

Rapid Lesson Sharing

Event Type: Tree Cutting Project Injury Incident

Date: March 13, 2017

Location: Potosi Ranger District, Mark Twain
National Forest, Missouri

"I was knocked face down, with my head facing left. I saw the bar of the saw six inches from my face. I could tell it was running, and was worried the chain brake had somehow been disengaged."

Injured Sawyer

NARRATIVE

During saw operations on a prescribed fire post-burn treatment area on the Potosi Ranger District, a Sawyer and Swamper were struck by a mature green cedar being felled.

The operations started out that day with a thorough briefing on the weather and site-specific safety concerns, including: chainsaw safety, weather, footing and slick conditions. It was determined that given the current conditions—about 2½ inches of snow on the ground and on all surrounding vegetation—crewmembers would not wear their packs. It was also decided that due to the freezing drizzle, cold weather, and slick footing conditions, there was no need to rush. They should keep a slow pace.

The Objective: Cut all cedar and hardwoods 9-inches DBH and below. Do not cut any pine. Do not cut shag bark hickory. Low stump all trees and drag slash to within 10-15 feet of the road to chipped.



Stump shot of the large cedar tree shows that the holding wood was cut through.

Small Cedar has Intertwining Branches with Larger Cedar

The sawyers paired-up into groups of two. The crew spread out the work area, providing for a safe distance between each saw team. Operations commenced.

The Sawyer explains: “I began limbing and bucking trees already on the ground to get back into having a saw in my hands and to get what was on the ground below knee height. I cleared out a section of low height regeneration and then fell 3-4 standing cedars without incident.”

The Sawyer then moved into a cluster of standing cedar. “I sized up the trees, deciding which ones to take first,” informs the Sawyer. “The farthest cedar away from the road in the cluster was leaning toward the road and the other cedars. So I decided to take down the ones closer to the road in order to make a nice stack.”

The Sawyer falls the middle cedar without incident, then moves on to the two cedars closer to the road. They are very close together.

“I made a small notch cut at the base of the small tree, sighting it parallel to the road, where I wanted both trees to fall. I finished with a back cut. The smaller tree didn’t fall. It was still intertwined with the branches of the larger one next to it.”

“I noticed the smaller cedar had multiple intertwining branches with the larger cedar,” says the Sawyer. “Both had the same lean, parallel to the road, and both bases were almost touching. I decided to cut the smaller cedar first, so when the larger one got cut, it would not impede the fall of the larger one.”

The Sawyer plans to have these two trees fall at the same time—but the smaller cedar needed to be cut first.

“I made a small notch cut at the base of the small tree, sighting it parallel to the road, where I wanted both trees to fall,” recalls the Sawyer. “I finished with a back cut. The smaller tree didn’t fall. It was still intertwined with the branches of the larger one next to it.”

Felling Operation Begins on Larger Cedar

Next, the Sawyer moves into position to cut the larger tree—making sure there is an escape route. Because this escape route is right next to the road, it is already clear. The Sawyer sights the larger tree in the same direction as the smaller one.

“We cut several trees before this one and everything was going as planned,” points out the Swamper. “[The Sawyer] sized-up this tree, went through all of the ‘Five Step Felling Plan,’ and began the tree felling operation.”

The Sawyer made the face cut, then started the back cut. Once the saw had gone in a few inches past the bar width, the Sawyer placed a safety wedge to prevent the tree from sitting back.

The Sawyer takes this time to sneak a peek around the other side of the tree to see how much farther must be cut to establish holding wood. “I noticed I was getting close,” says the Sawyer. “But I needed a few more inches. At this time, my Swamper had come up to the base of the tree to help with the wedge and to give a little push on the tree from behind—to ensure it would go in the direction of the face cut.”

“The face cut was appropriate, ops normal,” the Swamper assures. “The back cut was started and a safety wedge was set.”

The Sawyer cuts for a second, then stops. Finding it difficult to see where the edge of the face cut is, the Sawyer takes a moment to brush off debris from the bark. (The Sawyer does this to prevent the possible cutting of the holding wood.) The Swamper says to keep going.

Back Cut Goes through Hinge Wood— Starting a Chain Reaction

The Sawyer starts to saw again.

Right then, the saw and tree simultaneously pop forward off the stump.

“I yelled, ‘Oh sh**!’ and backed up four feet,” recalls the Sawyer. “I engaged the chain break on the saw. The tree stood up for a second on its stump. Then I noticed it beginning to angle back toward us and our escape route. I took another step or two back, and just as I turned to exit farther via my planned escape route, I noticed the tree seemed to be coming directly toward me and this escape route. I turned and took an angled step left, knowing I was veering from my technical escape route. I did this based on what I had just seen the bole of the tree do.”

The Sawyer continues: “In my escape, I was still carrying the saw in my left hand. I felt branches hit my back, and knew I was going to go down. I tried to throw the saw away from me as the branches hit my back and I was taken to the ground.”



“When the tree fell it contacted another tree to the left and I believe the branches of both trees caused a slingshot effect on the tree we were felling.”

“As I hit the ground, I felt the tree hit me very hard on the right shoulder. I was knocked face down, with my head facing left. I saw the bar of the saw six inches from my face. I could tell it was running, and was worried the chain brake had somehow been disengaged. I immediately tried to move my free left arm to move the saw away—to make sure the brake was on, or to turn it off.”

“I couldn’t do any of these things successfully,” the Sawyer explains. “I began to realize that my right arm was pinned and immobile. And I was unable to maneuver my left arm. That’s when I saw boots and someone move the saw away from me.”



“When the tree fell it contacted another tree to the left and I believe the branches of both trees caused a slingshot effect on the tree we were felling,” explains the Swamper. “The butt of the tree disconnected from the stump due to the holding wood being compromised on the off-side of the tree. The tree came back at both of us.”

When the Sawyer escaped out the escape route, the Swamper escaped out the secondary route. The Swamper was watching the tree and lost sight of the Sawyer.

“My helmet was knocked from my head,” the Swamper recalls. “I was struck by several branches and pinned to the ground by a branch. My right arm was under me which caused me difficulty getting to my feet.”

The Swamper’s first thought was to check on the Sawyer’s condition. “After getting to my feet, I located my helmet and made my way to my crewmember.” The Sawyer was awake and was in extreme discomfort.

The injured Sawyer was lying prone on the ground, moving a little bit and yelling—clearly in a great deal of pain.

Quick Response By Others

Other saw teams in the area responded quickly, including Sawyer2 who was an EMT. The Swamper had already extracted himself from under the tree and appeared relatively unharmed. The injured Sawyer was lying prone on the ground, moving a little bit and yelling—clearly in a great deal of pain. A quick assessment gave Sawyer2 the impression that the injured Sawyer was alert, oriented, had an open airway, and had no visible bleeding or any immediate life-threatening injury.

Sawyer2 explains that: “We had to roll the tree and move branches to get proper access to the injured Sawyer, who was able to self-assess enough to give us the impression that there was no sustained spinal injury. We decided the

best course of action was to stabilize the arm in the position of most comfort, and transport the patient in our truck as soon as possible. The injured Sawyer had a solid pulse, motor and sensory function distal to the injury.”

Sawyer2 continues: “I manually stabilized the arm, which the Sawyer had difficulty moving, making it very challenging to properly splint. During this process, I felt a pop in the Sawyer’s shoulder, who said it may have partially popped back into place. We slowly assisted the Sawyer to a standing position and I maintained manual stabilization as the Sawyer walked to the truck.”

“The other saw teams were nearby and came to our aid very quickly,” reports the Swamper. “Another EMT on the squad started the evaluation process while I made contacts to Rolla Dispatch and my Supervisor about the incident. While I was making these contacts, the other EMT on my squad started the SOAP (subjective, objective, assessment and plan) notes and the 9 Line process. The other three squad members assisted in getting the Sawyer out from under the tree. While I was on the phone with Rolla Dispatch, I informed them the situation was GREEN and we would be transporting the Sawyer by our crew carrier.”

The injured Sawyer was transported to the Emergency Room at a local hospital.

“From the time the Sawyer was struck until we were in the truck, headed to the hospital, was about 15 to 20 minutes,” informs the Swamper. “Time enroute to the hospital was approximately 50 minutes. My Senior drove the truck due to me dealing with calling contacts and looking for updates as I was the Point of Contact—and was slightly shook up for the entire incident.”

At the hospital, it was determined that the Sawyer sustained a separated shoulder.

LESSONS

Conclusions

What Went Wrong – The Obvious Reasons

- ✓ Holding wood was cut.
- ✓ Primary escape route was compromised due to no holding wood.
- ✓ Tree was measured at 27.5 feet in height. Its height, plus its width with branches, significantly decreased a successful exit via the primary escape route.
- ✓ Secondary escape route was not cleared or utilized.

What Went Well

- ✓ Time taken by the Swamper to establish project medical procedures.
- ✓ Communications with Dispatch and Supervisors.
- ✓ Medical response to incident.
- ✓ Post-incident learning process.

The Kickstand Effect



What Can We Do Next Time?

- ✓ If the smaller tree is entangled and can't be removed, cut a portion from the trunk to prevent the “kickstand effect.” In this case, the smaller tree acted as a “kickstand”—preventing the larger tree from falling in its intended felling direction. The weight of the large tree preloaded onto the small tree for a second, then slingshot backward, in this case a distance of 6 to 8 feet. (For more details on how this “kickstand effect” occurred on this incident, see the sidebar above.)
- ✓ Drop tree 180 degrees from kickstand, if possible.
- ✓ Cut both trees at the same height.

This RLS was submitted by:
Incident Overhead

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