



United States Department of Agriculture
Forest Service

GREEN TREE FALL INJURES FIREFIGHTER



8/11/2013

Facilitated Learning Analysis

Green Tree Fall Injures Firefighter

FACILITATED LEARNING ANALYSIS

Summary

On August 11, 2013 a firefighter was injured by a fallen green tree within the Six Rivers National Forest. During the fire incident, two Divisions were tasked to suppress a 35 acre fire and build direct handlines around it. The fire was located in heavy timber with snags on a steep slope (Figure 1). The top of a snag broke off and fell near two firefighters. Crews were then instructed to withdraw and fall back to a safe distance due to the hazards. However, the Task Force Leader trainee (TFLDt) of that Division remained to guide helicopter water drops to keep the fire from spreading up the opposite hill. While monitoring the helicopter water drops, the TFLDt heard a pop and groan, heard firefighters yell “snag,” then turned around and saw a tree uphill beginning to fall towards him. The firefighter darted downhill away from the tree but was struck in the back and head by what was believed to be tree branches. “Everything went black, and my helmet went flying off.” The TFLDt recalled being lifted by his pack straps by another firefighter and moved away from the fallen tree. The TFLDt was able to hike out of the area without assistance, was driven to the local District office and then taken by ambulance to a hospital. Approximately 5 hours passed between the time of the incident and arriving at the hospital. The employee was released from the hospital the same evening.



Figure 1. Steep terrain.

The Story

Following is the story according to the TFLDt:

The lightning-caused Grizzly Fire began August 9, 2013 and was managed as a Type 5 incident. I was returning from another assignment when I was notified that I would be the Incident Commander (IC) for this fire the following morning and manage it as a Type 4 incident. I was told to provide a briefing in the morning (August 10), but had not seen the fire, so I went to scout it and gather intel. So once I took over the incident, we tried attacking the fire from the top but were not covering much ground because of the heavy fuel loading due to the heavy brush. We could not see what was happening below. So when we tried to attack it from the bottom in an attempt to create a good anchor

point, we noticed a lot of rock, tree and debris rollout. It was just a bowling alley! It seemed just as dangerous and difficult from the bottom.

The following day (August 11), the incident transitioned to a Type 3 incident under a new IC due to the increased complexity in logistics, increased fire behavior, and heavy fuel loading. I was then assigned as one of the two TFLDt's.

When I was assigned as the TFLDt, I was able to provide intel of the fire during the operational briefing. I mentioned the change in fuel types due to elevation change, and to pay attention to the fuel loading. The green trees have shallow roots because of the rocky ground and when the deep duff layer is burned off the roots become exposed. This in turn makes the trees and snags less stable. The duff on the ground is deep, up to 20 to 24 inches. The roots of the trees are in that duff and during a fire trees come down in 2 to 3 days. We discussed the possibility of injuries and bad escape routes, so we were looking out for potential helispots.

We decided to attack the fire from the top and were able to start putting a hose lay down the flank of the fire. I got together with one of the other firefighters to check if what we were doing was working and decided it was from what we could see and based on the mitigations being applied. So we continued to flank my Division and began to turn the corner towards the other Division. While I was scouting ahead of the working resources, I noticed a snag patch of trees that looked like they were going to be a problem. I made contact with the IC and asked if there would be a ship in the area with a bucket that may be able to work this area. I then instructed resources to hold what they had because further progression would be too dangerous due to the snag and rolling rocks. The dangers of the snag patch prevented the last 500 feet of hose lay from being deployed and complete the handline.

Figure 2. Broken tree and debris field.



A helicopter was made available and, while the crews avoided the area of the snag patch, I directed a couple of bucket drops in an attempt to cool down the area, hoping to hold the fire until the next day when conditions would be more favorable to finish the hose lay. This was also to keep fire out of the drainage bottom and avoid a slope reversal that would jeopardize the gains made to this point. Around this time, a burning snag top fell between two firefighters, which prompted them to pull back even further from the area. We had been seeing other snags falling within the fire.

“We were aware of the snag top, so we kept an eye on it and safe distance while keeping the fire edge cool with hose,” stated one of the two firefighters.

The TFLDt continued: I remained in the area to direct the helicopter drops. I thought three more water drops were needed and then I would withdraw and join the rest of the resources who I directed to pull back. A few minutes later, I heard a pop and groan, and heard people yelling, “snag!!” I

looked up behind me, saw a tree coming down, and began to run to the northeast downhill, but away from the snag patch. I could hear the tree behind me come crashing down, wood splintering, branches breaking, and debris falling all around me (**Figure 2**). I pretty much thought I was dead! And then I felt something hit me in the back and head and I fell to the ground. It all got dark suddenly! It was from the cloud of debris stirred up by the tree hitting the ground. I remember one of the firefighters grabbing me by my pack straps to lift me up and pull me out. But I told him I needed to sit down. I just wanted to sit down for a second – I kept trying to sit.

“After I heard one of the firefighters yell ‘snag,’ I saw the tree crashing through the canopy, so I ran towards the rest of the crew and got behind a large tree,” stated the Crew Emergency Medical Technician (EMT). “I saw the tree coming down as the TFLDt was darting down the hill. The tree landed right behind him. Then a cloud of debris darkened the area and I couldn’t see him anymore. Another firefighter and I ran towards him and we saw him stumbling out of that black cloud! I immediately assessed him and did not see any visible injury. Over the radio they kept calling for the TFLDt and a crewman answered that he did not have his radio and added ‘We just had a near miss and everyone is getting off the hill.’”

The fallen tree was believed to be a white fir estimated between 36 to 40 inch in diameter at breast height and 75 to 100 feet tall. It was a live tree that had been burning at the base on the uphill side (**Figure 3 & 4**).

The TFLDt stated: The crew was just staring at me. So I felt my head, and saw no blood. My heart was pumping. I was wound up. I knew I was mashed up, but it didn’t matter. We needed to get off the hill. I knew my hardhat and radio were busted! It would kill my folks to carry me down the hill because of the terrain. I told everyone I could get out on my own power. Besides, it would have taken an hour to get medical staff and extrication equipment in and another hour to get out. It took about 40 minutes to hike down to Drop Point 1 (DP1). After getting to DP1 I began to feel pain throughout my body. I began to get shaky and could not focus.

Once at DP1, the IC approached the TFLDt to tell him he did a good job. “I noticed the TFLDt had been favoring the right hand so I put out my hand for a handshake but he was unable to shake my hand. So I decided to get the individual transported to the District Office immediately,” the IC said.



Figure 3. Looking uphill at stump of fallen tree.

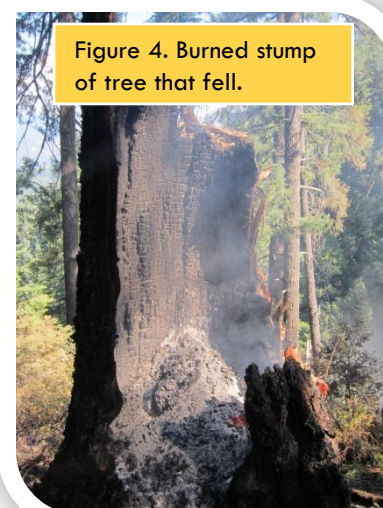


Figure 4. Burned stump of tree that fell.

Figure 5. Damaged bottles.



The TFLDt continued: I was still feeling pain after I got to the office. They told me they were calling an ambulance to take me to the hospital. But the ambulance never made it because it wouldn't start. So another ambulance from a different location was activated. When they arrived, they recommended an air ambulance, but there seemed to be some confusion about the timing and decision making, they decided to ground transport me. When I arrived at the hospital, the hospital liaison was there waiting for me. A CAT scan was performed, but they found no obvious breaks or other injuries. I was released that night. Everyone was telling me the next day that I was lucky to be alive. I felt pain the next day throughout my body and my fingers were numb and I felt what seemed like radiating needles and tingling throughout my arm. When I went to the hospital the next day (August 13), they told me they could find nothing wrong with me but that I had carpal tunnel syndrome. I told them that "I haven't been typing lately – I got hit by a tree!"

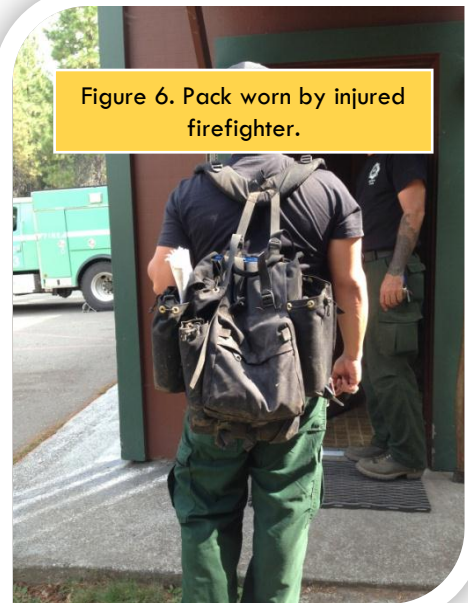
The day after the incident (August 12), a Safety Officer (SOFr) and Safety Officer trainee (SOF2t) arrived as requested by the IC. They came from another incident on the Forest. The SOF2 and SOF2t began gathering information from firefighters during the crew operational shift and requested they complete ICS214 (Unit Logs) of the incident that occurred the day before. The IC stated that he was under the impression that the SOF2 and SOF2t would do the accident assessment and gather intel for other hazards and mitigations on the fire. Some of the firefighters involved were not clear of the mission and intent of the SOF2 and SOF2t, this created confusion amongst those involved in the incident.

Other than scuff marks on the hardhat worn by the TFLDt, there was no visible evidence of damage to the hat. The hardhat was sent to the Missoula Technology Center for closer inspection and testing. **Figure 5** shows damage to metal water canteens located on the left side pockets of the TFLDt's pack he was wearing when struck by the tree.

Lessons Learned:

- The TFLDt was wearing a pack (**Figure 6**). He stated, "I think the pack took most of the blow. It was a full pack. It might have pulled me down, but I would have been in worse shape if I wasn't wearing it."
- I felt it was a poor choice to walk out. There were potential extraction zones, but it would have required cutting some trees and that would have taken some time. We didn't have the personnel to pack me out! The

Figure 6. Pack worn by injured firefighter.



terrain was too difficult to have them pull me out.

- We could have scouted the area a little more due to the brush in the understory.
- This area is in the Late Successional Reserve. The absence of fire on this landscape increased the hazard created by the trees in the fire area.
- All crews were instructed to withdraw and fall back to a safe distance due to the hazards.
- The day after the injury, firefighters went indirect with the fire to get off the steep slope.
- Having another EMT on the Division would have been good in case of multiple injuries.
- Having pre-planned Emergency Response Plans in place is critical in this environment. If the TFLDt had not been unable to hike out on his own, it would have taken probably 8+ crewmembers to carry him out.
- Hospital liaison was made available immediately and was present at the hospital when the firefighter arrived.
- Family liaison was approved and made available by Forest.
- OWCP (ASC) approval process went fast.

Lessons Learned by the FLA Team:

- The firefighters were informed of the incoming FLA team, their objectives and intent in an effort to gain their trust and cooperation.
- Excellent cooperation from firefighters received during the FLA.

FLA Team:

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Appendix 1

