



Rapid Lesson Sharing

Middle Fire Night Hoist

Background

The Shasta-Trinity (SHF) is a vast forest spanning from the Coast Range to the Cascades, encompassing both Mt Shasta and the much more remote Trinity Alps. The SHF is an active fire forest, especially in recent fire seasons. The extremely rugged area around the Trinity Alps is also known to provide critical risk management considerations to firefighters, as long distances and very difficult terrain make heavy aviation use essential for firefighter transport, support, and extraction.

In the massive 2008 fire season, two accidents on the Iron Complex on the SHF place these considerations in sharp relief. On the [Dutch Creek Incident](#), Olympic National Park firefighter Andy Palmer was struck by a tree and remained at the site for two hours while EMTs and fellow firefighters struggled to settle on and carry through a workable plan. In the end he was hoisted by a US Coast Guard (USCG) helicopter but was pronounced dead after landing at Mercy Hospital in Redding almost 3.5 hours after the accident. Two weeks later on the [Iron 44 accident](#), an S-61 helicopter transporting firefighters and a Forest Service employee crashed as it fought to climb out of a backcountry helispot surrounded by timber, killing nine.

Introduction

After Northern California's historic 2018 fire season, the pace of 2019 was a night-versus-day change. Into late summer lower and mid-elevation fuels were cured and ready to burn, but a lack of lightning ignitions had kept fire activity very quiet. At the end of August, widespread lightning was forecast, and forests around the north state started adding to their IA resources with agency and contract crews and engines. Crew 1, a contract Type 2 Initial Attack (IA) crew located in Redding, was activated on August 28 to support potential new starts on the Shasta-Trinity National Forest.

A week later, Crew 1 was still prepositioned at Mt Shasta Fire Station when an even larger dry lightning bust swept through the area. A total of 1,614 cloud-to-ground lightning strikes were reported across California Northern Operations, igniting 124 new fires – 18 on the Shasta-Trinity NF. Crew 1 was dispatched to the Middle Fire, just inside the Trinity Alps Wilderness.

Twelve hours later the crew would be standing on a steep ridge with fire creeping towards them, watching the lights of a Coast Guard rescue helicopter hover and circle above them against a dark sky. Thoughts of Dutch Creek and Iron 44 were inevitable on that agonizingly long night.

The Story

In the late night of September 4th and into the morning of the 5th, as crewmembers of Crew 1 slept, lightning lit up the sky over Northern California. The next morning, SHF fire management gathered information and decided to initiate their lightning plan. Eighteen new fires were confirmed, then prioritized and staffed by the Lightning Plan Incident Commander Type 3 (ICT3) team just setting up in Weaverville.

First thing that morning, Engine 1 (E1) from the Weaverville area made their way to a reported



Figure 1 Google Earth image of the Middle Fire location on September 5, 2019

smoke in the Canyon Creek drainage (Figure 1), near the trailhead that provides access into the Trinity Alps Wilderness. They reported that the fire – the Middle Fire – was ¼-½ acre in size, and began the steep two-hour-plus hike in. As another SHF engine crew made the long hike into the Middle Fire to assist E1, Forest and District-level fire management met in Weaverville around a picnic table to discuss the strategies for the fires scattered in the hills all around.

Some felt the Middle Fire could add burned acreage to the existing 2017 burn just downstream, creating a

large fuelbreak for future fires in Canyon Creek. In 2006, a fire had burned 200 acres in the same area as the Middle Fire, creating snags and accumulated dead-and-down on the steep slopes. Forest leadership saw the risks to firefighters on the ground, and those on potential future fires in the area, as too great compared to the values at risk from the Middle Fire. They drove back to Redding and began work on fire modeling to investigate the potential of using a “confine/contain” strategy for suppression of the Middle Fire.

Late in the day Crew 1 arrived on-scene of the Middle Fire and began constructing handline. Over 40 miles away at the SHF office in Redding, Fire Spread Probability (FSPro) modeling was completed, indicating low potential for large fire growth and good natural holding and slowing features. The sun sank lower in the west, nearing the peaks of the jagged Trinity Alps.

Crew 1 and the two SHF engine crews were making good progress on their direct handline, feeling only a couple more hours of work were needed to tie in at the top of the fire. In order to keep their resources available the next day, ICT3 at Weaverville directed both SHF engines to come off the hill before dark to rest and be ready for work the next day.

The SHF engine crews headed down the trail leaving Crew 1 Crew Boss (CRWB) in charge of the fire. As night began to fall across the hillside, Crew 1 CRWB-Trainee (CRWB-T) realized the fire extended up the hill and out of sight. The crew wasn't going to catch the fire tonight.

Crew 1 started to button things up for the night to leave the fire. At 21:00, the sawyer near the top of the fire yells, "Rock!" All crewmembers begin looking up slope for the hazard. It passes the first crewmember on the left flank... "Rock!" Then the next... "Rock!" The next firefighter, tracking the voices from above, was looking upslope through smoke. Just as he strained to see the rock through the screen of smoke, a car-battery-sized rock emerges, flying toward his face. Firefighter-A (FFT-A) only has enough time to turn his shoulder in an attempt to avoid the rock. It struck him in the back, the back of the shoulder, then the neck, before launching off his body toward FFT-B. FFT-A fell 25 feet down the hill and was unconscious for approximately 30 seconds. FFT-B was unable to avoid the rock flying at him. The rock hit his tool handle, splintering the wood, before striking his upper leg. He too fell about down the hill about 25 feet. The rock continued rolling downhill and disappeared into the darkness.

It was so steep the cup trenches were just ramps to launch stuff further down the hill.

SHF Engine Captain

CRWB-T relayed the emergency to the IC: "Hit by rock, head injury." FFT-B broke in on the radio: "Broken femur." The IC thought he had one patient with a head and broken femur. CRWB-B clarified that there were two patients, one with a head injury and one with a broken femur. Simultaneously, witnessing crewmembers raced to their aid. The crew had two qualified Emergency Medical Technicians (EMT), the CRWB-T and a sawyer. They split up, each taking a patient. The on-scene medical gear consisted of two ten-person first aid kits, a partial trauma bag with bleeding control, splints, and other basic first aid supplies. Using the medical gear they had on scene, they implemented C-Spine and bleeding control to FFT-A with the head injury and began splinting FFT-B's painfully twisted femur break (Figure 2).



Figure 2 X-Ray of FFT-B's broken femur

The IC called Weaverville with the emergency traffic, then tried to reach Redding Dispatch. He made three calls with no success before going back to the ICT3 Weaverville Communications as the main contact point for the incident. He transmitted all 8-Line information through

Weaverville Communications, who relayed the information to Redding Dispatch via phone. At 21:07, about ten minutes after the injuries occurred, the IC requested a hoist-capable medivac helicopter for extraction. Ten minutes later, the US Coast Guard (USCG) was called for their hoist capability, with a California Highway Patrol helicopter from Fresno as a backup.

The IC had two plans for the incident. Plan A was to hoist the injured firefighters off the hill. Plan B was to hike the patients the at least two hours down the trail to meet up with ground ambulances. An additional Type II crew was activated with more medical gear to hike up toward the incident. The IC had been on the Dutch Creek incident, and the comparison with what he was facing now made his heart sink. “All I can think of is Andy Palmer...”

I wouldn't have let them hike me out!

Injured FFT-B



Figure 3 View of the steep terrain and heavy fuel loading in the area of the Middle Fire

At 21:55, fire activity began to increase. Roll out had created fire below in the drainage. The crew needed to move. They first packaged FFT-B with the broken femur. Without knowing the exact location of the fracture in relation to the femoral artery, the EMT decided to stabilize the injured leg without pulling traction (The RLS team discussed this injury with a former US Army medic, a nurse, and a medical doctor, who all affirmed the decision not to risk further injury by rotating the injured leg). The crew cautiously moved the stretcher over the dark uneven terrain, up and over the dead and down (Figure 3). The 300 feet felt like a half a mile worth of pain. They delivered FFT-B, offloaded him and returned for FFT-A with the stretcher. They carefully packaged FFT-A utilizing the medical gear along with the yoke adjusters stripped from their packs for additional stabilization (Figure 4). The IC could hear the loud screams of his injured crewmembers over the hill in the distance. Fatigued and tired, the crew began moving FFT-A through the heat of the fire to new location. After the move, FFT-B began to decline and exhibit signs of shock.

At 22:52, the coast guard accepted the hoist mission. Due to the severity of the injury and the difficult terrain, the decision was made not to hike out the patients fearing that it would jeopardize their stability. Additionally, there were no other good hoist spots available on the way down the ridge if patient status worsened mid-transport. Just before 23:40, the crew heard the USCG MH-65 Dolphin helicopter (Figure 5) inbound over the canyon to them. A sense of relief swept through everyone on the hillside.



Figure 4 Yoke adjuster from fire pack used for stabilization

The helicopter made several passes but determined they could not immediately perform the mission safely. Hovering at over 4500 feet in warm weather was far from the ideal operating scenario for a helicopter based along Humboldt Bay on the Pacific Coast. Rotor wash from these reconnaissance passes began to increase fire behavior, throwing spots down the slope. Via the CALCORD emergency frequency, the helicopter informed the IC that they are too heavy and would have to burn off fuel.

Hearing the words “too heavy,” the IC immediately thought back to Iron 44. He had been on the flight immediately prior to the crash. Earlier he was reminded of Dutch Creek and now all he could think of was Iron 44 and the helicopter being “too heavy.” After burning fuel for over 90 minutes, the USCG determined they still could not complete the hoist and needed to reconfigure off-site. The USCG crew radioed they would return once reconfigured, and the helicopter’s lights disappeared behind the trees over the ridge.

The IC, out of options, waited patiently. He knew that there was greater risk to patient health and to the safety of the crew if they try to move them. The EMTs were firm that FFT-B in particular could not be moved. As the crew waited, hoping the USCG would return, fire behavior continued to increase around them. A log broke loose somewhere up the slope and rolled past them, igniting new spots fires as it went.



Figure 5 USCG MH-65 performing a marine rescue hoist training.
Photo Credit: Petty Officer 3rd Class Eric D. Woodall at Defense.gov

Nearly an hour later at 02:32, Redding Dispatch relayed to the IC that the USCG helicopter would be lifting back for the incident in 30 minutes but would only be able to take one of the

two patients due to the helicopter capabilities in a hover profile. He was asked to choose which patient would go and which one would have to stay on the hill until the next morning. Although both patients were of priority, the EMTs and the IC decided to transfer FFT-B with the femur injury first. A squad would carry FFT-A with the head injury down to a saddle and spend the night there until another helicopter could hoist him out in the daylight.



Figure 7 FFT-B waiting for extraction. His leg twisted 180 degrees after his femur was broken.

At 02:36, the IC established contact again with the USCG helicopter. He reconfirmed patient priority: one red and one yellow. Within 30 minutes of the aircraft arriving on scene, the helicopter told the IC to prepare both patients for extraction—they could take both after all. The squad, down at the saddle, immediately begin relocating FFT-A back to the hoist site for extraction.

Almost 250 feet above the crew, a rescue swimmer and basket appeared in the door of the USCG helicopter. He spun as he descended by hoist down below past the tall trees and into the hoist spot. Over the next few minutes, both patients were successfully extracted and safe aboard

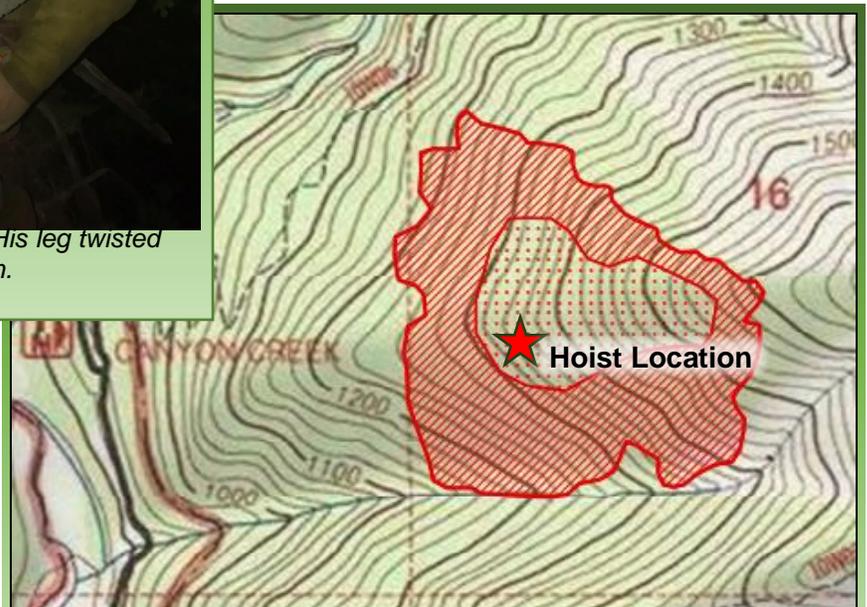


Figure 6 Middle Fire heat perimeter at the end of September 6, 2019. Elevation in meters.

the Dolphin. They landed at Weaverville at 03:50, were transferred to separate air ambulances and flown to Mercy Hospital for care.

Seven long hours from the time of the accident, there is a finally a happy ending for the two injured members of Crew 1.

The Middle Fire had become well established in the drainage to the south. With both injured crewmembers off the hill, the crew hiked off to bed down in the few remaining hours of darkness.

Video taken from the US Coast Guard Rescue Helicopter



The image on left is a screenshot taken from a seven-minute video that shows the rescue swimmer with basket successfully hoist the two injured firefighters into the rescue helicopter.

To see this video:

<https://youtu.be/-mF6O3ezDYI>

Lessons Learned & Discussion Points

Crew 1's Lessons Learned

- Medical gear sufficient to deal with the worst injury you could expect on an assignment needs to be accessible enough to be of use.
 - Crew 1's complement of medical gear surpassed Forest Service contract requirements.
 - Additional medical gear can be delivered aurally in some cases – by helicopter or smokejumper paracargo.
- Are you performing your own risk management process, or assuming the incident management team, local fire management or previous IC has it covered?
- Don't assume an aerial extraction is in your back pocket, even if you have access to multiple alternative aircraft.
 - What are the resources you have in your area to hoist? Night hoist?
 - What are the limitations or considerations when using aircraft?
- Be willing to turn down an assignment if evacuation of an injured person is not possible in a timely manner.

Ask Yourself

1. Do you have remote areas on your unit where you would need to plan a medevac to get someone out?
2. Are you preparing for the next step, if your current plan starts to fall apart?
3. What concerns would you have if you got an IA at 1800? What would you need for support?
4. When walking into a new fire, are you evaluating what it would take to get someone out—what is the tipping point when you would disengage—what are the values at risk to justify the assignment and the strategy and tactics?

Ask yourself this question “have I done everything to train and prepare my crew to respond to an emergency?”

Kudos

- Crew 1 EMTs made very sound patient care decisions, and centered patient care above all other considerations as the timeframe continued to lengthen.
- Crew 1 has developed a training program that included incident reviews.
- Coordination between agencies and contractors facilitated procuring additional medical equipment and developing alternate evacuation plans.

Related Learning Documents

Lime Fire Hoist RLS (Forthcoming 2019): Daytime hoist extraction performed on the adjacent Klamath NF less than ten days after the Middle Fire hoist.

[Hirz Fire Boulder Strike RLS \(2018\)](#): Hoist by Air National Guard on the **SHF**.

[Sandy Fire Hit by Tree \(2017\)](#): California Highway Patrol hoist on the **SHF**.

[Gregg Creek Broken Leg/Extraction \(2015\)](#): Hoist mission canceled due to safety concerns from firefighters.

[French Fire Night Time Hoist Extraction \(2014\)](#): A successful night hoist on the Sierra NF

[Bagley Fire Tree Strike Injury \(2012\)](#): Hoist by Air National Guard on the **SHF**.

[Nasty Fire Hoist \(2011\)](#): Documents a successful hoist operation.

[Panther Fire Medevac Hoist \(2008\)](#): Contains video showing rotor wash considerations.

The Team

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