

**Likely Fire Entrapment
Accident Investigation Report
Bureau of Land Management, Northern California District**

09/09/2012



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Co-Lead Investigator

10-17-2012

Date

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10-17-2012

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Executive Summary:

On Wednesday, September 5, 2012, at about 11:27 AM, two CAL FIRE Handcrews were dispatched from Intermountain Conservation Camp #22 on an initial attack assignment to a vegetation fire south of Likely, California.

The handcrews arrived at approximately 12:56 PM, and were assigned to anchor the fire to State Route 395 and begin constructing direct handline. At approximately 2:00 PM, the lead handcrew was constructing direct handline when the fire behavior suddenly increased during a wind shift. As the majority of the crew retreated into the black, three inmates found their escape route blocked by the advancing flame front. The inmates passed through the flame front into the black where they sustained first degree and some minor spots of second degree burns to their faces. The inmate firefighters were transported via ground ambulance to Modoc Medical Center where they were treated and released for minor burns.

Conditions:

Weather: Blue Door RAWS: (41.0547° N X 121.3375° W) BDOC1

Location: 10 miles SE of Incident Site
Date/Time: September 5, 2012 / 1:59 PM
Temperature: 81.0° F
Relative Humidity: 7 %
Wind Speed/Direction: 12 mph from SW
Wind Gust: 23 mph

Fuel Type: Rangeland consisting of: low sagebrush, mixed annual grasses, western juniper, conifer, and shrubs. Incident site was primarily grasses 6 to 8 inches tall.

Topography: The accident site sits at 4,918 feet and is relatively flat with a gentle slope falling toward the north. Area is covered with loose igneous rocks of various sizes.

Fire Behavior: Upon their arrival the crew encountered a backing fire along the flank with flame lengths averaging about 1 foot. The wind changed speed and direction at the time of incident increasing flame lengths to 3-4 feet with some sheeting and short range spotting.

Narrative and Sequence of Events:

On Wednesday, September 5, 2012, at about 11:27 AM, two CAL FIRE Handcrews were dispatched from Intermountain Conservation Camp #22 to initial attack a vegetation fire 7 miles south of Likely, California, along Highway 395 at Sage Hen Summit.

After the crews arrived at 12:56 PM, both Fire Captains met face to face with the BLM Incident Commander (IC) and were given their assignment to anchor the fire at Highway 395 and construct direct handline along the left flank. After the briefing with the IC, the Fire Captains met and decided a “Leap-frog” tactic would be used allowing the first crew to begin work about 200 feet up the fires edge from the highway and leaving the second crew the job of anchoring the fire at the pavements edge. Returning to the crew the Fire Captain gave a quick, but thorough safety briefing prior to beginning work. Much of the briefing was dedicated to utilizing the black as a safety zone and to maintain a direct attack on the fires edge.

At the time the handcrews began working this portion of the fire both the Captain and IC described the fire behavior as “Not extremely active,” and was characterized as “Backing against the wind in light grassy fuels.” Handline construction was hampered by the numerous rocks that were scattered throughout the area.

The “Leap-frog” tactic worked well for the crews, and as they progressed a CAL FIRE dozer arrived, advanced up the completed handline, and took a position in front of the lead handcrew. Rocky conditions slowed the dozers progress so the handcrew bumped past the dozer.

At about 2:00 PM, the weather conditions began to change and on several occasions the fire’s intensity increased due to wind gusts and small directional shifts. During these flare-ups, the Fire Captain would back the crew into the burn, and when conditions improved, the crew would resume working. At the time the inmates were injured, the crew was working parallel to a three strand barbed wire fence.

Three inmate firefighters, at the rear of the tool order, were working on a finger when the wind shifted and increased in speed cutting them off from the safety of the black. Alarmed, the inmates moved away from the approaching flame front and began moving parallel to the barbed wire fence and the approaching flame front. At this point they saw the Fire Captain up ahead of them and could hear the other crew members yelling for them to move into the black. Instead of paralleling the fire they turned and ran through the four foot, sheeting grass fire into the black. Traversing the rocky terrain caused two of the inmates to lose their footing and fall into the flame front. The third inmate, seeing a crewmate fall, stopped and reached back but due to the flames was unable to assist. The two fallen inmates quickly regained their footing, and along with the third clambered into the black.

The Fire Captain seeing the event unfold gathered up the entire crew in the safety of the black and surveyed the condition of the crew and the three inmates. The three inmate firefighters appeared to be unhurt but had some reddening of the cheeks and noses. At this point the Fire Captain believing the inmates were not injured put the crew back to work, but continued to monitor the three inmates’ condition.

About 20 minutes later the three inmates notified the crew's Swamper that they were burned. The Fire Captain re-examined the three inmate firefighters who had begun to exhibit more visible signs and symptoms of minor burn and at about 2:29 PM, made contact with the IC with the injury report. The IC made an ambulance request through the local dispatch center. The Fire Captain moved the three inmates back down the handline to Highway 395 to rendezvous with CDCR Officers and the ambulance.

The inmate firefighters were transported from the incident by ground ambulance to Modoc Medical Center in Alturas where they were treated for minor first and second degree burns. One inmate had first degree burn to the lower lip; one had first and second degree burns to the ear and cheek; and one had first and second degree burns to the nose and cheek. The injured firefighters were released about an hour after they arrived and returned to Devils Garden Conservation Camp # 40 to rest and recuperate before being reunited with their crew.

Investigation Process and Team:

A Joint BLM/CALFIRE Accident Investigation Team conducted this investigation. The investigation process included interviews, inspection of PPE, verification of documentation, and visit to the site where the injuries occurred. The Investigation Team consisted of the following individuals:

Todd Price, Cal Fire BTU (BC)	Co-Lead Investigator
Paul Bannister, BLM CA (SFMO)	Co-Lead Investigator
Kevin Chambers, BLM CND (DFMO)	SME
John Berglund, Cal Fire LMU (FCS)	LE Investigator
Mark Rotlisberger, Cal Fire LMU (FCS)	LE Investigator
Mike Smith, Cal Fire LMU (BC)	Training/Safety
Tim Williams, Cal Fire LMU (BC)	Union Rep.
Janet Lewis, Cal Fire LMU (OT)	Documentation

Findings and Recommendations:

Finding #1

The injured firefighters Nomex shrouds were down but not enclosed, at the time the entrapment occurred.

Discussion: The Captain stated that the crew's shrouds were down but not fully enclosed at time the firefighters sustained burn injuries to the face. Had shrouds been down and fully enclosed by the Velcro strip, the facial injuries to firefighters could have been reduced.

Recommendation: Ensure all fire crew members are appropriately wearing all Personal Protective Equipment (PPE), including shrouds, during active suppression operations.

Finding #2:

The inmate crew had received a complete briefing prior to initiating line construction on the fire.

Prior to crew engagement on the fire, the briefings by both the BLM IC, and the briefing by the Inmate Crew Captain were thorough and complete, and included LCES. The Captain made it clear to the crew that the line construction operation was to proceed with "one foot on the black", and the safety zone was clearly established as the black.

Finding #3:

All four Common Denominators of Fire Behavior on Tragedy Fires were present at the time the entrapment:

- On relatively small fires or deceptively quiet areas of large fires.
- In relatively light fuels, such as grass herbs and light brush.
- With unexpected shifts in wind direction or wind speed.
- When fire responds to topographic conditions and runs uphill.

Recommendation: Ensure that personnel are familiar with the information provided in the Incident Response Pocket Guide (IRPG). Incorporate information provided in the IRPG into all briefing and tailgate safety sessions as appropriate.

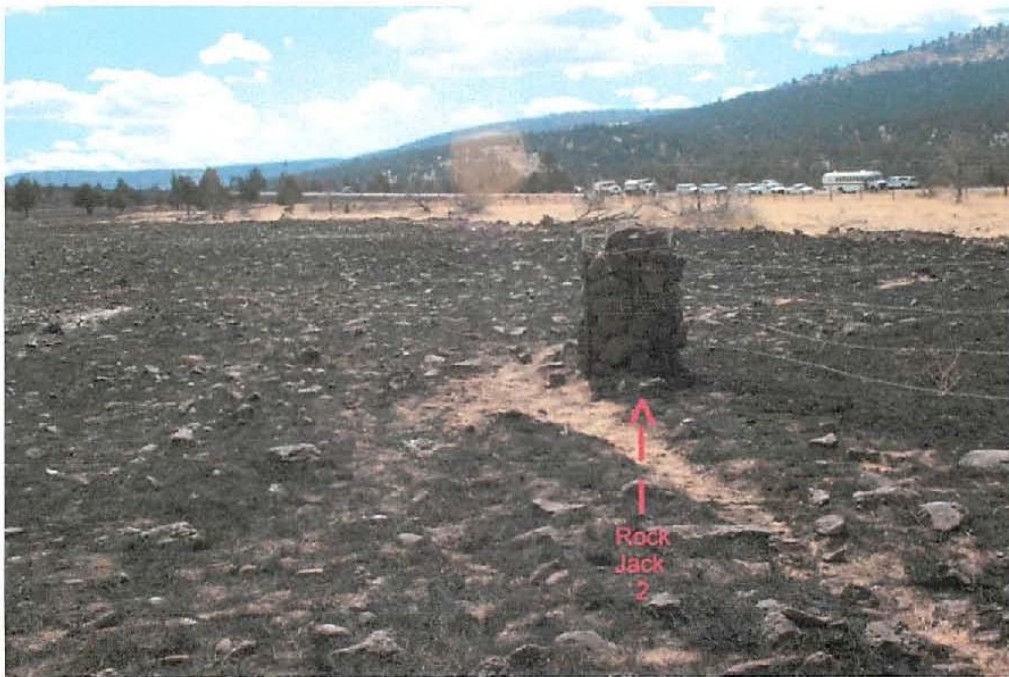
Finding #4:

Extremely rocky terrain made rapid short distance travel difficult.

Discussion: When the crewmembers were given the direction to retreat through the flame front into the black safety zone, numerous large rocks in the area caused two of the crewmembers to stumble and fall. This occurrence was a primary causal factor to the firefighters burn injuries.

Recommendation: When determining Escape Route and Safety Zone, consideration needs to be given to terrain topography and continuity.

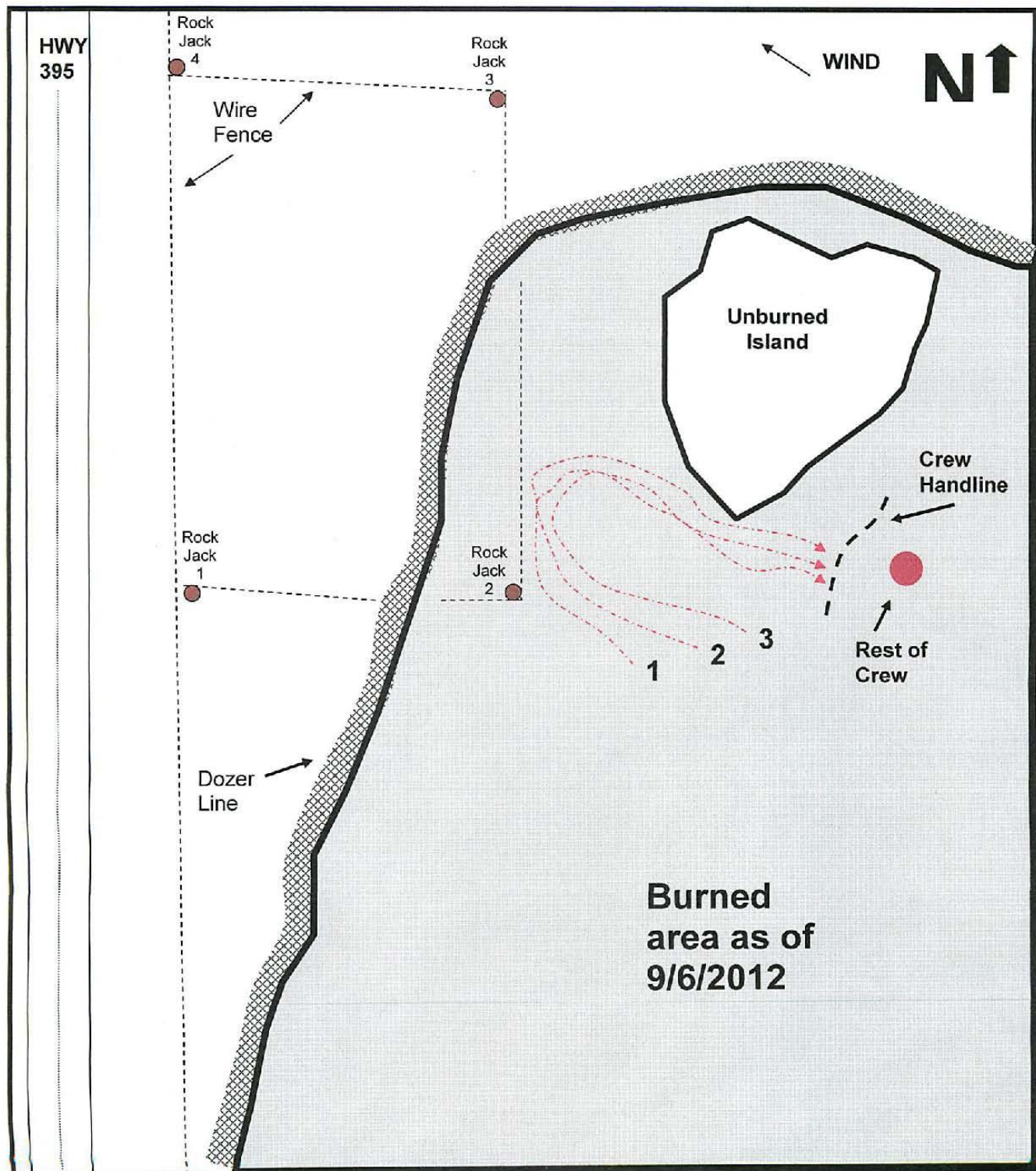
Maps/Photos/Illustrations



9/7/2012 1:21:35 PM
View to South West from Rock Jack 2.



9/7/2012 1:21:42 PM
View to North from Rock Jack 2.



Not To Scale

J. Berglund