

Storrie PAC Underburn Apparatus Burn Damage

Facilitated Learning Analysis



"In the past I wasn't a fan of SCBAs, now I am."

District Engine Captain

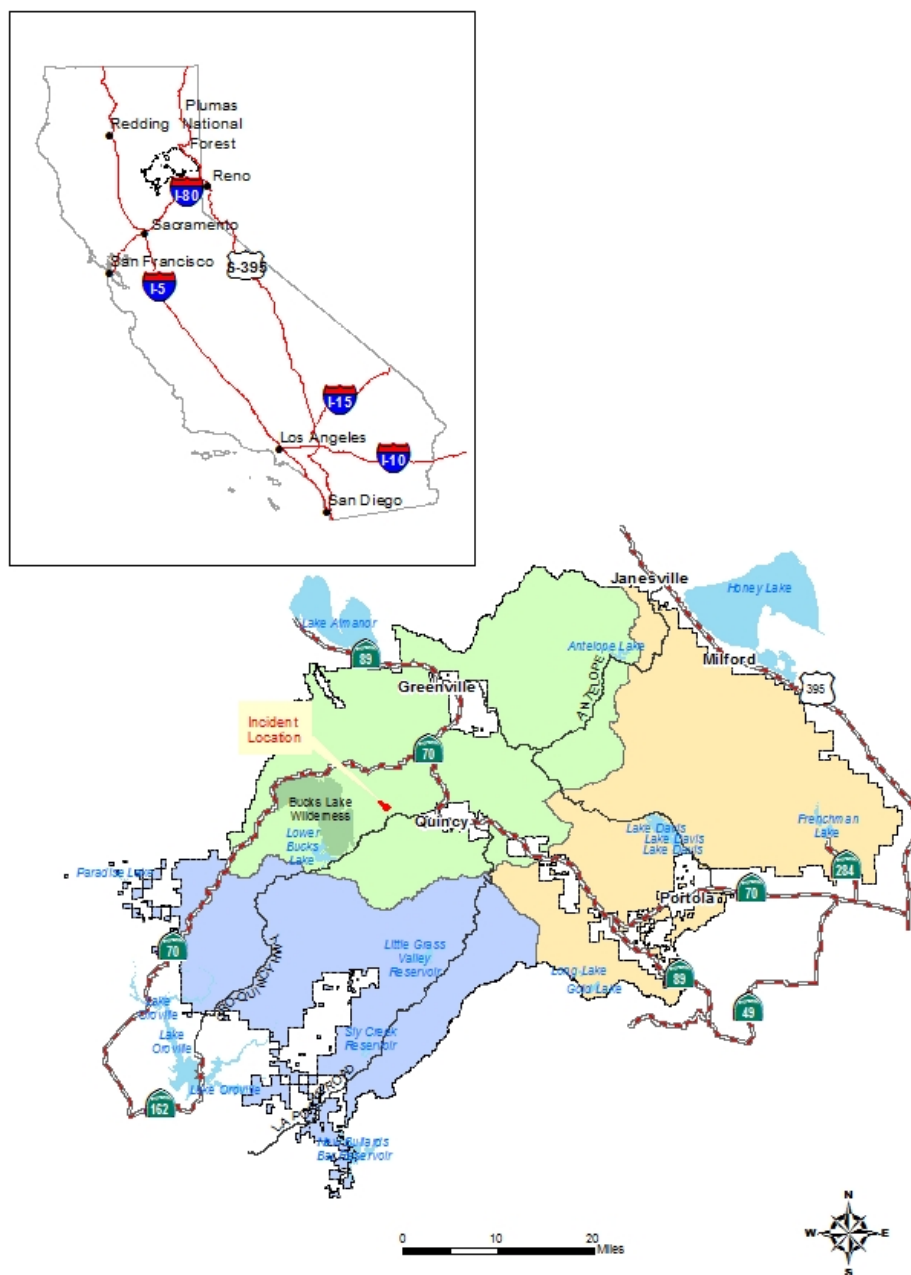
Plumas National Forest



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1. Introduction

On May 30, 2018 a Plumas National Forest engine (E-1) was notified it would be assigned to the Storrie PAC¹ Prescribed Fire Underburn the following day. Captain E-1 agreed to fill the position of Holding Boss on the project and arranged for additional engine crewmembers to come in on their day off to cover on the engine. The engine crew had just begun their 7 day staffing pattern for the season.

2. Summary

On May 31, 2018 at approximately 1400 hours, a Forest Service Model 326 engine sustained significant fire damage while working on a prescribed fire underburn. The engine crew was assigned to assist in a holding operation for the day. While performing a “rolling and holding” operation along a narrow National Forest System road, the engine operator parked the engine in a small turnout. She then began to grid for spot fires in the green. A spot fire ignited below the turnout on the north side of the road and ran up the slope to where the engine was parked. The driver’s side rear wheel well ignited and the fire spread to the water tank and compartments of the apparatus. Resources on scene of the prescribed fire responded to suppress the apparatus fire. A crewmember was transported to a local hospital and was treated for smoke inhalation.

3. Background

The Storrie PAC Underburn was a District priority project. Firefighters attempted to burn Storrie PAC Unit 7 a week prior, but were unsuccessful due to high fuel moisture. A warming trend dried out fuels and the District Fuels Battalion took advantage of the burn window. The plan for Unit 7 was to clean up 40 acres previously burned before completing the 200 acre unit.

Modules struggled to maintain a consistent training schedule due to staffing shortages and personnel being shifted around to achieve 7 day staffing following the absence of a Spring Fire Hire. Captain E-1 is a seasoned firefighter who has been working on the engine since 2008. The Fire Engine Operator position is filled with a detailer from another engine on the district. The Assistant Fire Engine Operator has been working on the engine for 2 years and is out of town for the week. The Apprentice Senior Firefighter has been with the module for three years and has a commercial driver’s license and is working on an Engine Operator Taskbook. E-1 is staffed with 3 temporary firefighters. Two are returnees who are beginning their second season on the engine and one is brand new to the position.

“Four different start dates for temps.. How do you get consistency with that? Not recognizing the pressure we put on our crews is a direct cause of what happened that day.”

District Fire Management Employee

¹ Protected Activity Center

4. The Setting

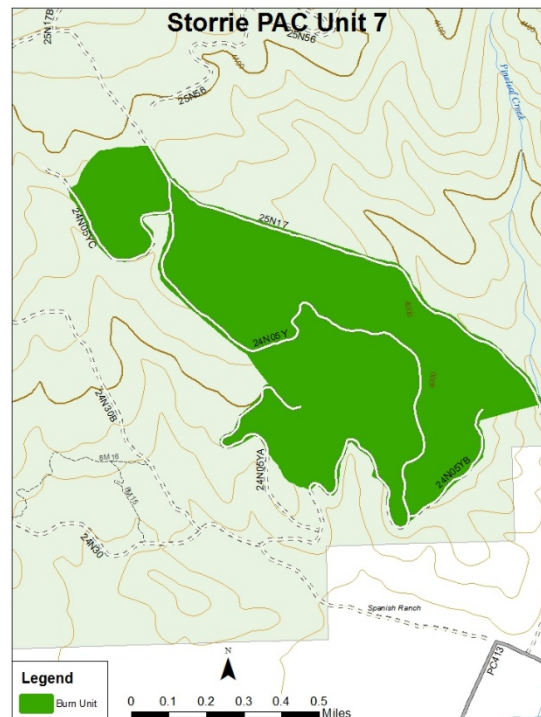
The Plumas National Forest is situated on the northern end of the Sierra Nevada Range in Northeastern California. Beginning in the foothill country, the Plumas NF extends through heavily timbered slopes into the rugged high country. The Storrie PAC Underburn is located near the small community of Meadow Valley west of Quincy, California on the Mt. Hough Ranger District. Storrie PAC Unit 7 is located adjacent to a narrow unpaved National Forest System Road, numbered 25N17. The fuels in the unit consist of mixed conifer, timber litter, brush, and hand piles.

The Spot Weather Forecast on May 31, 2018 called for partly cloudy skies with temperatures of 61-66 degrees Fahrenheit. Relative Humidity is predicted at 27-32 percent and winds are predicted out of the south at 4-8 mph with ridgetop and transport winds out of the southwest at 15 mph.

5. The Story

The crew of E-1 arrive at work at 0930 on Thursday, May 31, 2018 and complete their morning duties and engine checks. Captain E-1 is assigned as the Holding Boss for the underburn and will not be working on the engine. The Fire Engine Operator fills the roll as Engine Boss (ENGB) and the Apprentice Senior Firefighter next in command is now the Engine Operator (ENOP). Two additional crewmembers, FF-1 and FF-2, come in on their day off to staff the engine. A third firefighter, FF-3, is also staffed on the engine. Due to the personnel working their scheduled day off, FF-1 is left without a radio for the day. The Watertender, who works under Captain E-1, is staffed with an operator and a temporary firefighter, FF-4.

E-1 and the Watertender leave the station at 0935 and travel out to Storrie PAC Unit 7 for the 1030 briefing. The briefing is held at the top of the 25N17 Road. It is a standard briefing covering weather, communications, driving, hazards, and assignments. The underburn is staffed with three engines, a watertender, a handcrew, and miscellaneous single resources. E-1 is assigned to hold along the 25N17 Road and volunteer to take weather observations. A test fire is initiated in Unit 7 at 1105 and is successful. The Firing Boss requests additional lighters from the Holding Boss early on. The ENGB sends the ENOP, FF-1, and FF-3 to help with firing knowing he can pull them back to help with holding as they progress through the unit. The ENGB, FF-2, and FF-4 stay back to hold the line on the 25N17 Road and grid for spot fires in the green.



Around noon, conditions begin to change. The wind is picking up and fire behavior in the unit is increasing. Shortly after noon, FF-4 finds the first spot fire of the day. It is a small 5 feet x 5 feet spot approximately 150 feet in the green on the north side of the 25N17 Road. FF-4 works to suppress the spot fire while the ENGB requests his three crewmembers return back to holding. The ENOP, FF-1, and

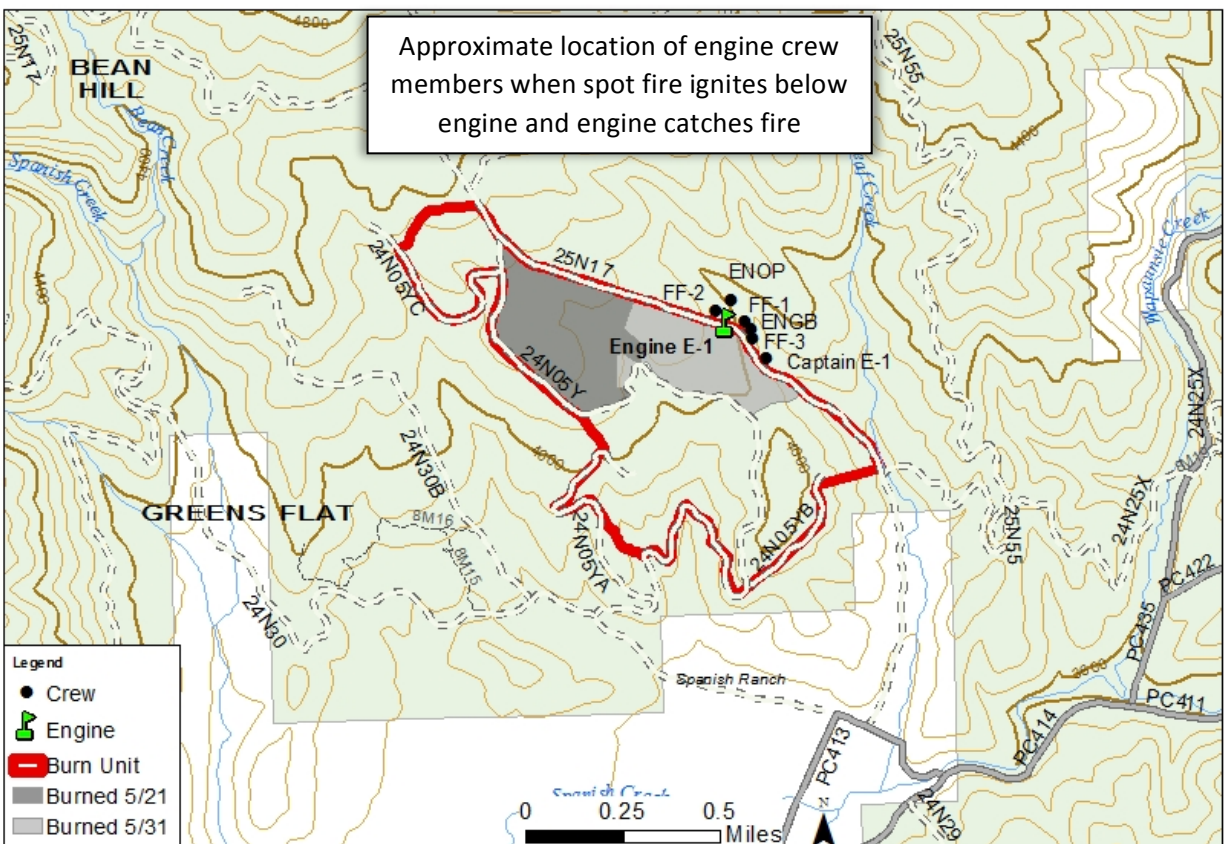
FF-3 head back to the engine and fill backpack pumps before tying in with the ENGB and FF-4 at the spot fire. The spot fire is quickly lined and suppressed. The ENGB instructs the crew to continue a grid 150 feet in the green for spot fires. There are now 6 people holding along the 25N17 Road.

The ENOP heads back to the engine after assisting with the spot fire. At 1220, FF-4 notices the base of a large tree burning near the road inside the unit. The ENOP moves the engine down the road to deliver water to FF-4. After the heat in the burning tree is knocked down, the ENOP decides to move the engine further down the road to stage it closer to where the lighters have progressed to. FF-4 heads back out to grid near the first spot fire. The ENOP drives down the road and comes upon a group of vehicles parked in a turnout. At 1240, she pulls the engine off the road approximately 20 feet northwest of the turnout and eats her lunch. She plans to park the engine in the turnout once the vehicles move. The vehicles leave around 1300 and she moves the engine into the turnout. The ENGB, FF-1, and FF-3 regroup at the engine with ENOP.

"I parked in the exact same spot earlier."

Division Chief

At approximately 1310, the ENGB, ENOP, and FF-1 find the second spot fire of the day and put handline around it. It is a small 1 foot x 1 foot spot fire below the 25N17 Road near the turnout. Shortly after, they notice a gust of wind push a large amount of embers over the road into the green. At 1400 the ENGB, ENOP, FF-1, and FF-3 line back out to grid for spot fires. The ENOP heads back into the green north of the engine toward FF-2. FF-1 lines out below the ENOP, followed by the ENGB, and then finally FF-3. FF-2 and FF-4 are still gridding near the first spot fire northwest of the engine's new location.



FF-1 begins gridding 150 feet into the green. Approximately five minutes into her grid, FF-1 glances back toward E-1 and sees flames. Unable to make out where they are coming from, she heads back toward the road. As she gets closer, she sees flames below the engine. At approximately 1413, FF-1 yells “Spot!”. She hurries to the road and sees the tire and the side of the engine are on fire. She yells “Spot!” a few more times and is unaware if or when anyone will arrive to help her. Unfamiliar with how to move the engine or run the pump, FF-1 is unable to safely take suppression action on the fire. She runs down the road to grab a staged backpack pump and sees a vehicle coming up the road. She begins waving her hands to flag it down.

Another firefighter (FF-5) who was patrolling the 25N17 Road and running fuel, is heading back up the road when he sees FF-1. He realizes E-1 is on fire and drives his vehicle past it and parks. He sees it is safe for him to get into the driver’s seat of E-1 and is able to start the engine and move it forward away from the spot fire. He makes it approximately 150 feet down the road when the brakes lock up and the vehicle stops moving. He gets out of the engine and grabs a backpack pump that is lying on the side of the road and begins spraying into the wheel well in an attempt to knock the fire down. FF-1 has another backpack pump and is spraying the tire. Realizing their attempts are going to be unsuccessful, FF-5 runs up the road to get the Watertender that is parked at the briefing spot. FF-1 continues to spray the tire, but it isn’t going out.

The ENGB is gridding in the green when he hears FF-1’s first yell. He knows something is wrong. He hears the engine moving and heads back toward it. He gets within approximately 150 feet of the road and sees the engine is on fire. The ENGB calls Captain E-1 on his radio and says, “The engine is on fire, I need help”. He makes it to the road and sees FF-1 spraying a backpack pump on the tire and immediately tells her to get back. The ENGB sees a parked utility truck (FF-5’s vehicle) and moves it forward away from the engine. He climbs into the engine, engages the pump, and then walks back around to the rear of the engine and opens the live reel compartment. He hears the tire blow out and backs out believing there is nothing more he can do.

Around 1420, FF-5 makes it back down to E-1 with the Watertender and other firefighters are beginning to arrive at the scene. A hose line is set up off the Watertender. The ENGB sprays water on E-1 from a distance, but it is ineffective. Captain E-1 arrives at the engine and assumes the role of Incident Commander. The crew of another engine working on the project, E-2, hear the radio traffic and hike down to the road from where they have been firing. Their AFEO has retrieved their engine from the briefing spot. Captain E-2 instructs the ENGB and his AFEO to get into turnouts and don SCBA’s. Captain E-2 sees the ENOP from E-1 and instructs her to run the pump on E-2. They begin suppressing the engine at 1435. It takes approximately 30 minutes and 2000 gallons of water to fully extinguish the apparatus fire.

***“This was my first time extinguishing an Engine.
A lot of crackling and popping.”***

District Engine Captain

After leaving her crewmembers at the turnout, the ENOP walks into the green on a small two track that runs perpendicular to the 25N17 Road. She meets up with FF-2 who had been gridding the area and goes over the weather observations with her before heading out another 50 feet into the green to get a better view from the ridge. She scans the area for spot fires and then turns back toward the engine. About that time, she hears over the radio that E-1 is on fire. She runs back toward the engine and sees the spot fire below the turnout. E-1 has been moved down the road and is on fire. The spot fire is backing down the slope and she helps to secure it with handline before being asked to operate the pump on E-2.

“If I knew there was going to be a spot fire there, I would have moved the engine.”

ENOP



“Was this preventable? Absolutely.”

District Engine Captain

With the fire now extinguished, Captain E-1 gathers his crew together. FF-1 appears to be suffering from smoke inhalation and the decision is made to transport her to the hospital to get checked out. At 1600, the District Division Chief transports her to the local hospital in Quincy. Although they did have a plan in place for a medical emergency, the Division Chief decided he could transport FF-1 to the hospital quicker, based on their remote location and FF-1's non-critical condition. While waiting for the tow truck, the crew of E-1 overhauls their engine and transport equipment back to their station in a utility truck. The tow truck arrives on scene at 1738. The crew departs the incident at 1800 and return to quarters.

***"If this was the worst day of my career,
that will be alright."***

ENGB

The Burning Operation:

The Burn Boss and Burn Boss Trainee, who are local to the area, complete their burn plan checklists and brief resources on scene of Storrie PAC Unit 7 Underburn. The Firing Boss lines 14 lighters out across the top of the unit. The test fire is initiated and ground fuels are receptive to ignition. Lighters clean up the area previously burned before continuing their firing operation through the unit. The Firing Boss has resources lighting in a flanking pattern and burning progresses well following the test fire. The fire carries through the ground fuels creating positive fire effects and meeting objectives. Onsite weather observations are taken and documented. Observations are similar to weather conditions predicted in the Spot Weather Forecast and to those observed at the nearest RAWS station.

Around noon, fire behavior begins to increase and the lighters slow down following the discovery of the first spot fire. The Burn Boss, Burn Boss Trainee, and Firing Boss hear the initial call of the apparatus fire over the radio at approximately 1415. They halt all firing operations in the unit and begin making notifications. At this time, an uncommitted District Battalion Chief takes over as Holding Boss on the project and the Firing Trainee takes over as Firing Boss. Several of the firing resources respond to assist with the suppression of the spot fire and apparatus fire. The remaining firing resources cut handline to secure the underburn. The Storrie PAC Unit 7 Underburn is contained to approximately 60 acres.

6. The Timeline

Time	Description of Events	Source
0930	Crew of E-1 comes on duty	E-1 crew
0935	E-1 and crew departs station to Storrie PAC	"
1005	E-1 arrives at Storrie PAC briefing spot	"
1025	Briefing begins	"
1100	Briefing concludes	"
1105	E-1 crew and Watertender crew brief. Test fire is initiated	"
1113	E-1 crew and Watertender crew asked to assist with lighting	"
1200	ENGB and FF-4 find Spot fire #1 a 5X5 spot	"
1205	E-1 crew regroups at spot	"
1210	E-1 crew mops up spot #1	"
1215	E-1 crew is holding	"
1220	FF-4 finds cat face on fire, ENOP moves E-1 to assist	"
1240	E-1 is parked 20 feet northwest of incident site	"
1300	E-1 is moved to incident site, parked in turnout on green side of the road	"
1310	ENGB, ENOP, and FF-1 find spot #2	"
1315	Firing pattern changed to dots	"
1350	E-1 crew holds mini briefing	"
1400	E-1 crew gridding for spots in the green	"
1413	FF-1 sees spot #3, she yells "Spot Fire" and arrives at E-1 with Backpack Pump, FF-5 arrives and moves E-1 150' east, FF-1 sprays left rear tire with Backpack Pump	"
1415	FF-5 leaves on foot to retrieve Watertender, ENGB arrives on scene and advises Captain E-1 that engine is on fire, firing in the unit is stopped	"
1416	ENGB attempts to suppress fire with E-1's pump, tire blows and he retreats	"
~1418	Captain E-1 assumes role of Incident Commander	"

1420	FF-5 arrives in Watertender	“
~1423	District Division Chief on scene	“
1425	E-2 on scene	“
~1427	Captain E-2 Assumes Role of Operations	Captain E-2
1430	Captain E-2 requests ENGB and AFEO E-2 to don SCBA gear	“
1435	Fire suppression of E-1 begins	“
1451	Tow truck requested	“
1505	E-1 fire is extinguished	“
1600	District Division Chief takes FF-1 to hospital	“
1738	Tow Truck arrives on scene	“
1800	E-1 crew departs project en route to station	“
1830	E-1 crew in quarters	“
1900	E-1 crew off duty	“

The ~ mark in the “Time” column indicates an estimated time.

7. Lessons Learned

- ❖ Teach all Employees on Engines how to drive and pump with engine
 - ❖ Cut line around your vehicle if you feel it is in a bad spot
 - ❖ ENOP should stay within sight of Engine if possible
 - ❖ It didn’t take a lot of heat to catch the Engine on fire
 - ❖ Had they not had SCBAs, it would have been difficult to safely suppress the Apparatus fire
 - ❖ Have enough holders for a large area
 - ❖ Have enough burners to get job done. Don’t rely on holders to burn
 - ❖ Burn piles first then reenter to do broadcast
 - ❖ Keep holders for holding don’t switch roles
 - ❖ Provide enough time to train entire crew before being available for projects
 - ❖ Always be proactive, plan for worst case scenario
 - ❖ Discuss with crew what to do if your engine catches fire
 - ❖ Report critical information on the Tac channel
 - ❖ Plan to have firefighters available to take over key positions in the event of an Incident Within an Incident occurs
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8. FLA Team Observations

- ❖ All personnel on the Storrie Pac Underburn were qualified for the position they held.
- ❖ All personnel met work/rest guidelines.
- ❖ All engines that were looked at were carrying fuel in the unvented left rear compartment, not in vented compartment on the right side.
- ❖ 20-pound fire extinguisher is no longer carried on Engine tailboard.

Questions

- ❖ Do you train all of your crew how to drive and pump with the engine?
- ❖ Do you have an SOG that the ENOP is always in site of the engine?
- ❖ Have you trained on how to suppress an Engine on fire?
- ❖ Do you conduct fire extinguisher training to raise awareness of fire extinguisher capabilities?

9. FLA Team Members

Janine Book, District Ranger, Lassen National Forest

Peter Tolosano, Retired Assistant Director for Risk Management, Pacific Southwest Region

Karen Juska, Safety Officer, Plumas National Forest

Jesse Loeffler, Engine Captain, Shasta-Trinity National Forest

Jesse Brunk, Battalion Chief, Shasta-Trinity National Forest

Jody Williams, Union Representative, Plumas National Forest

Courtney Wood, Fire Prevention Technician, Plumas National Forest
