

Incident 398

Hazard Tree Fatality



August 1, 2013

Sisters Ranger District

Deschutes National Forest



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Executive Summary

On August 1, 2013 John Hammack, 58, a professional faller employed by R&K Water Service was part of a two person falling module assigned to Incident 398 on the Sisters Ranger District, Deschutes National Forest, near Bend, Oregon. Incident 398 included the task of felling a large 64” diameter legacy Douglas Fir that was struck by lightning and set the top on fire. District personnel took initial action late in the day of July 31, 2013 but they did not have the time or proper tools to safely control the fire without taking undue risk, which included felling the tree. The mission on August 1, 2013 was for the felling module of John Hammack and his falling module partner to fell the burning tree. This was not a particularly unusual assignment.

At approximately 0911 hours, after several actions to prepare for a safe felling environment and just as John was returning to the base of the tree, a large portion of the top of the tree burned out, broke loose and tragically fell directly onto John killing him instantly while indirectly striking and injuring his falling partner.

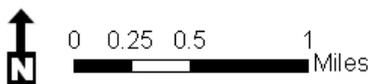
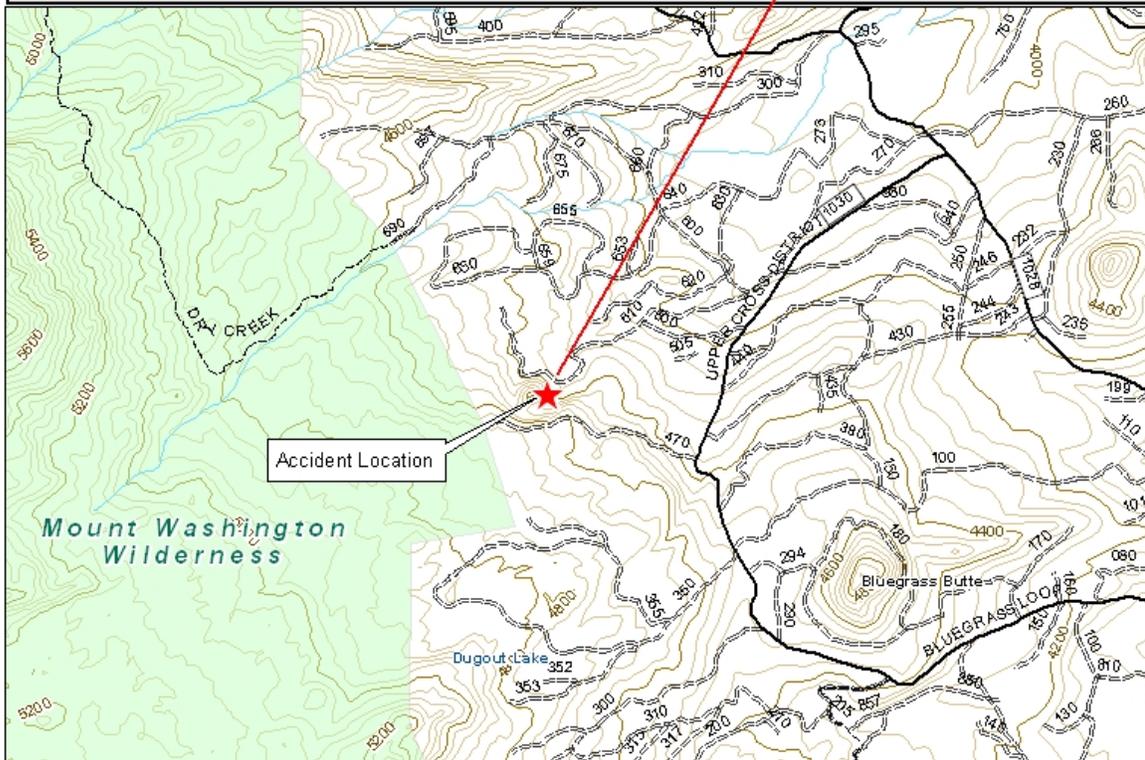
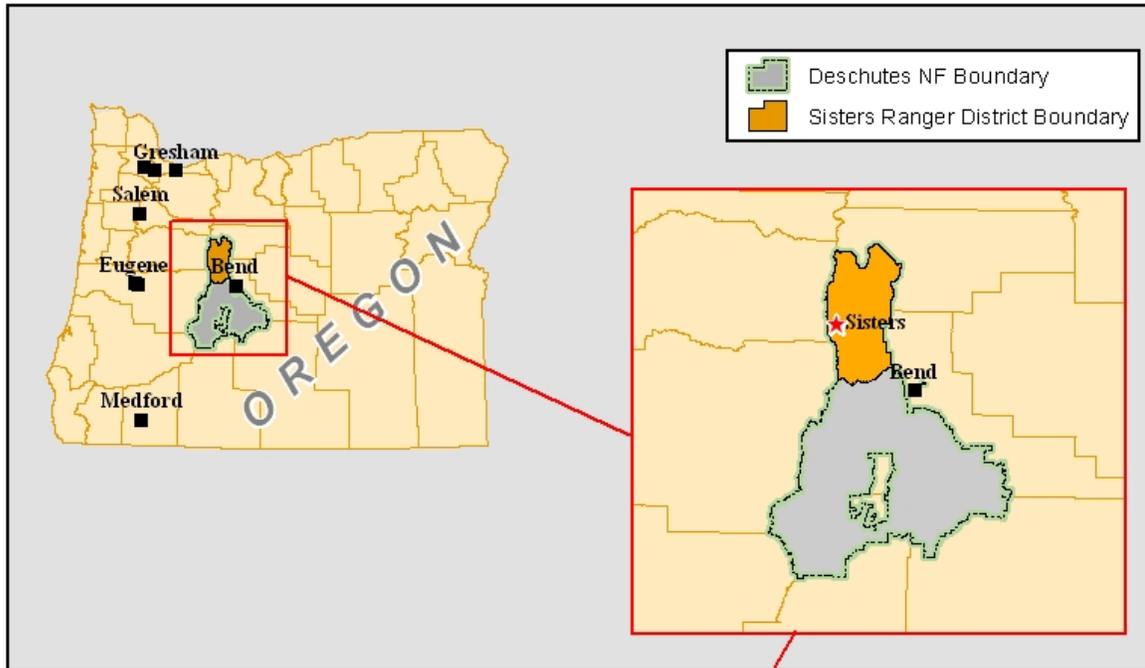
A Facilitated Learning Analysis (FLA) team was convened by the Regional Forester. The team was tasked with analyzing the circumstances of the accident, how decisions and actions made sense to those involved at the time, the lessons learned by those directly involved and sharing their story.

In summary, the actions and procedures of all involved were professional, courageous, prompt and competent. The incident management team had prepared for such an event and the preparation was altogether adequate. The fallers were integrated into planning and operations and were given tasks for which they were qualified. Additionally, the team reviewed contractual issues that may have affected this incident from both a compliance and lessons learned approach. The team found only minor contract compliance issues that had no direct influence on the accident. Through the interview process they heard several concerns regarding the contract specifications for the professional fallers.

FLA Team Members

Tom Contreras	Monty Bell
Howard Jubas	Persephone Whelan
Winston Rall	Steve Holdsambeck

Vicinity Map



All Locations are approximate
Map Date: August 8, 2013



The Story

A note to the reader

The story you are about to read is written to capture the perspectives of the people involved and endeavors to stay as close as possible to the story they shared. Some quotes are approximate but not exact. Other than John Hammack, the names of the parties involved have been changed.

July 31, 2013

This was the first big lightning bust of the season. Multiple fires were started on the Sisters Ranger District of the Deschutes National Forest.

The crew arrived at Incident number 398 at 17:50 and could see the lightning struck tree burning and smoking from the road. The four people hiked into the fire with a couple of bladder bags and a chainsaw. When they arrived on scene there was very little fire on the ground (10'x10' spot) and fire in the top of a very large 64" DBH Douglas fir (identified as the hazard tree for the rest of the story). The understory vegetation was brush and fir/pine regeneration. They were aware of small diameter, burning sticks and debris falling from the tree. The Type 5 IC trainee, Kate, sized up the fire and requested a C Faller to handle the hazard tree.

Bob had been working the past couple of days as a TFLD and Heavy Equipment operator on a few fires in the area. Once the lightning bust occurred, utilizing his 20+ years of experience on the district, he assisted the Duty Officer with coordinating resources and helping where he was needed. As an experienced C faller for the district he was requested to assist Incident 398.

From the road, when Bob arrived on scene, he called the resources on the fire to see if they needed more tools, etc. They told him to bring more wedges but he could use their chainsaw since it was already on scene. Bob hiked in and began his assessment of the hazard tree. When he sized up the hazard tree he didn't feel it was anything out of the ordinary; it was "technically difficult but not overly dangerous." In his past, he had fallen many trees similar to the one before him. He began to get to work.

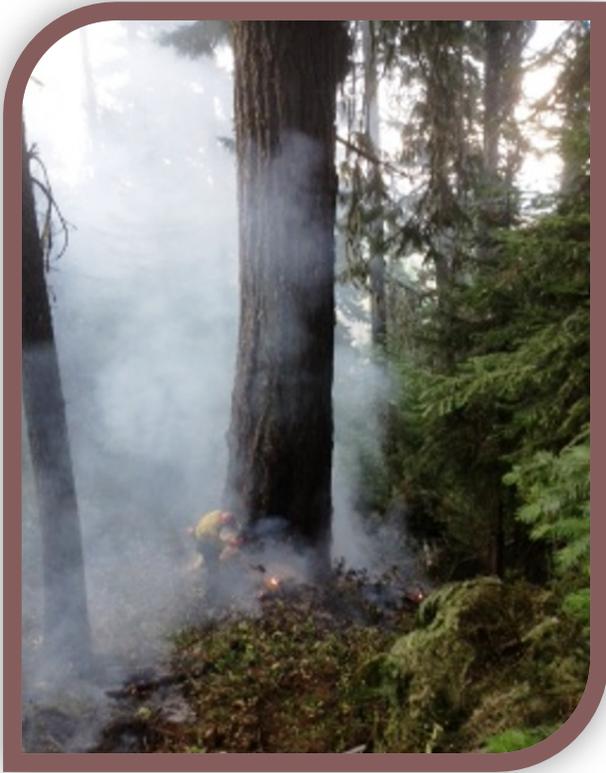


The lightning struck hazard tree.

Forty-five minutes later, after a tank of fuel and very hot feet the sawyer and the crew were realizing their efforts were not very effective. The firefighters had used all the water in the bladder bags to cool the area around the base of the tree for the sawyer but that was not working too well. To make matters worse, the chainsaw was dull and they could not find the round file that had been in the chaps to sharpen it. The IC Trainee had requested

bucket work but the helicopter was not available (it was busy inserting firefighters into other fires in the area).

The C Faller and crew on Incident 398 began to realize there were many small things that were just not quite going right. They discussed the situation: it was beginning to get dark, they couldn't get any bucket work to cool the surrounding area for the sawyer, their bladder bags were empty, and the sawyer needed a bigger saw. They discussed the face cut the sawyer had begun and that it did not impact the integrity of the hazard tree so it was safe to leave. They had lined the little bit of ground fire and bone piled the pieces to secure the area as best as they could. So they decided they would tackle this fire tomorrow. Around 2100, as the group hiked out they flagged their route to the road.



Bob working on the hazard tree on July 31, 2013.

August 1, 2013

The cool, early morning was interrupted with the usual controlled chaos of a lightning bust. A large number of resources assigned to fire suppression for the district were briefed at the main office and dispersed to different fires in the area. At 0630 Bob, the C Faller, was reassigned to another fire as the Type 3 IC. Crew 401 (Wes, Kate) was short two crewmembers. One was sick and the other crewmember had to attend a wedding. Frank was added to the Crew 401 to help out. Incident 398 was assigned a module (2) of professional fallers (John and Clint) to assist with the hazard tree. In addition to the fallers, Engine 642 was also assigned. They all drove out to the fire as a group.

They had a small but thorough briefing discussing the day's operations. The overall plan was to stage Paul (Engine Boss), his engine crew and Frank at the road with bladder bags in order to minimize the amount of personnel in the area during falling operations. As the others hiked into the fire, Frank and Paul watched the top of the hazard tree from across

“Man, that’s a lot of fire coming from the top of that tree.”

the small gully between the road and the fire. It was quite active today. Flames would shoot out the top of the hazard tree and then it would lazily smoke for a little while. Then flames would shoot out the top again followed by smoke billowing slowly up into the morning air. Paul commented to his crew, “Damn. That’s a BIG tree.”

Wes (IC), and Kate hiked to the fire with John and Clint. Once on the fire, John and Clint walked around the base of the hazard tree, sizing up its lean, potential issues and where it should fall. They discussed what they saw with Wes. They assured the IC the face cut that had been done the night before wouldn’t influence their operations. The Fallers were comfortable with felling the hazard tree and the proposed plan. They said they would first remove two snags in the area and then they would address the hazard tree. They then set to work.

Wes and Kate worked to prep the ground area. Over the night a few more small branches and debris had fallen to the ground. There wasn’t much more fire on the ground, still less than a 20’x30’ spot. Wes recalls not seeing any of the larger diameter branches on the ground. It was still all just small diameter sticks and smoldering debris. There was a lot of brush and regen (small pine and fir trees) in the area and it needed to be addressed to not further exasperate the fire once the hazard tree was on the ground. Wes and Kate discussed that once the hazard tree was on the ground they would need a lot more resources to secure the fire. They decided to transition the fire to a Type 4 and made the transition known to dispatch. Wes then inquired for the availability of an additional engine.

Kate noticed more debris dripping from the burning snag. She called out to the fallers about the small burning sticks and cones tumbling from the hazard tree. Clint thanked her for watching out for them. Nervous about burning debris falling from the hazard tree, she kept an eye on it while she worked prepping the area of where they believed the burning top of the hazard tree would impact the ground when the fallers took it down. It wasn’t unusual to have the small stuff falling



View of top of hazard tree after the top fell to the ground.

from the hazard tree but it was something that definitely needed to be kept an eye on. Wes worked below the hazard tree scratching some control line and sorting through the debris pile to ensure any burning debris from the top of the hazard tree hadn't dropped into the available fuel to ignite and cause issues for the fallers while they addressed the hazard tree.

Back on the road Paul and his crew were listening to the radio traffic on the command channel. "Black Butte was blowing up with fire traffic". Worried that he might miss Wes's call on Tac 2 to come join them, Paul took his radio off scan to listen for Wes's call.

John and Clint told Wes they were ready to begin falling trees. Wes met up with Kate and they moved around the small hill, away from the fire. Kate could see the top of the tree from where she was standing. They heard the saw running and the first small snag hit the ground and a while later the second snag hit the ground. They knew the next to come down was going to be the hazard tree.

Once Clint and John had dropped the second snag they began walking back down to the hazard tree to begin on it. There was no discussion between them about who would be the sawyer. Clint remembers that he just knew that John was going to be the faller.

After the second snag hit the ground Wes radioed Paul's crew on Tac 2 and asked them to start hiking in. Wes planned on stopping them at the bottom of the small gully when the hazard tree hit the ground so the crew would be closer to help contain the fire.

Paul's crew and Frank began hiking into the fire. Local protocol states that ingress and egress routes will be flagged with white flagging. Since Paul and Frank had not been on the fire they needed to follow the flagged route in but they were having trouble seeing the white flagging that identified the route. However they could see the burning snag top above the surrounding trees and figured they were headed in the right direction. While they were hiking in they heard a shout but figured it was the usual shouting back and forth that sawyers are known to do.

During the whole time they had been sizing up the main hazard tree and the surrounding area, John and Clint had both been keeping an eye on the burning tree top. Clint glanced down from watching the top to secure his footing and when he glanced back up he saw the flaming, 4 foot diameter top plummeting down on top of them. He shouted as he dove to the side.

At the same time, from a distance, Kate sees the top come out of the hazard tree. She yells out "SNAG!" She hears the top thump to the ground and both Wes and Kate shout, "Are you all right?!" They could hear a response but they aren't quite sure what is going on. After a few moments they can hear Clint calling for help.



Limbs, debris and top of the hazard tree.

They run to where they see Clint pulling green branches from a large debris pile comprised of limbs and the fallen top, near the base of the hazard tree. Wes and Kate ask where John is. Clint yells, “If he’s going to survive he’s going to be in these green branches.” They ask Clint if he is hurt and he replies, “yes but I can manage.” Kate jumps to action with Clint pulling and digging through the green limbs searching for John while Wes gets on the radio, announcing the emergency and begins requesting medical help.

Meanwhile, because Paul has taken his radio off scan, as the crew hikes in they are unaware of the emergency traffic being broadcast on the command channel. Once Wes is done calling on the radio to request resources he

yells to find Paul and the crew. When they yell back, Wes tells them to hurry up, they have an emergency. The crew runs the rest of the way into the fire.

A few moments after Kate and Clint begin digging through the debris that is not on fire, Clint realizes that he cannot continue and Kate tells him she can pull limbs and continue looking for John. Clint’s experience as a paramedic kicks in and he knows he’s in trouble. Unbeknownst to Clint or anyone else he had broken both shoulder blades. He tells Kate and Wes, “If I am going to get out of here without being carried out I need to leave now while I can still walk.” At this time Paul and the rest of the crew arrive. Seeing Clint hunched over and cradling his arms, Paul tells the EMT on his crew to assist Clint while he figures out what is going on. Clint tells the EMT he is a Paramedic and begins self-diagnosing himself. The EMT agrees with Clint’s assessment and the two begin hiking out to the road. At this time Paul and the rest of the group think the only person hurt is Clint.

“It was the worst case of wrong place at the wrong time.”

Wes then tells the group he needs a chainsaw to begin cutting out the branches and debris because John is somewhere under there. From Paul’s viewpoint he feels as if there is a long pause while he tries to figure out the situation (his sawyer is a novice and this probably isn’t the right situation for him to be cutting) but others see him instantly spring to action. Paul takes the saw and chops from his sawyer and goes to work cutting large limbs and branches that had fallen from the burning top.

Paul vividly illustrated the nightmarish scene to the FLA team. There is a large (approximately 3-4 foot diameter, 15 foot long) section of top of the hazard tree in a pile of limbs and debris. Half of the top is on fire with 2-3 foot flame lengths. Limbs ranged in size from small to 6-8 inches in diameter impede their search. The heat is intense and the fire begins to spread to the limbs and debris.

Kate and Frank pause when Paul and two others begin trying to tear apart the pile. They realize the location where the rescue operations are situated (under the hazard tree), is not safe because debris is still teetering above in the hazard tree limbs. It is also such a small space to work in that they don't want to add more firefighters into the mix. Kate asks Frank to hike up the slope and to position himself as a lookout to watch for more debris falling from the tree.



Burning pile of debris, limbs and top.

The flames and heat are making the rescue efforts impossible. Paul is cutting and ducking from the heat by cutting a limb, diving out, cutting a limb and diving out. It is so hot. Paul has two people pulling branches for him. They work down one side of the hazard tree and then run around the other side and cut up that side until Paul discovers John's saw bar under the most intense part of the flaming top and debris. When he sees the saw bar, power head and a glimpse of the fire shelter case in the flames he knows John is under there and that the worst had really just happened.

They knew there was nothing more they could do. John had been instantly crushed and killed by the falling top. Paul told the FLA team, "You read about it or you hear the stories but it is not the way you think it is until you are there. It's Final."

Paul knew when they began looking for John that debris was still dropping out of the hazard tree. His concern shifted to the exposure for his crew. They were apprehensive the fire would spread and make things even worse. Paul and Wes talked about what they were going to do and it was decided that Wes would remain the IC for resources responding for the medical and Paul would become the IC for the fire. By this time, four rappellers had arrived and began to cut a landing area less than a quarter of a mile away.



Close view of intense heat as the pile consumes.

spreading but the debris, limbs and top continued burning until it was almost completely consumed.

Within 30 minutes of his injury, the EMT and Clint hiked out of the fire and made it to the responding ambulance.

Paul was worried about the remaining snags in the area and large limbs from the hazard tree that might come down. Working on this fire, at this time, was dangerous. Paul gathered the remaining firefighters together and set them to working on cutting a trail from the road to the fire. Everyone mentioned that they knew it was busy work but they welcomed the task to help them cope with what had just happened. Eventually another IC arrived on scene to relieve Paul of command. Paul helped the firefighters cut the rest of the trail out. We transferred command for the medical incident to the Sheriff's department and Law Enforcement. From then on they all stayed on the road while more resources arrived on scene and the Sheriff's department began their interviews. Drivers later arrived on scene to drive C401 and Engine 642 back to the Ranger station.

The rappellers and one of the Sheriff's officers stayed on the fire through the night until the next day when the hazard tree could safely be taken care of and resources could escort John's remains off the fire.

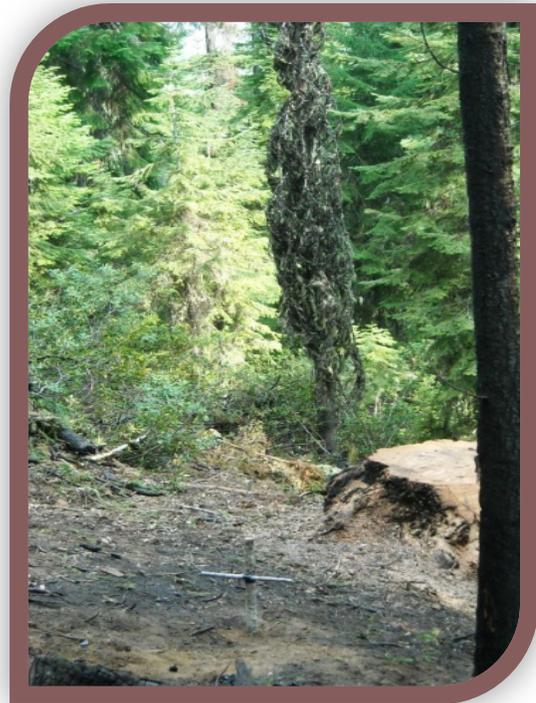
John Hammack's daughter wrote,

"We were very distressed leaving my dad's body in the woods that first night and we were assured that he would not be alone. Someone was with him on the mountain every minute until we could retrieve his body, covered overnight with an American flag. Respecting and honoring him after his death by surrounding him and never leaving him alone on the mountain gave our family a profound sense of peace."

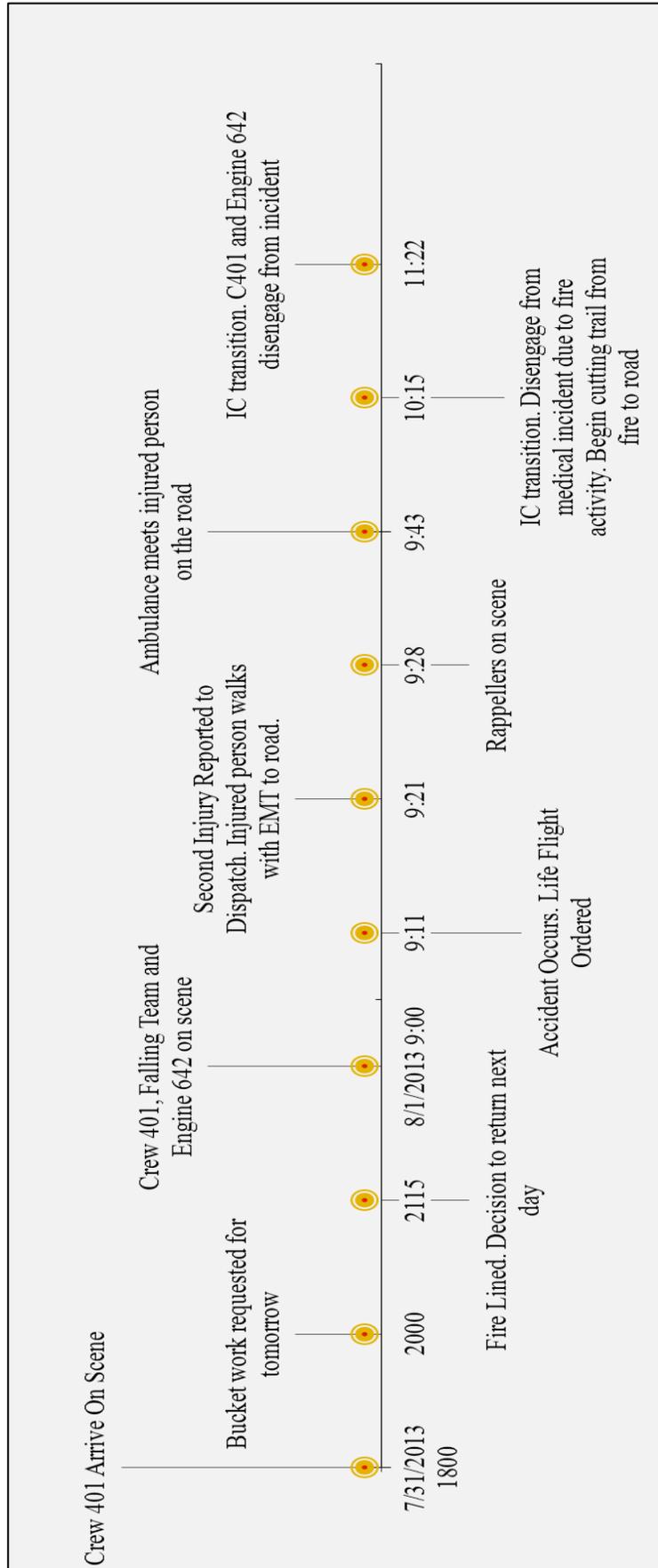
-taken from Letters to the Editor 08/07/2013 NuggetNews.com

Lessons Learned from the Participants

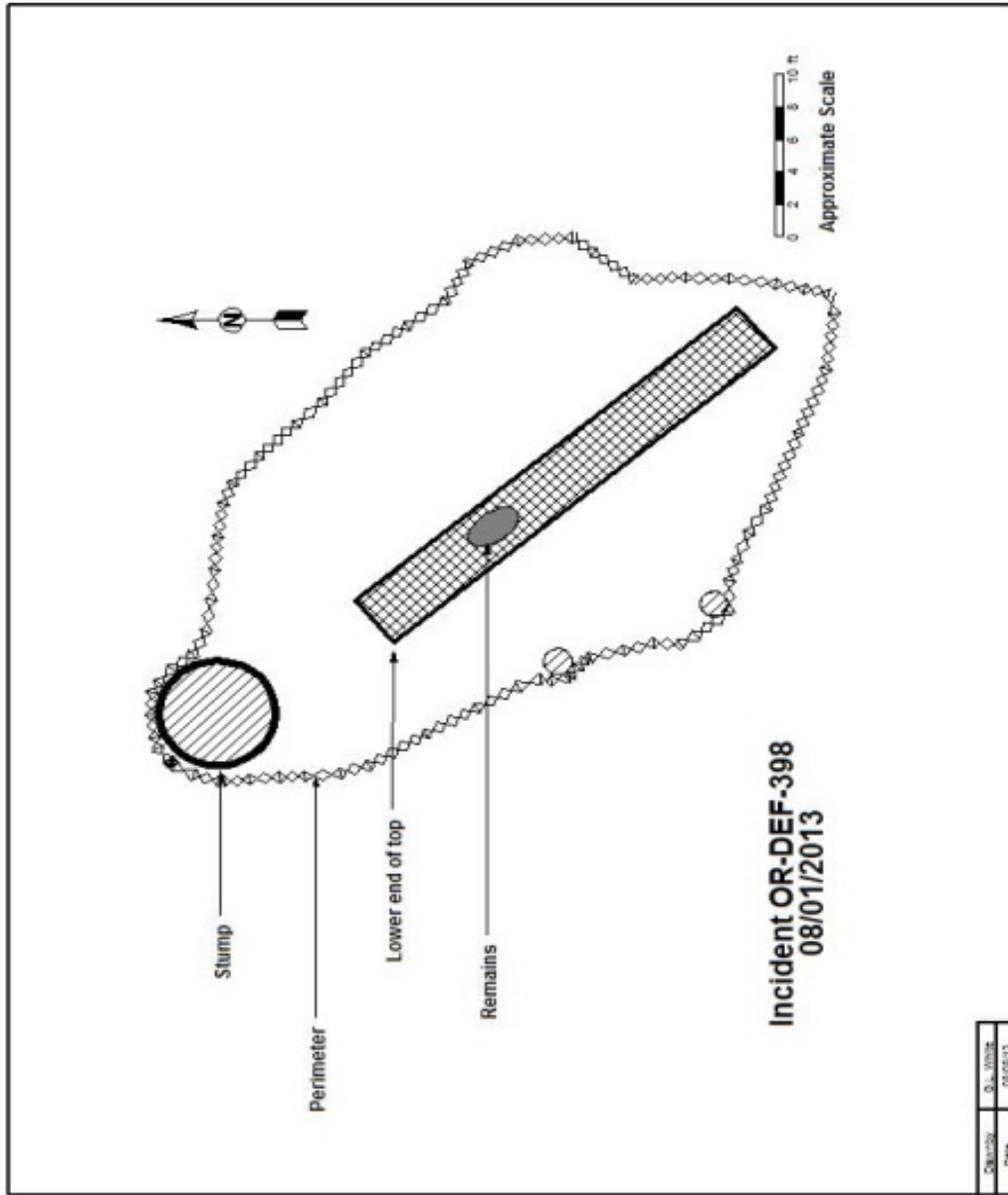
- Crew 401 had participated in training for medical emergencies in the past. They felt the training helped them manage the medical emergency and it helped people manage the incident calmly.
- We need to teach folks that a safe working distance for one hazard tree could be completely different from another. Often we think the danger zone is right next to the tree and the further away you get the safer you are; but this isn't always the case (a person could have been as much as 25' away from the hazard tree and been killed).
- We need to establish a system to let family members know people are all right. For example: Dispatch could call family members or, have a special number that family members can call to find out status.
- Agency personnel who carry EMT certifications aren't sure whether or not the agency will back them when utilizing their skills in the field. The question of whether or not their state certification covers them, a National Certification, Good Samaritan Laws, etc. also needs some clarification.
- At the Critical Incident Stress Debriefing individuals were given information on a handout. Many participants were not quite sure at the time if they needed the information at the debriefing but commented that it was very helpful later on.
- The Critical Incident Stress Debriefing would be more useful and comfortable for those directly involved if the debriefing was separated into groups. For example, holding one debriefing session solely for the individuals who were physically on scene.
- In hindsight, it would have been better to have taken more time to assess a hazard tree and its top by walking around to get different viewpoints.
- Many participants found it difficult to find white flagging in the field. They would like to change the local protocol to be able to utilize a more visible color like hot pink.



A handmade cross placed on location to honor John.



Timeline of Major Events



Accident Diagram

Enquiry

Why did it happen

It would be an injustice to those involved to claim this accident has a cause or to list causal factors. Accidents such as this arise from an extremely rare chance conjunction of events that evolve in a high risk work environment. Managing fires such as Incident # 398 required rational balancing of risk for gain and courage to make tough, high-consequence decisions in a context of high uncertainty. The person who briefed John and his partner at the ranger station that morning at 7 am told the FLA team, “sometimes briefings just seem to drag out forever; If only my briefing had lasted another 5 or 10 minutes longer, he wouldn’t have been in that position.” While perhaps true, this observation more powerfully exemplifies how much chance played a role in this outcome. There are an unlimited number of ‘*what-if’s*’ that could have made things turn out better or worse.

Everyone involved in incident #398 was horrified and shocked the morning of August 1st. Yet, every firefighter knows that such an accident was not outside the realm of possibilities; all had all heard stories of similar accidents and some personally knew firefighters that had been killed by limbs or tops falling out of trees. Less than two months earlier, a Forest Service smoke jumper was killed by a limb from a fire weakened tree on a fire in Northern California. Two years ago, on this same Ranger District, a firefighter was put in the hospital by a snag. In both of these recent incidents as with John’s accident the victim had not even touched the tree.

Hazard trees receive a great deal of attention and safety emphasis among firefighters. The subject of hazard trees is included in virtually all briefings for firefighters working in forested areas. Included in this report is an appendix of similar incidents where hazard trees released limbs or tops striking employees. Everyone directly involved in incident # 398 would have known of at least a few of these incidents, if not most of them.

Why then did every firefighter on Incident #398 deliberately accept the risk of working under and adjacent to hazard trees? Why would fallers accept an even greater risk of cutting down a hazard tree?

One answer lies in much of our work in the wildland environment is inherently risky. Many risks are uncertain. While we diligently strive to create safety, we know that risk is characteristically a byproduct of production. That is to say that some work cannot be accomplished without accepting additional risk. Working among hazard trees is an intense example of the inherent tension between production and protection.

After sizing up the fire for example, the field commanders had several decisions to make about risks. One of the first decisions was what to do with the hazard tree that was on fire. They could let the tree burn out on its own, or get it down – somehow – and put it out. If they chose to let the tree burn out on its own, any experienced firefighter would

know that decision means incident #398 would last all summer - and maybe longer. It would need to be constantly monitored and spot fires from the burning top would continuously set new fires throughout the remainder of the fire season. During periods of high fire danger, this tree would likely ignite new fires that would become challenging to suppress. A decision to *not take down* the tree is a decision to involve potentially hundreds of firefighters, working in snag infested country over a long period of time. A decision to *not take down* the tree defers and amplifies the risks associated with this incident. The decision *to take down* the tree was clearly a sound risk management decision but, clearly, not without risk.

Another decision that had to be made is how best to get the tree down. The longer they let the tree stand, the higher the likelihood of blowing embers throughout the area and the more intense the fire would be within the top of the tree. At the time of the decision, the current weather conditions were relatively cool and fairly humid. Over the next few days (the weather was forecast to get hotter and drier) the difficulty of containing spots and ground fires would increase significantly. So, in this incident, risk is decreased, safety is enhanced, by *quickly* getting the tree down. The incident management team initially brought in an agency faller to assess the tree and bring it down if he felt it was *safe*. His options included felling it himself that evening, assuming ground forces and a helicopter, if available, would be able to cool the area around the tree. A second option was to bring in professional fallers (with a greater level of expertise) the following day. Also available to the faller was the decision to not cut the tree down. There is no mechanized equipment available to fell the tree mechanically. Essentially there was only one way to fell, the tree and that was by chainsaw.

The faller's experienced judgment was that he could bring down the tree, without harm to himself or others, that evening. The risks he accepted by this decision are imprecise, uncertain and fundamentally incalculable. Again, as with many decisions firefighters make constantly, they choose to accept some risks because by doing so they decrease other and greater risks. There is no actuary table for hazard trees that display probability of lethal limbs or top falling out. The faller's decision, like so many other decisions made in the wildland environment, is a largely an intuitive judgment based on training and experience bounded by the context of the situation. Likewise on the second day the John and his partner made similar risk management decisions.

Fallers are taught to look up as much as possible when felling a tree. Often if a faller sees a threat falling from above she or he can react in time, and in the appropriate direction, to escape from serious harm. A partner prepared to yell "snag!" or "heads-up!" offers some risk mitigation to the faller but this requires a sequence of time critical events. First the partner has to recognize the hazard, then verbalize it, then the faller has to hear and interpret the warning over the noise of the saw, then the faller looks up, then s/he has to perceive and interpret the hazard, and then react appropriately. Experience has shown

that the length of time it takes to react appropriately to a verbal warning *significantly* compromises the faller's ability to escape harm.

This fact poses a classic production versus protection dilemma. A faller looking up, is not looking at their task. No faller can efficiently (or safely) cut a tree without looking, frequently, at the base of the tree they are cutting, the position of the saw and many other things they need to see that are in their immediate work area. Moreover a faller can fell a tree faster and with greater efficiency watching what s/he is doing. The faster the faller fells the tree the less time the faller is exposed to the hazard of falling materials. The best any faller, or anyone else performing work around a hazard tree, can do is look up as frequently as possible knowing and accepting the risks associated with the time they must spend looking elsewhere.

Learning from tragedy

There are several powerful lessons that have been shared from this tragedy and actions we can take that may reduce the risk of a similar one. First we need to share this report, quickly, with firefighters across the country. We also need to share the similar reports (see *Similar Incidents* page 18). Reading and listening to these stories will enhance the intuitive decision making skills critical in high risk / high uncertainty tempo work environment.

Second is the lesson shared by John's friend and partner who barely survived the accident, "*Take more time to assess the top. Walk around to get different viewpoints.*" There is no way to know if this extra measure of caution would have made any difference in this accident. But importantly, this is the lesson from the person closest to the accident with the most direct perspective. Fallers across the country need to hear his advice.

Third, John and his partner were ordered to the incident to fell a hazard tree. This is common, typical, and entirely justified under the circumstances. There may be some value however to ordering fallers to assess a hazard tree rather than fell it. We know there is a natural human tendency, if given a mission, to focus on how to best accomplish the mission rather than invest time and energy in considering alternatives. If we bring fallers to a hazard tree and ask them to assess the tree, rather than fell it, there might be an extra measure of caution engaged in the action. There is no way to know if any of these lessons will prevent another tragedy but it is reasonable to believe they will reduce some of the risk.

Epilogue

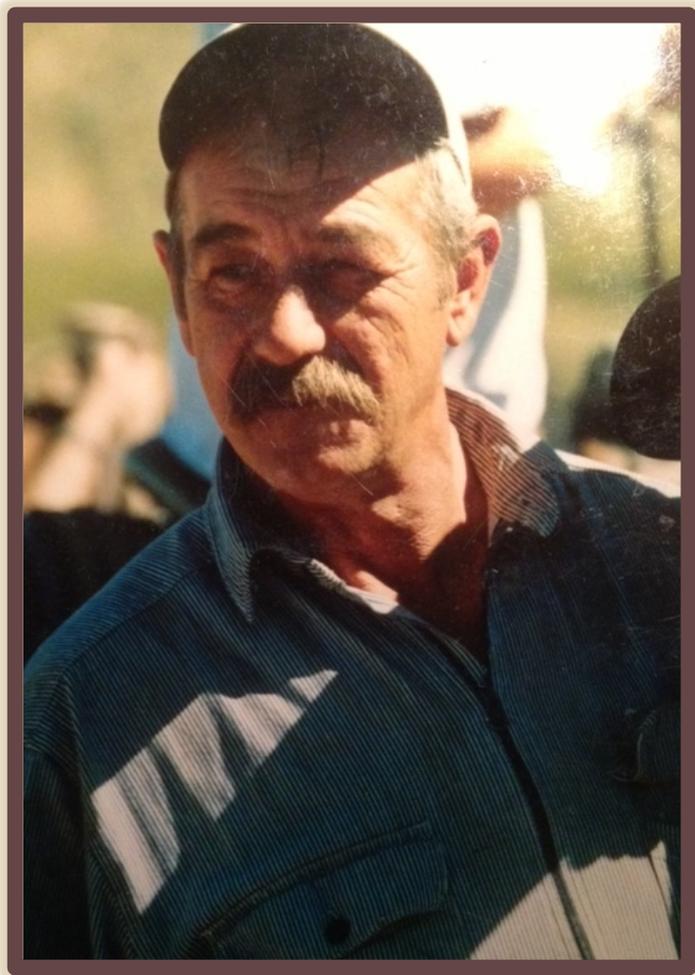
John Earl Hammack was a Rodeo Cowboy, a Timber Faller, a mentor, and lover of our Natural Resources. To many he was a hero and said to be “Larger than life”. John grew up in Sisters, Oregon and was considered to be one of the best Bareback Riders in the Pacific Northwest. John made his living Rodeoing and Logging. He loved the outdoors. He was a hardworking man and always took the time to teach and ensure that he and his partners were safe while working in the woods. He was a man of his word and reverently respected.

One of John’s passions was mentoring; in his later life he got his greatest joys from helping kids, coaching them in the sport of rodeo and horsemanship, passing on his wisdom and experience, not only in rodeo but in ways of life.

He was often referred to as “Big” John. He was larger and tougher than life and he touched everyone that he encountered. It was important to him to make his own way in life.

John loved the woods, if he could pass a message on to us it would be to manage and conserve our forests in such a way that we would not have so many devastating fires.

- *Contributed by the family of John Hammack*



Appendix A – Similar incidents from around the nation - in all of these incidents, the hazard tree was not being cut at the time.

August 1986: A male firefighter working on the Ace Creek fire in northeast Washington was struck by a 132 foot “green” White Pine with heart rot, as his crew walked up the fire line.

July 1987: An experienced faller working on the 400 acre Reynolds fire was killed by a falling snag. The faller was clearing fireline and was aware of the hazardous snags in the area.

October 1988: A firefighter was killed on the Clover Mist fire by a falling snag that hit him on the head while watching a helicopter bucket drop on a hot spot in burned-over Lodge pole Pine.

August 1990: A CDF firefighter working on a hose lay on the Recer fire was killed by a 20-30 foot falling snag. The hoselay was being used to control a spot fire in medium to heavy timber understory.

August 1991: A second year firefighter was struck and killed by a 6” diameter falling snag while taking a rest break on the fireline at night. The two person crew was taking initial attack action on the Vaughn Lake fire, in dense spruce with the presence of heavy downfall, and standing snags. There was no wind or fire above the ground in the snag that fell.

July 1992: An engine crew member was killed by a falling snag while establishing a pump and hoselay at the base of the fire perimeter on the Silver Creek Fire. The fire was 4 acres in heavy logging slash within a 6 acre clearcut.

August 1992: A firefighter with the Oregon Dept. of Forestry working on the Pryor fire was killed by a 7” diameter snag which had been growing out of the base much larger Douglas Fir.

October 2001: On October 31, 2001, a firefighter was struck and seriously injured by a snag on the Poplar Log Fire. The Poplar Log Fire was located on the Redbird Ranger District of the Daniel Boone National Forest.

July 2002: Alan Wyatt, a veteran sawyer from Ontario, Oregon, was felling a tree on Middle Mountain above Vallecito Reservoir when he was struck from behind and killed by an aspen tree with a root system weakened by fire.

July 2003: Dan Michael was watching the pine that had been struck by lightning and saw it starting to fall up the hill into the fire. He shouted to everyone on the crew to get away from the fire and the falling pine. While fleeing from the tree one Pomeroy crewmember caught his leg between two small trees and twisted his knee. Another crewmember fell and was able to get up and away from the falling tree. Ken Meyers also hit his shins

while moving away from the tree. All injuries were minimal and the crew was able to get away from the tree to safety.

October 2004: Firefighter Daniel Holmes died on October 2, 2004 when the top of a burning snag fell, striking him on the head resulting in fatal injuries. The accident occurred on the Grant West Prescribed Burn located in the Grant Grove area of Kings Canyon National Park. Daniel was a member of the Arrowhead Interagency Hotshot Crew, based at Sequoia and Kings Canyon National Parks.

July 2008: A firefighter working on a blaze west of Neihart was injured by a falling tree and was evacuated from the area by helicopter.

September 2008: The TFLs spotted a small spot fire on the non-fire side of the road and stopped to work the spot fire. The vehicle was parked on the non-fire side of the road. Both individuals did a quick assessment of hazards overhead and otherwise and did not identify any. After working on the spot for a few minutes, they heard a loud crack or pop and looked up to see the crown of a large Douglas fir falling toward them and the vehicle. One of the TFLs ran into the timber away from the direction of the falling tree. The other ran down the road. A large section of the tree landed directly on the parked vehicle completely destroying it.

August 2011: The tree was a 36" DBH Ponderosa Pine Snag about 45 ft. tall and had about a 3-3.5 ft. lean off center and therefore the decision was made to take the tree with the lean. The top 15 ft. of the tree had snapped off prior to felling operations resulting in fire on the ground and several trees torching out. The tree was on fire at the base but hadn't burned through more than a couple of inches, at the top there was a chimney and the tree was dropping embers. There were branches all the way around it at the top but most appeared still solidly attached to the tree. The sawyer proceeded to double cut the face; at the base of the tree it was extremely hot and smoky. While cutting the face cut the sawyer stepped away from the tree to get out of the smoke and heat temporarily by walking around the back of the tree. He then stepped to the other side of the tree to cut the remaining wood out of the face cut. When the sawyer stepped around to the back of the tree to do the back cut he noticed a 5" diameter 10 ft. long branch that hadn't been there 30 seconds prior. (The branch had fallen while the sawyer had stepped from the back to the front to finish the face-cut) There was a spotter about 20 yards off that had yelled to the sawyer about the branch coming down, but the sawyer was already stepping around the tree away from it. The spotter thought the sawyer had seen it but he had not and he hadn't heard the warning shout either) If the sawyer had been hit by the branch it is believed it would have resulted in serious and possibly fatal injuries.

August 2011: The top 18' of an approximately 50' tall snag fell and struck a firefighter, working as a swamper, in the shoulder/upper back while constructing fireline in an area of heavy dead and down timber

September 2011: While working on a hazard tree removal project a "C" level faller was struck by a snag that fell as the result of chain reaction set in motion by the snag that he had fallen.

August 2012: “*Snag falling!*” Kerry yells as he sees a tree across the creek falling toward them. Everyone scatters; some firefighters run downhill while Kerry and Anne run uphill. A quick glance and Kerry sees it strike another tree and – believing he and Anne are in its path – yells “*Down!*” and switches directions, running down the fireline. With his fists and teeth clenched, he expects to be hit. He hears a tremendous sound as the trees crash downward and feels the whip of limbs on each side of him. He falls down but, upon realizing he is uninjured, quickly gets up and looks for Anne who he thought had been right behind him. He finds her three or four strides uphill under the tree branches. After quickly clearing them away, he determines she did not survive.

June 2013: Redding Smokejumper Luke Sheehy was struck by a falling portion of a tree while constructing a fire line on the SaddleBack Fire in the Modoc National Forest, South Warner Wilderness. The jumper aircraft returned to the scene and delivered five additional jumpers and trauma equipment. Sheehy was treated by fellow smokejumpers at the scene and flown by AirMed 3 to a hospital in Alturas, California, but all efforts to revive him failed.

August 1, 2013: At approximately 0900 two contract fallers were preparing to fall a large Doug Fir tree which was burning at about 70 feet above ground. All other firefighters had hiked away from this tree to provide a safe distance for falling. The fallers were at the base of the tree, but had not yet begun cutting the tree, when the top portion of the tree with several green limbs attached broke away from the main tree and fell upon the contract fallers. John Hammack was killed instantly. The other faller was knocked to the ground, breaking both of his shoulder blades.