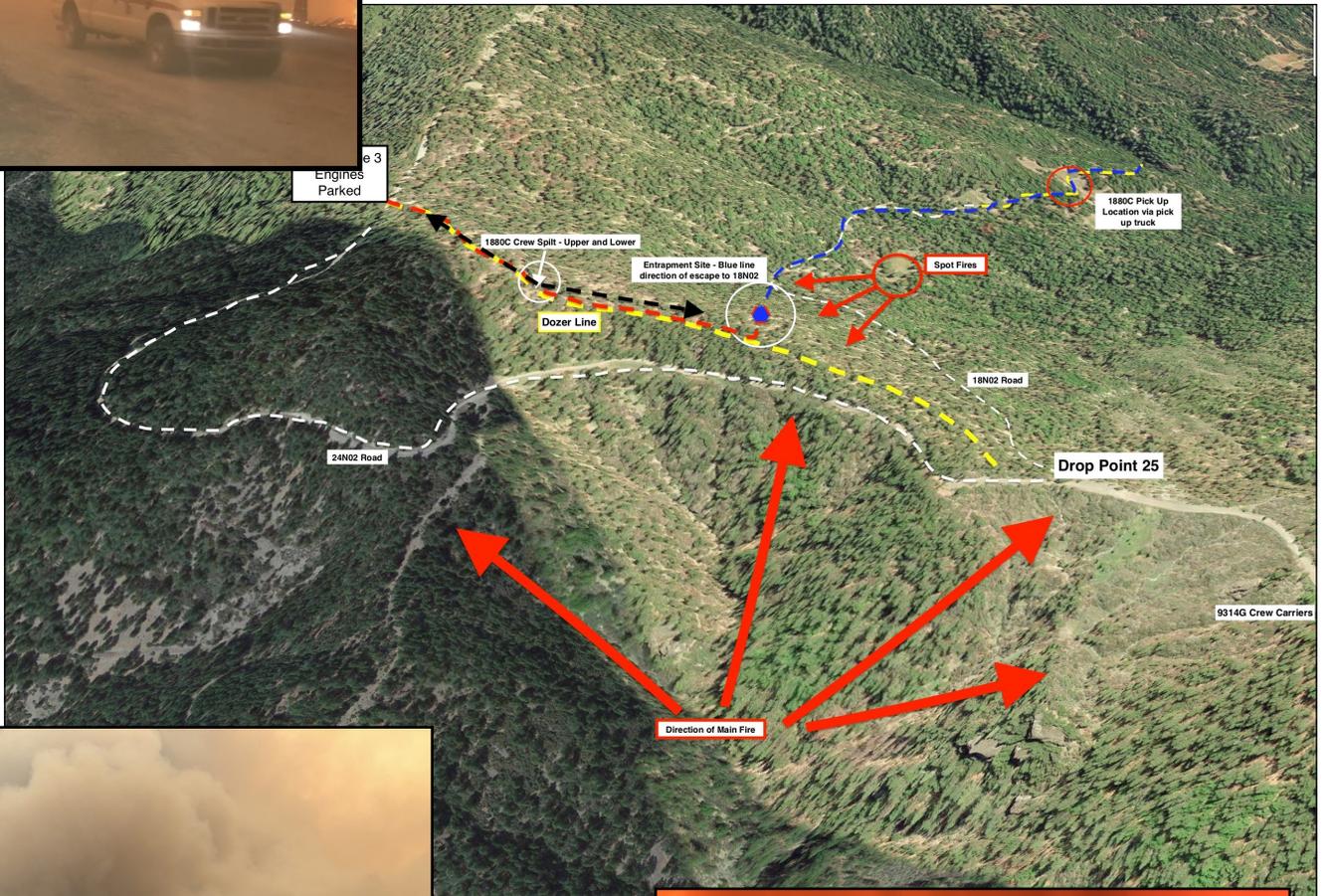




MENDOCINO COMPLEX FLA

August 19, 2018

During burnout operations, a sudden wind shift and explosive fire growth occurred and cut off personnel from their escape routes.



“The goal for the last 5-6 days was to close that door off.”

-Branch II Charlie



“I didn’t know I was burned. I just thought I was hot from running.”

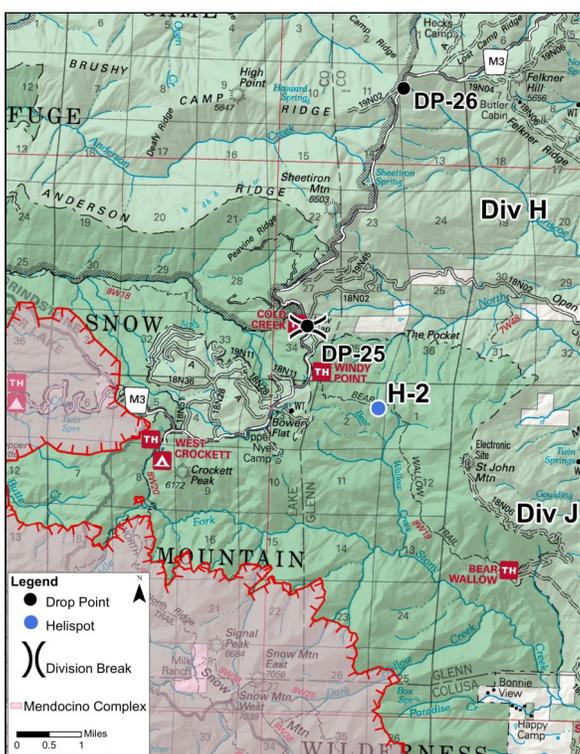
HEQB Lee

EXECUTIVE SUMMARY

The Mendocino Complex consisted of the Ranch and River fires that started on July 27th. The fires experienced significant growth during the first ten days, including growing 50,000 acres on August 5th. Up until August 19th, the fire growth had been steadily moving both south/southeast and north/northeast. Most days experienced warming and drying trends with very poor recoveries and critically low fuel moistures and afternoon relative humidities near single digits. Steep terrain, poor ventilation, fire intensities and long travel times made it difficult to insert crews and utilize aircraft in certain areas of the fire.

On August 19th, the plan for the fire's northeast flank was to secure dozer line north of drop point 25 (DP-25) near the division break in Branch II with a firing operation. Resources from other divisions were brought over to help with the operations. During the burnout operations, a sudden wind shift and explosive fire growth happened and personnel were cut off from their escape routes. Most of the firefighters were able to move back to their vehicles to exit the area. However, six individuals farther down the dozer line were forced to run in front of the advancing flame front, through unburned fuels to a nearby dirt road for approximately one mile before they were picked up and transported for treatment. Five Los Angeles Fire Department firefighters and one CAL FIRE firefighter were injured. Two unoccupied CAL FIRE emergency crew transports parked in the vicinity sustained damage from the fire when it jumped containment lines.

Learning from unintended outcomes is not a step-by-step process nor is there a single recipe for any organization, group, or agency to follow. It is an expedition filled with rabbit trails, discoveries, and moments of quiet reflection. It is not easy to share a perspective earned through



Map for the area of focus in Branch II of the Mendocino Complex.

life-changing events with coworkers and peers you trust. It is even harder to share that story with the public, and across agencies and jurisdictions. The bravest act of all is to share the thoughts and actions from the moment they are made without looking back and puzzling what could have been done differently. Sharing the fog of war can be uncomfortable and confusing.

In the following pages live three main stories or perspectives. There is a story of what happened from the perspective of the firefighters on the ground in the vicinity of the entrapment. There is a story of what happened from the perspective of the aviation resources assigned to the incident. Finally, there is a story of what happened from the perspective of the Incident Management Teams and Agency Administrators responsible for the fire.

The names of the individuals have been changed.



The Mendocino Complex Fire began July 27, 2018 eventually becoming California's largest wildland fire at the time burning 459,123 acres.

Various overhead arrive at DP-25 and notice several resources at the drop point. The fire is active and has an established column below DP-25.

Roughly 1430: After being re-directed several times and driving for nearly 6 hours, 1880C arrives at Stonyford camp and is instructed to fuel up and head to DP-25.

8/19/2018: Strike Team 1880C attends morning briefing and is assigned to Branch II during division breakouts. They were to head to DP-21. Fire was believed to miles from DP-25.

The fire flares up and slams FR24N02 near DP-25 below the dozer line and settles down. Urgency to defensively burn out the line increases in order to hold the fire at that location.



Misc overhead near DP-25 develop a firing plan

Strike Team 1880C assigned to holding and incoming Golf Strike Team assigned to lighting. Strike Team 4700G declines firing operations. Strike Team 1880C is reassigned to firing.

1733: The 6 individuals of the southern firing team get cut off from their escape routes. Flame lengths estimated to be 100ft above the tree tops. Day light turns into pitch black instantly.

1733: Wind shifts and the fire grows explosively. It jumps the line and runs toward the southern firing team.



One firing team burns to the north, the other burns south toward DP-25.

1733: Resources at DP-25 realize they need to burn around the drop point for safety. The fire flanks around DP-25 trapping the resources in place.



The firing team drops their torches and runs into the green.

Priority traffic: entrapped ignitions team relays position, escape plan, and requests air support.

The escaping firefighters regroup, and identify a nearby road on their map that they can run to.



The six firefighters are picked up on FR18N02 ahead of the fire.



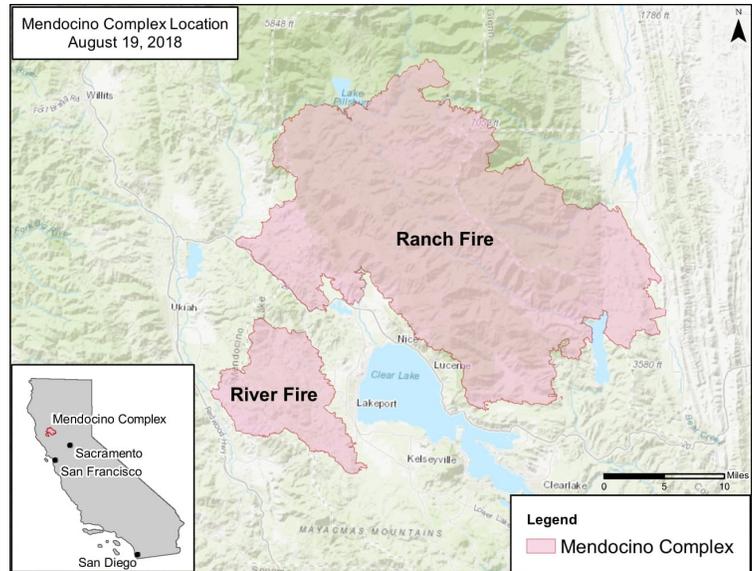
Injuries are assessed and its decided to fly out 2 firefighters. The remaining 4 firefighters are transported to the medical unit. All resources near DP2-5 leave the area once the heat subsides.

8/20/18: All 22 members of Strike Team 1880C are reunited during breakfast at the Stonyford Incident Command Post.

A STORY FROM THE GROUND

The days prior to the entrapment

It was the biggest fire in California history and there was a lot going on. Smoke issues and a lack of infrared information hampered intel gathering efforts. The National Preparedness Level was 5 and limited resources forced teams and firefighters to be creative with what they had. With large fires come large populations of firefighters from many different agencies and organizations. The Mendocino Complex had firefighting resources from over 34 different agencies including CAL FIRE, US Forest Service, Nevada Division of Forestry, Australia and New Zealand.



Vicinity and location of the Mendocino Complex.

Just how many agencies were on the Mendocino Complex?

Potter Valley Fire, Redwood Valley Fire, Ukiah Fire, California Office of Emergency Services, California Department of Corrections and Rehabilitation, Lake County Sheriff's Office, Mendocino County Sheriff's Office, Colusa County Sheriff's Office, Glenn County Sheriff's Office, California Highway Patrol, Pillsbury FPD, Australia and New Zealand Fire, Bureau of Land Management, Bureau of Indian Affairs, Department of Defense, US Fish and Wildlife, National Park Service, Hopland Fire, Lakeport Fire, PG&E, AT&T, California Conservation Corps, North Shore Fire, American Red Cross, Kelseyville Fire, California State Parks, Cal Water, Lake County Farm Bureau, Nevada Division of Forestry, Nevada Department of Corrections and additional agencies from throughout California and other States.

There were many conversations regarding line viability, the strategic plan, if it was doable, and alternative areas on the east side of the fire. Branch II and Deputy Branch II pulled together as many resources as they could for that area. They felt the section of line from H-2 to DP-26 was still viable but only for a day or two. The Branches discussed the possibility of the fire getting into Cold Creek with the winds predicted. The ridge above Cold Creek was an important line to hold because if the fire jumped into that drainage it could likely be off to the races and potentially affect communities east of the fire. Everyone wanted to try firing the night of the 18th. With a successful operation, the IMTs could switch their efforts to St. Johns Mountain south and hold everything on Brush Camp Ridge.

While the IMTs discussed where they could stop this fire and contingency plans, firefighters on the ground described the last piece of line in the northeast corner of Branch II as the ultimate line. It was important to keep the footprint of the fire as small as possible and the team did not want the fire any further east. In the days prior, line construction was a struggle when the fire would blow up and run, and it happened a lot. The firefighters talked about the urgency they felt to get the line in and prep it. There was also a competing priority with the fire coming around Stonyford Creek and the potential there to impact houses in the Bonnie View and Happy Camp areas.

August 19 - The day of the entrapment

Deputy Branch II (Dep. Branch II) Pat began his day trying to

CAL FIRE Engine Strike Team

Designators

Engine Strike Teams (five of the same type engine, one battalion chief leader)

Type A: Type 1 Engines (full-size structure, 1000gpm, 400gal tank, staffed 4)

Type B: Type 2 Engines (mid-sized multipurpose, 500gpm, 400gal tank, staffed 3)

Type C: Type 3 Engines (4x4 wildland high-clearance, 120gpm, 300gal tank, staffed 3)

Type D: Type 4 Engines (pickup frames, 50gpm, 200gal tank, staffed 3)

figure out a gigantic puzzle; where to place the limited number of resources assigned to his branch. Division I would be established in the vicinity of DP-25 for tomorrow's shift and needed resources. He knew Division Group Supervisor (DIVS) L/M/N Taylor did not have any resources on his division. Taylor had worked in this area as a Firefighter, Fire Captain, and Battalion Chief, so it made sense to bump him over to this new division. They had about three miles of line to burn out and hold.

Due to a prolonged inversion over the past several days and no IR flights, Dep. Branch II Pat was worried about where the main fire had moved and its proximity to the line. The firefighters had been working hard getting the line in and prepped for the burnout. Division J resources were focusing on burning around the structures on the south end of their division and bringing fire south from H-2. However, this left a big gap between DP-26 and H-2 that needed to be burned out. He thought about asking the

Helicopter Coordinator (HLCO) to take a look over the branch if the air was clear enough, to ensure the plan was still viable. He got resources assigned, penciled in changes on his IAP, and headed out to see the situation for himself.

Since being assigned to the fire, Heavy Equipment Boss (HEQB) Lee¹ had worked with dozer operators putting in line on several divisions including divisions H and J. On August 19, his day began as a resource assigned to division G but there were problems finding a heavy equipment boss to replace him after his 24-hour shift. They decided to switch him to a 12-hour shift since the dozers he was working with would not be on night shift. HEQB Lee searched for Dep. Branch II Pat to discuss the plan. Communications on the radio and cell phones were so bad in the area that he drove from Division G to DP-25 to find Dep. Branch II.

After taking 24 hours off to reset from working night firing operations on the fire, Division Group Supervisor Jordan (DIVS Jordan) arrived at 0530 on the federal side of ICP in Ukiah. The Operations Section Chief (OPS) Trainee let DIVS Jordan know he was being moved to the other side of the fire. He wanted DIVS Jordan to check out the area around DP-25 for a burnout operation. They discussed it would be a tricky area because of the wind and the drop point's location in a saddle. He cautioned DIVS Jordan to be careful, it "will be a touchy spot."

As DIVS Jordan drove the three hours to DP-25, he thought about his experience so far on the Ranch fire (part of the Mendocino Complex). In Division F, crews had been run out several times, when the winds would push the fire from 1400-1900 every day. He had also run several successful firing operations at night over the past several days.

On August 17, the firefighters of 1880C had a very productive and positive work period in Division G. They felt they were on a grind working their way "out of the bottom of the barrel" to get better and better assignments on the fireline. There was a rumor floating around they were paying the price for decisions made by the crew they had replaced. They had heard the group before

¹Lee was later used as a qualified FIRB in charge of one of the firing operations on the dozer line north of DP-25.

them had turned down an assignment and were being punished for it by being assigned to pick up trash and hose around the fire. The guys also talked about whether they were getting crummy assignments because they were from LA City Fire and weren't seen as good enough to do firing operations. There was a feeling that if they did not take an assignment they would be back picking up trash and there seemed to be a lot of pressure from above to get work done quickly.

Regardless the reason, the crew wanted to work hard, do a good job, "clear their name" and build some street cred with the IMTs. It was clear to the Strike Team Leaders they had a confident and well-versed crew that wanted to produce work. As the strike team bounced from division to division, finding themselves on a different division every day, they tackled each assignment as if it were a test and received compliments about their work. Although the group did not have a clear understanding of the big picture direction for the fire or of leader's intent (division breakouts felt confusing and rushed), they were proud of the work they were accomplishing.

"The culture in LAFD, when we are here, we are here to do a good job."

-1880C firefighter

The morning of August 19, 1880C had breakfast at 0630. Strike Team Leader Riley (STEN Riley), his trainee, STEN(t) Andy, and the officers of each engine company attended the morning briefing at 0700. The weather portion attracted STEN Riley's attention. There had been no relative humidity (RH) recovery overnight and the RH continued to stay low. It had been hot and dry and was predicted to be that way for the next couple of days. After the main briefing, 1880C officers attended the Division D breakout. During the breakout, Deputy Branch I approached 1880C and informed them they were being reassigned to Branch II. STEN Riley asked where they should report. At first, Deputy Branch I said he did not know, but later told them they should go to DP-21.

It was a bit frustrating, reassigned with no travel plan, no communications plan, and no real direction of where to report. They began searching for more information, stopping at the print trailer to get maps. They also heard from Comms it was likely they should report to Division J. Before they left camp, 1880C leadership briefed the crew and let everyone know they were going to Branch II, DP-21. There was confusion because Branch II was the northeast portion of the fire but DP-21 was on the northwest side of Lake Pillsbury. STEN(t) Andy told the crew the decision to move them to Division J was a reflection on their work from yesterday. They were being horse traded because they wanted some work done. They formulated a travel route to DP-21, which everyone was familiar with because they had worked on Division E prior doing structure defense. On the way, STEN(t) Andy was finally able to establish communications with DIVS J and was told to head to DP-32 south of Blue Dip in Division L. At this point, they had two choices: go all the way back around the fire the way they had come and back up the east side of the fire or continue up and around the top of the fire and down to the drop point. They decided to keep going up and around the fire.

The 6+ hours of travel that day was not easy. At one point, one of the engines trying to dodge an overhanging branch became stuck in a culvert when a soft shoulder sucked it off the road. Digging out the engine delayed the group another hour. Many times during their drive they tried to contact DIVS H, DIVS J and Dep. Branch II Pat but it was challenging even over the repeaters to get ahold of anyone. After 6 hours of driving, the crews were getting anxious to do some work

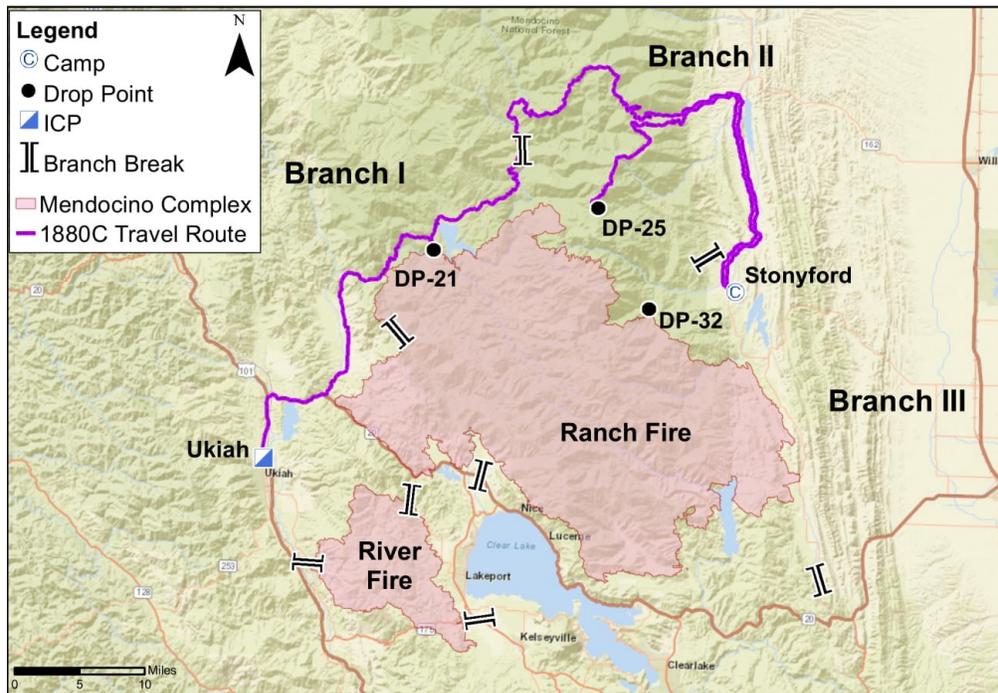
and wondering what was going on. The long day of driving on bumpy, crummy roads with minimal information was frustrating.

Eventually, 1880C got over to the helibase on the northeast corner of the fire and made contact with Dep. Branch II Pat who told the group to report back to Stonyford Camp, fuel up, and then drive to DP-25. When they finally got on the road to DP-25,

STEN(t) Andy waited until they were a couple of miles north of DP-25 before reaching out to Dep. Branch II Pat again. Dep. Branch II Pat gave them the most information they had heard all day and told them to keep coming.

As 1880C was working their way around the fire, DIVS Jordan arrived in DP-25, where he found Dep. Branch II Pat talking to some hand crews. DIVS Jordan let Dep. Branch II Pat know he was there to look at the possible burnout operations and asked if he had an idea what his role would be? Dep. Branch II Pat told DIVS Jordan he had already made a plan and was going to fire off the saddle.

DIVS Jordan was surprised and thought to himself, why is a Branch putting the firing plan together? In DIVS Jordan's experience, a Division Group Supervisor would be planning the burn operation while a Branch would be looking at the big picture for safety. DIVS Jordan was worried. In his experience, when someone plans a firing operation, they generally do not want to give that plan up but will do everything they can to see it through. DIVS Jordan, expecting to be formulating a firing plan himself, expressed to Dep. Branch II Pat he thought Pat was too far in the weeds. Dep. Branch II Pat seemed upset with this comment. The exchange between



The purple line illustrates 1880C route of travel to eventually arrive at DP-25.



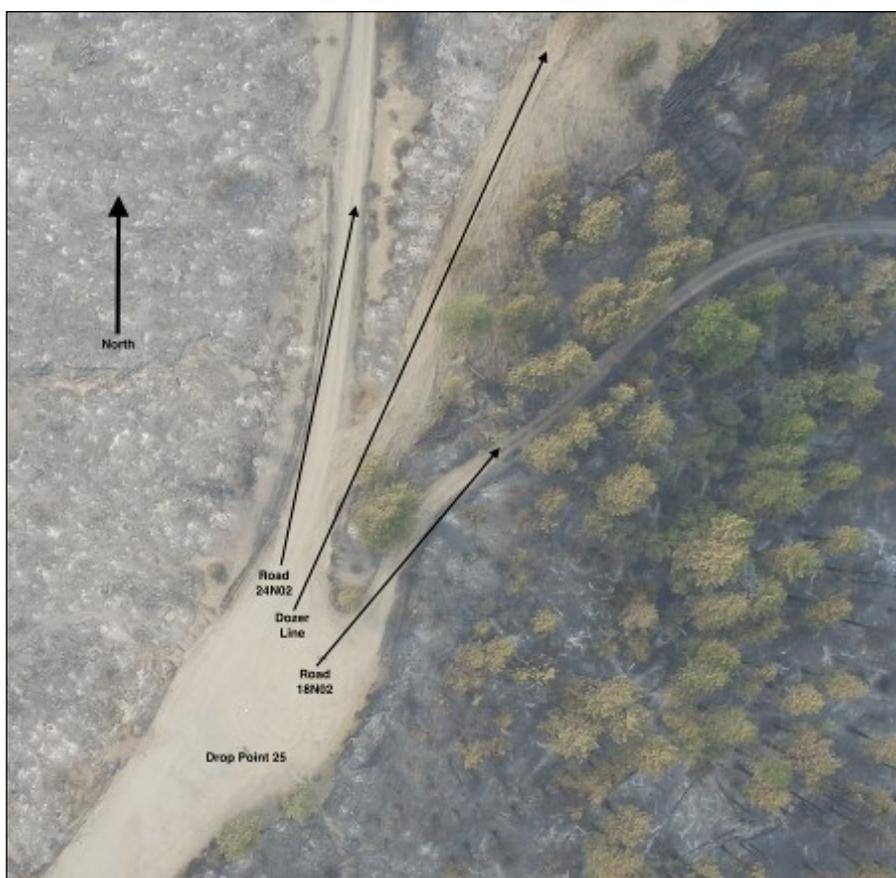
View from DP-25 earlier in the day.

the two did not seem to be working too well so DIVS Jordan backed off and drove away. He ran into DIVS H trainee who told DIVS Jordan they had worked out the resources necessary for the burn operations. DIVS Jordan was confused about what was going on and wanted a briefing. They decided to go back to DP-25 to talk to Dep. Branch II Pat to figure out their roles in the day's operations.

Around 1200-1300 there was another small briefing. Dep. Branch II Pat outlined a plan of where to put fire and established the bowl south of DP-25 as the priority. Winds were not favorable at that time and they were still waiting on resources. Firing operations would have to wait. DIVS Jordan struggled with not feeling included in the planning. He looked for opportunities to share his experience where he could. The group resumed waiting for the ordered resources.

For the California Interagency IMT (CIIMT) Operations Section Chief Tyler (OPS Tyler), a chance to get out in the field was a welcome change. It had been hard talking to Branch II or Dep. Branch II with the communications problems and he wanted to know how the planning for the burn out was going in Division H. He was glad he would get a chance to look at the fire from the ground and validate what he had heard with what he had seen from the air. Around 1530, he arrived at DP-26.

OPS Tyler met with CAL FIRE Operations Section Chief Sam (OPS Sam) and Battalion (BC) 1 Taylor² at DP-26. Dep. Branch II Pat contacted them on the radio and advised them HLCO had let them know the fire had made another run but was not in the bottom of Cold Creek yet. He wanted to do some firing to check the fire at DP-25. They



DP-25, Road 24N02 , Dozer line and Road 18N02 intersection.

supported the plan. As DP-26 was one of the few places on the fire that had cell service, OPS Tyler stuck around to make phone calls about resource needs for the next burn period. While OPS Tyler was on the phone, he saw 6111C, an NDF strike team drive through headed to DP-25, he was confused because he thought they were working at the bottom of Division J.

Curious, OPS Tyler drove out that way to see the ground and validate what was going on in the DP-25 area. Around 1630, as OPS Tyler drove to DP-25 he noticed three or four unloaded low

² Battalion 1 was DIVS L/M/N for the Mendocino Complex. On August 19, he did not have resources assigned to his division and was told he would be taking over the newly developed Division India on his next shift. He came out to familiarize himself with the area in preparation for taking over.

CAL FIRE Crew Strike Team

Designators

Hand Crew Strike Teams (two 16 person crews totaling 32 persons at a minimum, crew captains, strike team leader)

Type G: No restriction on use and has dedicated fireline construction training. These consist of CDC/CYA crews, USFS/BLM/NPS/BIA Hotshot crews and TSI crews.

Type H: Restricted use which usually includes no hotline fire line construction, limited in the amount of line they can construct per hour, and requires training on the incident before they go out. These crews are Blue Card crews, Volunteer hand crews, crews organized on the spot, mixed-agency crews, etc.

boys parked along the way, as well as a large group of equipment and people at the drop point. There were five engines, a couple golf strike teams, and a masticator with a utility vehicle working the saddle. OPS Tyler spotted a group of people in a typical planning huddle behind a truck, which included OPS Sam. OPS Tyler got out of his truck and walked over to where the group was meeting.

As 1880C drove through Branch II, STEN Riley was concerned about their safety and the bad radio communications. Up until now, there had been a strong inversion over the fire and the group had only caught glimpses of the column from ICP. They had an idea of where the fire was based on their Avenza maps: close to DP-25 moving NE, and close to the Cold Creek drainage. As STEN Riley drove, STEN(t) Andy consulted the map on Avenza, noting the dozer line was tied in with the road on the east side of DP-25. As they drove down the road to DP-25, they caught their first full view of the fire. The fire was active with an established column in the drainage. They met Dep. Branch II Pat as he was coming out of DP-25. He told the group to turn around and

go back to the top of the hill where the dozer line left the road. He would tie in with them there for a briefing.

During the usual chaos of turning a bunch of engines around, the firefighters could see fire below the road with 100' flame lengths (south of the road that leads to DP-25). One firefighter joked, "Man, I think the beast is behind the smoke." Another firefighter responded, "No, I think that's the sun." All joking aside, the captains instructed their people to hurry up, grab their gear, and get tooled up. Several firefighters wondered why all those people were just sitting there. Had they been waiting for 1880C to arrive? As they arrived where the dozer line and road intersected north of DP-25, STEN(t) Andy asked STEN Riley to stop so he could get out and have a face-to-face with Dep. Branch II.

After dropping STEN(t) Andy off, STEN Riley moved the command vehicle off the road facing north as heading north would be the only egress option for them. As he parked the command vehicle, STEN Riley kept thinking about how they were new to this area of the fire and did not yet have good situational awareness. He kept assuring himself as soon as they had a briefing and found out what they were doing, it would be better. Two of his engines turned around to face DP-25 and he told them to reposition facing uphill. STEN Riley had noticed several resources at DP-25, half a dozen buggies or golf team buses, a masticator, and various



1880C Turning engines around.

“With structure we go really fast, but with wildland, we know we need to slow down with LCES, etc.”

- 1880C firefighter

personnel. He was concerned about some of the vehicles facing downhill as it might cause a choke point if the group needed to turn around and leave in a hurry.

At DP-25, Dep. Branch II was building a plan to fire off the road. Towards the west, he noticed trees

torching in the area he had been warned about earlier by the HLCO. By this time, HEQB Lee and Dep. Branch II discussed the firing of the road as they scouted the lines together. HEQB Lee told Dep. Branch II Pat “I’m here if you need me.” HEQB Lee understood this was a critical piece of line to hold the entire ridge.

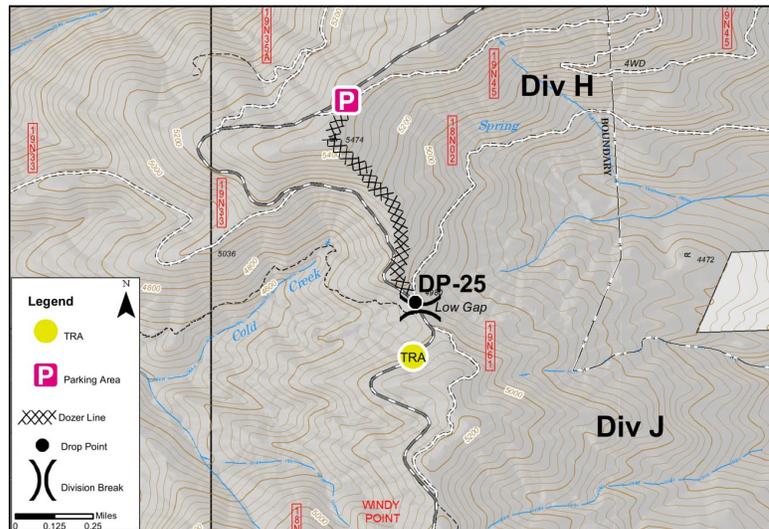
About this time, the fire stirred, shooting a finger of fire uphill, slamming the road and quickly settling down again. There were reports of a few spots over the road into the horseshoe west of the dozer line. The plan rapidly changed. The atmosphere went from relaxed to compressed and the group decided to fire the dozer line. The best option seemed to be starting the firing operations from the highest point on the dozer line, and having BC 1 Taylor bring fire north along the dozer line while HEQB Lee brought fire south towards DP-25. Dep. Branch II Pat, BC 1 Taylor, and HEQB Lee all agreed to the new plan. They needed to burn now if they had any chance of holding the fire there. They held a quick briefing with the overhead group present. HEQB Lee contacted Dep. Branch II Pat and told him, “We might have a chance to hold that dozer line.” He then went to join BC 1 Taylor on the north end of the dozer line where it met the road.

With the fire pushing closer and closer, BC 1 Taylor and Dep. Branch II Pat felt the pressure to get things moving quicker. Dep. Branch II Pat assigned BC 1 Taylor the task of burning out the dozer line. He was focused on getting back to DP-25 and getting the resources wrangled up to start the firing operation to burn out around the TRA³ south to H-2 when STEN(t) Andy approached. Dep. Branch II Pat told STEN(t) Andy, “Get your people out and get ready to burn.”

STEN(t) Andy tried to get more information but Dep. Branch II Pat indicated BC 1 Taylor and said they would be working for him and left.

STEN(t) Andy introduced himself to BC 1 Taylor and attempted to get a briefing, asking questions to try to understand the situation. BC 1 Taylor told STEN(t) Andy 1880C’s assignment would be holding while the golf strike team would do the firing. STEN(T) Andy asked who the firing boss and burn boss were and told him he didn’t have a FIRB on 1880C. BC 1 Taylor told him HEQB Lee was FIRB and BC 1 Taylor was the Burn Boss.

³FIRESCOPE defines TRA (Temporary Refuge Area) as a fire ground location intended to provide firefighters with limited short-term relief or refuge from an unexpected increase in fire intensity without the immediate need of a fire shelter. A TRA should provide time enough for responders to assess their situation and execute a plan to safely survive the increase in fire behavior.



FLA Team constructed map to illustrate points of interest throughout the story.

When STEN(t) Andy approached HEQB Lee, he pressed with more questions like, “Where are we starting? Where are we stopping? Are we the firing team? What’s the objective? Where is our TRA?” HEQB Lee told STEN(t) Andy 1880C would be holding and someone else would be firing and that STEN(t) Andy needed to get his guys lined out quickly as they needed to start burning. STEN(t) Andy went back to the rigs, quazi-briefed his firefighters, passing on what information he had gathered. He told them all to gear up and asked a few firefighters to grab torches and then tie in with HEQB Lee. STEN(t) Andy continued to get ready. When he turned around all he saw were helmets scattering up the hill into a triangle of timber created by the dozer line and road. After driving for over six hours, the strike team members were ready to go. It was like letting dogs out of a kennel. They were ready to work.

“We felt like dogs coming out of a kennel.”
- 1880C Firefighter

Back in the saddle, DIVS Jordan felt everything happened all at once. The fire was steadily moving towards the group in DP-25 and DIVS Jordan felt they needed to fire off the bowl. This was no longer an offensive firing operation; it was now a defensive one. Everyone began to gather their resources and vehicles in the middle of the saddle thinking that would provide them a buffer from the main fire. 9314G was already at the TRA on foot helping burn. The fire started picking up and getting closer.

At DP-25, OPS Tyler turned around and saw the finger of fire running up the drainage and hitting the road. OPS Sam said they needed to put some black down and add depth on that side of the road. OPS Tyler thought to himself, “We are really rushing this, but, I understand his objectives.” They still did not have the golf strike team at this time. BC 1 Taylor contacted them over the radio asking if they could start the firing operation. OPS Tyler said yes, but reminded him that they did not have a FIRB. He replied it was no problem, HEQB Lee was the firing boss.



View from as a 1880C engine parked.

The Burnout

As events unfolded, time did not follow a steady progression but compressed, slowed down and compressed again. Moments went from still, to chaotic, to sharp clarity and back into chaos. Among everything that was happening in the area, there are three major areas of activity: DP-25, the firing operations north from the hilltop, and firing operations south of the hilltop down the dozer line. From this point on several firefighters on the dozer line,

on the road, and in the drop point had similar thoughts, “What are we doing? Why are we burning? Where are our escape routes? I have a really bad feeling. This is not good. What is the fire doing? Its dicey but it might be doable.” Paired with these thoughts there were many emotions ranging from hesitancy, frustration, anxiety, confusion, eagerness, and urgency.

Earlier when STEN Riley drove up the road heading north, he advised STEN(t) Andy, “You know you have fire established in the drainage below us?” Andy indicated he knew. STEN Riley parked

and wrote the lat/long on his windshield. As he grabbed his gear and put on his pack he noticed STEN(t) Andy had formed two firing teams and they were already headed out. One group was hiking down the dozer line while the other group was waiting where the dozer line tied in with the road. STEN Riley was concerned that people were going to work already and he didn't know what Dep. Branch II had briefed STEN(t) Andy on, but that was how they had handled things yesterday and he figured STEN(t) Andy would brief him.



View from 24N02 road and dozer line intersection roughly around 1733.

STEN(t) Andy felt some small relief when BC 1 Taylor indicated they were burning out the small island of green between the road and the fireline. Burning the island was not too complicated and they were right next to the road. STEN(t) Andy assigned a lookout⁴ and told the group their escape route would be north to DP-26. He asked the engine operators to go back to their engines and reposition them facing north.

At this time 4700G arrived. BC 1 Taylor approached them asking if they were ready to burn. The

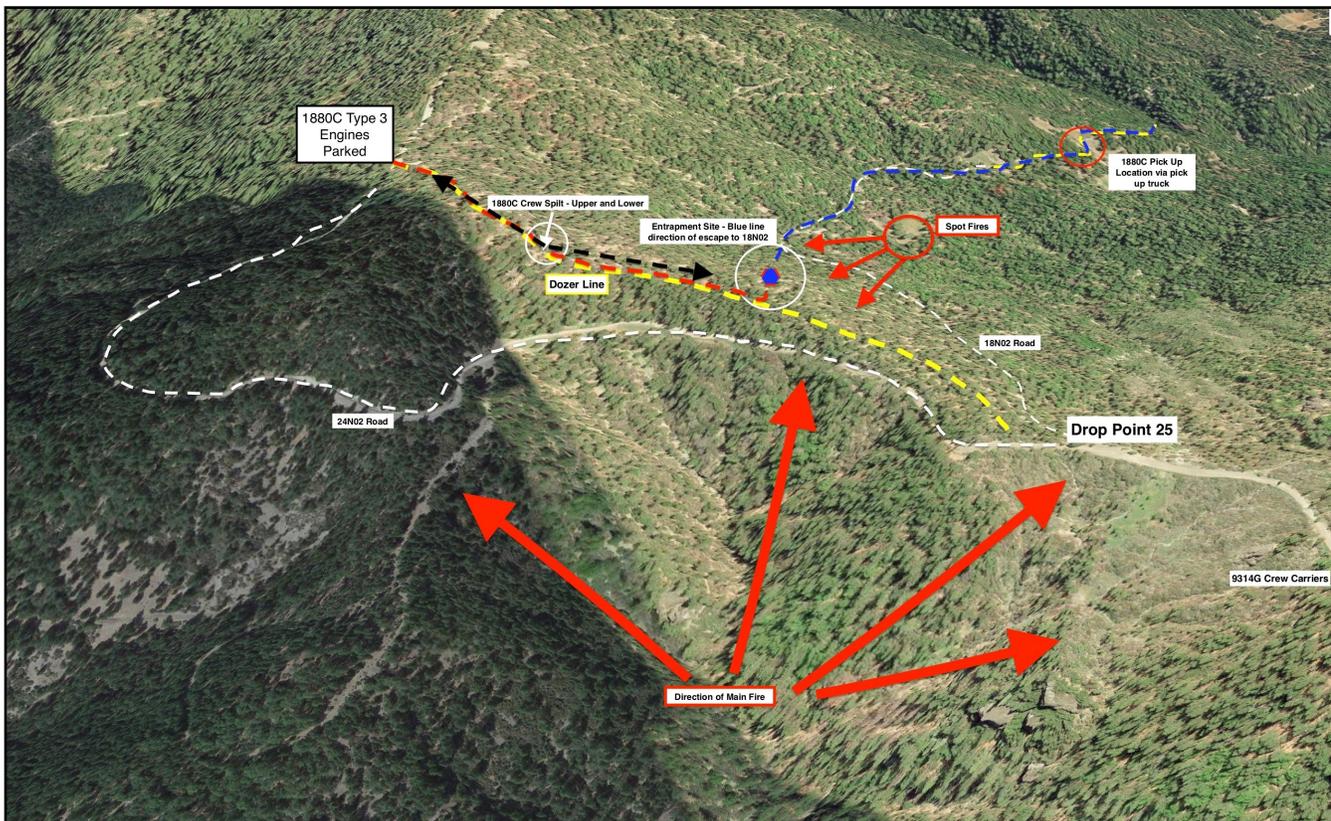


Illustration showing direction of fire spread and approximate locations of key personnel and geographic locations.

⁴The lookout spot was a knob, just a slightly higher spot than the firefighters on the line. It was the best spot he could find in the time given.

Strike Team Leader told BC 1 Taylor they had only ever burned in juniper and were not comfortable firing in the timber. BC 1 Taylor quickly assigned them to holding and reassigned 1880C to firing. As everyone gathered tools and torches, the wind was at their back from the north and was favorable for the burnout.

As STEN Riley ran down the dozerline to the small hill, he approached STEN(t) Andy. STEN(t) Andy gestured to the group who had already started down the line and asked STEN Riley, “Are you going down there?” STEN Riley said he was and STEN(t) Andy replied, “OK, I’m going to stay up here.”

A few moments later STEN(t) Andy informed STEN Riley the wind was favorable for the burn. STEN Riley asked him if he had a lookout, thinking he wanted someone watching the road and the green side. STEN(t) Andy replied they had a lookout established. Someone notified them to “Bump down to 25. You have a holding team behind you. You guys look good.”

Earlier, right before 1880C arrived, OPS Tyler and OPS Sam looked downhill from DP-25 and had a brief conversation. The fire appeared to be across both drainages and pushing its way towards the road north of DP-25. They both looked at each other and walked over to Dep. Branch II Pat who asked if he should burn. They said he would pretty much have to at this point. As 1880C arrived, Dep. Branch II Pat told BC 1 Taylor and HEQB Lee to start the firing plan with 1880C. Dep. Branch II Pat turned 1880C around and pushed them north of DP-25 to the intersection of the dozer line and the road past the horseshoe. As 1880C drove back out to the north that was the last time OPS Tyler saw them.

Dep. Branch II Pat’s plan was rapidly falling into place. OPS Sam and OPS Tyler began positioning resources within DP-25. The fire began to run, pushing out from the south. OPS Sam and OPS Tyler both said, “We need to burn the saddle out NOW.” They did not say DP-25 was a safety zone but that is what they both were thinking. There was major activity below and the fire began sucking wind downhill back into the fire.

North Firing Operations

As 1880C turned around and was parking, one crewmember, Casey, jumped out of the engine and looked up at the column. He felt something did not seem right and quickly took a photo of the column developing. He had experience on a hotshot crew before he joined the LA City Fire Department and he knew they were being



Photo taken by Casey when he arrived on scene around 1630.

rushed. When he heard they were burning he thought to himself, “Why are we firing? Who here has had S-234? Who has experience burning in timber? This [burnout] should have been done earlier in the day. I don’t know the lay of the land. I don’t have weather updates.”

Casey walked down the road trying to figure out what was going on and saw the dozer line. He talked to BC 1 Taylor and HEQB Lee who told him there were a couple of spots between the do-
⁵Casey didn’t know that the hilltop where everyone was meeting was not the halfway point. It was only a couple hundred feet south from the road on a dozer line that stretch 0.75 miles.

er line and the road. Casey pushed through the dense vegetation to get a look. He saw the spots just creeping through the litter, which made him feel a little better. He thought, “OK we can burn. We can take it slow, back it down, and create a little buffer.” Looking at the map, he could see the horseshoe of the road and thought it was just a small piece of dozer line⁵. He thought it would not be so bad splitting the dozer line in half and dragging fire both ways. He rejoined the group gathered on the hilltop and began firing south down the dozer line.

STEN(t) Andy’s group was dragging fire from the hilltop north to the road. He watched their fire creep around in the triangle of green. He stayed in constant communication over the 800 MHz radio with STEN Riley as he and his group worked south from the hilltop down the dozer line.

The south group was roughly 200 feet down the dozer line as STEN(t) Andy watched their hard hats disappear over the crest of the hill. In a breath, a mere moment, the fire stood up, crowned, and ran in different directions.

South Firing Operations

As the firing operations began, STEN Riley looked up and down the double blade-wide dozer line. His main concern was the dozer line to DP-25, which was lined with heavy timber. STEN Riley tied in with HEQB Lee and his four firefighters from 1880C, whose experience levels ranged from one on their first wildland fire assignment ever, to Casey, who was quite experienced in the wildland environment.

The group began firing on foot south along the dozer line. With just two torches their fire was sucking in off the line well. As STEN Riley walked down the dozer line looking back he felt their firing operation was working. They had made it about 200 feet downhill paralleling the dozer line when HEQB Lee told them to pick up the pace. The lighters began speed walking but HEQB Lee kept encouraging them to move faster. They could hear the urgency in his voice and almost started jogging. The slope and vegetation kept tripping the lighters as they moved and it was difficult juggling their tools and torches. It was getting harder to look back to check their fire and watch where they were going.

The main fire began picking up speed. Suddenly the winds changed from at their backs out of the north to out of the south and into their faces. A few moments later, HEQB Lee told the lighters to run. The lighters start running while thinking something is not right. Casey, the most interior torch, knew the fire they were putting down was no longer effective because they were rushing. He began running towards the other lighter, Blair, who was lighting directly off the dozer line. The trees were dense and Casey wanted to get back on the line to see what was going on, and how close they were to the road.

The lighters pushed out to the dozer line and saw a red glow in front of and behind them. HEQB Lee said the fire had crossed the line. They could see through the trees a large column of smoke lit from within by orange flames. It was hard to tell if it was in timber across the dozer line in the trees where they were at, or from across the road.

As he glanced around, STEN Riley saw the fire crowning over the dozer line behind him to the north. He looked south to DP-25 and saw fire blowing over the line between them and DP-25. They were cut off from their escape route.

Conditions changed rapidly as a crown fire exploded around them. Trees ignited instantaneously

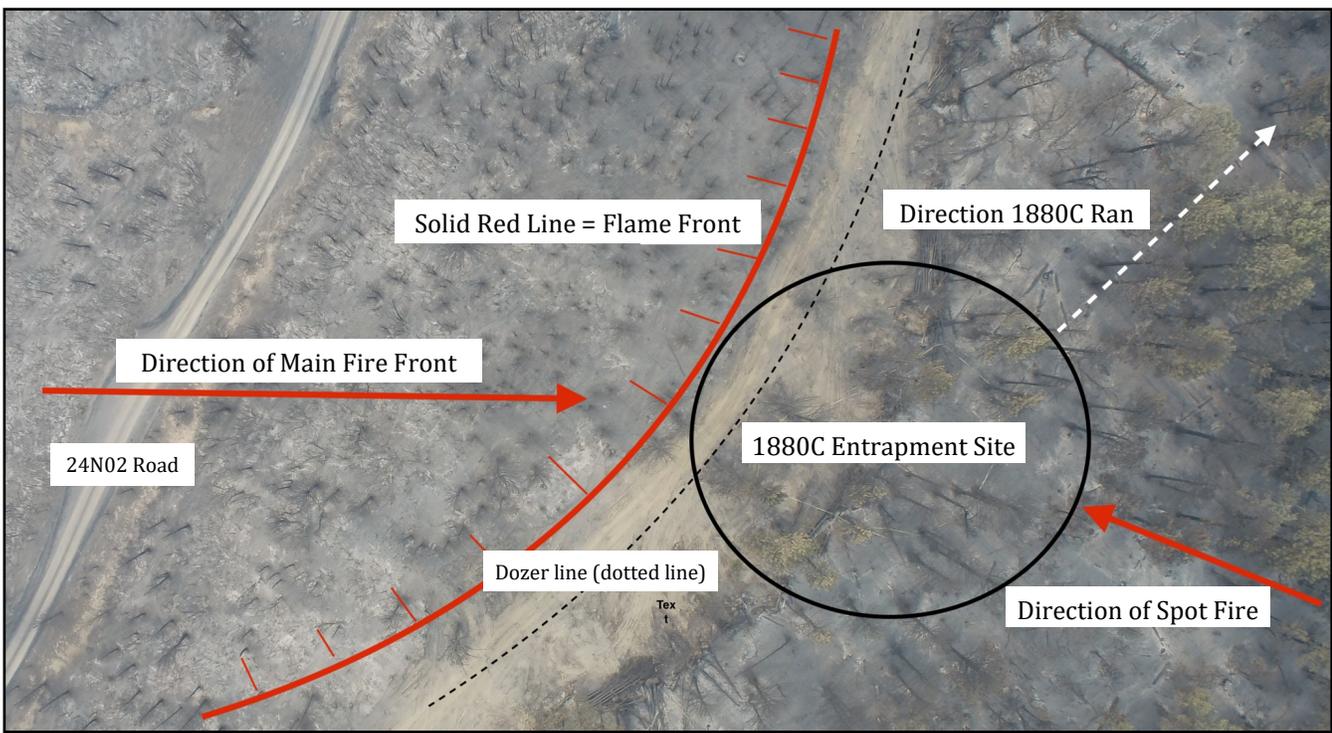


Illustration of entrapment location.

from the bottom to 100-foot flame lengths stretching off the tops. It went from daylight to pitch black night instantly. Embers and ash swirled around them. The roar of the fire silenced everything. As STEN Riley looked around, the other firefighters were silhouetted against the fire in background. He started counting heads.

Seconds passed like minutes as STEN Riley thought, “Where are we going? What are we doing?” STEN Riley looked down towards DP-25, which from his recollection looked very close⁶, but it

“Man, this is where we are going to die. This is how it ends. We are going to be vaporized.”

- STEN Riley

was very smoky. He looked up to the top of dozer line; it looked like a viable option for escape through the flames. The trees up there were not as involved. Then he noticed fire on the other side of the dozer line in the leaf litter.

Calmly, STEN Riley looked around to a scene that etched itself in his mind. The force and the power of the fire around him was unbelievable. He looked at the fire for a second, thinking, “Man this is where we are going to die. This is how it ends. We are going to be vaporized.”

In several microscopic moments, most of the six firefighters recalled feeling the same way as STEN Riley. Casey came up the dozer line to STEN Riley and very calmly said, “This ain’t good chief. This is not good.” It was surprisingly a calm moment.

As the eternity of seconds collapsed into fast moving minutes, they looked around to see where they could go as the heat drove them to the offside of the dozer line. There was a large jackpot of debris pushed into a pile on the edge of dozer line that came to STEN Riley’s waist and the 1880C firefighters grouped up there. The only person that was unaccounted for was HEQB Lee. The group was almost mesmerized by the fire and the noise it was making. Suddenly the heat slapped them in the face, forcing them into action.

They dumped their torches and tools and the first three firefighters leaped over the debris pile

⁶DP-25 was actually a ¼ mile away

to run through the green. As Blair jumped over the pile, he tripped and face planted on the opposite side, his fuses and water bottles flew out of his pack. He had no idea where anyone was but ash was raining down. He felt the heat of the fire on his back, jumped up, ran a few more steps, and fell again. He scrambled up again and kept running.

At the debris pile, another firefighter, Alex, watched the facial expressions of his companions. HEQB Lee appeared and told him to get his hood up. Alex grabbed the structure hood around his neck and pulled it up. He also pulled down his shroud. HEQB Lee told him to grab his shelter. As Alex reached for his shelter, he felt the heat burning his neck and shoulders. He thought, “Screw it” and started scrambling over the debris pile to run. His pack snagged on something in the debris pile. Struggling to get loose, he teeter-tottered over the pile headfirst, stuck out his arm to catch himself and impacted the ground hard with a jolt of pain. He looked up, saw the others, shrugged out of his snagged pack and ran.

The scattered group zigzagged through the trees and brush⁷. Spot fires ignited around them and fleeing deer emerged in the vegetation as the group escaped from the flame front.

Moments earlier, when HEQB Lee looked back up the line he saw people on the ground. He noticed large piles of slash next to them and said, “Get up and run”. HEQB Lee did not feel it was a safe deployment site and they did not have time. HEQB Lee ran over to the log, jumped over, and ran with the two other firefighters. After moments of running through the green the six firefighters grouped up. STEN Riley counted everyone to ensure they were all there. Alex, who had fallen over the debris pile, told the group, “I think I broke my arm” to which someone responded, “Suck it up. We need to move.” HEQB Lee pulled his phone out and looked at his Avenza map. They could see they were close to a road. It was downhill from them and paralleled the main road. They had a direction out of there.

As the fire came upon them again, radio traffic exploded. BC 1 Taylor contacted 4700G and 1880C to terminate firing and head back to DP-26. HEQB Lee declared priority traffic over the radio, reported their location, and requested air support. He informed Dep. Branch II Pat they were in a bad spot. In Avenza, HEQB Lee dropped a pin on their location and called out the coordinates over the radio. BC 1 Taylor jumped on the radio and told HEQB Lee he was on his way to pick them up. HEQB Lee notified BC 1 Taylor of the road they were headed to. In the meantime, STEN Riley called STEN(t) Andy on the 800 MHz radio and told him they had been pushed off the dozer line and were headed east to another road. The group took a compass direction and started walking. Casey, still uncomfortable with the situation said, “We are still not good. We need to run.” The group took off running again.

As they ran through the green towards the road, they gained distance between themselves and the flame front. When they finally got to the road, they had to slide down a steep embankment on their butts to reach it. Once down, all six grouped up on the road. As they stood there, deciding what to do, a few spot fires ignited around them and the group could see a large column. They still did not feel safe. They decided to keep a slow jog down the road until someone could pick them up. At first, everyone was silent, but then the group began talking to each other, encouraging each other to keep the pace and keep moving.

Drop Point 25

Just like on the dozer line, the events in DP-25 moved in ways only time understands. There were ⁷Firefighters could pin point the moment they ran by looking at their personal heart rate monitors and seeing when a spike in heart rate began. For the two firefighters, it was at 17:35.

moments of rapid, yet controlled chaos punctuated with flashes of slow clarity as over a “30-minute period it went from not good to worse.”

As the fire raced up the drainage at them, OPS Tyler and OPS Sam went into defensive mode, discussing escape routes and the viability of the TRA around the corner. OPS Tyler said “negative” about staying in the TRA, they needed to pull back to the saddle while the fire made its run. They figured they could easily burn the brushy, grassy area around DP-25 and ride it out there. They began telling resources to report to DP-25 while notifying Dep. Branch II they were pulling resources because the plan was no longer viable. As resources began moving into DP-25 the fire made a significant run to the south. Both OPSs were worried the engines were not moving fast enough to get back to the saddle safely, so they encouraged them to quicken their pace. Meanwhile the firefighters of 9314G were lighting the saddle and around DP-25. They encouraged 9314G to fire the saddle quicker. The big opening around DP-25 allowed them to burn the area quickly. The main fire below sucked their fire downhill rapidly.



View from dash camera in DP-25.

Suddenly with a rapid wind shift, there was heavy fire to the north and south and they were getting spots at DP-25. There was a good buffer around DP-25 and the group knew they could weather the fire there. It was smoky and warm but people were doing OK. The crews did accountability checks. The group overheard radio traffic about someone leaving the line but everyone was accounted for. The OPS asked about the resources on the dozer line and road and heard they

were OK.

At this time, DIVS Jordan had heard the two OPSs call the burn off. The fire had flanked the group on the north and south in the timber stringers and was licking the sides of DP-25. DIVS Jordan briefly thought of the TRA. Was it really a safety area? He had heard conflicting information on whether it was big enough for everyone. With the fire flanking them they were trapped in DP-25. And that’s when everything went crazy. DIVS Jordan tried to get accountability of resources but it was difficult because there was no established roles, organization, lookouts, etc.

DIVS Jordan was unable to speak to others via radio and for a while lost all accountability except for 4700G. DIVS Jordan, along with OPS Tyler and OPS Sam, were worried if they did not fire out the bowl the fire would burn-over them and cause a lot of damage. DIVS Jordan did what he could to help the firefighters firing the edge of DP-25 by throwing grenade ignition devices over the hillside, into the bowl, trying to gain depth. The main fire pulled in what they lit very well and created a good buffer. This was no longer an offensive operational mission anymore, it had become a defensive one and they were doing everything they could to increase the safety for the resources trapped in DP-25. For DIVS Jordan, his priorities throughout the event were the accountability of everyone in DP-25 and getting everyone out of there once it was safe to do so.

The group in the saddle took ember showers and 15-20 mph winds as the fire pushed over them. As the fire moved around the drop point, they had to shift everyone to the opposite side. OPS Tyler helped moved vehicles and other equipment as far as possible from the heat and began recording the events on his dash camera. There was a good buffer around DP-25 and the group knew they could weather the fire there safely. It was smoky and warm but people were doing OK. The crews conducted accountability checks. The OPSs asked about the resources on the other side of the line and heard everyone was OK.

As the group at DP-25 tried to make radio contact with Dep. Branch II Pat they overheard radio traffic about a near entrapment and firefighters running for it. DIVS Jordan could hear something over the radio that did not sound like an incident-within-an-incident (IWI) but had started a moratorium on radio traffic. Then they heard “we bailed off the back side running though the green. We need rescue.” At that moment, OPS Sam figured out what road they were running to.

Somewhere in middle of the chaos, Dep. Branch II Pat arrived back at DP-25. He had a quick conversation with OPS Sam and OPS Tyler about the road they thought the firefighters are running to. They did not think the engines could drive it but were pretty sure the trucks could. OPS Sam jumped in BC 2’s truck while Branch II Charlie jumped in his own truck. Both drove north out of DP-25 to the two track. At times, they had to stop and let the fire cool down enough before they could get through.



Example of damage to crew carriers in the TRA near DP-25.

Back at DP-25, the remaining resources had to wait for the heat to dissipate before they could leave the area. They did not know how far the fire had run so Dep. Branch II Pat recon’d the road, making sure it was cool enough for the group to leave. They had to wait in a few areas for the heat to subside. It took a while to get out.

About that time, Dep. Branch II Pat was informed that the 9314G crew buggies left in the TRA had sustained damage. Upon examination, they found blackened paint, burned stickers, and melted lenses. They

looked like hell but they were not out of service. Around 1811 everyone made it safely to DP-26.

Reflecting on the significant runs the fire had made in the past, OPS Tyler contacted DIVS H to move resources until they knew where the fire had run to ensure they did not have another problem. Without hesitation, she moved her resources down past DP-23. Once all resources were accounted for, everyone was pulled down to the bottom of the fire for the evening until they could scout where the new fire perimeter was and make a plan to reengage. En route back to ICP, OPS Tyler gave an update on the radio a few times and upon arrival, he debriefed the ICs in camp.

The Pickup and Rescue

When the fire exploded, BC 1 Taylor tried contacting HEQB Lee multiple times with no response. BC 1 Taylor was frustrated. There was only 100 yards separating them but he had no idea what

was going on. Suddenly, HEQB Lee’s voice was on the radio letting BC 1 Taylor know they were overrun by fire, it was not good and he needed air support. HEQB Lee declared priority traffic on the Tac channel. BC 1 Taylor shut off all the noise of the fire, wind, and people around him, kept his radio only on Tac and focused on HEQB Lee. HEQB Lee told BC 1 Taylor they were running through the green. BC 1 Taylor asked for accountability. HEQB Lee responded “PAR⁸ 5. Correction 5 plus me, PAR 6”. BC 1 Taylor replied, “We are coming to you.”

STEN(t) Andy’s group had only lit the unburned triangle and progressed about 100 feet when the fire slammed the dozer line. There was zero visibility and STEN(t) Andy stared at the edge of the road, into the thick smoke where the dozer line went south thinking, “They have to be right there.” Worried about what STEN(t) Andy was thinking, another firefighter told him, “Chief we’re not going in.” Suddenly, STEN(t) Andy’s radio had STEN Riley’s voice saying they were all off the line in the green moving east. All the resources in the area started accountability checks, unclear who was where. It felt like it took a while to figure out where everyone was. STEN(t) Andy quickly arranged to get the rest of the crew out of there. As they moved out towards DP-26, everyone’s thoughts were on the six entrapped firefighters.

Due to all the equipment jammed into the parking area where the north end of the dozer line met the road, BC 1 Taylor’s truck would be hard to get out. He looked around for a better option and saw HEQB Lee’s truck in a spot he could easily get out of. BC 1 Taylor jumped in, leaving his cell phone with its maps behind in his own truck. He headed downhill from the parking area and drove the main road around the horseshoe. He got to about the area he thought was below where HEQB Lee and the firefighters were overrun and had to stop. The fire front was right there. While BC 1 Taylor waited for the fire to settle enough to keep driving, his eyes searching uphill past a large group of boulders looking for hard hats. He was still in contact with HEQB Lee on Tac who relayed he was dropping a pin on his map and had a lat/long of their location. BC 1 Taylor did not tell HEQB Lee he did not have his Avenza map. He looked around the cab of HEQB Lee’s truck for a paper map. Grabbing an older map from the back, he thought he understood where the two track HEQB Lee was describing was.

When the fire settled enough for BC 1 Taylor to start driving, he realized he could not see through the dusty windshield and the windshield wipers were broken. BC 1 Taylor rolled down the window and looked out through the side window as he drove down the road. He contacted Dep. Branch II Pat and let him know he made it through the fire front. As he drove around a corner to the two track, he found Branch II Charlie (with BC 2) parked in the road with OPS Sam nearby.



Photo taken when BC 1 Taylor arrived to pick up firefighters.

⁸PAR is a Personnel Accountability Report .



Photo taken during drive out the 18N20 road.

Branch II Charlie pulled forward and led BC 1 Taylor and OPS Sam down the two track. As they drove, they passed a fire shelter case strewn alongside the road⁹. They drove another ¼ to ½ mile further until they found the crew. They paused long enough for the crew to jump in and kept driving to a safer location.

When the six firefighters saw the truck there was little to no conversation. HEQB Lee jumped into the front seat with BC 1 Taylor. Two firefighters and STEN Riley piled into the back of BC 1 Taylor's truck. Alex and another firefighter loaded into OPS Sam's truck while fire and smoke charged downhill behind them. BC 1 Taylor called OPS Tyler and gave him a PAR. As they left the area, the fire dropped embers, which quickly grew into spot fires on both sides of the road. HLCO called, asking what they needed and gave them a quick update on the fire's location. He told them he could take up to four per-

sonnel if they needed a transport. BC 1 Taylor initially declined thinking they would drive the firefighters to ICP.

Meanwhile, Alex could barely stand the pain of the truck jostling down the rough road. OPS Sam quickly realized Alex had a dislocated shoulder and notified BC 1 Taylor. He stopped, secured Alex's shoulder as best as possible with items from his medical kit, and then drove as slowly as possible behind BC 1 Taylor and OPS Sam. Hearing about the injury, BC 1 Taylor had decided to fly Alex out rather than put him through a long, painful drive out when HEQB Lee mentioned his face felt hot. BC 1 Taylor looked over at HEQB Lee and noticed his skin looked red and there were small blisters right below his sideburns. BC 1 Taylor told HEQB Lee, "Looks like you got a little burned." HEQB Lee was surprised, "I thought I was just hot from running." HEQB Lee looked in the mirror and saw little red dots on his face. He told BC 1 Taylor, "I'm good." BC 1 Taylor replied, "No we are going to fly you out." BC 1 Taylor quickly pulled over and grabbed water from behind the seat to pour on HEQB Lee. HEQB Lee's face still felt hot.

As BC 1 Taylor wondered about the rest of the firefighters, he requested three air and five ground ambulances. He decided the two worst off, HEQB Lee and Alex, were going to get in the helicopter with HLCO. They kept driving until they met up with HLCO.

As the group waited for OPS Sam's truck with Alex to arrive, HLCO picked back up to help guide the retreating firefighters from DP-25 out of the division. He returned, picked up Alex and flew them to helibase. At the

⁹The FLA team think it is likely the fire shelter case fell out of a pack while the firefighters ran down the road.



View from helispot looking back towards the fire.

helibase, the two men were examined. They cut off HEQB Lee's shirt and noticed his back was burned. The helibase manager had HEQB Lee flown to the UC Davis Firefighters Burn Institute Regional Burn Center and Alex was flown to Enloe in Chico for treatment.

Meanwhile, the four remaining firefighters rode with OPS Sam, BC 1 Taylor, and Branch II Charlie after a quick medical assessment. They did not see anything other than red faces and one firefighter messing with his pant leg. There was concern they had burn injuries but the firefighters declined medical treatment. STEN Riley's concern was to get back with the rest of 1880C. He knew they were headed to DP-26 and at some point they would get back together. As BC 1 Taylor

"This is mother nature, this isn't a single family dwelling. I would hate to lose guys over brush."

- Firefighter's thoughts while driving off the fire.

drove, he was unable to hit Command to save his life. Air to Ground and Tac were the only frequencies that worked.

BC 1 Taylor contacted HLCO to confirm the ambulances were still in route because he could not get anyone on command. Every now and then, he could hear STEN Riley coughing in the back of the

truck. Unfortunately, the ground ambulances received inaccurate reporting instructions and were told to meet at the wrong intersection so they were not there when the firefighters arrived. BC 1 Taylor called and told the ambulances to go to Stonyford Camp (East ICP). They decided to go straight to the Medical Unit Leader at Stonyford Camp and there they found the ambulances.

The Medical Unit Leader at Stonyford took them to the medical tent, where the firefighters' conditions were evaluated. At the time, it was just some red faces and ears. They played it off as nothing and were released. After mulling it over for a while, STEN Riley, knowing that his department policy was to always seek care for any type of burn, no matter how small, decided he and the other three firefighters should be evaluated at a hospital. They were sent to a medical center in Williams, CA where they were treated for head and neck burns and then released.

For the rest of 1880C, the ride off the fire was frustrating. They saw the helicopter come in low and knew something was not right. Some of the firefighters thought it was HEQB Lee that was hurt, while others worried it was a friend. Others focused on keeping a clear head and driving as safely as possible. The strike team headed to the helibase. The drive was long and STEN(t) Andy kept stopping to make calls. When they got to the helibase, their companions were not there. They talked to the Safety Officer who told them an 1880C firefighter and a CAL FIRE firefighter had been transported to hospitals. They eventually heard the remaining four were headed to Stonyford ICP, so they went there.

When they saw the four firefighters, they were elated but immediately felt the absence of the one in the hospital. Some went with the four firefighters to the hospital while others went to the hotel. It was a long day with a late night and 360 miles of driving. Everyone felt the best moment was when they saw Alex at breakfast the next morning. They were 22 strong again.

A STORY FROM THE AIR

During the morning circuit around the fire, Helicopter Coordinator (HLCO) Parker was preparing for his mission for the day. Division F was to be the primary focus for the day. He received a call from Battalion Chief (BC) 1 Taylor early in his shift requesting he look at the area by DP-25 for a burnout operation they were planning.

Midday, as HLCO Parker approached DP-25 in the helicopter, he could not see the entire fire but he could see where the fire was backing off the ridges, just as it had done the past several days. He contacted BC 1 Taylor on the radio and told him the burn operation was viable but needed to happen very soon. He felt if the fire spotted or became established in the bottom of the bowl to the west below DP-25, firing the line would not work. HLCO Parker also advised that if it spotted in the drainage, it would blow out over DP-25. If that happened, the smoke would reduce visibility and helicopters would be unable to work in the area. Deputy Branch II Pat asked him about the smoke column. HLCO Parker responded there was a significant column that looked ominous, but wasn't that bad and it was blending in with other smoke in the area. He reiterated the fire was still backing down, but when it reached the bottom of the drainage, it would blow up to DP-25.

Around the same time, back on the Helibase, HLCO Kelly was getting ready to transition with Parker as a HLCO for the fire. He had served in many roles over the duration of this fire, including serving as Incident Commander (IC) and division group supervisor during the early stages of the fire. He was feeling comfortable with his first shift on the incident as HLCO. His 19 years in the Stonyford area as a hotshot and Superintendent meant he knew the area very well. Talking with the pilot who had flown two days prior, HLCO Kelly knew visibility was

not good but it was safe to fly. He wanted to get up and see the fire so he could get his bearings.

"I knew by his voice he had his hands full."

-HLCO Kelly talking about Deputy Branch II.

HLCO Kelly was flying in the smoky Lake Pillsbury area on the west side of the fire when he heard Dep. Branch II Pat on Air to Ground, saying the area around DP-25 was starting to receive spots. "I knew by his voice he [Dep. Branch II Pat] had his hands full." As his map slowly loaded on his iPad and they picked their way over, HLCO Kelly thought about the topography of the area. He knew if this situation got busy, he would have his hands full managing the four helicopters doing bucket work in Branch I and the situation at DP-25 in Branch II. He would not be able to manage both situations effectively due to communication and terrain issues. He immediately requested an air attack or another HLCO. After he ordered help, he heard another transmission from Dep. Branch II Pat saying they were in a tight spot.

From this point on, things started moving fast and communications became confusing. When HLCO flew at a lower altitude, transmissions became broken. Due to the smoke, he could not see what was going on and was stuck visualizing what could be happening on the ground as he caught bits and pieces over the broken radio transmissions. Listening to the radio, he en-

visioned spot fires compromising firefighters, and their ingress or egress dematerializing. He had no clear idea of what was actually going on but knew there were issues. He anticipated they would need help. At one point, he asked for a lat/long, but heard nothing back from Dep. Branch II Pat. It was obvious they had their hands full.

“I was trying to be creative in a way that helped them without being a liability.”

- HLCO Kelly

As HLCO Kelly and his pilot approached from the west, they realized smoke prevented them from dropping lower in altitude. They tried two other ways into both DP-25 and DP-26 but kept hitting walls of smoke. While he searched for ways to assist the firefighters on the ground, he also struggled with not wanting their helicopter to be in danger. “I was trying to be creative in a way that would help them without being a liability.” He remembered their forward-looking infrared (FLIR) camera. With the FLIR they could get visuals of the activity on the ground.

HLCO Kelly and his pilot opted to use the camera instead of dealing with the smoke. Utilizing crew resource management (CRM), HLCO Kelly and his pilot talked through what each other was doing because his head would be looking down into the camera and not watching around them for hazards. While he got the camera started, he thought about the times he had been in the Windy Gap area, where DP-25 was located. It was a low point or gap in the terrain with broken fuels, and grass. He thought, “That’s a tough spot to burn and hold. There are going to be adverse winds.”

Over the radio, he heard the firefighters were defensively firing the ridge. The pilot kept maneuvering the helicopter to find angles around the knob where they could use the camera to see people. They could not pick up any vehicles or people but could pick up location of the fire they lit versus the main fire to help them navigate. He could see pieces of the firing operation. As he looked through the camera, he saw where the firefighters had put fire on the ground. They had not made it very far but he could tell their fire had become established. He also noted the winds were normal. His whole focus was about helping the firefighters on the ground.

HLCO Kelly overheard someone requesting an air attack and four air tankers. HLCO Kelly contacted Dep. Branch II Pat to let him know the fixed wing assets would not work. HLCO Kelly was 100% sure the fixed wing assets wouldn’t be valuable because the visibility was too poor. Dep. Branch II Pat told HLCO Kelly, “Regardless I want them orbiting.” There was so much traffic on the radio HLCO Kelly struggled with trying to gain situational awareness about what was happening on the ground. When he could get a quick word on the radio, HLCO Kelly relayed the order for tankers and air attack. He asked them to stage at the IP (aviation reference to an initial rally point in the air above) when they arrived on scene. Throughout this exchange, they were still trying to gain access through the smoke but they could never get a good angle they were comfortable to fly in order to help the firefighters on the ground.

As HLCO Kelly flew around a knob, they saw there was a possibility down low that a helicopter could use to access the area. He contacted Elk Creek Helibase on the Victor radio and let them know what they were trying to do. HLCO Kelly had several helicopters standing by to help. Aware of the complexity of the situation, he did his best to brief the orbiting pilots, maintain good communication, and use vertical separation to keep aircraft safe.

Back at the helibase, HLCO Parker was requested to return to the fire. The cobra had been unable to get under the smoke column and was currently looking for people who had been cut off or lost. HLCO Parker and his pilot immediately got in their helicopter, flew out and began looking for people as well. He had heard the request for an air attack and four tankers and added a sky crane just in case. He thought air attack was over the fire, but was unable to reach air attack while flying at the lower elevation in the bowl¹⁰.

Quickly coordinating together, HLCO Parker assumed the role of East HLCO while HLCO Kelly took West HLCO to help coordinate helicopters on the west side. Communications were poor and the helicopters often needed to gain altitude to talk to other aircraft. Concerned about the number of aircraft in the area with marginal communications HLCO Kelly decided to send the helicopters back to Lake Pillsbury. With the smoky conditions, he knew he did not want a bunch of aircraft in the area.

As HLCO Kelly's group moved over to Lake Pillsbury and Division D, communications were spotty with HLCO Parker and that side of the fire. They figured HLCO Parker knew they were there and would call if he needed them. HLCO Kelly switched his resources' frequencies to a different Air to Ground to minimize their impact to the frequency being used near DP-25. Even the command frequencies were scratchy and he eventually lost communication with the other HLCO. From what they could hear, HLCO Parker seemed calm, squared away, and taking care of things.



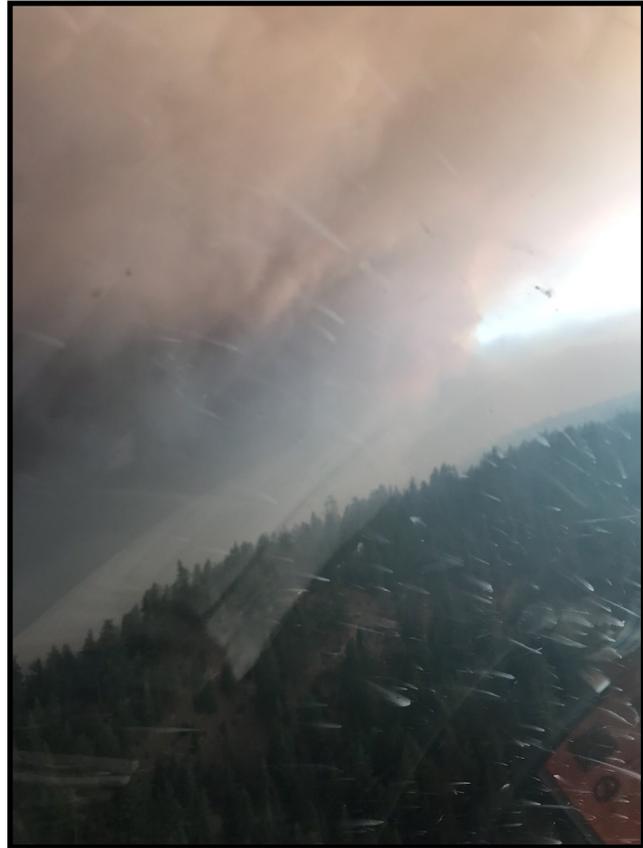
HLCO Parker's smoky view into DP-25.

HLCO Parker tried to contact the cut-off firefighters and was unsuccessful. He contacted Dep. Branch II Pat and was notified the separated firefighters were heading down to a two-track road. HLCO Parker believed he could see the road Dep. Branch II Pat was talking about but could not find anyone. Someone informed him all personnel were accounted for but they were still in a bad spot. At this time, the fire had a large, well-developed, leaning column. The pilot was able to maneuver the helicopter under the column and into the bowl area.

¹⁰HLCO Parker was unaware Air Attack was not over the fire because the visibility was too poor for fixed wing aircraft.

HLCO Parker saw significant fire behavior with spot fires below DP-25 and in the bowl. The largest spot fire was around 10 acres. He then contacted BC 1 Taylor. BC 1 Taylor had the firefighters and were making their way out. With the declining air quality, HLCO Parker was worried about leaving the bowl and not being able to get back in.

HLCO Parker contacted BC 1 Taylor and recommended they fly out the injured personnel. The initial response was they were not going to fly any patients. The next thing he knew, they were telling him they had people with injuries to fly. Locating a spot to meet up and get the patients was difficult. HLCO Parker kept trying to look for landmarks to communicate about something they both knew. HLCO Parker considered bringing in air medical helicopters¹¹ and decided it was not safe to bring in another aircraft for fear they would be smoked out or trapped. He knew everyone was familiar with Pocket Dip so he flew there and waited on the ground for the trucks. With the helicopter on the ground, communications were much worse. Realizing it would be a little while before the injured firefighters arrived, they picked back up again to manage air resources but also to burn off fuel to lose weight.



HLCO Parker's view of the fire, post entrapment.

As they flew, HLCO Parker found two vehicles navigating the road¹². They found a landing area next to the road close to the trucks and asked for a face-to-face. They had a quick discussion about the patients – one with seemingly minor burn injuries and another yet to arrive with a shoulder injury. While loading the burn patient, there was a radio call from Dep. Branch II Pat requesting assistance in guiding firefighters off the division due to the fire behavior. HLCO Parker realized he could go help them while the third truck with the other injured firefighter worked its way to the impromptu landing area. With HEQB Lee onboard, he left to scout the road and fire behavior. HLCO Parker discovered it was just smoke crossing the road from DP-25 and told Dep. Branch II Pat they were OK to proceed. Meanwhile, he still had the sky crane orbiting in clean air. He told his pilot to bump up in elevation to look at the big picture and provide situational awareness. Then HLCO Parker's pilot navigated their helicopter back to the waiting vehicles where the patient with a shoulder injury was loaded up.

At that time, the column really lifted and gave them a clear path back to Elk Creek helibase. HLCO Parker coordinated and rerouted the requested air ambulances to Elk Creek helibase.

¹¹ The air ambulances were ordered by the Medical Unit Leader.

¹² The third vehicle was moving very slowly to minimize jostling the firefighter with the dislocated shoulder.

Once there, he called back to BC 1 Taylor to let him know he had delivered the patients to helibase. After dropping off the two injured passengers, HLCO Parker returned to where he had met up with the trucks but they were gone. They flew over the lines and checked for stragglers. They found all the equipment leaving and followed them to ensure they got out of the area safely. HLCO Parker released the orbiting air tankers because he could not use them and continued scouting, noticing the fire blowing up in multiple areas.

On the other side of the fire, HLCO Kelly heard HLCO Parker over the radio stating six firefighters were in a good spot and they were in a pickup being driven to a safer location. HLCO Kelly heard that and noticed HLCO Parker's voice had changed to a more calm and relaxed tone. They felt that whatever the scenario was it was starting to de-escalate, people were ac-

counted for and vehicles were getting them out. Hearing the good news made them feel better. When they completed their missions for the day, they returned to Ukiah. Once on the ground, HLCO Kelly made phone calls to inform people what had happened and to find out what he needed to do to help.



HLCO arriving to pick up injured firefighter.

A STORY FROM THE OVERHEAD

CAL FIRE Team 2 arrived in the Ukiah, California area on Friday, July 27 to assume command of the River and Ranch fires that eventually became the Mendocino Complex. On Saturday July 28, the team took over command at 1000. Geographically, there were several fires going on, some receiving heavy national attention: Ferguson fire and the Carr fire¹³. Most of the fires in the state were growing rapidly because of current weather conditions and available fuels.

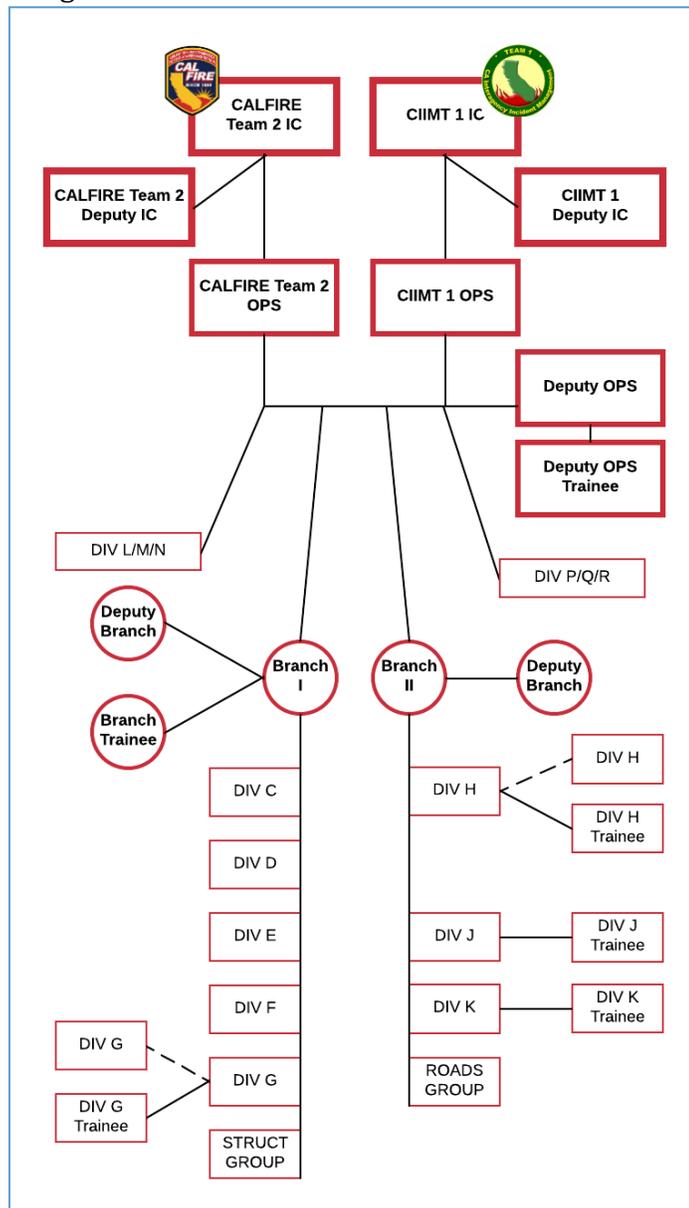
The Forest Service Agency Administrator requested a Type 2 team to work in unified command with the CAL FIRE team. On July 31, 2018, NOR CAL Team 2 (Type 2 Inter-agency team Dalrymple) went into unified command with CAL FIRE Team 2 on the Ranch fire. When a new fire occurred north of the Ranch fire on August 1, NOR CAL team 2 assisted the Forest Service by applying a majority of their assigned resources to it, containing the Eel Fire at 972 acres. It was a high priority to button up because they did not want another large fire.

Early on, CAL FIRE Team 2 concentrated a majority of resources on the River Fire because the fire threatened a number of residential structures and Highway 20. After CAL FIRE Team 2 determined they had provided adequate protection for life and property on the River Fire, they switched their focus to the Ranch fire.

When the Ranch fire first began, NOR CAL Team 2's focus was on Potter Valley and allowing the fire to burn down to the valleys where they focused on structure protection. The emphasis was on divisions F and G, towards a State Responsibility Area

(SRA) comprised of state timber and private lands. The Ranch fire experienced significant growth during the first ten days, growing approximately 30,000 acres on August 3, 40,000 acres on August 4 and 50,000 acres on August 5. Most days experienced red flag warnings, warming and drying trends with very poor recoveries, critically low fuel moistures, and afternoon relative humidities near single digits. Up until August 19, the fire growth had been steadily moving both south/southeast and north/northeast into the Mendocino National Forest. Steep terrain, poor ventilation, fire intensities, and long travel times made it difficult to

¹³ Cranston fire had 12 structures lost and 2000 people evacuated. Whaleback, Donnell and Lions fires were also utilizing similar numbers of resources.



Organizational chart of the Operations Section adapted from ICS form 203 in the corrected incident action plan for August 19, 2018.

“Four thousand people, that’s bigger than the town I live in.”

-CIIMT 1 IC talking about the size of the fire camp.

insert crews and utilize aircraft in certain areas of the fire. If the fire were to leave the Mendocino National Forest it would impact a large number of counties, increasing the complexity by involving more agency administrators, etc.

On August 3, as the fire progressed, the Agency Administrator utilizing WFDSS, determined the need for a Type 1 team. On August 7, 2018 NOR CAL Team 2 was replaced by California Interagency Incident Management Team 1 (CIIMT 1). CIIMT 1 had a perception it would be business as usual with one team handing over the management of the Ranch fire. CIIMT 1 quickly learned that the CAL FIRE Team 2 would be staying on the Mendocino Complex and they received direction to zone the fire between the two teams.

That night after they figured out zones, the CAL FIRE IC got an uneasy feeling and did not sleep well. He tried to put himself in the CIIMT 1 IC’s shoes. If the teams were to separate, CIIMT 1 would end up with barely any resources. They would have 400 people for 50 miles of line. Support resources were so scarce that if another camp was established it would not have any equipment. The teams would have to work together.

The next day, the teams talked about the pros and cons of integrating the two teams versus working separately. They felt if the firefighters could figure it out, the teams could too. They decided to keep the teams together rather than zone the fire, which was an unusual organizational structure for everyone.

“With each team comes a different culture and method of operation – one not better than the other – just different.”

- FLA participant

At this time the Ferguson, Cranston, and Carr fires were all competing for resources, in addition to several large fires in other states. Hotshot crews on the Mendocino Complex were timing out. The teams could get equipment but could not get crews.

Both ICs gathered everyone to figure out how to work together. Agency administrators, CAL FIRE and both the IMTs discussed strategies and objectives. There was a lot of debate on how to set where containment lines would go. With metrics of probability for success, a “big box” concept around the fire materialized. Some were comfortable with the concept whereas others were not as familiar with it. They talked through the “big box concept” and how to do it.

“On the dirt we fight fire and it shouldn’t be that different on the teams.”

-CIIMT 1 IC

In the beginning, figuring out how to work together was clunky. They had different ways of doing business, but both teams were trying to work through it.

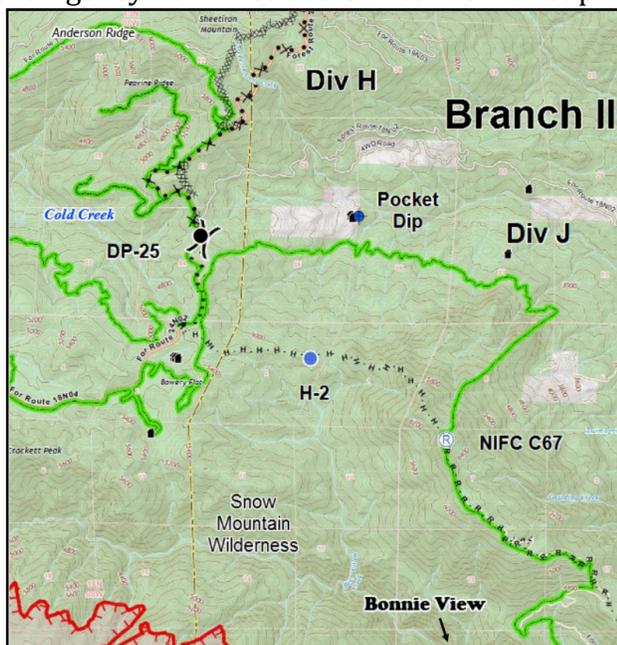
The teams matched their Command and General staff up and worked through most issues. There was a lot of give and take. For example, CIIMT1 was trying to get resources but North Ops¹⁴ told the team they weren’t telling the story in the 209. Both ICs continued to work through these type of issues as they arose.

Further down the organization chart past operations, positions and duties became less clear. There were two sets of operational positions working the same ground. Branches now had deputy branches and there was confusion as to who was developing the plan.

¹⁴North Ops is the Northern California Geographic Area Coordination Center

The overall strategy for both teams was to meet the Agency Administrators' intent of full suppression to keep the fire from spreading. In Branch II, on the eastern and northern flanks of the fire, they wanted to hold the fire in divisions F, G, and H. There were residential structures of high concern in the Bonnie View area if they could not check the fire. They would then work towards Snow Mountain Wilderness, utilizing the 2012 Mill Creek fire scar and road system down through Division L.

On the map, it looked possible but in actuality, it was over 40 miles of line construction to make that happen. CIIMT IC thought it was a "monumental effort to get across that thing. I don't know if folks understand how big the fire was across there." The operations group was looking at the area hard. If the fire got into Cold Creek by Anderson Ridge, it was going to want to whip west to east through Cold Creek (the draw below DP-25).



Area of concern on Branch II of the Ranch fire adopted from the operational map from August 19, 2018.

When the fire grew to 300,000 acres, people were tired of it. The team would add an additional 100,000 acres with control line constructed from Stonyford to Division H. The ICs felt the Agency Administrators didn't want more acres, more smoke, more communities involved, or more forest burnt. It was decided to take a more direct suppression line that involved the saddle near DP-25.

"People were tired of this fire".
- CIIMT 1 IC

For several days before the entrapment near DP-25, the ICs talked with the Operation Section Chiefs seeking opportunities to utilize aerial ignition to take energy away from the fire. Due to the smoky air conditions, they were unable to find opportunities to do so or to put down retardant to check the fire's spread. The team waited for the air to clear. There was talk among the team that the situation could get really ugly if they couldn't hold Division H. For a week, the 1700 planning meetings were chaos because around 1600 the fire would stand up and run each day. The teams braced themselves for a whole other ball game if checking the fire did not work.

To make matters worse, communications were difficult. The team worked to get adequate re-

Definition of entrapment in Chapter 18 of the Interagency Standards for Fire and Fire Aviation:
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. Entrapment may or may not include deployment of a fire shelter for its intended purpose. Entrapment may result in a serious wildland fire accident, a wildland fire accident, or a near-miss.

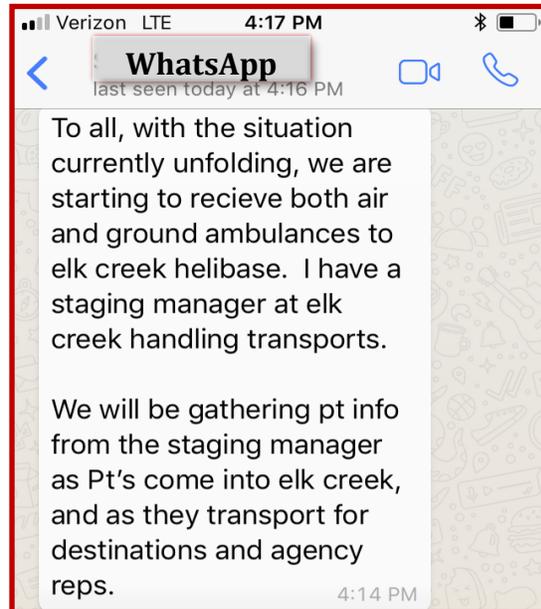
peaters set up but the fire was growing so quickly, by the time they put a repeater in, it was time to move it again. This made communications difficult even in the incident command post.

Day of the accident

The teams received the priority traffic radio transmission at 1732 declaring missing firefighters. The request from the area was for one air attack and four air tankers to be on standby. Unfortunately, there was too much smoke for Air Attack to get in. Both teams gathered to listen to the radio conversation to figure out what had taken place. Fifteen minutes later the missing firefighters were found and being driven out of the fire area. By around 1800 the teams heard there were possible burn injuries and required an airlift.

The ICs gathered their Command and General staff and notified the Agency Administrators so everyone understood what they had going on. They knew they had one CAL FIRE injury that needed to be flown to the burn center. The drive times to get in and out were long and the fire was still raging so they were juggling the logistics of getting the firefighters treatment while still monitoring the fire growth. One IC commented, "It was really scary at this point because we were getting scattered information and we knew we needed to get there to assist." By 1900, they had the names of all the firefighters involved and who they worked for. The information they received was one burn injury, one separated shoulder and four refusing transport. The CAL FIRE team had established a group text in "WhatsApp" to share information. They utilized the Incident-Within-an-Incident (IWI) protocols and the "WhatsApp" group text to make notifications as quickly as possible. Within an hour, the CIIMT 1 IC met with the Agency Administrators and requested they start a Serious Accident Review Team (SART) or Facilitated Learning Analysis (FLA) so they could learn from the entrapment. The next day they found out about the two-crew buggies damaged in the temporary refuge area (TRA).

Hospital liaisons were sent to the burn center at UC Davis Medical Center and Enloe in Chico. CAL FIRE reached out to a Chief near Chico to meet Alex in Enloe to make sure he was not alone. The Chief's wife sent along some fresh cookies and he picked up some shorts and flips-flops on his way to the hospital. Once the hospital released Alex, the Chief took him to a nearby hotel for the night but remained with him to ensure he was not alone.



Example of Team communications during the entrapment using WhatsApp group texts.

LESSONS LEARNED BY THE PARTICIPANTS

Interviews were conducted with key personnel involved in the entrapment on the Ranch Fire. At the conclusion of each interview, each person was asked what they learned for themselves from this event and what they believe the greater wildland fire community could learn. The following are the subsequent lessons the participants shared with the FLA Team that they believe could benefit others. When possible, these lessons were written in the words of those interviewed, though a few places lesson were edited for clarity. These lessons were broken into four categories: Aviation, Inter-Crew, Fireline, and Overhead.

AVIATION

I'm not sure what lessons I learned could apply to the ground. It is not my job to second guess what folks are doing on the ground. My job is to support them and give them our perspective to help them to succeed. They use our input as another tool.

Let incoming aircraft know what type of response they are being requested. This is what it would sound like, "Declare an IWI and have them report to Mendo IP (initial point - aviation) for an IWI."

We had an awareness of not taking risks that would incur potential damage or injuries or add more complexity. There is a balance when you are dealing with a life threatening situation that we didn't make things worse, i.e. compromise ourselves in poor visibility. We ordered additional support to maintain span of control. We immediately ordered up additional support and didn't try to tackle it ourselves. Didn't want to be a liability.

Declare an IWI when injuries are discovered and follow IWI protocols so communication is clearer. Not declaring this an IWI created a lot of confusion because others did not understand the extent of the injuries or people involved.

I knew the voice on the ground so I did not provide decision points or trigger points. I just gave him the facts based upon what he was seeing. If it was someone else, I might have said no to the operation (in reference to when Dep. Branch II was asking about location of the fire for the burn-out operation).

"Do not let urgency influence your actions."

- FLA participant

INTER-CREW

Everybody has a responsibility to run a risk management profile and use Crew Resource Management.

Ask questions when something does not make sense to you.

Ensure you and your resources are briefed thoroughly and information is flowing. People need to understand the assignment and have buy in.

Maintain transparent communication between resources and within your crew.

Speak your mind if something does not feel right. Make sure your voice is heard and understood when doing so. Validate subordinates concerns by passing them up the chain of command. If you are asked a question and don't have an answer, re-evaluate.

Trust but verify. You will receive intel from other resources, but validate that information for

yourself. Gather your situational awareness.

Rely on your experienced personnel within the group, no matter what position they hold.

Do not let urgency influence your actions.

FIRELINE

Remain vigilant and consider the worst-case scenario. Play the “What if?” in your mind.

“I’ve been reflecting on why I didn’t [have the courage to stop the operation], and I can’t really tell you why I didn’t.”

- *STEN(t) Andy*

Take the time to assess the situation and determine if it fits an IWI circumstance. “I was mad at myself for not following the IWI in the 206.”

Good communications are critical. Validate the information you are given. Take time to scout the line. The best thing to do is ask questions for the things that are unknown and communicate with your people frequently.

Have the courage to turn down an assignment.

Vulnerability and approachability are key traits of a strong leader.

There was a perception that refusing an assignment could get you less desirable jobs or reasigned on the fire.

Rank adds to the confusion and tension around speaking up.

I think the dysfunction and disconnect between commanders intent and what was happening in division and branches was a contributing factor to the very rushed firing operation.

The CAL FIRE-Fed rivalry was evident on this fire and I believe it was a detriment to the operational tempo and production.

Help your supervisors and use humble inquiry to have a discussion about tactics. Do things make sense? What is the end state?

There was no good vantage point for the lookout. Our perception is that a lookout can see the fire but is maybe in a less than desirable location.

If you don’t get a good briefing, ask for it. Make sure to receive a thorough briefing from supervisors.

“I wish someone would have said, “Hey Chief, this sucks we shouldn’t do it.”

- *Multiple FLA participants*

I think we need to encourage a culture of voicing concerns in a professional manner. Leadership needs to be approachable.

I’ve been a metro firefighter for more than 30 years. I’ve only been in wildland for 6 years, and I’m like born again after doing some structure protection just a few weeks before on another fire (burning out around six homes, we saved five of them). I really believe in that – this highly influenced my decision to accept the assignment. Huge mistake.

PPE. We have it for a reason. Wear it all appropriately, in particular shrouds and gloves.

OVERHEAD

Who can call for a “Roll Call” to ensure everyone is accounted for? Should it be done at the divi-

sion or with the Team?

Command channel was never cleared. Weather was read over Command during the incident. It was a difficult unified command. We typically go unified with an IC and maybe OPS, but not unified with two whole teams.

Trying to meld two Type 1 teams is not advantageous. There are too many voices and it muddies the water. That was happening on this incident. Having Deputy Branches was a side effect of blending two teams together. We had different operational mindsets and they weren't communicating clearly enough. If we ever have two Type 1 teams again we need to address this more clearly.

Don't get down into the weeds. This is very difficult when there is a Branch and a Deputy Branch. They need to stay up and out of weeds.

Don't use deputy branches. I will fight tooth and nail not to have a Deputy Branch again. Next time I can isolate branches, make them smaller or broken apart.

Regardless of how good the plan is, timing is a critical element of the development of the plan. Sometimes we get wrapped up in the plan and fail to reassess the plan. When conditions changed, we needed to reevaluate.

I should have spoken up sooner. When I drove up, I should have voiced more that this was not a viable plan.

Put too much time in trying to salvage a line that was already lost.

I need to ask more questions to get a clearer picture.

Make sure everyone has a clear plan. The basics. LCES. Where are we going? Who is in charge? Leaders Intent, even if briefing has to be hasty.

Drop points are not safety zones. TRAs are not safety zones or deployment zones.

When you have two teams there can be difficulties like one team pushing for one thing and the other team pushing for another. You have to be more vocal. If we make deputy branches, they have to ride in the same vehicle. They cannot divide and conquer tasks because there is confusion about who is in charge.

We created a hybrid of the ICS system. The two ICs got along great. Below OPS is where it got muddled. Both teams had some failures when it came to how we were organized and communicated below us. Once we got feedback from the field, we cleaned up and it went better. There are definitely ways to make it work better.

"I should have spoken up sooner. When I drove up I should have voiced more that this was not a viable plan."

-OPS Tyler

I should have come up on Command and at least notified the medical unit there was an IWI. I should have forced myself to help Branch check those boxes. I've been thinking how I could have helped. "At all costs you have to address what you feel isn't safe."

I'm not blaming CAL FIRE or the Forest Service, I'm blaming human nature. We have to let go of

what's on your shoulder [referring to the organization/agency patches]. Talk to each other. We have qualifications for a reason. At the end of the day, we have to work together and realize there are good people out there in all agencies.

Talk with people to determine their experience levels and comfort in different fuel types, conditions, etc. If someone is a qualified division, they are qualified. Base actions on the complexity of what the fire is going to do instead of I don't know this guy or trust him so I'm going to just take this on myself.

It took too long for the FLA team to get here. Quite honestly, we were talking to you seven days later. Guys were barely at the hospital when I requested a team. Bring someone in to look at this objectively. I'm a little frustrated that it took a while to get here.

When we decided to meld the teams, we asked for Agency Administrators and Incident Commanders to get together and have a frank discussion behind closed doors. I believe that should happen more.

Letter of delegation is not real. You need closed-door discussions and talk about it. This settled things down a bit. It might be a best practice.

I believe that CAL FIRE and Forest Service are going to work together in the future. Anytime we are going to do that we need to work out *HOW* beforehand. Every time we have worked out something it's been during a fire and that's not the time to do that. We need to look at how both sides operate and drill down how it works and whose going to do what, before the fire bell rings. On the dirt, we fight fire, and it shouldn't be that different on the teams.

For me personally, as Operations when I am in the field I try not to be overly involved in tactics so I don't know all the details of what has already being looked at. If you get too involved you can get things messed up. I should have spoken up sooner. When I drove up I should have voiced more that this was not a viable plan. Looking back, we should have just fired out to protect people. I took for granted that was what was going on.

Branch was calm when the separation happened. He handled it well. It was textbook on how to help folks that are cut off and running. He asked for resources and kept his voice calm. Once the message was passed to all resources that we would shelter in place in the saddle we realized it was not the best place for a safety zone. People stayed calm, folks understood what they needed to do, and it allowed Branch to deal with separated folks.

Peer support is important. Having CISM there was awesome. They had a couple of therapy dogs. We now want to have a permanent CISM and dog on our team.

OPS leadership out there at the time helped people. They had their heads down on the mission and OPS being there may have helped them survive.

We recognized radiant burns can be misdiagnosed or dismissed as minor or superficial. Blisters and swelling can occur many hours later. The burns need to be looked at by a specialist and we had to convince the doctor to get referral to a specialist. We also had firefighters refusing treatment. One firefighter that went in had red ears the night before and the next day they looked like cauliflower. We need a universal protocol.

From the FLA Team's Perspective

The following section summarizes the discussions the FLA team had during interviews, while exploring gathered information, and as we built the FLA documents. Throughout the process, the FLA Team members attempted to put themselves in the participants' shoes when there could be no knowledge of the outcome and asked themselves what made sense at the time, and why. This section is not comprehensive or concrete – nor is this section passing judgement. These are conditions observed that organizations interested in learning may consider in their journey toward improving the wildland fire system of work. This is a snapshot in time, relevant only to the story as we heard it, filtered through the team's own perspectives, biases, and experiences.

As you read through the following sections, pick any of the people who shared their story for this FLA, put yourself in their situation. Recognize that because you know the outcome, you are already affected by "hindsight bias"—or the perspective that you could have predicted the outcome. Consider how you would react if you only had the information that those involved had available to them at the time.

Take the key elements and questions presented here and discuss them with peers, coworkers, or supervisors with the objective of sharing similar experiences, or with the objective of stimulating debate and dialogue.

UNIFIED COMMAND: ORGANIZATIONAL ROLES AND RESPONSIBILITIES

A common view shared by both Incident Management Teams on the Mendocino Complex was a general frustration with having to integrate two entire Type 1 Incident Management Teams (IMTs) under a single, unified command.

While utilizing two complete IMTs under a unified command is common in wildland fire, it is typically done by dividing the incident into two zones and assigning one team to each zone. During initial discussions about how to manage the Mendocino Complex, the two IMTs and the agency administrators preferred to do just that. However, the logistical requirements that would have been required to support duplicate incident command posts, including caterers, bathrooms, and shower units was unfeasible at the time. If the fire had been zoned, one IMT felt the other would have had to manage their zone with only 400 total personnel and no logistical support.

This atypical and creative application of the Incident Command System organizational structure created tension among the teams' members. There was a lack of understanding of the roles and responsibilities of the teams, in the command staff and below the operational Operations Section Chief level. Several team members expressed confusion as to who was making decisions and what the rules of engagement were for those working in duplicate positions, such as Branch Director, Safety, and other team positions.

Many of the participants stated that duplicating positions at all levels of the organization led to increased layers of bureaucracy, blurred lines of formal communication, and replication of efforts. This was also felt at the field operations level where the perception among the troops was that the tension between the two IMTs was impacting some of the decisions on the ground.

Questions for Dialogue:

- What were your thoughts when you read through the Unified Command story?
- If you were an IC or OPS and were presented with a similar situation, what options could you present to the Agency Administrators and another team you may be tasked to work with?
- Are there avenues within ICS that allow ground-pounders to provide feedback to IMTs with regards to how things are functioning?
- What does your local unit or IMT do to review Annual Operating Plans ? How do you gather and provide feedback on how to better work across jurisdictions and agency boundaries?

URGENCY: REAL AND PERCEIVED PRESSURES

By mid-August, the Mendocino Complex had been burning for nearly a month, consuming thousands of acres daily and creating significant social and economic impacts. Firefighters and civilians alike were ready for the fire to be over. The fire was moving towards an area the IMTs felt was critical to protect for a number of reasons. The IMTs felt they were at a point where they could possibly box the fire in. Tactically, the plan was to identify indirect roads and dozer lines that could be used to burnout. This action, if successfully completed, would likely box the fire in, ultimately halting its spread.

Questions for Dialogue:

- Operating in the wildland fire system is inherently risky on its own. When we add a sense of urgency to the system, how might that affect one’s decision-making processes [with regards to risk]?
- Have you been in a situation where you found yourself having an internal conversation questioning the plan? Perhaps thinking to yourself, “Why are we here?” or “Do I know the plan?”
 - Did you continue to go along with the plan? If so, why?
 - What was the outcome?

PROVIDING THE PERTINENT INFORMATION

When urgency becomes the mission, as it may have on August 19, critical aspects of how firefighters operate in the wildland fire system can be pushed to the side. Creating a time-wedge, real or perceived, can push people to give briefings that lack the pertinent information, or to skip them altogether. It can prevent resources from having adequate time to gather their own situational awareness, relying solely on the information of others. If that information isn’t clearly communicated, those involved may not have a clear understanding of what they are being asked to do.

Questions for Dialogue:

- How did the real or perceived pressures affect sharing of information and communications for those in and around DP-25?
- What is the difference between briefings given to a group of people who commonly work together and a briefing between a group of people who just met?
- Have you ever been given a compressed or abbreviated briefing?

- What was the situation around those circumstances?
- What are the minimum elements needed even in an abbreviated briefing?

SPEAKING UP: CREATING AN ENVIRONMENT THAT PROMOTES PSYCHOLOGICAL SAFETY

When personnel do not have a clear understanding of the plan, as was the case for many of the resources working near DP-25, uneasiness can settle in. Several individuals were uncomfortable with the assignment that day as well as the operational tempo. A few spoke up about their concerns and asked for more information up their chain-of-command with mixed results. A few others briefly scouted around to seek out more detailed information for themselves. Most had a feeling of confusion and apprehension.

No single person can pick up on every signal or cue in their environment, so there is a good chance that others may not be seeing, hearing, or feeling what you are. Yet there is a stigma within the wildland fire community that speaking up might cost a person their reputation. Things like, a fear of reprisal or looking foolish, offending those around them, or a lack of confidence in their knowledge and abilities can prevent people from speaking up.

The practice and ability to speak up on a team during operations can be critical to a team's safety and that of others. Knowing what to say and how to say it are both important, but when to say it is also essential to successful two-way communication and improving briefings.

Questions for Dialogue:

- During the process, the FLA team members had candid discussions about the effects of rank upon firefighters and their desire for to speak up. Have you ever been in a situation where rank influenced your decision about whether to speak up?
- Have you ever been in a situation where rank didn't influence your decision about whether to speak up?
- If you have experienced both situations, what differences between the two experiences influenced your ability to speak up?
- If you work within an organization where rank is important, how do you create a working environment that encourages people to speak up (even in contrast to orders given) but still respect a person's rank?

LOGISTICAL COMPLEXITIES OF A LARGE FIRE

On August 19, the Mendocino Complex was approximately 384,568 acres in size, making it the largest fire in California's recorded history. The pace at which the Mendocino Complex grew created many communications issues. The large size of the fire also increased travel times from camps to the fireline. Overcoming these challenges was a day-to-day struggle due to the large runs the fire made every afternoon.

As the fire grew, radio communication and extended drive times hampered operations. Many "dead zones" made radio communication nearly impossible in some locations. There were not enough tactical channels to cover the whole incident. In addition, resources were often driving three or more hours each day to get to their assignment and back. Road conditions quickly deteriorated under the heavy use and further increased drive times.

Questions for Dialogue:

- How does your IMT typically handle communication and extended travel issues?
- In today’s environment of large fires and minimal logistical support (especially during PL5), what can you do to compensate for communications issues?
- What alternatives can be utilized to reduce excessive drive times on large fires?

DEPLETED GROUND RESOURCES

Due to the size and location of the Mendocino Complex, it crossed multiple jurisdictional boundaries, demanding a unified command structure. Unfortunately, a busy fire season prevented the teams from being able to fill all of the overhead positions that would have been required to staff two full teams and forced them to modify the ICS-system to meet their needs. The teams were also struggling to fill overhead and crew needs. At one point, there were five unable-to-fill (UTF) requests for line safety officers (SOFs), and one of the team safety officers recalled that she could have used an additional sixteen SOFs to truly staff the fire.

A lack of resources is becoming an increasingly common problem nationally. In the past five years, the U.S has reached a National Preparedness Level 5 three times. During these times, the number of requests for resources that are being turned back as UTF can be higher than the number that are actually filled (NIFC 2017)¹⁵.

Questions for Dialogue:

- During times of resource scarcity, does the way you strategically manage a fire differ?
- Have you experienced a lack of critical resources? How did you handle it?
- As an IC, how do you prepare for the possibility of not getting all of your requests filled?
- Wildland firefighters often pride themselves on being able to think on their feet and adapt to changing situations on the fly. Have you experienced any positives or negatives to adaptation and creativity working on the fireline or when managing large fires?

SPAN OF CONTROL

Managing a fire when resources are scarce, especially overhead positions, is forcing incident management teams to become creative in how they develop strategies and tactics, as well as how they organize the response geographically. One such overhead position is the division supervisor (DIVS). As fires get bigger and there is an inability to fill DIVS positions, incident management teams are being forced to create large geographic divisions staffed with many ground resources. This can cause issues maintaining adequate span of control.

Span of control refers to the number of resources a supervisor can effectively manage. That number is typically between three to seven; five being optimal. However, it is becoming more commonplace for a DIVS to be assigned far more than the recommended amount. For example, on Division G of the Mendocino Complex, there were four pages worth of resources assigned to it in the Incident Action Plan (IAP) for August 19. To mitigate this, grouping resources into configurations such as strike teams or task forces that come with their own leader is often used to reduce the number of people a DIVS is directly supervising. More often than not, though, the number of people a DIVS is directly supervising is not reduced below seven.

¹⁵https://www.predictiveservices.nifc.gov/intelligence/2017_statsumm/annual_report_2017.pdf

Questions for Dialogue:

- How often have you experienced a situation where you are managing more than the optimal five to seven resources? How have you handled it?
- Have you ever been in a situation where you are assigning resources to a person beyond their optimal span of control? How have you handled it?

PICKING YOUR TEAM FROM A DEPLETED ROSTER

The selection of the right team for the job is critical to the success of any operation. Some of these operations, including firing, can be very specialized. The planners of firing operations typically have specialized training and are highly experienced in burning a variety of fuel types, topography, and weather conditions. It is not uncommon for the Operations Section Chief to hand select Branch Directors, Division Supervisors, Engine Strike Teams, and Crews to carry out these more complex firing operations.

However, picking the right resources for the job becomes more difficult when resources are scarce. While the overhead that were selected to plan the firing operation near DP-25 were experienced, some of the ground resources that were assigned to help carry out the mission were not; some had only burned in brush and were unfamiliar with burning in timber.

Questions for Dialogue:

- Have you ever carried out a plan with whatever resources are available rather than what you asked for?
- Did you continue with the plan? How did you handle it? What did you do instead?

PEN-AND-INK CHANGES: EFFECTS ON GROUND RESOURCES

A lack of familiarity of the ground that our fire personnel are working on can be an issue for wildland fire resources. With larger fires comes larger geographical areas to cover. Combine this with a general lack of resources in a busy fire season, and it leads to an increasing need to bounce fire personnel from one geographic area of a fire to another.

During the six 24-hour shifts that Strike Team 1880C worked on the Mendocino Complex, they were re-assigned to a different division seven times. While the strike team was happy to help with whatever mission they were assigned, several members noted that the frequent reassignment prevented them from building relationships with the resources they were working with as well as gaining awareness of the ground they were working. These issues were further compounded when the reassignments were last-minute changes.

While last-minute changes are not unusual in a large complex incident, many of those interviewed shared concerns that when they received a last-minute assignment change there was minimal follow up at the Branch and Division level breakouts. Reassignments often had minimal information, including their overall objective and more commonly who and where to report to for an assignment.

Questions for Dialogue:

- As an OPS, have you even been in a similar situation where resources are scarce? How did you handle it?

- When deciding to move resources to different geographical areas, what do you consider?

RELIANCE ON STATE AND MUNICIPAL ORGANIZATIONS - MIXING THE MISSION

Some of the interviewees talked about their limited experience in fighting timber fires. “We’re a metropolitan department and timber fires are not really what we do.” The reality of California’s now almost year-round fire season is that metropolitan fire departments will assist more and more in large wildfire suppression, regardless of the fuel types.

Metropolitan fire departments and wildland fire agencies are as different as fire engines and bulldozers. The training that each agency receives is limited in the other’s setting. While there are mandated qualifications for all agencies, the cross-training to the level necessary to adapt from structure firefighting to timber fires is hard to accomplish. CAL FIRE has managed to combine the two distinct disciplines into its operations but no one agency can tackle these large complex fires that burn for months and eat up hundreds of thousands of acres.

Questions for Dialogue:

- How well do you understand the mission and training background of resources that work for a different agency than you?
- In your experience, what difficulties and benefits have you found working with other agencies?
- As a leader, how do you gain an understanding of an unknown resource’s strengths and weaknesses? Does that change during time-compressed operations?

24-HOUR SHIFTS

Mixing missions and cultures is not the only complexity that comes with working with federal, state and municipal department resources. There is also the issue of utilizing and mixing different shift policies.

While a majority of wildland fire resources typically work a 16-hour shift, there are other possibilities for length of shift. For example, California state fire and municipal resources work 24 hours on and 24 hours off. Some Incident Management Teams (IMTs) mitigate for the cycle of a 24-hour shifts during their off period by pairing them with another 24-hour resource that has the opposite schedule. This may add to the complexity of managing resources from the IMT-level down to the divisions. Division supervisors and adjoining resources may require additional time to develop the same working relationship with a municipal resource, or an understanding of their capabilities, than they would with a resource that works 16-hr shifts and is on the fireline every day.

The 24-hour shift also adds complexity for 24-hour resources themselves. Working every-other day adds to the complexity for a 24-hour resource to gain familiarity with a piece of ground and the associated fire behavior. Due to the large fire growth and scarcity of resources, several personnel on the Mendocino Complex noted that it was hard for them to gain an understanding of the daily trends: what the localized weather patterns were, the regular fire activity fluctuations, or even the approximate time the inversion would break each day.

Questions for Dialogue:

- As an IC, have you ever worked with 24-hour shift resources? How did that affect your strategic planning and resource allocation?
- In the field, have you ever worked with an adjoining resource that had a different shift schedule than you? What benefits or difficulties did that present?

DECLARING AN INCIDENT-WITHIN-AN-INCIDENT (IWI)

The need to declare an incident-within-an-incident (IWI) can sometimes be obvious, but other times vague. Remembering it is always easier to Monday-morning quarterback events, there is an important discussion here around when an incident should be declared an IWI or not.

When six firefighters in Branch II were overrun by fire and their escape route compromised, the initial communication on Command was a call for “priority traffic,” requesting “one air attack and four tankers to division Juliet DP-25,” that “we have five individuals on the line with limited radio contact, fire has jumped the line. Need air support to circle overhead.” Thirteen minutes later, all six were accounted for and thought by most to be uninjured.

In hindsight, it can be easy to pronounce that those involved should have declared an IWI, the benefits which would have been a single point-of-contact for planning and a reduction in radio traffic among other things. However, in the moment, those involved felt that they had come through the worst; the situation had played itself out and everyone was doing well.

The definition for an IWI is quite general. It is defined as “any accident or medical emergency during an incident directly involving Incident Management Team personnel or assigned resources.” (NIFC 2017¹⁷) While some things are obvious, such as serious injuries, other events are open to interpretation.

Questions for Dialogue:

- Without a clear definition of circumstances, how does your unit prepare for the uncertainty?
- Has your unit ever had a discussion around the pros and cons of declaring an IWI, or utilized practice scenarios that help your unit navigate the conversation space of whether to declare an IWI?
- In your experience, have the circumstances for an IWI been explained or were they assumed? How can you have a discussion to define IWIs when you are changing resources or supervisors frequently on a wildfire?
- As an IMT, how can you clearly communicate your expectations for when and how an IWI should be declared?

UTILIZING THE 8-LINE (MEDICAL INCIDENT REPORT¹⁸)

Whether a situation is declared an IWI or not, if injuries are involved and medical treatment required, it is good practice to utilize the 8-line. After the entrapment, and the possibility of injuries was announced over the radio, there was little information being fed to the Incident Command Post and Medical Unit. With a lack of information, the Medical Unit Leader began preparing for the worst case scenario. In this case, it resulted in the ordering of three air ambulances and seven ground ambulances.

¹⁷<https://www.youtube.com/watch?v=4C2STvEkAHo>

¹⁸ The Medical Incident Report (MIR), found in the IRPG and many incident IAPs evolved from the 9 Line Form. The intent of the MIR is to provide firefighters with a system to report medical incidents/injuries.

While planning for the worst in a situation like this is standard protocol, in the medical unit leader's words, it caused him to have to completely drain the local 911 resources. Had a local emergency occurred, there would have been no emergency transport available to respond. Utilizing the 8-line ensures that those coordinating the medical response have an understanding of the situation, allowing them to request the right type of equipment to the right location.

Questions for Dialogue:

- How do you and your home unit prepare for an emergency situation? Does your preparation include the use of the 8-line?
- As an IMT, does your team expect the utilization of the 8-line by incident resources? How does your team communicate this expectation and process?

PERSONAL PROTECTIVE EQUIPMENT - PPE

Throughout the FLA process, the topic of PPE came up with many of the participants. The usual discussion about wearing PPE occurred but there were also insightful conversations about *where* you keep your PPE and how prepared we are for when in seconds things change from just another day on the fireline to life threatening. For example, one participant was wearing a nomex structure hood around his neck in addition to the shroud on his helmet. When the fire pushed them off the line, he was able to quickly pull up his structure hood and pull down his shroud. Another interesting conversation happened regarding the individual who fell down and the water bottles and various equipment came out of his gear, scattering on the ground. One FLA team member has resolved to go back to his crew and ensure they attach their shrouds to their helmets so they can simply pull them down if they ever need them.

Consider the circumstances around the burnout operation, how quickly the fire blew up, and the time critical decisions firefighters made and then think about their PPE and equipment they used that may have led to their successful escape. For each of the firefighters and for the FLA team there were certain items that resonated as lifesaving equipment and there were some eye-opening conversations regarding how easy it would be to access those items.

Questions for dialogue

- What are the items you feel would be instrumental in your survival in an escape or fire shelter deployment?
- How easily is it for you to access those critical items? If you tossed your pack, grabbed your shelter and ran would you still have those items?
- Consider how your PPE is configured on your body and in your gear. If the fire behavior made a sudden change in the middle of your operations, will you have the time to stop and adjust your PPE?

IN CONCLUSION

You will find what you seek. As a review team we entered this situation looking under every rock for areas to improve. The reality is that a lot went well on the Mendocino Complex. Key elements found in the lessons learned are common threads the team identified through observations and interviews. By no means is this team saying everything went wrong on the Mendocino Complex. We do not want to discount all the decisions, actions, and adaptability to the incredible fire activity. We want to highlight the great things that were occurring, the planning, and the flexible nature of the employees responding to significant fire behavior. There is also the positive outcome of firefighters making life-saving decisions in critical moments, resulting in the successful escape and extraction of employees who received injuries but are still with us to tell their story. The lessons learned that we are sharing are because the leaders of our organizations tasked this team to look for ways to improve the wildland fire system. The information listed above are some of the elements identified as opportunities for us to look for learning and changes.

The single most important time for a leader or learning organization are the decisions made immediately following a serious accident. At this moment after an event, an organization's employees are paying very close attention to the decisions – specifically, are these decisions leaning more toward a reporting and learning culture? Is my leader looking out for my wellbeing?

The FLA Team would like to recognize and commend the Agencies involved in this FLA for their cooperation, support and dedication to learning from unintended outcomes. It is the team's intent that this process creates dialogue within each agency, with the aim to improve the wildland system working environment.

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