structure, concrete building; fence and boat are threatened/igniting	O		
TD-104	11/8	23:17	Photo	0	39.732188	-121.636807	Photo	TD, Photo	garage fully involved	O		
TD-104	11/8	23:17	Photo	0	39.732316	-121.636503	Photo	TD, Photo	structure is smoking and about to ignite	R		
TD-104	11/8	23:17	Photo	0	39.732228	-121.636919	Photo	Photo	structure fully involved	R		
TD-104	11/9	00:04	Photo	0	39.732221	-121.636437	Photo	TD, Photo	fence and vegetation (oleander) burning up against structure	V		
TD-104	11/9	00:04	Photo	0	39.732221	-121.636437	Photo	Photo	fence and vegetation (oleander) burning up against structure	V		
TD-104	11/9	00:30	Photo	0	39.732313	-121.636505	Photo	TD, Photo	structure burning	R		
TD-104	11/9	00:30	Photo	0	39.732322	-121.636507	Photo	Photo	structure igniting; flames through the roof	R		
TD-104	11/9	00:42	Photo	0	39.732313	-121.636505	Photo	TD, Photo	structure well involved; burning up in roof; burned from south to north	R		
TD-104	11/9	00:42	Photo	0	39.732322	-121.636507	Photo	Photo	structure well involved; flames through the roof	R		

Neal Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-104	11/9	00:43	Photo	0	39.732322	-121.636507	Photo	Photo	structure well involved; flames through the roof	R		
TD-104	11/9	00:45	Photo	0	39.732322	-121.636507	Photo	Photo	structure well involved; flames through the roof; generating firebrands	R		
TD-104	11/9	00:48	Photo	0	39.732313	-121.636505	Photo	TD, Photo	house collapsed, wall fell and ignited fence on north side	R		
TD-104	11/9	00:48	Photo	0	39.732322	-121.636507	Photo	Photo	structure fully involved	R		

Butte Creek Canyon and Lower Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
911-223-1	11/8	09:11	911-223-1	0	39.735791	-121.687568	Inferred	911-223-1	fire about a mile beyond covered bridge	S		
TD-014	11/8	10:55	Radio Log	0	39.724188	-121.692273	Radio Log, Imagery	Radio Log	vehicle fire with threat to vegetation	O		
TD-026	11/8	12:45	Inferred	15	39.724188	-121.692273	TD	TD	pickup truck, SB in NB lanes has already burned; had previously caught fire and was abandoned	O	x	
Radio Log	11/8	13:02	Radio Log	0	39.729033	-121.704007	Radio Log	Radio Log	spot fires on both sides of Honey Run, Centerville and Honey Run	S		
TD-117	11/8	14:00	TD	0	39.742833	-121.673188	TD	TD	fire in backyard of two homes, moderate rate of spread, flames 1.8 m to 3 m (6 ft to 10 ft) flames	V		
TD-117	11/8	14:00	Inferred	120	39.744503	-121.680751	TD	TD	fire on ridge in Honey Run canyon; est. 30 m to 60 m (100 ft to 200 ft) flames	V		
TD-117	11/8	14:00	Inferred	120	39.739515	-121.678863	TD	TD	ember showers	O		
TD-117	11/8	14:00	Inferred	120	39.741952	-121.678063	TD	TD	fire threatening structure	O		
TD-007	11/8	15:40	TD-012	80	39.777748	-121.690993	TD	TD	spot fires in the Doe Creek area	S		
TD-117	11/8	16:00	Inferred	300	39.736583	-121.684689	TD	TD	fire spotting on homes down canyon; fire fronts are joining	O		
TD-117	11/8	16:00	Inferred	300	39.748322	-121.686532	TD	TD	fire moving quickly on Centerville Rd	O		
TD-117	11/8	16:00	Inferred	300	39.732949	-121.693106	TD	TD	fire coming down, merging from ridgelines pinching Honey Run Rd; homes burning both sides of road	R		
TD-117	11/8	16:00	Inferred	300	39.717714	-121.719930	TD	TD	chicken coop on fire; propane explosion	O		
TD-117	11/8	16:00	Inferred	300	39.717714	-121.719930	TD	TD	quick moving fire fronts, merging again from the ridgelines	O		
TD-117	11/8	16:00	Inferred	300	39.717714	-121.719930	TD	TD	fire both sides of the road	O		
TD-114	11/8	16:00	Inferred	0	39.714896	-121.709757	TD	TD	fire near Tuscan Ridge	V		
TD-076	11/8	16:34	Photo	0	39.762416	-121.679481	Photo	Photo	4 ha to 8 ha (10 ac to 20 ac) spot fire in Butte Creek Canyon	S		
TD-012	11/8	18:12	Radio Log	0	39.774467	-121.685367	AVL	TD	fire licking up canyon wall, 30 m to 60 m (100 ft to 200 ft) flames; fire sheeting through brush 15 m to 18 m (50 ft to 60 ft) flames laying down into thick brush	V		
TD-201	11/8	20:17	AVL	0	39.693348	-121.758855	TD	TD	fire is approaching Hwy 99 near Skyway [line between Spanish Garden Dr and Estates Dr]	V		
TD-009	11/8	21:00	Radio Log	0	39.778893	-121.682500	Radio Log	Radio Log	fire has moved to top of Doe Mill Ridge; hard push through Buzztail/Wilder Rd	O		
TD-201	11/8	21:04	AVL	146	39.693348	-121.758855	AVL	TD	edge of fire line	V		
TD-117	11/8	21:07	Radio Log	0	39.717714	-121.719930	Radio Log	Radio Log	Honey run to Centerville has all been impacted many structures lost	R		
TD-009	11/8	21:08	Radio Log	0	39.714953	-121.724329	Radio Log	Radio Log	fire overcomes any containment or defense in Honey Run Canyon	O		

Butte Creek Canyon and Lower Skyway												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-091	11/8	21:28	AVL	226	39.693891	-121.757183	AVL	TD	perimeter of fire	V		
TD-201	11/8	21:40	Radio Log	0	39.687153	-121.762226	Radio Log	TD	edge of fire line	V		
TD-117	11/8	22:00	Inferred	300	39.722532	-121.753911	TD	TD	fire front coming down the hill toward the west	O		
TD-009	11/8	22:02	Radio Log	0	39.747231	-121.752331	Radio Log	Radio Log	fire has moved up out of Stilson Canyon, coming up over Old Humboldt Rd approaching Hwy 32 at the lower end by the powerlines	V		
TD-012	11/8	22:02	Radio Log	0	39.746706	-121.754674	Radio Log	TD	fire moved up out of Stilson Canyon, spotting over Humboldt Rd	V		
TD-009	11/8	22:06	Radio Log	0	39.740790	-121.766486	Inferred	Radio Log	fire is pushing down to lower Humboldt Rd near Hwy 32 in Yosemite Dr area	V		
TD-012	11/8	22:34	AVL	90	39.747309	-121.752984	AVL	TD	fire slops over Humboldt Rd into tall grass	V		
TD-009	11/8	23:22	AVL	192	39.749204	-121.746987	AVL	TD	lower fire activity	V		
TD-201	11/8	23:32	AVL	10	39.703904	-121.756177	Inferred	TD	subdivision is catching fire	R		
TD-201	11/9	00:00	AVL	13	39.706787	-121.739586	AVL	TD	subdivision is catching fire	R		



Valley View Drive												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-111	11/8	08:41	Inferred	4	39.749885	-121.653210	TD	TD	fire had clearly spotted over Paradise, can see smoke in canyon	S		
911-182-1	11/8	08:48	911-182-1	0	39.749224	-121.653849	911-182-1	911-182-1	spot fire started near creek, white smoke coming from the canyon right now	S		
TD-006	11/8	08:51	AVL	0	39.751079	-121.655498	AVL H901	TD	spot fire in Butte Creek Canyon	S		
911-200-1	11/8	08:57	911-200-1	0	39.751090	-121.652243	Inferred	911-200-1	spot fire kind of by Valley View Dr	S		
911-202-1	11/8	08:59	911-202-1	0	39.750171	-121.651946	Inferred	911-202-1	spot fire visible, just started, rapid spread	S		
TD-038	11/8	09:00	TD	0	39.746843	-121.653427	TD	TD	fire in backyard on Russell Dr	S		
911-204-1	11/8	09:00	911-204-1	0	39.750408	-121.652292	Inferred	911-204-1	spot fire just started	S		
911-218-1	11/8	09:08	911-218-1	0	39.748911	-121.653470	Inferred	911-218-1	can see fire in the canyon	S		
911-221-1	11/8	09:11	911-221-1	0	39.750934	-121.653271	Inferred	911-221-1	fire in the canyon off of Point West Dr	S		
911-225-1	11/8	09:12	911-225-1	0	39.748218	-121.654093	911-225-1	911-225-1	fire in canyon, not too big yet	S		
TD-055	11/8	09:14	Radio Log	0	39.749567	-121.652485	TD	TD	well seated fire seen down in Butte Creek Canyon, moving good, multiple ac	S		
TD-007	11/8	10:10	Radio Log	0	39.748925	-121.652728	TD	TD	established spot fire in Butte Creek Canyon	V		
Radio Log	11/8	10:10	Radio Log	0	39.748447	-121.651678	Radio Log	Radio Log	fire is well established in Honey Run Canyon just below Canyon View Dr, multiple spots running back up towards Canyon View Dr	V		
TD-012	11/8	13:28	Photo	0	39.753186	-121.657372	Photo	Photo	fire burning on ridge at end of Point West Dr	V		
TD-012	11/8	13:30	Photo	0	39.753186	-121.657372	Photo	Photo	flames on west side of paradise, view from Doe Mill Rd; fire burning on ridge at end of Point West Dr (Valley Ridge Dr)	V		
TD-044	11/8	14:30	TD	30	39.758911	-121.657097	TD	TD	saw flames in canyon to west	V		
TD-123	11/8	15:54	AVL	15	39.762050	-121.622783	AVL	TD	small propane tank blows	O		
TD-123	11/8	15:54	AVL	15	39.762409	-121.622805	AVL	TD	Jack in the Box restaurant building on fire	C		
TD-123	11/8	15:54	AVL	15	39.762244	-121.622885	AVL	TD	commercial building on fire	C		
TD-014	11/8	16:55	AVL	0	39.765405	-121.626297	AVL	TD	Fire all around	O		
TD-020	11/8	17:00	Photo	0	39.760163	-121.647251	Photo	Photo	all but 3 structures are burned to foundation and flaming; 2 standing, 1 other well-involved	R	x	
TD-020	11/8	17:00	Photo	0	39.760029	-121.646928	Photo	Photo	structure well involved; landscaping vegetation on fire or igniting	R		
TD-014	11/8	17:10	AVL	35	39.762229	-121.649664	Radio Log	TD	fire making a hard run out of the canyon	V		
TD-201	11/8	17:45	AVL	40	39.762561	-121.622127	AVL	TD	downtown commercial buildings are burning or catching	C		
TD-020	11/8	17:52	Radio Log	59	39.760295	-121.647590	TD	TD	most structures burning on Valley Ridge Dr	R		
TD-020	11/8	17:52	Radio Log	59	39.759942	-121.647294	TD	TD	fire threatening structures	O		
TD-020	11/8	17:52	Radio Log	59	39.759829	-121.647638	TD	TD	bushes, fences on fire	O		

Valley View Drive												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-123	11/8	18:23	AVL	44	39.763283	-121.622533	AVL	TD	fire threatening structures	O		
TD-044	11/8	19:00	TD	60	39.759285	-121.644392	TD	TD	loose burning vegetation blowing against structure; embers everywhere now	V		
TD-044	11/8	19:00	TD	180	39.759363	-121.645332	TD	TD	putting out spot fires all over	S		
TD-044	11/8	19:00	TD	180	39.759928	-121.645674	TD	TD	Fence to boat to house ignition	R		
TD-111	11/8	19:00	Inferred	225	39.760085	-121.647534	TD	TD	fire threatening structure	O		
TD-123	11/8	19:41	AVL	10	39.763317	-121.622567	AVL	TD	fire threatening structures	O		
TD-109	11/8	19:51	AVL	103	39.761608	-121.636388	AVL	TD	a lot already on fire	R		
TD-123	11/8	20:00	AVL	26	39.760050	-121.647250	AVL	AVL	fire threatening structures	O		
TD-123	11/8	20:59	AVL	4	39.759167	-121.647500	AVL	TD	burned car in driveway	O		
TD-030	11/8	21:18	AVL	28	39.760150	-121.647250	AVL	TD, Inferred	fire threatening structures	O		
TD-122	11/8	21:56	AVL	7	39.762700	-121.622300	AVL	TD	fire threatening structures	O		
TD-044	11/8	22:30	TD	0	39.759653	-121.646100	TD	TD	structure ignites from direct flames from wood pile	R		
TD-044	11/8	22:30	TD	0	39.759597	-121.646678	TD	TD	structure ignites	R		
TD-122	11/8	22:35	AVL	31	39.763083	-121.622817	AVL	TD	fire threatening structures	O		
TD-044	11/8	23:00	TD	0	39.759855	-121.645544	TD	TD	sheds and fences burning	O		
TD-030	11/8	23:27	AVL	450	39.760150	-121.647250	AVL	AVL	fire threatening structures	O		
TD-017	11/8	23:47		80	39.757412	-121.644727	TD	TD	fire threatening homes	O		
TD-017	11/8	23:47		80	39.756752	-121.643697	TD	TD	fires in the area	O		

Foothills												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
PPD-08	11/8	12:27	PPD-08	0	39.721894	-121.674285	Inferred	Radio	fire	O		
TD-035	11/8	13:00	Inferred	60	39.699244	-121.612972	TD	TD	fire across roadway; fire coming up slope burning over road	V		
TD-210	11/8	13:30	AVL	0	39.695569	-121.614212	AVL	TD	approximate fire edge	O		
TD-046	11/8	13:30	TD-054	40	39.692996	-121.615581	TD	TD	see fire and smoke; stopped and turned around, sent back to Butte College	V		
TD-121	11/8	14:00	Inferred	180	39.701096	-121.580489	TD	TD	fire spreading south, threatening structures	V		
TD-132	11/8	14:08	Photo	0	39.679630	-121.610502	Photo	Photo	can see fire on ridgetop to east of Clark Rd	V		
TD-141	11/8	14:08	Photo	0	39.683823	-121.607416	Photo	Photo	southern edge of fire, up on ridge	V		
TD-141	11/8	14:09	Photo	0	39.683823	-121.607416	Photo	Photo	fire up on ridge	V		
TD-141	11/8	14:10	Photo	0	39.695215	-121.615773	Photo	Photo	lower intensity fire front, moving south in grass and brush; limit of fire along Clark Rd	V		
TD-110	11/8	14:11	Photo	0	39.693195	-121.615368	Photo	TD	southern edge of fire; fire both sides of Clark Rd	V		
TD-132	11/8	14:11	Photo	0	39.693195	-121.615368	Photo	Photo	encounter southern edge of fire; fire both sides of Clark Rd	O		
TD-133	11/8	14:11	Photo	0	39.693158	-121.615411	Photo	Photo	spot fires burning against road; southern edge of main fire burning lower intensity in grass	V		
TD-133	11/8	14:12	Photo	0	39.704519	-121.609577	Photo	Photo	oak woodland has burned through	V	x	
TD-110	11/8	15:00	TD-208	0	39.682207	-121.619353	TD	TD	wind shifted in afternoon and blew fire down canyon	V		
TD-208	11/8	15:17	AVL	2	39.679450	-121.624567	AVL	TD	flames sheeting 3 m to 4.6 m (10 ft to 15 ft); fire burned over hood	V		
TD-102	11/8	15:25	Photo	0	39.695654	-121.628735	Photo	Photo	line of fire, nominally east to west	V		
TD-210	11/8	15:28	AVL	8	39.673320	-121.624817	AVL	TD	finger of fire	V		
TD-210	11/8	15:28	AVL	124	39.662638	-121.628727	AVL	TD	igniting spots along west side of Clark Rd; several spots about 15 m (50 ft) off road	S		
TD-102	11/8	15:29	Photo	0	39.695654	-121.628735	Photo	Photo	observe short range down slope spotting	S		
TD-102	11/8	15:30	Inferred	0	39.695572	-121.628333	Photo	TD	fire is approaching from the north	V		
TD-102	11/8	15:30	Inferred	0	39.695572	-121.628333	Photo	TD	approximate fire line	V		
TD-102	11/8	15:40	Photo	0	39.692556	-121.632043	Photo	Photo	fire spreading in vegetation	V		
TD-110	11/8	15:45	Inferred	0	39.690847	-121.628419	TD	TD	fire hung up on ridge to north	V		
TD-102	11/8	15:53	Photo	0	39.693027	-121.631477	Photo	Photo	fire has burned vegetation in field; stumps and logs still burning	V		
TD-210	11/8	16:14	AVL	57	39.668315	-121.615784	AVL	TD	fire threatening structures	O		
TD-119	11/8	16:30	Inferred	270	39.697461	-121.628272	TD	TD	fire up on ridge, coming downhill; extreme and variable winds; fire spotting	V		
TD-119	11/8	16:33	Photo	0	39.692447	-121.625820	Photo	Photo	disorganized fire front burning downhill through grass oak woodland; minimal flame heights	V		

Foothills												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-102	11/8	16:38	Photo	0	39.692004	-121.633525	Photo	Photo	flames burning downhill in grass oak woodland, east toward structure	V		
TD-102	11/8	16:39	Photo	0	39.692606	-121.631818	Photo	TD	large tree down, burning	V		
TD-102	11/8	16:39	Photo	0	39.693027	-121.631477	Photo	Photo	fire has burned vegetation in field; stumps and logs still burning	V	x	
VTD-18	11/8	16:48	TD	0	39.690713	-121.619650	video	video	southern end of fire on west side Clark Rd; east side burned already south of here	V		
VTD-18	11/8	16:49	TD	0	39.686175	-121.633755	video	video	southern edge of main fire in vegetation (estimated)	V		
TD-120	11/8	16:55	Photo	41	39.692265	-121.629073	TD	TD	shed burned	O		
TD-120	11/8	17:00	Photo	0	39.691985	-121.628919	Photo	Photo	vegetation fire	V		
TD-120	11/8	17:00	Photo	0	39.689585	-121.630534	Photo	Photo	disorganized fire front	V		
TD-211	11/8	17:03	AVL	25	39.679420	-121.627067	AVL	TD	fire had already burned through Rattlesnake Flats Rd	V	x	
TD-120	11/8	17:03	Photo	0	39.693513	-121.629937	Photo	Photo	surface fuels in area have burned through, glowing remains, localized flaming	V	x	
TD-120	11/8	17:03	Photo	0	39.692509	-121.630674	Photo	Photo	surface fuels in area have burned through, glowing remains, localized flaming	V	x	
TD-102	11/8	17:15	AVL E2185	0	39.691312	-121.629354	TD	TD	fire gets very close	V		
TD-106	11/8	17:18	VTD-01	0	39.707698	-121.677168	video	TD	fire all around roadway driving down Neal Rd; held up by fire whirl for a minute	V		
VTD-01	11/8	17:18	Video	0	39.707698	-121.677168	video	Twitter	fire whirl on Neal Rd	V		
TD-106	11/8	17:30	Inferred	23	39.691565	-121.694399	TD	TD	fire is slope reversal, lining up with drainages	V		
TD-121	11/8	17:30	Inferred	120	39.698313	-121.584541	TD	TD	fire is moving south quickly	O		
TD-121	11/8	17:30	Inferred	120	39.689064	-121.593182	TD	TD	fire burning SW down ridge	V		
TD-119	11/8	17:36	Photo	0	39.689512	-121.630477	Photo	Photo	increased fire activity, widespread across hillside	V		
TD-102	11/8	17:40	AVL E2185	0	39.668311	-121.636192	TD	TD	drove through fire	V		
TD-102	11/8	17:40	Inferred	0	39.657612	-121.647394	TD	TD	fire had passed below and was burning in Cory Canyon	V		
TD-119	11/8	17:45	TD	195	39.678369	-121.634608	TD	TD	detached garage burned, shed damaged	O		
TD-065	11/8	17:50	Inferred	0	39.656833	-121.646325	TD	TD	fire is burning around Butte College	V		
TD-042	11/8	18:00	TD	30	39.664504	-121.742140	TD	TD	fire crossing Hwy 99	V		
TD-091	11/8	18:14	AVL	13	39.674000	-121.726967	AVL	TD	both sides of Neal Rd are already burned north of pull out	V	x	
TD-120	11/8	18:23	Photo	0	39.679162	-121.636959	TD	TD	fire burning from the west downhill towards structures; burning in grass	V		
TD-120	11/8	18:26	Photo	0	39.678149	-121.638786	Photo	Photo	vegetation fire	V		
TD-091	11/8	18:27	AVL	24	39.669583	-121.716700	TD	TD	fire coming across valley from the east	V		
TD-120	11/8	18:27	Photo	113	39.678184	-121.639388	TD	TD	fire near structure	V		
TD-120	11/8	18:27	Photo	0	39.678149	-121.638786	Photo	Photo	vegetation fire, grass	V		

Foothills												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-092	11/8	18:28	AVL	23	39.673967	-121.726883	AVL	TD	fire coming across valley from the east	V		
TD-110	11/8	18:45	Inferred	0	39.639898	-121.628709	TD	TD	fire jumped Durham-Pentz Rd; limited resources and burning away from houses, so let it go for now	V		
TD-076	11/8	18:47	Photo	0	39.637289	-121.697731	Photo	Photo	fire south of Durham-Pentz Rd	V		
TD-071	11/8	18:47	TD-076	0	39.639288	-121.696609	Photo	TD	fire both sides of Durham-Pentz Rd between 99 and College	V		
TD-076	11/8	18:47	Photo	0	39.636897	-121.700941	Photo	Photo	intense fire burning in grass	V		
TD-069	11/8	18:50	TD-064	0	39.655188	-121.646304	Inferred	TD	Butte College; hillside catches fire	V		
Radio Log	11/8	18:50	Radio Log	0	39.653679	-121.728297	Radio Log	Radio Log	Fire is bumping Hwy 99 between Neal Rd and Durham-Pentz Rd	V		
TD-064	11/8	19:00	Inferred	0	39.655188	-121.646304	Inferred	TD	hillside at Butte College catches fire	V		
TD-106	11/8	19:00	Inferred	0	39.661045	-121.735427	TD	TD	fire heading down hill, bumping Hwy 99	V		
TD-102	11/8	19:04	Photo	0	39.666830	-121.644068	Photo	Photo	active fire in vegetation	V		
TD-102	11/8	19:04	Photo	0	39.665794	-121.642383	Photo	Photo	fire burning in grass on hillside above structures	V		
TD-201	11/8	19:05	Radio Log	0	39.651152	-121.727633	Radio Log	TD, Radio Log	Fire jumped Hwy 99, 0.8 ha to 1.2 ha (2 ac to 3 ac); also jumped Durham-Pentz Rd; wind driven from NE	V		
TD-201	11/8	19:05	Radio Log	0	39.640100	-121.710110	Radio Log	Radio Log	fire also jumped Durham-Pentz Rd into that triangle and will be bumping Hwy 99 there as well	V		
TD-201	11/8	19:05	AVL	0	39.658273	-121.724358	TD	TD	fingery fire; 11 m/s to 13 m/s (25 mi/h to 30 mi/h) winds; spotting fires in grass and jumping over Hwy 99 in at least 3 places	V		
TD-211	11/8	19:07	AVL	0	39.638700	-121.681767	AVL	TD	fire burning up along Durham-Pentz Rd; drove through flames blowing onto road	V		
TD-092	11/8	19:07	AVL	0	39.659543	-121.737382	AVL	TD	slop over, fire burning on W side of Hwy 99	V		
TD-091	11/8	19:10	AVL	110	39.661225	-121.744638	AVL	TD	fire slop over Hwy 99	V		
TD-106	11/8	19:10	AVL TD-091	110	39.659543	-121.737382	AVL TD-091	TD	fire slop over on south side Hwy 99; fire shoots through underpass culvert	V		
TD-211	11/8	19:14	AVL	0	39.657102	-121.740002	AVL	TD	fire burning on west side Hwy 99	V		
TD-110	11/8	19:24	Radio Log	0	39.631947	-121.638452	Imagery	Radio Log	fire is about to jump Clark Rd, south of Durham-Pentz Rd	V		
TD-102	11/8	19:24	Radio Log	0	39.630269	-121.638327	TD	TD	advised that fire is crossing Clark Rd at the Camelot Horse Farm; residents had evacuated animals to the farm	V		
TD-121	11/8	19:30	TD	0	39.681618	-121.572735	TD	TD	fire threatening neighborhood	V		
VTD-01	11/8	19:45	Twitter	0	39.664384	-121.744302	video	Twitter	fire spotting across Hwy 99 at Neal Rd	V		
TD-020	11/8	20:00	Inferred	0	39.692918	-121.580194	TD	TD	active fireline	V		
TD-102	11/8	20:13	Photo	0	39.639481	-121.670731	Photo	Photo	fire burning in grass north of Durham-Pentz Rd	V		

Foothills												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-054	11/8	20:20	Photo	0	39.651845	-121.656006	TD	TD	fire approaching ridge line	V		
TD-120	11/8	20:22	Inferred	0	39.677156	-121.635476	TD	TD	shop fully involved	O		
TD-120	11/8	20:22	Photo	0	39.678810	-121.635421	Photo	Photo	firing operation in grass above structure	V		
Radio Log	11/8	20:27	Radio Log	0	39.601640	-121.662023	Radio Log	Radio Log	fire is at Hwy 149 and Shippee Rd, about to cross Hwy 149	V		
TD-054	11/8	20:40	Photo	0	39.648509	-121.653927	TD	TD	fire reaches Butte College, right up to concrete	V		
TD-121	11/8	21:00	TD	120	39.697846	-121.574343	TD	TD	fire burned homes	R		
TD-102	11/8	21:12	Photo	0	39.639993	-121.664305	Photo	Photo	fire in grass burning against north side Durham-Pentz Rd	V		
TD-102	11/8	22:00	TD	60	39.656505	-121.653190	AVL	TD	structure burned	R		
TD-102	11/8	22:00	TD	60	39.663508	-121.644901	AVL	TD	structure burned	R		
Radio Log	11/8	22:24	Radio Log	0	39.601640	-121.662023	Radio Log	Radio Log	high probability of spots across Hwy 149	V		
TD-102	11/8	23:18	Radio Log	0	39.660557	-121.652699	Radio Log	Radio Log	small fire in the corner of structure	R		
TD-102	11/8	23:29	Inferred	66	39.660557	-121.652699	TD	TD	small fire in structure	R		
TD-201	11/9	00:31	Radio Log	0	39.655600	-121.741876	AVL	Radio Log	fire burning in wood facility	O		
Radio Log	11/9	01:15	Radio Log	0	39.601640	-121.662023	Radio Log	Radio Log	extent of fire; perimeter established	V		
TD-201	11/9	01:41	Radio Log	0	39.647250	-121.662260	Radio Log	Radio Log	imminent structure threat	O		
TD-102	11/9	01:53	Inferred	333	39.648667	-121.664614	TD	TD	low creeping fire activity	V		
TD-102	11/9	01:53	Inferred	333	39.648667	-121.664614	TD	TD	burning woodpiles	O		

Nelson Bar Road and Highway 70

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-008	11/8	11:08	Radio Log	0	39.710355	-121.556751	Radio Log	Radio Log	fire established in canyon to point where river turns into lake	V		
TD-108	11/8	12:25	Photo	0	39.722200	-121.551798	Photo	Photo	southern extent of fire, burning in canyon	V		
TD-031	11/8	12:38	Photo	0	39.732934	-121.539099	Photo	Photo	massive gray smoke plume from main fire rising from canyon	V		
TD-031	11/8	13:00	AVL	11	39.743772	-121.524825	AVL	TD	Huge fire to north of Comfort Ln	V		
TD-013	11/8	13:00	Inferred	0	39.736194	-121.540577	TD	TD	fire down in the canyons	V		
TD-013	11/8	13:00	Inferred	300	39.720645	-121.541835	TD	TD	fire threatening structures	O		
TD-138	11/8	13:00	Inferred	390	39.723426	-121.542672	TD	TD	low intensity fire backing down	V		
TD-137	11/8	13:53	Photo	0	39.726779	-121.549450	Photo	Photo	fire burning NW of the pond, beyond ridge	V		
TD-137	11/8	13:53	Photo	0	39.729353	-121.549158	Photo	Photo	smoke rising from canyon	V		
TD-062	11/8	14:11	AVL	445	39.728383	-121.540450	AVL	TD	fire came from NE; destroyed 5 of 7 structures	R		
TD-140	11/8	14:14	video	0	39.741429	-121.526257	video	TD	fire is spotting ahead of main front, south toward Nelson Bar Rd	S		
TD-140	11/8	14:14	Photo	0	39.740353	-121.526549	Photo	Photo	several spot fires burning in thick brush, pines; west side of Concow Rd	S		
TD-140	11/8	14:14	Photo	0	39.742514	-121.525605	Photo	Photo	large flame lengths, active fire west of Concow Rd	V		
TD-140	11/8	14:15	Inferred	165	39.733180	-121.542777	TD	TD	fire is burning toward the SW in the drainage north of Nelson Bar Rd	V		
TD-140	11/8	14:15	Inferred	165	39.730634	-121.544377	TD	TD	fire burning toward Nelson Bar Rd from drainage	V		
TD-031	11/8	14:25	Photo	0	39.733386	-121.541970	Photo	Photo	significant smoke plume rising from general area	V		
TD-027	11/8	14:40	Inferred	0	39.742334	-121.524345	TD	TD	fire 60 m (200 ft) from structure	V		
TD-136	11/8	14:55	Photo	0	39.733386	-121.541970	Photo	Photo	significant smoke plume rising from general area	V		
TD-136	11/8	14:59	Photo	0	39.730005	-121.548356	Photo	Photo	large amount of smoke coming from canyon	V		
TD-136	11/8	15:00	Photo	7	39.724755	-121.538913	Photo	Photo	view west along fire front	V		
TD-136	11/8	15:03	Photo	0	39.724755	-121.538913	Photo	Photo	large amount of smoke coming from canyon	V		
TD-136	11/8	15:07	Photo	0	39.728941	-121.548790	Photo	Photo	fire burning in canyon	V		
TD-027	11/8	15:40	video	0	39.742334	-121.524345	TD	TD	pickup truck was burning, threatening house	O		
TD-027	11/8	15:40	Photo	0	39.742220	-121.524139	Photo	Photo	vehicle fully involved next to structure	O		
TD-013	11/8	15:43	AVL E2364	0	39.730535	-121.513448	AVL E2364	TD	fire threatening structures	O		
TD-027	11/8	16:00	TD	0	39.738810	-121.526594	TD	TD	fire overruns property	R		
TD-027	11/8	16:22	Photo	0	39.739538	-121.525511	Photo	Photo	fire front burning through forested area; line oriented east to west	V		
TD-027	11/8	16:30	TD	0	39.739806	-121.526244	TD	TD	fire approaching Concow school	V		
TD-027	11/8	17:00	Inferred	0	39.723704	-121.544424	TD	TD	fire front approaching parallel to Nelson Bar Rd from NW	V		

Nelson Bar Road and Highway 70

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-136	11/8	17:00	TD	0	39.730078	-121.537927	TD	TD	fire approaches from the north; very intense, and fast, lots of spot fires; burning through thick manzanita fuel	V		
TD-136	11/8	17:00	Inferred	420	39.724929	-121.538485	TD	TD	fire on Nelson Bar Rd	V		
TD-140	11/8	17:00	TD	0	39.723868	-121.544055	TD	TD	fire spotting across the flats	S		
TD-137	11/8	17:06	Photo	0	39.721500	-121.547443	Photo	Photo	fire burning in drainage beyond ridge to west of pond	V		
TD-137	11/8	17:06	Photo	0	39.721591	-121.549953	Photo	Photo	fire burning in canyon	V		
TD-137	11/8	17:12	Photo	0	39.724355	-121.545271	Photo	Photo	fire front entering the field from the N/NW	V		
TD-137	11/8	17:12	Photo	0	39.724404	-121.545078	Photo	Photo	low intensity line fires moving through grass	V		
TD-137	11/8	17:20	Photo	0	39.723815	-121.543971	Photo	Photo	fire front working through savannah down slope toward pond	V		
TD-137	11/8	17:20	Photo	0	39.723060	-121.543448	Photo	Photo	spot fire starts in field by the pond	S		
TD-137	11/8	17:20	Photo	0	39.723128	-121.543394	Photo	Photo	spot fire in grass	S		
TD-137	11/8	17:20	Photo	0	39.725463	-121.545639	Photo	Photo	main fire burning south through grass oak woodland	V		
TD-140	11/8	17:24	video	0	39.724312	-121.542186	TD	TD	intense fire approaching structures	V		
TD-140	11/8	17:24	Photo	0	39.726475	-121.539972	Photo	Photo	15 m to 30 m (50 ft to 100 ft) flames burning through forest, spreading south toward Nelson Bar Rd	V		
TD-140	11/8	17:24	Photo	0	39.724175	-121.541637	Photo	Photo	significant fire front burning in vegetation up to meadows and structures	V		
TD-140	11/8	17:29	video	0	39.724737	-121.538897	TD	TD	fire rapidly impacting structures and Nelson Bar Rd	V		
TD-140	11/8	17:29	Photo	0	39.724796	-121.539567	Photo	Photo	numerous short-range spot fires, intense fire front reaching Nelson Bar Rd, threatening structures	V		
TD-139	11/8	17:30	TD-140	30	39.727377	-121.533871	TD	TD	fire jumps Nelson Bar Rd by the school	V		
TD-139	11/8	17:30	Inferred	210	39.709145	-121.545065	TD	TD	fire on west side of Nelson Bar Rd south of Lunt Rd	V		
TD-137	11/8	17:32	Photo	0	39.722000	-121.542103	Photo	Photo	fire burning through field down slope closer toward structure	V		
TD-137	11/8	17:32	Photo	0	39.722435	-121.542043	Photo	Photo	fire burning south downhill through grass	V		
TD-137	11/8	17:52	Photo	0	39.722562	-121.544111	Photo	Photo	fire reaches pond	V		
TD-137	11/8	17:52	Photo	0	39.722568	-121.544233	Photo	Photo	grass fire reaches pond	V		
TD-137	11/8	18:00	TD	84	39.721413	-121.541900	TD	TD	burn out around structures	V		
TD-031	11/8	18:30	TD-140	30	39.727224	-121.536955	TD	TD	Fire blows over north side of Nelson Bar Rd	V		
TD-013	11/8	18:30	Inferred	0	39.730563	-121.530870	TD	TD	fire now up to Nelson Bar Rd and Concow school; new goal to hold Hwy 70	V		
TD-140	11/8	18:30	TD	0	39.736794	-121.516785	TD	TD	fire progressing south of Deadwood Rd	V		
TD-140	11/8	18:30	Inferred	30	39.727309	-121.533655	TD	TD	fire spotting across Nelson Bar Rd	S		
TD-140	11/8	18:30	Inferred	30	39.726214	-121.536846	TD	TD	structure is on fire	R		
TD-137	11/8	18:33	Photo	0	39.721787	-121.542269	Photo	TD	fire approaching house	V		



Nelson Bar Road and Highway 70

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-137	11/8	18:33	Photo	0	39.721868	-121.542289	Photo	Photo	fire burning through thick brush; 6 m (20 ft) flames; embers lofting	V		
TD-140	11/8	19:15	video	0	39.723855	-121.541314	TD	TD	fire front has passed, spot fires around	S		
TD-140	11/8	19:15	Photo	0	39.723829	-121.541302	Photo	Photo	widespread scattered fires; fire front has passed through; heavy fuels remain burning	O		
TD-137	11/8	19:30	TD	210	39.729826	-121.525793	TD	TD	fire burning around the Concow pool	V		
TD-138	11/8	19:30	Inferred	0	39.724681	-121.538771	TD	TD	fire bumps Nelson Bar Rd, spotting across	V		
TD-008	11/8	20:00	TD	0	39.726344	-121.531083	TD	TD	Fire made significant run up from Concow, spotted across Nelson Bar Rd and school	V		
TD-139	11/8	21:00	TD	0	39.724280	-121.540569	TD	TD	shed has burned down	O	x	
TD-139	11/8	21:00	Inferred	540	39.716273	-121.521100	TD	TD	fire bumping along Hwy 70	V		
TD-062	11/8	22:05	AVL	0	39.721550	-121.536683	AVL	TD	fire coming from ridge above N/NE	V		
TD-137	11/8	23:21	Photo	0	39.729342	-121.525624	Photo	TD	heavy fire burning in vegetation around Concow pool	V		
TD-137	11/8	23:21	Photo	0	39.729264	-121.524825	Photo	Photo	intense vegetation fire	V		
TD-013	11/9	00:00	TD-031	0	39.707357	-121.534655	TD	TD	main fire spots south across Lunt	V		
TD-027	11/9	00:00	Inferred	300	39.685168	-121.544534	TD	TD	fire slopped over line south of Lunt Rd	V		
TD-136	11/9	00:00	TD	0	39.724929	-121.538485	TD	TD	fire intensity has dropped	V		
TD-136	11/9	00:00	Inferred	470	39.722445	-121.527019	TD	TD	fire creeping toward Shuman Ln	V		
TD-062	11/9	00:01	AVL	0	39.706703	-121.553878	TD	TD	approximate fire edge	V		
TD-031	11/9	00:07	AVL	293	39.704378	-121.530668	AVL	TD	main fire came jumped 6 m (20 ft) over Lunt Rd and took off	V		
TD-062	11/9	00:47	AVL	238	39.704400	-121.530417	AVL	TD	fire jumps line	V		
TD-008	11/9	01:28	Radio Log	0	39.722908	-121.532174	Inferred	Radio Log	fire is well established on the Hwy 70 side of Nelson Bar Rd	V		
TD-027	11/9	02:00	TD-028	120	39.739166	-121.495736	TD	TD	fire front approaching Station 36	V		
TD-028	11/9	02:19	TD	0	39.740270	-121.496226	Photo	TD	fire threatening structure	V		
TD-031	11/9	03:29	Photo	0	39.704142	-121.530384	Photo	Photo	firing operation	V		
TD-008	11/9	03:30	TD-031	0	39.719866	-121.531235	TD	TD	fire grows south of Nelson Bar Rd, fire jumps line	V		
TD-031	11/9	03:30	Photo	0	39.704378	-121.530668	AVL	Photo	vegetation fire	V		
TD-013	11/9	03:30	TD-031	25	39.707985	-121.535131	TD	TD	spot fire Nelson Bar Rd/Concow Rd, spread jumped the line; crossed Lunt Rd and drainage in 10 min, then died on south face; winds 18 m/s to 22 m/s (40 mi/h to 50 mi/h) flames laying down, brush fuel 1.8 m to 3 m (6 ft to 10 ft)	V		
TD-031	11/9	03:55	Photo	0	39.704378	-121.530668	AVL	Photo	Big fire south of Lunt Rd	V		
TD-031	11/9	03:55	Photo	0	39.703723	-121.530324	Photo	Photo	fire burning on south side Lunt Rd	V		

Nelson Bar Road and Highway 70

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-031	11/9	03:55	Photo	0	39.703456	-121.530897	Photo	Photo	fire spotted and well established and running WSW from Lunt Rd	V		
TD-008	11/9	04:00	TD-028	0	39.739151	-121.495848	TD	TD	late night fire run impacts Station 36, wind driven from canyon	V		
TD-028	11/9	04:00	TD	0	39.739156	-121.495763	AVL	TD	Fire hit Station 36 from canyon to east and wrapped around station from north. Fire both slope- and wind-driven	V		
TD-028	11/9	04:00	TD	0	39.722671	-121.493224	TD	TD	fire pushed south to big bend mountain mobile home park	V		
TD-013	11/9	05:35	Photo	0	39.685985	-121.540458	Photo	Photo	intense fire line burning through forest up on ridge	V		
TD-136	11/9	06:30	Inferred	80	39.722024	-121.526158	TD	TD	sunrise causes fire intensity to pick up dramatically; visibility decreases, suddenly everything is burning again, trees, needles, houses	R		
TD-140	11/9	06:40	AVL	0	39.725066	-121.517156	AVL	TD	fire is coming hard toward pool	V		
TD-140	11/9	06:40	Inferred	40	39.727277	-121.523958	TD	TD	fire burning across Pinkston Canyon Rd towards Concow Rd; worried about getting pinched	V		
TD-140	11/9	06:40	Inferred	40	39.722063	-121.526952	TD	TD	fire threatening structure	O		
TD-137	11/9	07:09	Photo	0	39.720999	-121.523302	Photo	TD	Shuman Ln; fire burning in area, but not intense, piles of pine needles and slash debris	V		
TD-137	11/9	07:09	Photo	0	39.720999	-121.523302	Photo	Photo	widespread vegetation surface fires	V		
TD-013	11/9	07:20	Photo	20	39.725467	-121.503032	TD	TD	surrounded by heavy fire activity in vegetation	V		
TD-137	11/9	07:20	Inferred	7	39.720999	-121.523302	Photo	TD	fire intensifies quickly	O		
TD-137	11/9	07:20	Inferred	7	39.728044	-121.525331	TD	TD	roadway blocked by fire	O		
TD-140	11/9	07:20	TD-137	7	39.721039	-121.523620	TD	TD	wind shift; fire starts coming down from west side, then east side; both sides of Concow Rd are burning; Station 37 is hit hard	V		
TD-139	11/9	07:20	Inferred	0	39.721190	-121.524352	TD	TD	fire approaches, wind increases, huge embers	O		
TD-013	11/9	07:21	Photo	0	39.726078	-121.502943	Photo	Photo	vegetation fully involved	V		
TD-013	11/9	07:22	Photo	0	39.726078	-121.502943	Photo	Photo	vegetation fully involved	V		
TD-140	11/9	07:27	Inferred	20	39.718795	-121.521428	TD	TD	house fully involved	R		
TD-138	11/9	07:27	TD-137	21	39.727070	-121.525007	TD	TD	fire activity blew up	V		
TD-139	11/9	07:30	TD-140	90	39.716463	-121.521202	TD	TD	fire coming across Hwy 70	V		
TD-013	11/9	07:42	Photo	0	39.725745	-121.503254	Photo	Photo	vegetation all around, surface fuels burning, glowing	V		
TD-140	11/9	07:47	video	0	39.717375	-121.519713	video	TD	fire spots across Hwy 70 at Concow Rd	S		
TD-140	11/9	07:47	Photo	0	39.718327	-121.518966	Photo	Photo	fire on north side of Hwy 70	V		
TD-140	11/9	07:47	Photo	0	39.717118	-121.520144	Photo	Photo	spot fire on south side of Hwy 70	S		
TD-140	11/9	07:49	Photo	0	39.716565	-121.520843	Photo	Photo	Spot fires on both side of Highway	S		

**Nelson Bar Road and Highway 70**

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-136	11/9	07:50	Inferred	0	39.719236	-121.522166	TD	TD	drive out through fire across Concow Rd; engine takes slight damage	O		
TD-137	11/9	07:50	Inferred	0	39.727062	-121.525020	TD	TD	wait at Concow Rd and Pinkston Canyon Rd; fire intensity not as severe	O		
TD-136	11/9	07:56	Photo	0	39.716264	-121.520942	Photo	TD	Hwy 70 at Concow Rd; active fire burning along west side Hwy 70	V		
TD-136	11/9	07:56	Photo	0	39.717691	-121.520010	Photo	Photo	vegetation burning up against road; 6 m (20 ft) flames	V		
TD-031	11/9	08:20	Photo	0	39.694825	-121.531726	Photo	Photo	low intensity fire in shrub and grass west side Hwy 70; burn operation along roadway	V		
TD-140	11/9	08:27	Photo	0	39.716962	-121.521799	Photo	Photo	significant vegetation fire approaching Hwy 70 from Concow Rd; light embers shower	V		
TD-140	11/9	08:40	video	0	39.716256	-121.521104	video	TD	fire well established on South side Hwy 70	V		
TD-140	11/9	08:40	Photo	0	39.716247	-121.521073	Photo	Photo	well-established heavy fire on both sides of Hwy 70 at Concow Rd	V		
TD-140	11/9	08:55	Photo	0	39.714743	-121.520527	Photo	Photo	heavy fire heading south from Hwy 70 into Yankee Hill	V		
TD-140	11/9	08:55	Photo	0	39.715309	-121.520570	Photo	Photo	intense vegetation fire activity; trees torching	V		
TD-138	11/9	09:00	Inferred	0	39.710393	-121.526320	TD	TD	heavy fire activity along Hwy 70	V		
TD-137	11/9	09:01	Inferred	0	39.721146	-121.523534	TD	TD	Station 37 is burned down	C	x	
TD-137	11/9	09:02	Photo	0	39.716878	-121.521218	Photo	TD	fire had burned through area	O	x	
TD-137	11/9	09:02	Photo	0	39.717100	-121.521021	Photo	Photo	surface fuels have burned, still glowing	V	x	

Magalia and Coutolenc Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
911-092-1	11/8	08:01	911-092-1	0	39.804374	-121.578145	Inferred	911-092-1	spot fires on west side of canyon by Sawmill Peak	S		
TD-006	11/8	08:41	Radio Log	0	39.804814	-121.578638	TD	TD	spot fires in Old Magalia	S		
911-207-1	11/8	09:02	911-207-1	0	39.804374	-121.578145	Inferred	911-207-1	new fire starting	S		
911-217-1	11/8	09:07	911-217-1	0	39.804374	-121.578145	Inferred	911-217-1	fire both sides of road	S		
911-230-1	11/8	09:16	911-230-1	0	39.804374	-121.578145	Inferred	911-230-1	structures are burning	R		
911-240-1	11/8	09:21	911-240-1	0	39.712138	-121.578005	911-240-1	911-240-1	structure on fire	C		
911-241-1	11/8	09:21	911-241-1	0	39.712138	-121.578005	911-241-1	911-241-1	fire	C		
PPD-02	11/8	09:46	PPD-02	1	39.802526	-121.578640	video	video	spot fire in vegetation on both sides of Skyway up against roadway	S		
TD-041	11/8	11:05	Inferred	0	39.806386	-121.577594	TD	TD	fire is up to edge of Skyway; northern flank of fire	V		
PPD-10	11/8	11:53	PPD-10	0	39.801315	-121.582699	video	video	large flames	O		
TD-079	11/8	12:10	AVL	0	39.804683	-121.577867	AVL	TD	everything on fire driving up Skyway - both sides of road	O		
TD-060	11/8	12:18	AVL	0	39.812633	-121.575716	AVL	TD	spot fire down in canyon	S		
TD-009	11/8	12:18	AVL	0	39.810739	-121.577389	AVL	TD	estimated flank of the fire	O		
TD-083	11/8	12:21	AVL	0	39.803900	-121.581867	AVL	TD	fire on south side of Ishi Dr, only one fire on north side (detached garage on fire, mobile home burning under floor)	R		
TD-060	11/8	12:27	AVL	14	39.808500	-121.579350	AVL	TD	Fire hit old fire station in Old Magalia and trees pretty hard. Pine needles on metal roof ignite.	V		
TD-079	11/8	12:28	AVL	16	39.803254	-121.583125	AVL	TD	side panel of house on fire, houses igniting by ember ignitions	R		
TD-079	11/8	12:46	AVL	20	39.802787	-121.585373	AVL	TD	grass fires, not all homes burning yet	V		
TD-060	11/8	12:56	AVL	62	39.800715	-121.600447	AVL	TD	10 structures fully involved, fire moving house to house (S side of Andover Dr)	R		
TD-060	11/8	12:56	AVL	62	39.800954	-121.598777	AVL	TD	fire threatening structures	O		
TD-060	11/8	12:56	AVL	62	39.800586	-121.597584	AVL	TD	4 to 6 structures on fire	R		
TD-060	11/8	12:56	AVL	62	39.808038	-121.598450	AVL	TD	fire threatening structures	O		
TD-060	11/8	12:58	Radio Log	0	39.800960	-121.597524	AVL	Radio Log	fire at S Park Dr and Adrian Dr	O		
TD-040	11/8	13:00	Inferred	540	39.798283	-121.601389	TD	TD	some of first homes to ignite were on Achilles Dr and Andover Dr	R		
TD-060	11/8	13:03	AVL	8	39.799470	-121.604749	AVL	TD	flanking fire [in wildlands] behind homes on S Park Dr	V		
TD-079	11/8	13:09	AVL	3	39.803661	-121.582198	AVL	TD	all structures burning	R		
TD-079	11/8	13:24	AVL	13	39.798323	-121.602435	AVL	TD	some houses burning, could not access end of road	R		
TD-045	11/8	13:50	AVL	16	39.799450	-121.602817	AVL	TD	active fire near structures	V		
TD-113	11/8	14:00	TD	300	39.798536	-121.597654	TD	TD	fire burning upslope into Andover Dr	V		
TD-089	11/8	14:40	AVL	172	39.795999	-121.607217	TD	TD	just a small slop over the access road	V		
TD-089	11/8	14:40	AVL	172	39.791325	-121.617666	TD	TD	fire in drainage	V		

Magalia and Coutolenc Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-079	11/8	14:42	AVL	169	39.796295	-121.606723	TD	TD	active fire in drainage	V		
TD-084	11/8	14:48	AVL	161	39.794128	-121.623309	TD	TD	fire in drainage	V		
TD-041	11/8	14:55	Inferred	0	39.808416	-121.576810	TD	TD	edge of fire	V		
TD-085	11/8	14:57	AVL	157	39.798757	-121.603341	AVL	TD	fire hung up in drainage	V		
TD-045	11/8	15:00	Inferred	155	39.795334	-121.608407	TD	TD	Fire hung up on ridge behind houses	V		
TD-041	11/8	15:00	Inferred	0	39.811869	-121.590965	TD	TD	structures on east side of Andover Dr are already burned to the ground	R	x	
TD-126	11/8	15:00	TD	480	39.797181	-121.601162	TD	TD	wood piles, decks, fences, other detached combustibles burning, threatening structures	O		
TD-060	11/8	15:04	AVL	148	39.793906	-121.613192	AVL	TD	fire swung around below us	V		
TD-045	11/8	15:05	AVL	150	39.797597	-121.604738	TD	TD	Light fire behavior. Creeping fire	V		
TD-100	11/8	15:45	Inferred	15	39.808486	-121.588058	TD	TD	fire is burning on south side of dam and Andover Dr	V		
TD-143	11/8	16:30	Inferred	36	39.813108	-121.594710	TD	TD	destroyed structures	R	x	
TD-143	11/8	17:06	Photo	39	39.800196	-121.596171	TD	TD	house completely gone; well-past burning; firewood pile is burning	R	x	
TD-114	11/8	17:14	TD	166	39.815047	-121.590572	TD	TD	fire burning in area around SAV-MOR Foods	V		
TD-045	11/8	17:35	Inferred	0	39.796955	-121.616092	TD	TD	See well established 6 ha to 8 ha (15 ac to 20 ac) spot fire	S		
TD-060	11/8	17:42	AVL	33	39.802567	-121.597617	AVL	TD	fire threatening structures	O		
TD-060	11/8	18:17	AVL	276	39.805100	-121.595183	AVL	TD	fire backing up hill, flanking	V		
TD-045	11/8	18:20	AVL	156	39.804078	-121.595806	AVL	TD	Creeping fire behind structures	V		
TD-085	11/8	18:32	AVL	82	39.806330	-121.583206	AVL	TD	many structures already burned	R	x	
TD-079	11/8	18:34	AVL	119	39.806217	-121.583424	AVL	TD	fire threatening structures	O		
TD-089	11/8	18:38	AVL	412	39.805960	-121.585905	TD	TD	fire in drainage in heavy brush pushing uphill toward lshi Dr	V		
TD-089	11/8	18:38	AVL	101	39.805642	-121.584355	AVL	TD	several homes in area already burned	R	x	
TD-014	11/8	19:00	AVL	10	39.814181	-121.592112	AVL	TD	Significant fire push up draws	V		
TD-014	11/8	19:00	AVL	10	39.811020	-121.592326	TD	TD	Structures burning Andover Dr, South Park Dr, and along Skyway by Rite Aid; unable to drive into South Park Dr	R		
TD-143	11/8	19:11	Photo	0	39.800181	-121.596180	Photo	Photo	structure burned to foundation; no active fire visible	R	x	
TD-087	11/8	19:27	AVL	66	39.805977	-121.583638	AVL	TD	fire threatening structures	V		
TD-085	11/8	20:18	AVL	12	39.803817	-121.595483	AVL	TD	some houses already affected	R	x	
TD-089	11/8	20:20	AVL	202	39.805642	-121.584355	AVL	TD	fire threatening structures	V		
TD-087	11/8	20:37	AVL	41	39.805625	-121.584345	AVL	TD	fire threatening structures	V		
TD-043	11/8	21:00	Inferred	210	39.804939	-121.577902	TD	TD	approximate fire edge; burning south of Indian Dr	O		

Magalia and Coutolenc Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-045	11/8	21:03	AVL	255	39.808034	-121.576487	AVL	TD	Fire bumping driveway. Low-intensity fire. Fire burning south of here	V		
TD-015	11/8	21:09	AVL	54	39.815313	-121.570113	TD	TD	fire still across the West Branch and on Sawmill Peak	V		
TD-061	11/8	21:13	Radio Log	0	39.815423	-121.570155	Inferred	Radio Log	fire is still down in drainage backing into the wind	V		
TD-087	11/8	21:51	AVL	41	39.805625	-121.584345	AVL	TD	fire threatening structures	V		
TD-126	11/8	22:00	Inferred	60	39.797181	-121.601162	TD	TD	fire bumping structures along canyon rim; creeping fire, not extreme	V		
TD-087	11/8	22:55	AVL	156	39.805625	-121.584345	AVL	TD	fire threatening structures	V		
TD-126	11/8	23:00	Inferred	30	39.797096	-121.598801	TD	TD	fire coming up from canyon	V		
TD-084	11/8	23:12	AVL	142	39.807185	-121.593998	AVL	TD	fire fingering up into structures, leapfrogging burn-out operations, coming from drainage and canyon	V		
TD-061	11/8	23:23	Radio Log	0	39.832039	-121.573995	AVL	TD, Radio Log	spot fire up Coutolenc Rd 90 m to 180 m (200 yd to 300 yd) down and east of road; 0.8 ha to 1.2 ha (2 ac to 3 ac)	S		
TD-061	11/8	23:23	AVL	0	39.822151	-121.561335	AVL	TD	main fire burning on back side of Sawmill Peak, up high; Series of spot fires on ridge	V		
TD-126	11/8	23:23	TD-061	74	39.832298	-121.576802	TD	TD	fire up closer approaching homes	V		
TD-126	11/8	23:30	Inferred	0	39.819739	-121.573512	TD	TD	spot fire down in canyon, can't see it yet	S		
TD-007	11/9	00:00	TD	120	39.812419	-121.573191	TD	TD	fire ran up canyon into Magalia	V		
TD-209	11/9	00:07	AVL	66	39.812305	-121.575998	AVL	TD	fire starting to spread to ground but not fast; fire pushing up canyon	V		
TD-089	11/9	00:09	AVL	81	39.805642	-121.584355	AVL	TD	fire threatening structures	V		
TD-043	11/9	00:30	Inferred	30	39.817747	-121.579302	TD	TD	fire came over ridge, spotting	V		
TD-061	11/9	00:37	Radio Log	0	39.830473	-121.577872	AVL	TD	fire has crossed Coutolenc Rd. Well established, burning with the wind	V		
TD-061	11/9	00:53	Radio Log	0	39.815090	-121.573200	Radio Log	Radio Log	fire making major run across Coutolenc Rd	V		
TD-061	11/9	00:53	AVL	24	39.812883	-121.578283	AVL	TD	main fire front blew straight across Skyway at Coutolenc, estimated 22 m/s (50 mi/h). Wood guardrails igniting.	V		
TD-041	11/9	00:53	TD-061	24	39.814257	-121.576492	TD	TD	fire hits out of east canyon hard	V		
TD-125	11/9	00:53	TD-061	24	39.812793	-121.578158	TD	TD	fire coming up from canyon, strong wind; softball size embers; embers igniting houses	R		
TD-126	11/9	00:53	TD-061	24	39.813127	-121.577541	TD	TD	fire coming towards house, fire blows up	V		
TD-115	11/9	01:00	Inferred	60	39.812751	-121.578417	TD	TD	hit wall of fire on Coutolenc Rd	O		
TD-115	11/9	01:00	Inferred	60	39.812152	-121.578021	TD	TD	structure burning	C		
TD-040	11/9	01:00	TD	0	39.822559	-121.589547	TD	TD	find several acre spot fire established on west side of lake	S		

Magalia and Coutolenc Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-126	11/9	01:00	TD	60	39.812768	-121.578424	TD	TD	fire spreads west and north of Skyway	V		
TD-126	11/9	01:00	Inferred	60	39.813813	-121.585729	TD	TD	fire burning both sides Skyway north of Dogtown Rd; cannot get through	O		
TD-126	11/9	01:00	Inferred	60	39.815439	-121.589180	TD	TD	fire working uphill towards Lakeridge Cir from lake	V		
TD-060	11/9	01:03	AVL	32	39.807307	-121.593886	AVL	TD	300 to 400 spot fires starting in S Park Dr, Andover Dr, Endicot Cir, Altus Ct area. [fire came from Coutolenc Rd blow-up]. Fire coming to north end of Andover Dr from Little Butte Creek Canyon	V		
TD-041	11/9	01:14	Photo	0	39.820733	-121.587872	TD	TD, Photo	fire spotting to east side of Dogtown Rd along lake	S		
TD-041	11/9	01:14	Photo	0	39.820292	-121.580220	Photo	Photo	flames on the ridgetop	V		
TD-209	11/9	01:17	AVL	0	39.815404	-121.592327	AVL	TD	fire not quite to road; spot fires throughout businesses	S		
TD-045	11/9	01:18	AVL	0	39.811246	-121.568248	TD	TD	fire creeping down Sawmill Peak	V		
TD-045	11/9	01:19	AVL	120	39.812594	-121.578472	AVL	TD	Lots of spots. Tree stands torching. Fire came roaring up from the canyon. Spotting below Skyway and into Old Magalia	V		
TD-127	11/9	01:22	Photo	0	39.815722	-121.577526	Photo	TD	crown fire coming from the W Branch toward Coutolenc Rd	V		
TD-127	11/9	01:22	Inferred	27	39.821756	-121.587876	TD	TD	spot fires along west side Magalia Reservoir	S		
TD-127	11/9	01:22	Inferred	27	39.817219	-121.592681	TD	TD	fire	O		
TD-127	11/9	01:22	Inferred	27	39.812071	-121.588898	TD	TD	fire burning on Skyway/Dogtown Rd/dam	V		
TD-122	11/9	01:23	Photo	17	39.818067	-121.589767	Photo	Photo	fire	S		
TD-041	11/9	01:23	Photo	0	39.818286	-121.589932	TD	TD, Photo	spotty fire between Lakeridge Cir and Dogtown Rd	S		
TD-127	11/9	01:23	Photo	0	39.816533	-121.578257	Photo	Photo	30 m (100 ft) flames on the ridge	V		
TD-041	11/9	01:23	Photo	0	39.818000	-121.589667	Photo	Photo	surface fire in leaf litter	V		
TD-043	11/9	01:30	Inferred	0	39.807558	-121.579823	TD	TD	lots of scattered spot fires	S		
TD-087	11/9	01:33	AVL	113	39.808001	-121.578911	AVL	TD	fire hits crazy from water station. Fire pushed from the dam	V		
TD-040	11/9	01:33	Photo	0	39.818406	-121.590000	TD	TD	fire spotting / spreading into Magalia	S		
TD-089	11/9	01:44	AVL	102	39.809900	-121.583985	TD	TD	big push of fire from east; fire also came up drainage from west	V		
TD-127	11/9	01:45	TD	0	39.817810	-121.591917	TD	TD	fire coming hard toward Coutolenc Rd	V		
TD-209	11/9	01:48	Photo	0	39.819625	-121.591566	Photo	Photo	mass fire glow, significant fire from this area	V		
TD-209	11/9	01:48	Photo	0	39.820000	-121.590120	Photo	Photo	significant fire, glow, coming from drainage	V		
TD-209	11/9	01:48	Photo	0	39.818743	-121.591089	Photo	Photo	firebrand showers	O		
TD-061	11/9	01:49	Radio Log	0	39.811425	-121.587877	Radio Log	Radio Log	fire behavior is probably a 22 m/s (50 mi/h) wind burning straight over to Andover Dr	V		
TD-122	11/9	01:50	AVL	309	39.816250	-121.590383	AVL	TD	Subway shop is burning, and propane is venting	C		

Magalia and Coutolenc Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-040	11/9	01:51	Photo	0	39.811214	-121.590053	TD	TD	fire coming from little butte creek, north into Andover Dr/Skyway	V		
TD-041	11/9	01:51	Photo	0	39.818743	-121.591089	Photo	Photo	surface fire in pine/leaf litter	V		
TD-209	11/9	01:52	Photo	0	39.819212	-121.589838	Photo	Photo	fire, orange glow coming from canyon	V		
TD-041	11/9	01:53	Photo	0	39.819124	-121.591425	TD	TD, Photo	ground fires moving fairly quickly; flare-ups and ember cast from everything, 100 % ignition	V		
TD-041	11/9	01:54	Photo	0	39.818743	-121.591089	Photo	Photo	surface fire in pine/leaf litter; ladder fuels	V		
TD-041	11/9	01:54	Photo	0	39.818198	-121.590650	Photo	Photo	vegetation fire	V		
TD-041	11/9	01:57	Photo	0	39.818834	-121.591188	Photo	Photo	surface fire in pine/leaf litter; ladder fuels	V		
TD-109	11/9	01:58	AVL	94	39.816167	-121.590400	AVL	TD	Magalia Pines Baptist Church did catch fire at some point	C		
TD-041	11/9	01:58	Photo	0	39.818743	-121.591089	Photo	Photo	surface fire in pine/leaf litter; ladder fuels; lots of small embers through air and on road surface	V		
TD-061	11/9	02:00	AVL	84	39.813922	-121.592928	AVL	TD	all structures around here are burning; fire is burning across the "fairway"	R		
TD-061	11/9	02:00	AVL	84	39.815785	-121.595632	TD	TD	structure to structure fire spread	R		x
TD-060	11/9	02:08	AVL	176	39.817592	-121.591940	AVL	TD	fire around us, burning in eaves of Donut shop; unsavable	C		
TD-041	11/9	02:09	Photo	0	39.818850	-121.591692	Photo	Photo	spot fire in parking lot vegetation	S		
TD-084	11/9	02:10	AVL	174	39.817442	-121.591647	TD	TD	fire threatening structures	O		
TD-209	11/9	02:11	Photo	0	39.820144	-121.591938	Photo	Photo	well-established vegetation fire	V		
TD-041	11/9	02:20	Photo	0	39.819911	-121.592060	Photo	Photo	fire threatening structures	V		
TD-127	11/9	02:23	Photo	0	39.817277	-121.591326	Photo	Photo	large flames from structure or torching trees	O		
TD-041	11/9	02:24	Photo	0	39.818128	-121.592764	Photo	Photo	well established fire; possibly structures burning	O		
TD-041	11/9	02:28	Photo	0	39.820144	-121.591938	Photo	Photo	well-established vegetation fire	V		
TD-041	11/9	02:30	TD	60	39.806540	-121.602037	TD	TD	sounds like war zone with explosions; fire came into W Park area toward Pine Ridge School from east and south	V		
TD-143	11/9	02:30	TD	0	39.819394	-121.590539	TD	TD	fire approaching structure	V		
TD-041	11/9	02:36	Photo	0	39.820266	-121.592884	Photo	Photo	well-established vegetation fire	V		
TD-127	11/9	02:41	Photo	0	39.816879	-121.592792	Photo	Photo	structures fully involved; propane tanks venting	R		
TD-123	11/9	02:44	AVL	0	39.820120	-121.592755	AVL	TD	everything on fire	O		
TD-124	11/9	02:45	AVL	0	39.823850	-121.590583	AVL	TD	fire on both sides of Dogtown Rd	V		
TD-041	11/9	02:51	Photo	0	39.820252	-121.593127	Photo	Photo	heavy fire on parcel; vegetation, structure, fully involved	R		
TD-123	11/9	02:55	AVL	73	39.822098	-121.600180	AVL	TD	houses on fire, propane tanks exploding	R		
TD-127	11/9	03:09	Photo	0	39.817290	-121.591744	Photo	Photo	structure fully involved	C		



Magalia and Coutolenc Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-041	11/9	03:20	Photo	0	39.819299	-121.593102	Photo	Photo	fence burning, pine tree torching, right up against structure	O		
TD-041	11/9	03:22	Photo	0	39.819299	-121.593102	Photo	Photo	structure igniting on eaves from fence and pine tree	R		
TD-089	11/9	03:29	AVL	97	39.805642	-121.584355	AVL	TD	fire threatening structures	V		
TD-087	11/9	03:34	AVL	181	39.805625	-121.584345	AVL	TD	fire threatening structures	V		
TD-009	11/9	03:38	AVL	9	39.816263	-121.592633	AVL	TD	active structure fires	R		
TD-045	11/9	03:41	AVL	0	39.814356	-121.584692	AVL	TD	Area near the dam is destroyed, homes along Skyway fully involved	R		
TD-045	11/9	03:46	AVL	14	39.817283	-121.592250	AVL	TD	Fire still intense in area	O		
TD-041	11/9	03:51	Photo	0	39.820402	-121.594622	Photo	Photo	multiple parcels, structures, vegetation, vehicles, wood piles, all fully involved	R		
TD-045	11/9	04:04	AVL	5	39.818283	-121.594317	AVL	AVL	fire threatening structures	O		
TD-045	11/9	04:11	AVL	30	39.818383	-121.596650	AVL	AVL, TD, Inferred	fire threatening structures	O		
TD-045	11/9	04:50	AVL	5	39.818933	-121.593550	AVL	AVL	fire threatening structures	O		
TD-123	11/9	04:58	AVL	44	39.814650	-121.600083	AVL	TD	fire threatening structures	O		
TD-124	11/9	05:01	AVL	41	39.814383	-121.599867	AVL	TD	fire threatening structures	O		
TD-079	11/9	05:14	AVL	209	39.805047	-121.584566	AVL	TD	fire creeping up from canyon. Fire behavior had reduced; just residual fire from before	V		
TD-089	11/9	05:15	AVL	36	39.822211	-121.594354	AVL	TD	fire threatening structures	O		
TD-041	11/9	05:37	Photo	0	39.823670	-121.595660	Photo	Photo	structure fully involved, past peak; parcel mostly done burning	R		
TD-041	11/9	05:37	Photo	0	39.823412	-121.594865	Photo	Photo	structure fully involved; detached garage/shed burned to ground	R		
TD-084	11/9	05:38	AVL	128	39.825109	-121.597752	AVL	TD	mobile home vinyl melting	R		
TD-084	11/9	05:38	AVL	128	39.825782	-121.596645	AVL	TD	homes on fire	R		
TD-084	11/9	05:38	AVL	128	39.825786	-121.597587	AVL	TD	house, needles on roof ignite	R		
TD-084	11/9	05:38	AVL	128	39.822694	-121.603184	TD	TD	fire threatening structures	O		
TD-045	11/9	05:41	AVL	63	39.817383	-121.597117	AVL	AVL, TD, Inferred	fire threatening structures	O		
TD-060	11/9	05:45	AVL	78	39.825369	-121.597549	AVL	TD	fire threatening structures	O		
TD-127	11/9	05:52	Photo	0	39.816839	-121.598021	Photo	Photo	all structures north of Ponderosa; intense flaming, burned to ground	C		
TD-209	11/9	05:59	Photo	0	39.815479	-121.600513	Photo	Photo	structure fully involved	R		
TD-209	11/9	06:00	AVL	5	39.815816	-121.600570	AVL	TD	houses engulfed; intense fire	R		
TD-209	11/9	06:00	AVL	5	39.815590	-121.600796	AVL	TD	1.5 m x 1.5 m (5 ft x 5 ft) spot fire starting	S		
TD-209	11/9	06:00	AVL	5	39.815590	-121.600796	AVL	TD	propane tank explodes	O		

Magalia and Coutolenc Road

Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-127	11/9	06:00	AVL TD-209	0	39.815590	-121.600796	AVL TD-209	TD	fuel BLEVE	O		
TD-123	11/9	06:21	AVL	374	39.843081	-121.585436	TD	TD	fire making run toward houses in Rosewood Dr area	V		
TD-124	11/9	06:30	AVL	366	39.847069	-121.584623	AVL	TD	embers are still falling	O		
TD-087	11/9	06:47	AVL	115	39.844457	-121.583907	TD	TD	Fire creeping on side hill below streets. Multiple wood pile fires	V		
TD-087	11/9	06:47	AVL	115	39.846615	-121.585351	AVL	TD	fire threatening structures, woodpiles burning	O		
TD-128	11/9	06:57	Photo	0	39.815019	-121.601170	Photo	Photo	fire	O		
TD-128	11/9	06:57	Photo	0	39.815026	-121.601606	Photo	Photo	fence and vegetation burning	O		
TD-128	11/9	06:57	Photo	0	39.815659	-121.601912	Photo	Photo	structure fully involved	R		
TD-128	11/9	06:57	Photo	0	39.815426	-121.601728	Photo	Photo	structure fully involved	R		
TD-041	11/9	07:00	TD	180	39.825494	-121.596972	TD	TD	intense fire activity; like furnace	O		
TD-064	11/9	07:00	TD	30	39.807898	-121.603846	TD	TD	houses burned down, some still burning; W Park Dr/Ferguson Dr/Pueblo Dr loop	R		
TD-064	11/9	07:00	TD	30	39.804668	-121.599371	TD	TD	intense burning, cannot pass due to fire	O		
TD-128	11/9	07:05	Photo	0	39.815119	-121.601366	Photo	Photo	significant fire burning behind structure	O		
TD-060	11/9	07:07	AVL	29	39.823059	-121.600530	AVL	TD	fire threatening structures	O		
TD-205	11/9	07:09	AVL	2	39.816054	-121.598818	AVL	TD	Fire in crown on both sides of road	V		
TD-127	11/9	07:10	Inferred	0	39.812606	-121.597612	TD	TD	fire is flanking through S Park Dr area toward Pine Ridge School	O		
TD-202	11/9	07:20	AVL	4	39.813976	-121.603160	AVL	TD	drove through serious fire to get to safety of Pine Ridge School	O		
TD-128	11/9	07:20	AVL	0	39.813992	-121.603197	AVL	TD	fire blowing across Compton Dr from west	V		
TD-127	11/9	07:20	Inferred	0	39.812994	-121.598349	TD	TD	fire hits Pine Ridge School from the east	V		
TD-127	11/9	07:20	Inferred	0	39.814422	-121.604598	TD	TD	fire coming into Ponderosa Dr from south	V		
TD-128	11/9	07:21	AVL	84	39.813300	-121.601309	AVL	TD	1 school building on fire, Pine Ridge School	C		
TD-207	11/9	07:23	AVL	80	39.813000	-121.600883	AVL	TD	hotspots around Ponderosa Elementary School	O	x	
TD-205	11/9	07:24	AVL	80	39.813333	-121.600983	AVL	TD	fire is surrounding the Pine Ridge School	O		
TD-205	11/9	07:24	AVL	80	39.814391	-121.603115	AVL	TD	intense fire on north side of Pine Ridge School property	O		
TD-200	11/9	07:24	AVL	80	39.812291	-121.599922	AVL	TD	fire coming hard	V		
TD-205	11/9	07:32	AVL	20	39.813250	-121.599966	AVL	TD	Pine Ridge School: portable classrooms are smoldering and starting to ignite on corners	C		
TD-041	11/9	07:46	Photo	0	39.814910	-121.602640	Photo	Photo	structure fully involved	R		
TD-205	11/9	08:02	AVL	0	39.814416	-121.603962	AVL	TD	saw structures on Ponderosa igniting	R		
TD-041	11/9	08:18	Photo	0	39.817729	-121.602227	Photo	Photo	structure fully involved	R		
TD-203	11/9	09:33	AVL	8	39.815339	-121.600087	AVL	TD	all homes on Ponderosa Dr are engulfed	R		
TD-200	11/9	09:40	TD	41	39.817395	-121.605794	TD	TD	fire too intense, everything engulfed	O		
TD-200	11/9	09:44	AVL	16	39.815800	-121.605350	AVL	TD	propane tanks exploding; houses fully involved	R		

Magalia and Coutolenc Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-205	11/9	09:46	video	0	39.818750	-121.596648	AVL	video	all structures on east side of Pineland Cir loop are thoroughly burned down already	R	x	
TD-205	11/9	09:46	Photo	0	39.818725	-121.596641	Photo	Photo	all structures burned to foundation, minimal flaming rubble	R	x	
TD-200	11/9	10:21	AVL	15	39.815617	-121.605350	AVL	TD	fire threatening to burn entire block	O		
TD-205	11/9	10:40	AVL	0	39.814725	-121.606477	AVL	TD	Ponderosa Dr all on fire / houses burned down.	R	x	
TD-205	11/9	11:15	AVL	19	39.816778	-121.609948	AVL	TD	structure previously ignited/damaged	R	x	
TD-205	11/9	11:15	AVL	19	39.816613	-121.609884	TD	TD	house is burning	R		
TD-205	11/9	11:34	Photo	0	39.816610	-121.609938	Photo	Photo	structure collapsed, flaming; small vegetation spot fires scattered around	R	x	
TD-205	11/9	11:57	video	51	39.816533	-121.609500	video	video	several structures fully involved	R		
TD-205	11/9	11:57	Photo	0	39.816270	-121.609521	Photo	Photo	structure fully involved	R		
TD-207	11/9	11:58	AVL	66	39.817467	-121.608633	AVL	TD	fire threatening structure	O		
TD-207	11/9	11:58	Photo	0	39.816407	-121.609367	Photo	Photo	multiple structures around fully involved or collapsed; fire threatening surviving structure	R		
TD-128	11/9	12:00	Photo	0	39.817941	-121.608074	Photo	Photo	multiple structures at end of cul-de-sac are burning	R		
TD-128	11/9	12:00	Photo	0	39.817617	-121.608670	Photo	Photo	fire	O		
TD-205	11/9	12:36	Photo	0	39.815972	-121.608981	Photo	Photo	structure fully involved	R		
TD-205	11/9	12:36	Photo	0	39.816105	-121.609292	Photo	Photo	structure fully involved; propane/fuel tank venting	R		
TD-205	11/9	12:37	Photo	0	39.816105	-121.609292	Photo	Photo	propane tank venting	O		
TD-207	11/9	13:09	AVL	49	39.816967	-121.609850	AVL	TD	fire threatening structure	O		
TD-205	11/9	13:45	AVL	14	39.816533	-121.609500	AVL	TD	fire threatening structures	O		
TD-207	11/9	13:59	AVL	22	39.817200	-121.609383	AVL	TD	fire threatening structure	O		
TD-128	11/9	14:14	Photo	0	39.817973	-121.608184	Photo	Photo	structures on Stetson Ct igniting	R		
TD-128	11/9	14:14	Photo	0	39.817873	-121.608503	Photo	Photo	structure ignited, fire becoming well established on structure	R		
TD-128	11/9	14:14	Photo	0	39.818227	-121.607792	Photo	Photo	structure ignited, fire becoming well established on structure	R		
TD-128	11/9	14:14	Photo	0	39.818099	-121.608342	Photo	Photo	structure burning	R		
TD-128	11/9	14:14	Photo	0	39.818250	-121.608145	Photo	Photo	structure burning	R		
TD-207	11/9	14:50	AVL	70	39.817550	-121.608567	AVL	TD	fire threatening structure	O		
TD-205	11/9	15:26	AVL	49	39.820177	-121.604178	AVL	AVL, TD, Inferred	fire threatening structures	O		
TD-205	11/9	16:23	AVL	17	39.816533	-121.609500	AVL	TD	fire threatening structures	O		
TD-207	11/9	16:28	AVL	101	39.816883	-121.609867	AVL	TD	fire threatening structure	O		
TD-205	11/9	16:55	AVL	98	39.817400	-121.607283	AVL	AVL, TD, Inferred	fire threatening structures	O		

Magalia and Coutolenc Road												
Source #	Date	Time	Time Source	Obs Window (min)	Latitude	Longitude	Location Source	Info Source	Fire Behavior Observations	Type of Fire	Residual Fire?	SSI
TD-207	11/9	18:15	AVL	24	39.815650	-121.605467	AVL	TD	structure had burnt deck	R	x	
TD-205	11/9	19:40	AVL	73	39.816533	-121.609500	AVL	TD	fire threatening structures	O		
TD-082	11/9		TD	0	39.822323	-121.607479	TD	TD	structure fully involved	R		
TD-082	11/9		TD	0	39.821598	-121.607799	TD	TD	fire threatening structures	O		
TD-082	11/9		TD	0	39.821598	-121.607799	TD	TD	fire threatening structures	O		

## Appendix G. Technical Discussion Comments

Technical discussions often included statements or comments about the incident or WUI fire in general that were not directly related to establishing the incident timeline or linked to a specific observation. The comments came from a broad range of perspectives and contain a plethora of valuable observations from a range of different first responders.

The comments are included here as transcribed from the TD and include estimates of distances or lengths, generalized comments, and personal opinions.

The following are the ten categories used to sort the TD comments. Keywords were further used in each category to organize the TD comments.

1. Pre-Planning/Mitigation: efforts that are taken pre- or post-event to limit the loss of life and property in the event of a disaster. This includes egress, mitigation, notification, planning, and regulations.
2. Pre-Fire Hazard: any type of hazard that exists prior to and contributed to the wildfire event. This primarily consists of vegetation and fuel loads.
3. Fire Behavior: the way fuel ignites, flames develop, and fire spreads, including other related interactions of weather, topography, and fuels. This category includes but is not limited to ambient conditions, embers, flames, fire history, and vegetation.
4. Evacuation/ Notifications: protective actions in an emergency to help save lives of residents and first responders, for example by encouraging evacuations and limiting access to potentially dangerous or affected areas. This includes safety zones, planning, notifications, practice drills, egress, contraflow, hazards, and special needs.
5. Response: strategies of monitoring, confining, containing, point protection, and suppression in response to controlling a wildfire. This includes but is not limited to fire conditions, crews, firing methods, equipment, hazards, suppression, training, and water supply.
6. Operations: execution of a given set of tactical actions for containing/controlling a wildfire during the incident. This includes communication, coordination, equipment, resources related to needs, and availability.
7. High-Level/Other Agencies: coordination and mitigation efforts among federal, state, and local agencies. This includes but is not limited to multi-agency involvement or needs, coordination efforts, communications, and resource availability.
8. Equipment: equipment and personnel focusing on the use of specialized equipment, training, and tactics to effectively control, surround and eventually extinguish a wildfire.
9. Training: focused on quality of training, additional training needs, and equipment related to issues and preparedness throughout the event.
10. Other Responses: important comments that do not fall into the other nine categories.

The following tables include TD comments related to Pre-Planning/Mitigation (**Table 39**), Pre-Fire Hazard (**Table 40**), and Fire Behavior (**Table 41**) as they relate to the fire progression theme presented in this report. The remaining categories will be presented within the relevant NIST Camp Fire report.

**Table 39.** Pre-Planning/Mitigation Comments.

<b>TD</b>	<b>Keyword</b>	<b>Comments</b>
TD-084	research	urban sprawl into areas with fire history
TD-104	resources	need to provide more resources to both forest service and fire prevention/mitigation; I would pay \$100+ more in property tax to support FD
TD-128	TRA	Temporary Refuge Areas (TRAs) worked as they were supposed to
TD-055	TRA	TRAs were a plus, but concerned about where discussion is going. Pre-planned TRA is not ideal, it was last resort in this incident because so many people out on foot
TD-055	TRA	TRA is not a substitute for evacuation
TD-085	TRA	big beneficial lesson = TRAs; saved hundreds to thousands; make sure people know to get to them
TD-074	utilities	underground electric would be good
TD-014	utilities	underground utilities
TD-017	utilities	underground power lines would be good; benefits would be evacuations, trapped people, accessibility to locations and reduced ignitions.
TD-017	vegetation	roadway prep brush removal or grass buffer to remove roadside flame impingement on traffic
TD-017	vegetation	dry annual grass buildup along roadways. They're doing all this work to upgrade Clark Rd but [they're] going to plant dry annual grass along for erosion control that no one is going to maintain/clear
TD-017	vegetation	rural residents must be aware of fuel requirements for protracted/extended evacuations
TD-008	vegetation	brush grows back faster than new conifers, so untreated growth since previous fires results in very heavy brush, too dense for dozers
TD-008	vegetation	Area around Concow is experiencing fuel-type conversion: changing from timber to brush. Reentry of fire in high country is preventing regrowth of conifers.
TD-008	vegetation	Current landscape-level planning Butte county-wide all interconnects: beginning to connect fuel breaks (extensive county-wide fuel management projects)
TD-084	vegetation	behind on vegetation management—fire is probably the way to keep up, but there are houses and people in between
TD-084	vegetation	vegetation around house is a liability - but you want the veg for appearance
TD-090	vegetation	1970s-80s.... Environmentalists protested logging and shut it down; responsible logging would have resulted in significant amounts of fuel removal and reduced fire intensity
TD-090	vegetation	you cannot control the wind, but you can reduce fuel loading

TD	Keyword	Comments
TD-090	vegetation	millions of board-feet of wood have gone to waste due to disease, now it is fuel ready to burn
TD-088	vegetation	dozers are portrayed as the devil regarding environmental impact
TD-211	vegetation	need more fuel management
TD-202	vegetation	vegetation management not very good
TD-069	vegetation	in previous generations Paradise was not as forested; there should be regulations regarding vegetation in town
TD-084	vegetation	fuel treatments worked when fire behavior / wind reduced on day 2; understory and ladder fuel removal project (3 year project) completed 5 years ago; shaded fuel break [Magalia, 39.835482, -121.584838, TD-084-27]
TD-104	vegetation	need to clear vegetation along roadways
TD-087	vegetation	unless more fuels projects are enacted CA climate going to have more of these events
TD-090	vegetation	the state needs to look at regulations to enforce fuel clearing around homes
TD-014	vegetation	Road clearance of vegetation to avoid vehicle impingement
TD-033	vegetation	need better vegetation fuel breaks off the roadways; roads were not safe because of vegetation proximity
TD-114	vegetation	it's not that homes are too close, there is too much vegetation
TD-090	vegetation	lots of environmental restrictions prevent vegetative fuel management efforts
TD-087	vegetation	don't like the knee jerk reaction now for fuel management
TD-127	water	protecting a parcel is a multi-faceted endeavor; power generation, pumps and sprinklers for water, filling gutters with water (plugs), landscape management, including live animals for grazing
TD-041	water	need built-in water testing, air testing, and new air filters (station and on engines) are needed immediately at locations that are still staffed; this lesson seems to be re-learned after every fire event
TD-143	water	Del Oro system is on wells connected to PID by pipeline
TD-143	water	all Del Oro tanks were topped off to within 0.6 m (2 ft) from the top before the fire
TD-143	water	It was over a month before PID flushed their system; Del Oro started flushing very soon
TD-015	WUI	all existing infrastructure in county WUI areas is not adequate for WUI
TD-015	WUI	need a WUI "design fire" to evaluate worst case scenario for preparedness and design



**Table 40.** Pre-Fire Hazard Comments.

TD	Keyword	Comments
TD-206	clearance	trees within 1.5 m (5 ft) of houses; clearance huge issue
TD-011	conditions	if it was plastic...it melted; 6 major culverts (diameter of 1.2 m (48 in)) plus 60 to 100 minor culverts
TD-206	defensible space	domino effect from house to house; clearance huge issue (3 m to 6 m (10 ft to 20 ft) between houses)
TD-015	egress	long twisty roads as main travel routes
TD-008	embers	Super dense continuous brush, 2008 fires put 1000-hr fuels on the ground contributing to long-range spotting
TD-127	fences	plastic fence slats burning
TD-113	fuel model	typical California fuel model; extremely overgrown, thick, cannot walk through it
TD-035	infrastructure	culverts under road burned all the way through
TD-036	infrastructure	hundreds of plastic culverts burned out; both 1.5 m (5 ft) and 0.9 m (3 ft) diameters
TD-036	infrastructure	culvert burned, including plastic 413 kPa (60 psi) gas line inside - caused jet flame
TD-017	inspection	old/bad catalytic converters in poorly maintained cars; need better catalytic inspection
TD-123	pine needles	had to rake pine needles and fuels away from houses
TD-206	pine needles	older homes with dry wood siding, 7 cm to 10 cm (3 in to 4 in) deep pine needles on roof
TD-087	pine needles	pine needles ignite structure and then structure takes off
TD-016	pine needles	extensive needle cast, piles of needles eddying on decks, gathering in roof valleys
TD-079	regulation	neighborhood was super bushy, lots of trees, lack of maintenance. Trees conducting fire to homes made it hard; maintenance would have made big difference
TD-084	research	urban sprawl into areas with fire history
TD-045	structure	sheds may have caused many structures to ignite
TD-091	vegetation	don't use decorative bark next to your house
TD-017	vegetation	people want trees/brush next to house
TD-008	vegetation	extreme loading of 1000-hr fuels. Estimated 2.24 kg/m <sup>2</sup> to 3.36 kg/m <sup>2</sup> (10 ton/ac to 15 ton/ac), estimated 125 % timber overstock.
TD-045	vegetation	pine needle drop a few days before and during the fire
TD-090	vegetation	thick with dry needles; lots of fuel - noticing thick ground fuels more and more in fires
TD-128	vegetation	too much fuel
TD-201	vegetation	day 3...Station 35 was standing, covered with pine needles, gutters overflowing with needles from the wind prior to fire
TD-035	vegetation	Spring 2018 had lots of needle death; lots of Ponderosas in area are diseased
TD-127	vegetation	too much fuel, overgrowth and dead timber

TD	Keyword	Comments
TD-023	vegetation	0.9 m to 1.5 m (3 ft to 5 ft) tall dead brown grass in orchard; grass was mowed only at end of street
TD-017	vegetation	dry annual grass buildup along roadways; they're doing all this work to upgrade Clark Rd but they're going to plant dry annual grass along for erosion control that no one is going to maintain/clear
TD-008	vegetation	brush grows back faster than new conifers, so untreated growth since previous fires results in very heavy brush, too dense for dozers
TD-008	vegetation	area around Concow is experiencing fuel-type conversion: changing from timber to brush; reentry of fire in high country is preventing regrowth of conifers.
TD-084	vegetation	vegetation around house is a liability - but you want the vegetation for appearance
TD-090	vegetation	1970s-80s.... Environmentalists protested logging and shut it down; responsible logging would have resulted in significant amounts of fuel removal and reduced fire intensity
TD-090	vegetation	you cannot control the wind, but you can reduce fuel loading
TD-090	vegetation	millions of board-feet of wood have gone to waste due to disease, now it is fuel ready to burn
TD-014	vegetation	road clearance of vegetation to avoid vehicle impingement
TD-206	visibility	visibility a big issue, especially with speed of incident
TD-112	wind	cleaned out gutters but the wind kept refilling them
TD-035	wind	Pearson Rd; observed huge piles of needles deposited by wind; needles piling against homes
TD-127	windows	plastic window frames melt and glass panes fall out

**Table 41.** Fire Behavior Comments.

<b>TD</b>	<b>Keyword</b>	<b>Comments</b>
TD-061	conditions	underestimated fire behavior
TD-012	conditions	eerie still before the blow up
TD-090	conditions	extreme fire behavior; never saw anything like it
TD-090	conditions	complete blackness lasted about 10 minutes at a time
TD-090	conditions	door handle on transport was hot to touch through gloves; windows cracked from heat
TD-006	conditions	visibility out of Chico [Airport] during most of event was 0 m to 400 m (0 mi to 0.25 mi)
TD-006	conditions	air attack was not very effective due to smoke and wind
TD-203	conditions	fire moving so fast; had to reach into "toolbox" to come up with creative ways to hold
TD-203	conditions	not much stopping fire on first night
TD-011	conditions	if it was plastic...it melted; 6 major culverts (diameter 1.2 m (48 in)) plus 60 to 100 minor culverts
TD-076	conditions	even with hours of notice, there still would have been casualties
TD-022	conditions	stopped being a vegetation fire when it hit Pentz Rd
TD-113	conditions	green vegetation was nuking
TD-113	conditions	felt like blow dryer right in the face
TD-002	conditions	flames up to 15 m (50 ft) high; 22 m/s (50 mi/h) wind from north; embers size of golf balls
TD-090	conditions	felt nothing could have been done to stop the fire
TD-079	conditions	ignition component near 100
TD-005	conditions	seemed like things became well involved or uncontrollable faster than normal (all day long you see spot fire on roof, turn around to get handline, turn back and structure is a quarter involved.
TD-014	conditions	some areas were re-burned later in the day
TD-017	conditions	fuel, topography, and weather all aligned for this event.
TD-113	conditions	Poe Fire burned north during the day and south at night
TD-056	conditions	visibility in Paradise was restricted, could see the bus in front but not much further
TD-020	embers	truck windshield broken by flying ember; dinner-plate-sized chunk
TD-014	embers	embers were biggest issue.
TD-017	embers	pine needles very susceptible to embers; there was significant ember cast.
TD-008	embers	super dense continuous brush, 2008 fires put 1000-hr fuels on the ground contributing to long-range spotting
TD-087	embers	quarter size ember showers
TD-015	embers	paper-sized embers landing in Chico (observed 19:00)
TD-022	embers	massive spotting, fire well established into vegetation

TD	Keyword	Comments
TD-022	embers	after spotting, fire would back-fill into unburned areas
TD-127	embers	only true fire front was overnight at Coutolenc, everything else was spot fires
TD-013	embers	surprised by speed of initial growth of spot fires
TD-027	embers	fire spotting at least 400 m (0.25 mi) across Lake Oroville
TD-110	embers	ember wash from homes was heavy and long lasting
TD-042	embers	spotty fire behavior allowed use of TRAs, unlike the Carr Fire which was a wall of flame
TD-002	embers	ember landed 9 m (30 ft) up in tree and was glowing for 2 to 3 days
TD-026	embers	glowing dime-sized embers landing on street as evacuating
TD-026	embers	pinecones catch fire and explode embers
TD-006	embers	secondhand story: spot fire in juniper, went to get line, return and fire had spread to attic and entire bush (on Merrill Ln)
TD-063	embers	some spot burns on the inside of vehicle from embers
TD-100	embers	spot fires could have been put out easily, all fires start small
TD-014	flames	91 m (300 ft) flame lengths burning out of the Honey Run Canyon
TD-008	flames	In Concow area, timber/brush 3 m to 4.5 m (10 ft to 15 ft) tall, 18 m to 24 m (60 ft to 80 ft) flames
TD-079	flames	3 m to 4.5 m (10 ft to 15 ft) flames laying to ground
TD-084	flames	propane tanks exploding; 150 m (500 ft) flame lengths reigniting trees, fuels
TD-084	flames	90 m (300 ft) flame lengths off timber, 6 m to 9 m (20 ft to 30 ft) off brush; flames laying over with the wind; what structure can survive this?
TD-012	flames	houses feet with 60 m (200 ft) clearance burned due to horizontal flame lengths in wind
TD-129	hazards	falling trees may have knocked down power lines
TD-011	hazards	Pearson Rd and Skyway traffic light pole/signal sagged and melted onto roadway (steel pole)
TD-011	hazards	light pole arm at Pearson Rd and Recreation Dr deformed and sagged
TD-066	hazards	power poles start burning at the bottom, middle, and cross tees
TD-076	hazards	melted/singed shirt sleeve on side of vehicle it was so hot
TD-071	hazards	powerlines down everywhere
TD-110	hazards	surprised how fast power poles and lines came down in Concow
TD-126	hazards	needles falling on homes would ignite
TD-026	hazards	wood chips still smoldering in yard on November 11
TD-090	hazards	saw trees snapped off 6 m to 9 m (20 ft to 30 ft) above ground
TD-085	hazards	put out fires on his vehicle multiple times

TD	Keyword	Comments
TD-069	fire history	1936 or 1944 fire in southern part of town with same burn scar as 2018 fire
TD-079	fire history	we were told at the Thomas Fire this was once in a career fire behavior; followed by Carr; followed by Camp.
TD-081	fire history	wasn't like any other fire
TD-085	fire history	thousands of structures burning, cars blocking access, Armageddon-type behavior – civilians didn't help situation
TD-089	fire history	never seen this type of fire behavior in 17-year career
TD-061	fire history	10 years ago, [2008 Butte lightning fires] fire took 3 to 4 days to progress from Concow to West Branch
TD-079	fire history	fire behavior similar to Carr Fire
TD-060	pine needles	pine needles blowing and igniting on roofs
TD-087	pine needles	pine needles ignite structure and then structure takes off
TD-085	conditions	number of runs and intensity were unprecedented
TD-022	structure	structure-to-structure fire spread
TD-127	structure	fire front lasted about 40 minutes due to nearby structures burning
TD-127	structure	framed OSB houses under construction survived only because no ground vegetation around
TD-127	structure	composite materials can burn as severely as natural materials (e.g., decking and wood)
TD-026	structure	tile roof and \$2000 ember vents; wood eaves, cedar fence; stucco survived but framing burned out
TD-045	structure	sheds may have caused many structures to ignite
TD-106	topography	terrain did not help because there was a lot of lava cap rock, not soil; hard to make line through the rocks
TD-061	topography	different fire behavior on lee-sides and drainages
TD-012	topography	took only 40 minutes from fire crossing Butte Creek Island to come up the walls of Doe Mill
TD-037	topography	seems like structures in draws survived; fire blew right over topography; 2 houses on Malibu Dr that survived are down in draw
TD-055	topography	Helltown had same terrain, same winds, but fire behavior was different; if it had been the same, we would have died
TD-014	vegetation	ground fuels burned first, winds shifted, then burned up trees.
TD-028	vegetation	vegetation fuel in Flea Canyon near Pulga probably contributed to lots of embers when it burned quickly
TD-084	vegetation	fuel treatments worked when fire behavior / wind reduced on day 2; understory and ladder fuel removal project (3 year project) completed 5 years ago
TD-100	wind	wind howling, didn't shift until afternoon
TD-079	wind	erratic winds 7 m/s to 9 m/s (15 mi/h to 20 mi/h), gusts to 13 m/s (30 mi/h)

TD	Keyword	Comments
TD-087	wind	purely wind driven with high fuel loading; terrain played a part
TD-061	wind	wind driven fire; fuel wasn't grass or brush or timber - it was houses
TD-090	wind	wind blowing crazy, then would clear up a bit, back and forth visibility
TD-090	wind	weird how the wind was shifting/spinning around
TD-211	wind	crazy wind speed; watched power poles snap from wind
TD-091	wind	winds were strong
TD-092	wind	nothing worked because of the wind
TD-129	wind	wind was blowing over trees
TD-006	wind	15 m/s to 25 m/s (30 kt to 50 kt or 34 mi/h to 57 mi/h) is critical wind limit for fixed wing operations
TD-006	wind	erratic winds shut down fixed wing operations around 08:00 on November 8
TD-041	wind	erratic winds and smoke conditions constantly changing
TD-076	wind	winds were strong the whole day
TD-086	wind	Butte is known for Jarbo winds; fire burning north all day will switch and reverse more intense back toward the valley in the afternoon
TD-022	wind	creeping fire, then flared up with wind gust
TD-116	wind	gusting winds caused bellowing effect on fire
TD-043	wind	wind was strong enough to blow off helmet (in field at Merrill Rd at 08:30 on November 8)
TD-127	wind	called for rescue, but explosions and extreme fire behavior prevented access; wind 9 m/s to 13 m/s (20 mi/h to 30 mi/h), bushels of pine needles burning
TD-106	wind	with wind, not a whole lot you can do with this fire
TD-047	wind	lots of people don't know how close the fire came to burning the whole county; wind shift could have blown it straight to Oroville
TD-081	wind	down-canyon winds normal for midnight ... morning to early afternoon up canyon, then settles late evening, midnight to 02:00 winds reverse strong; happened summer 2018 fire up in Magalia, same thing during 2008 Concow fire
TD-084	wind	2 to 3 city block diameter whirls
TD-084	wind	hard to survive intense fire, > 27 m/s (60 mi/h) winds and tornados – cannot defend