

Summary

On Wednesday, January 10, 2024, a group of Texas A&M Forest Service firefighters were working on a trail improvement project on Dogwood Trail in Tyler County. The task for the day was hazard tree removal in order to improve safety for the public that utilize the walking trail. While felling a sizeable southern magnolia (*Magnolia grandiflora*), a sawyer was struck in the face by a falling limb, resulting in multiple injuries.

“All of a sudden, it went dark.” – FAL3(t)

Background

In 2022, Texas A&M Forest Service was gifted 40 acres of land consisting of mature pine and hardwood timber with creeks and drainages that wind through the property. This land was named Dogwood Trail and became the agency’s first State Trail. It is approximately three miles east of the city of Woodville, TX. The land had been unmanaged for 15 or more years and there are several improvement projects that are planned for the property, including hazard tree removal, trail improvement and walking bridge replacement. These projects are coordinated by the local District Forester and implemented by agency staff.

Narrative

A crew of five Texas A&M Forest Service employees had arranged to meet at Dogwood Trail on the morning of January 10 to remove some of the hazard trees present near the walking trail on the property. This crew consisted of one Intermediate Faller (FAL2) Certifier, two qualified Basic Fallers (FAL3), one FAL3 trainee and one Firefighter Type 2 (FFT2) serving as a swamper. The FAL2 Certifier is a qualified FAL2 that meets agency requirements as well as NWCG standards in order to serve as a Final Evaluator for the FAL2 level and below. They also serve as a lead instructor for both S-212 and RT-212 training deliveries.

The crew met on site at Dogwood Trail at approximately 10:00 that morning. They started the day by walking part of the trail and scouting some of the hazard trees that had been previously flagged for removal by the District Forester. During this initial walkthrough, it was discussed that most of the trees were large diameter with wide canopies that were close together, characteristics that add complexity to felling operations. After the walkthrough, the crew gathered back at the trucks that were parked along the side of the county road that bordered the property on the east side. At that time, they briefed on the operations for the day and general safety concerns. Then, they donned PPE and began prepping their saws and equipment.

Once everyone was ready, the group went into the woods to start working and stayed together as one crew. They approached each tree as a group and discussed the best options to get the tree safely on the ground. This included determining lean, discussing options for direction of fall, analyzing hazards and cutting techniques. The FAL2 Certifier cut the first tree and each of the other sawyers took turns cutting other trees as the crew continued down the trail, taking their time to discuss each tree prior to felling. The only time the five-person crew was not together was around noon when the FAL3 trainee and swamper left to pick up some food for lunch while the rest of the crew stayed and continued to work because they either had snacks with them or were not hungry. The two that left for lunch returned after about an hour and joined the rest of the crew.

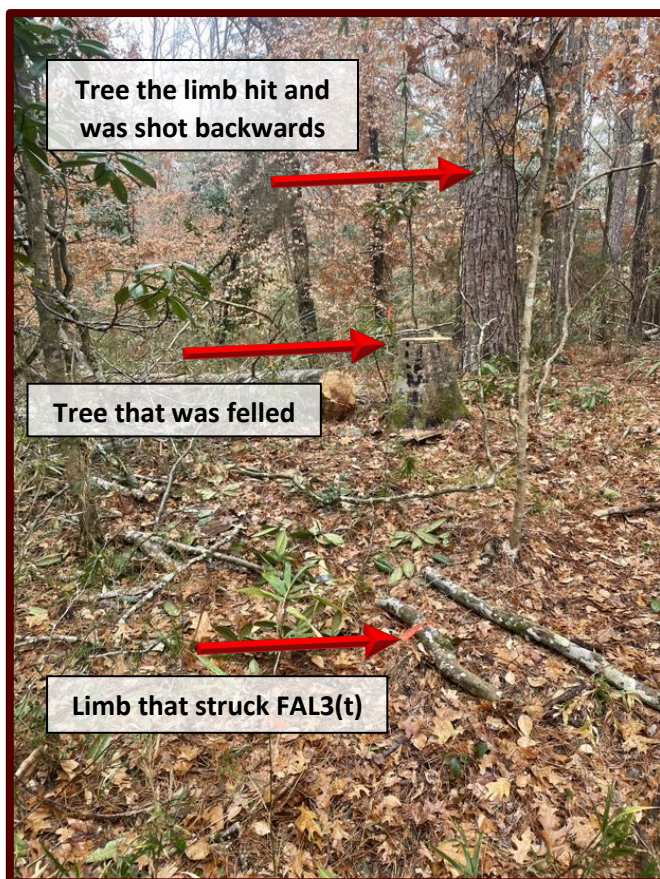
By about 13:30, the crew had safely cut down a total of six trees, both pine and hardwood, of varying diameters. All sawyers on the crew had cut at least one tree at this point, and nobody had run into any issues with felling operations. At this time, they approached a southern magnolia that was approximately 18 inches in diameter and 60 feet tall. As they had been doing throughout the day, the group gathered at the tree and began assessing lean, direction of fall, hazards, etc. They all agreed that the tree should be felled in the direction of the predominant lean and where most of the limb weight was. They also discussed how wide the crown was and how many limbs were in it. The crew talked about how limb showers from the large crown were a potential hazard. It was also noted that the tree was infected with hypoxylon canker, which is a fungus that can infect stressed hardwood trees. It grows underneath the bark and can cause mortality and increased rates of decay. While the tree was dead, the crew did not observe signs of rot or decay. One of the qualified FAL3's stated that they would fall the tree and he sounded it with a felling axe. The FAL3 determined it was solid and the others agreed. Before they began cutting, the other qualified FAL3 mentioned that the tree would be a good one for the FAL3 trainee to cut for a final evaluation in his task book. Everyone agreed, and the trainee stated that he was comfortable cutting the tree.

The FAL3 trainee had already participated in the group size-up of the tree and agreed with the decided direction of fall, based on the previously discussed factors of lean and crown weight distribution. He also sounded the tree again, using a felling axe, and agreed that it sounded solid. The group also noted that when the tree was sounded, there was no movement in the crown of the tree, indicating a solid structure. Once the FAL3 trainee was ready to start his cuts, the FAL2 Certifier stood at a safe distance perpendicular to the direction of fall to safely observe the FAL3 trainee making the face cut. The other three moved to a safe area at about the seven to eight o'clock position from the intended direction of fall and about 70 to 80 feet from the tree. Once the face cut was complete, the FAL2 Certifier helped to ensure the cuts were good and would not create any potential issues when the tree was coming down. At that time, the trainee moved to the other side of the tree to do his back cut and the FAL2 Certifier also moved to the opposite side so he could still observe the cut at a safe distance while also being able to communicate with the trainee. The Certifier had a large loblolly pine to stand by as extra protection for when the tree began to fall. The back cut went smoothly and the Certifier and trainee communicated to ensure the hinge wood was sufficient and even. The trainee also placed a small wedge into the cut once the bar was deep enough into the tree to prevent the cut from closing and pinching the bar. Once they agreed the cut was deep enough and even, the trainee removed the saw from the cut, turned it off and placed it on the ground next to the base of the tree. The Certifier and trainee agreed that using a felling wedge to drive the tree over was the best course of action to get the tree safely on the ground. The trainee pounded the wedge into the tree and, after a few hits, the tree started to fall.

As the tree started falling, the FAL3 trainee moved away from the tree at a 45-degree angle, as is taught during chainsaw training. This was at about the seven to eight o'clock position from the direction of fall. The trainee moved in that direction to a distance of about 20 feet, keeping an eye on the tree as it fell. Just before the tree hit the ground, a limb about three inches in diameter and three feet in length was observed falling from the crown in the direction of the trainee. The limb appeared to have pushed against the large pine that the Certifier had been standing by and sprung back in the direction of the trainee. It happened very quickly and someone yelled out a warning. Just as the trainee was tilting his head up to look for overhead hazards, the limb struck him vertically across the forehead/nose area. It struck the front brim of his hard hat, pushing it off of his head to the rear and it smashed his safety glasses. He immediately fell backwards to the ground.

Dogwood Trail Tree Strike Facilitated Learning Analysis

All other crew members witnessed the limb strike the sawyer and rushed to his assistance. The FAL2 Certifier was the first to get to him and immediately began assessing his injuries. The trainee was trying to get on all fours to stand up but the Certifier told him to stay on the ground. The Certifier started looking into the eyes of the trainee to see if they were dilating and he began asking him questions to ensure he could think clearly. "Can you breathe ok? What is your name? Where are you right now? Who do you work for?" The trainee was able to answer these questions correctly and clearly. The Certifier looked at the others in the crew and asked them to call an ambulance. One of the qualified FAL3's was a local and knew they could get him to the hospital faster than an ambulance. It was determined the trainee could be moved safely and without inflicting any further injury, so they helped him to his feet and two of the crew members helped him walk as they made their way down the trail approximately 900 feet to the trucks.



Quarter placed on the end of the limb that struck FAL3(t) to show size/scale

As they made their way down the trail, one of the qualified FAL3's started making phone calls to notify supervisors of the incident. They continued talking with the trainee and asking him questions as they helped him along the walking trail to ensure he remained coherent and conscious. When they made it to the trucks, they put the trainee in the passenger seat of the local FAL3's truck. The other FAL3 retrieved some gauze from a first aid kit in his truck, and he gave it to the trainee to try to stop the profuse bleeding from his nose. The gauze was not enough for the amount of blood that was flowing, so he was given a yellow Nomex shirt to hold onto his face as they drove the few miles to the hospital in town. The entire process from assessment to transport happened very quickly. They arrived at the hospital seven minutes from the time of the injury, and the injured sawyer was immediately taken back in the emergency room for treatment.

While the trainee was being transported, the FAL2 Certifier stayed on site to continue to make notifications and start the process of workers' compensation paperwork that he knew the hospital would need. After notifications and administrative needs were complete, he and the rest of the crew that remained behind started documenting the events. They walked back to the scene of the incident to flag the locations of equipment, the trainee and the limb that fell as well as take photos.

“Everyone fell into place without being told what to do.” – FAL2 Certifier

In the emergency room, the trainee was assessed and found to have his nose broken in three places, multiple lacerations to his head and nose, bruises and abrasions on his face and four broken teeth. He received a total of 18 stitches in his nose, four internal and 14 external. He also received a stitch to close a cut on his forehead. The hospital took x-rays and a CT scan to check for head or neck injuries and for further bone or tissue damage. He was found to have no additional injuries. He stayed at the hospital to receive treatment and was monitored before he was released to go home that evening.

Post Incident/Treatment

When the FAL3 trainee was released from the hospital, he was advised to follow up with an Ear, Nose and Throat Specialist (ENT). He had an initial visit with one during the week following the incident. Two weeks after the incident, he had another appointment with the ENT so that they could look at his sinuses with a scope to determine if there was damage or blockage that needed to be fixed. He also had an appointment for another CT scan in order to determine if there was any additional facial damage that might need to be repaired. A dental appointment was also scheduled so he could get four crowns, one filling and a root canal. Following these appointments, it was determined that his nose bone had several fractures and was displaced to the right. His nose cartilage was also displaced, but to the left. There was also a fracture to his right cheek bone. At the time of this report, he recently had an appointment with a cosmetic surgeon and determined that the bottom part of his nose was completely destroyed and would have to be surgically rebuilt.

Lessons Learned

- **Do you, as a Faller, use the Risk Management Process throughout the felling procedure?**
 - Working in a small group format, the Fallers still made sure to account for proper spacing and had discussed the limb showers observed from previous trees. Unfortunately, even adhering to our training, we can not eliminate all risks associated with felling hazard trees. When everything is done right, bad things can still happen.

- **When does training take precedence over production?**
 - The individuals chose to work in a group format, rather than splitting up into two-person teams. Even though this may have slowed production, it allowed them to discuss each tree in depth and assess hazards specific to each tree before felling. This was a viable option since there was a wide range of experience and it allowed everyone to be on the same page before felling a tree and to watch out for one another.

➤ **How familiar are you with patient assessment and extraction?**

- There were multiple lookouts for the FAL3(t), but the limb strike happened so quickly that no one was able to act in time to prevent the incident and could only react. The group did this with outstanding execution by delegating each task while prioritizing patient treatment. The group mentioned that their familiarity with the 8-line process was due to their training with the Type 2 Agency Hand Crew as well as other training scenarios, which allowed them to be quick and decisive in their decision making.

➤ **Do you wear all required PPE for project work versus a wildfire?**

- The individuals were wearing all the required PPE for felling operations. The PPE worn by the FAL3(t), including hard hat and safety glasses, likely prevented more serious injury.
- What PPE does your agency require during chainsaw operations? Are there options available that provide better protection than others?



Smudge where limb impacted FAL3 Trainee's hard hat and knocked it off his head



Damaged safety glasses worn by FAL3 Trainee

➤ **Do you have a plan in place before starting work?**

- This response worked out well but what if they were in a remote area or didn't have as much local knowledge? Where is the closest hospital, area for helispot, how to determine if self-transport or ambulance is best, etc.? Having these things decided upon and discussed prior to an accident can save valuable time in the response efforts.

- **Are you familiar with the local medical plan?**
 - The group discussed the local hazards for the site, including how they would mitigate them, before beginning operations. They had resources that were local to the area and were familiar with the local EMS response, allowing them to make the quick decision to transport the patient by vehicle rather than wait for an ambulance. Having that local familiarity was crucial in getting the patient the appropriate treatment in a short amount of time. We know that having local knowledge may not always be available to us when we are assigned to other areas across the nation, but getting that information from the locals in the form of an ICS-206 or other means can make the difference.

- **Do you often explore the possibilities of using alternative equipment or means in order to complete a task?**
 - As wildland firefighters, we often rely on personal experience and knowledge as well as direction from supervisors when determining the proper tool to use to complete a job. It is universally understood and accepted that using chainsaws to cut down trees is a dangerous job, but that is typically the tool we grab when getting a tree on the ground is the task at hand. While it is not always viable in some instances, it may be possible to utilize other mechanical means to complete the job, trading time and expense for increased safety for personnel.