“It’s kind of a gray assignment. It’s up to you as a firefighter.”

“It’s kind of a gray assignment. It’s up to you as a firefighter.”

“A tree fell, I jumped out of the way, got hit a little bit by it and fell on some rocks.”

“If you have fractures, you wouldn’t be able to walk.”
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I. Executive Summary

CRRAAAACK! The unmistakable sound of a tree’s holding wood popping ricocheted off the steep canyon walls early that July 5th afternoon. Shannon instantly recognized the sound. She knew a tree was falling, but where? She was standing on a log jam above Main Elk on the White River National Forest looking at her hand-held GPS. As she looked up in the direction of the sound, she made a split second decision that saved her life; Shannon launched off the log. Branches of the 60 foot tall, 12-inch Douglas fir caught her in mid-air, twirled her around, and slammed her onto the rocky streambed 5 feet below.

The seriousness of her injuries was not fully understood by Shannon or her supervisor for nearly 2 weeks after the accident. Word of this accident did not reach fire managers on the White River National Forest for almost a month.

On August 3, 2010, the Deputy Regional Forester for the Rocky Mountain Region commissioned an Accident Prevention Analysis team to review the circumstances surrounding the accident and the delays in reporting. An Accident Prevention Analysis (APA) is conducted under the principles that reinforce the model of “Just Culture.” The instructions to the team were to identify opportunities to strengthen our safety culture without fear of reprisal and with the learning vital to accomplishing our mission safely and successfully.

The team interviewed individuals involved with the Meadow Creek Fire on the Rifle Ranger District of the White River National Forest and employees at the home unit of the injured firefighter on the Ashley National Forest. Interview questions covered the fire, the accident, follow-up, and eventual reporting of the accident. The story that follows is based on those interviews. Participants were also asked what lessons they think firefighters and managers could learn from this incident. Thus, in addition to the story, the report also lists those lessons learned by firefighters and managers. Finally, the APA team conducted an analysis of the lessons learned and the report provides insights into organizational and cultural conditions that contributed or enabled the accident or the delays in reporting. Also included are appendices that contain a chronology of events, a visual depiction of the messages that people heard, and a set of discussion points to define terms and to elaborate upon points made in the APA team analysis lessons learned.

Even though this incident was specific to two wildland fire modules, the lessons learned apply to all resource types who might find themselves in a similar situation, such as hotshot crews, smokejumpers, helitack and engine crews. The APA Team’s Lessons Learned Analysis identified the following conditions that may have contributed to or enabled the accident and delays in reporting:

- The APA Team found the modules were implementing what they thought was leader’s intent, but without the leaders’ full understanding of the hazards and risks being accepted on their behalf.
- A general lack of understanding of reporting an accident as an opportunity for organizational learning about risk management caused a delay in reporting, and even led to allegations of a cover-up.
- Certain human factors affected individual and collective sensemaking about the accident and the injuries, and contributed to delays in accurate information being widely shared in
a timely manner. Human factors can also help to explain strong reactions to news of the
tree strike and the resulting injuries once this information became more widely known.

Based on the lessons learned analysis, the APA team developed and presented recommendations
to Region 2 for further consideration and action. This report will be posted on the Wildfire
Lessons Learned website for organizational learning.
II. Methodology

A foundational principle of High Reliability Organizing is the commitment to continuous learning. Learning from success is essential and learning from failure is critical. The process is predicated on both a just culture and an understanding that our employees are inheritors of the production pressures, tools, trainings, artifacts, and systems of the workplace.

An APA does not identify causes in the traditional sense (errors, mistakes, and violations) but, rather, approaches the accident from the perspective that there is risk in everything we do. The responsibility of leaders is to guide employees as they think about the tradeoffs between safety and other organizational goals. The APA tries to minimize the common human factor trait of hindsight bias, often referred to as “arm-chair quarterbacking” or “looking back at human error” on why bad outcomes occurred, which is all too often associated with traditional accident reviews and investigations. (See Appendix C Discussion Point on “Hindsight Bias”)

The Accident Prevention Analysis or APA is used to help extract lessons learned in order to prevent repeat accidents. The APA is used with the intent to openly gather lessons learned from actual participants involved in accidents and near-misses. Created in a manner that calls for multi-level trust and open communication, an APA is conducted with the primary intent of learning what caused unintended outcomes. Improving fire line communications and fire line decision-making, along with instilling high reliability organizing into fire organizations, all serve to promote the Learning & Safety Culture. Recent hallmarks of the Risk Management program include new systems management practices and incident reporting tools that allow fire fighters to feel confidence and trust in practices that incorporate transparency and strive to eliminate blaming.

The team followed the methodology outlined in the August 3, 2010 Accident Prevention Analysis Implementation Guide. The APA guide was developed in the spirit of the “Foundational Doctrine” for fire activities. The APA team based its analysis on the philosophy that “employees are expected and empowered to be creative and decisive, to exercise initiative and accept responsibility and to use their training, experience and judgment in decision making to carry out the leader’s intent.” With that in mind, the APA team sought to understand the situation in which the wildland fire modules found themselves on July 5, 2010, and sought to understand the situation in which the Regions found themselves on July 31, 2010.

The events and facts presented in this report were determined through a variety of methods. Sketches, maps, interviews, and documents were used to depict the events between June 20 and August 2. Information gathered was correlated to determine the most accurate flow of events associated with the incident. In most cases, human and environmental conditions, decision points and actions were corroborated with two or more sources. The chronology is based on a careful analysis of the various information sources.

The Accident Prevention Analysis Team conducted more than 35 interviews with firefighters, fire support personnel, and leadership personnel to tell the story based on the information shared. Different people may perceive a shared event differently, and perception of “facts” may vary from one person to the next, and so these discrepancies are written into the story itself. The process included developing a narrative of events which was read back to those interviewed to correct or clarify important details.
The amount of detail the team was able to gain is testament to the empowering effect that the promise of no punitive action can have: empowering for both the APA team in doing its work and for the participants in sharing their perspectives. It is important that the premise by which the information was gathered—no reprisal—be honored by leaders in both regions.
III. Story of the Accident

Notes to the Reader

This story is told from the perspective of those involved in order to place the reader in their shoes with the same information the participants had at the time. Pull quotes and questions for reflection appear in sidebars throughout the story as a way to invite you, as the reader, to think about how the issues raised in each section might apply to you or your home unit. These questions may also be appropriate for group discussion of the story with fellow members of your team.

Asking you to take the perspective of the people in the story is not intended to deny you any reasonable reactions to what you are reading. If you are alarmed by what you are reading, this might be a good sign. But if you find yourself shaking your head and pointing your finger, consider that many people have felt frustrated by traditional accident investigations because that is where they have tended to stop. Rather than seek to rid the organization of bad individuals who “caused” past accidents, a highly reliable organization (HRO) takes the fact of an accident as evidence of current and ongoing system problems; specifically, that similar actions may be going on, undetected, more frequently than we think. HROs know that there is a danger in saying that a particular accident was an isolated incident because, under the right circumstances, the underlying conditions could lead to even worse consequences in the future.

Instead of judging, try to take the more difficult path toward learning by inquiring, could it have made sense to do this? What do I know about incentives and disincentives in the culture that would cause this to make sense? How does that affect our collective management of risk? Even if you truly feel you would act differently under similar circumstances, what is different about your own workplace conditions that others could learn from? How did those come to be? How can you share that information? What needs to change in the broader fire culture to get everyone to a point where they would respond as you believe they should? What messages do leaders need to reinforce right now with their own people, and later with incoming resources?

Background

This story involves two wildland fire modules assigned to the Meadow Creek Fire on the Rifle Ranger District of the White River National Forest (Figure 1) during early July 2010. These modules were formerly referred to as wildland fire use modules. They were originally established to provide support to wildland fire use events. They are typically self-sufficient, requiring minimal logistical support, and are equipped with sophisticated equipment including generators, fuel ovens, computers, and satellite phones.

With the revised Implementation Guidance for Federal Wildland Fire Management Policy, “wildland fire use” is a term no longer used to describe fires that are managed for resource benefit. As a result, these modules are now referred to as wildland fire modules (WFM). Module 1 consists of 10 crewmembers and was formed in 2006 on the Ashley National Forest. The module members have between 1 and 13 years of fire experience. The crew has an appropriate mix of seasoned veterans and new firefighters. Module 2 is a seven member BLM module formed in 2004 and is assigned to the Upper Colorado River Interagency Fire
Management Zone (UCR) and is based in Grand Junction. Three members of Module 2 were assigned to the Meadow Creek Fire during the time Module 1 was there while the four remaining crew members were assigned to the Water Creek Fire. Both modules met the qualification standards defined in the 2008 Interagency Fire Use Module Operations Guide.

Even though this incident was specific to wildland fire modules, the lessons learned apply to all resource types that might find themselves in a similar situation, such as hotshot crews, smokejumpers, helitack and engine crews. For the most part, fictitious names have been used rather than clumsy titles to make the story more readable. Central characters in the story and the positions they held are displayed in a sidebar on page 14.

Whatever happened to *Wildland Fire Use*?

Does your unit have a label for these types of fires?

Is it consistent with two types of fire recognized by federal fire policy: wildfires and prescribed fires?

Are your publics and cooperators confused by your label?

Figure 1: Location of Meadow Creek Fire on the Rifle Ranger District, White River National Forest.

**The Story**

**June 20 – Off Forest Assignment to Colorado**

On June 20, 2010, Module 1 received a dispatch call for the Water Creek Fire near Rifle, Colorado. The permanent assistant module leader was on a temporary detail away from the forest and was not available. In order for the module to be dispatched, Terry, the module leader, needed...
to fill the assistant module leader position. Shannon, a professional member of the district staff, who had filled the assistant position several times previously, was available for the detail. She had 17 years fire experience and was highly respected by the crew as a strong firefighter and leader.

The module left Vernal, UT, at about 0730 hours on June 21 and traveled directly to the Water Creek Incident Command Post (ICP) near Rifle, CO. Upon arrival, Terry and Shannon received a briefing from the Type 3 Team assigned to that fire. They do not remember receiving any written materials at the briefing. However, Terry recalls finding a packet of information that someone had left on the seat of his pickup a few days afterward. This packet included maps and a listing of phone numbers for the UCR. He does not recall receiving any information regarding Region 2's reporting policy for falling tree accidents or near misses.

**June 28 – New Fires Start**

Fire activity was low nationally and regionally, and preparedness levels were at 2 on a scale of 1 (low) to 5 (high). The Zone Fire Management Officer (ZFMO) phoned the District Ranger, to tell him of three new fires that had been discovered in the vicinity of Meadow Lake. The ZFMO then ordered two smokejumpers for the Meadow Creek fire and told them to monitor the fire and to gather intelligence.

The acting Zone AFMO and the District Ranger flew the fire by helicopter on June 29, and then discussed their observations with the ZFMO. The fire was within “Fire Management Polygon C” which allows for what the UCR calls “meeting multiple management objectives.” (See the Appendix C Discussion Point, “Multiple Management Objectives” (MMO) Fires on the UCR)

The District Ranger said, “We want to get this right. It’s a big opportunity” to improve diversity across the landscape. In developing a management strategy for this fire, the District Ranger noted that the 1000-hour fuels were ready to burn, but that certain other fuels might provide natural barriers. He believed the aspen could provide an adequate firebreak, but was concerned about the oak brush. He felt that monitoring the fuel moisture for that fuel type would be important. The District Ranger also recalls telling the ZFMO that he did not want anybody going down into the drainages. He told the ZFMO, “Let’s do it.”

The District Ranger called the Forest Supervisor to discuss his observations and his ideas for how to manage the fire. Previously, the Forest Supervisor and District Ranger had discussed the high risk of falling trees to firefighters. During this conversation, the Forest Supervisor reminded the District Ranger of a regional conference on firefighter risk management they had attended in May. The District Ranger and the Forest Supervisor decided on the strategy to manage the fire to achieve resource objectives and to minimize exposure to firefighters. As part of their plan, the Forest Supervisor said he didn’t want anybody “by the oak brush.”

The terrain is one of broad mesas cut by deep gorges. Slopes along the narrow drainages are extremely steep. Precipitous rock cliffs along mid and upper slopes were recognized as a serious hazard. Vegetation ranged from grass and brush in the lower elevations to scattered conifer and aspen stands at the higher elevations. Many park-like areas existed on the mesa tops with dense conifer stands on the north and east facing slopes in the steep drainages.
June 30 – Increased Fire Activity

Throughout June the ZFMO had been performing the Strategic Operational Planner (SOPL) duties. Due to the uptick in fire activity, the ZFMO made a decision to order additional overhead to provide him assistance in managing the ongoing fires. On June 30, he ordered a SOPL, a SOPL(t) with WFDSS experience, and a Fire Behavior Analyst trainee (FBAN(t)). They arrived in Rifle on July 2 and began working as a team to develop the long term implementation plan that was signed on July 8. See Appendix C Discussion Point on Scaling Up and Span of Control.

July 1 – Module 1 Reassigned to Meadow Creek Fire

After nine days on the Water Creek fire, Module 1 was reassigned to work the Meadow Creek Fire. The ZFMO went to the Meadow Creek Fire to retrieve the smokejumpers and to facilitate the team transition. He met with the Module 1 leader, Terry, and asked him to be the new Incident Commander Type 4 (ICT4) for the Meadow Creek Fire. At 2000 hours the ZFMO, Terry, and the two smokejumpers conducted the transition. The smokejumper IC pointed out the steep slopes and rolling debris, and cautioned, “The cliffs are really dangerous and someone could die.” The ZFMO reinforced to Terry not to try and walk the perimeter of the fire. While a wildland fire module may typically do so, Terry understood that

A person can only focus fully on one thing at a time and can only juggle about 5 things at a time. When a person tries to do too many things at once, vigilance suffers.
the perimeter of this fire was not to be GPS’d on foot. Terry also remembers the ZFMO telling him that no one was to go into the fire from the top or into the drainages.

The remaining module members left the Water Creek Fire on July 1 to join up with Terry. While Terry was tying in with the ZFMO and the smokejumpers, assistant module leader Shannon took the rest of the crew to set up the web camera. The webcam was a specific fire monitoring camera, which continuously posted pictures to the internet in 5 minute increments. The SOPL and the Ranger were viewing the webcam on a daily basis. That evening, Terry returned to the Meadow Lake area to camp with the rest of the module.

**July 2 – Gathering Information on New Assignment**

Terry went to Rifle to receive an additional briefing about the Meadow Creek Fire. The content of that briefing included the overall strategy of the fire, weather, and logistics. The overall message was that it was okay for the fire to move north in the drainages, but they did not want it to go south to the private land. Terry also took a helicopter reconnaissance of the fire. While Terry was in Rifle, the remainder of Module 1 spent the day finishing the camera installation and scouting the mesa on the west side of the canyon. That evening they went to New Castle for fuel and then set up camp near Clinetop Cow Camp on top of the mesa on the east side of Main Elk. After the camera installation was completed, Module 1 was to conduct structure assessments in the area, make public contacts, monitor fire behavior and smoke drift, measure fuel moisture, and take pictures.

Although Module 1 had just transitioned in, the ZFMO knew that they would soon time out. He ordered a second wildland fire module to transition with them before they left. Module 2 arrived in Rifle on July 3 and received a briefing from the ZFMO and SOPL. The ZFMO told them he was “concerned about getting people close to the fire,” and that management was “okay with staying back and monitoring the fire from afar for long-term planning.” He wanted to stay three days ahead of the fire, in order to be proactive versus reactive. Later, Adrian, the assistant module leader for Module 2, recalled that he did not hear any specific instructions to stay out of the drainages.

**July 3 – Module 2 Assigned to Meadow Creek**

Module 2 arrived early in the afternoon to shadow Module 1 in order to take over the fire when Module 1 timed out. Due to the extra amount of time it took to hike in and set up the webcam, Module 1 did not have much fire intelligence to share with Module 2. Regardless, the Module 2 leaders remember that they were excited to “build a plan from the ground up.”
On July 3 leaders of both modules met at 1400 hours at Clinetop Cow Camp on top of the mesa. Module 2 leaders Hayden and Adrian set out on ATVs to the top of the fire. Terry and Shannon followed in a side-by-side utility vehicle (UTV). The two-track was choked at times with 6 to 10 foot high oak brush. Adrian was initially concerned about the oak brush, but, when they arrived at the top of the fire, he was relieved to see that the brush was not burning. Instead the fire was creeping and smoldering and burning under the timber and in the heavy dead and down fuel.

Looking over the edge, Adrian could “see why they didn’t want to put people near the fire,” as it was steep and cliffy. As part of this discussion, Terry agreed that they “didn’t need to put any people down in there.” The four leaders spent 45 minutes talking about potential strategies and tactics they could use for the upcoming days.

After Module 2 had set up their camp, they scouted to the north for a better lookout position where they could see into the canyon. Meanwhile, Module 1 made contact with nearby residents and performed structure assessments. They later returned to camp to upload data. At the end of the day, the module leaders agreed to meet at Clinetop Cow Camp for a 0700 hours briefing the next day, July 4.

July 4 – Plan Development/Transfer of Command

The 4\textsuperscript{th} of July started out cloudy and cool. A brief shower had passed over the fire during the night. At the morning briefing, the module leaders agreed on and discussed the plan for the day with members of both modules. The plan for the two modules included scouting the area, establishing a med-evac site on the mesa, identifying lookout points, collecting fuel samples, monitoring weather, fire, and smoke and requesting a spot weather forecast.

Hayden and Adrian were scheduled for an 1100 hours recon flight with the FBAN(t). Module 2 members understood from their in-briefing that the District’s plan for the Meadow Creek fire was to allow the fire to burn the entire mesa top, along with allowing the fire to spread to the north in the Main Elk drainage. This would accomplish numerous resource objectives. As part of this plan, the ZFMO was considering aerial ignition of the mesa top. The fire would be prevented from coming off of the mesa top by using helicopter bucket drops.
Hayden and Adrian planned to use the recon flight to gain a better perspective on the fire and the terrain. Specifically, they wanted to evaluate potential fire behavior, to see the proximity of structures to the fire, and to determine places where they might anchor and hold the fire to keep it from going down canyon.

During the flight, they identified rock scree located at the bottom of the slope below the lowest cliff band. They were concerned about a pocket of heavy fuels next to the scree that could burn and throw spots over the rocks to the south or even across Main Elk to the west. If the fire moved south beyond its current location, the topography, fuels, and aspect became much less favorable for containing the fire.

Adrian did not want to let the fire go south or west, and felt they needed to establish a heel or anchor. He wanted to get people in on the ground from the top to see if they could ‘check it’, and maybe put water on the bottom with a helicopter. Not knowing that there was solid black from the top down was worrisome, and he really wanted to be able to use the road up top, cold black down the south flank, and the creek on the bottom in order to prevent south and west movement of the fire. Hayden and Adrian recognized the potential opportunity to secure the south flank by tying together a combination of black, cliffs, scratch line, and rock scree.

After the flight, Hayden discussed with the SOPL what they had seen. Hayden told the SOPL that the fire was larger and further down the hill than they had thought. He estimated it to be about 5 to 10 acres, and burning from the top of the canyon to about two-thirds of the way down the slope. Adrian really did not think the idea of plastic sphere dispenser (PSD) ignitions on the mesa combined with buckets to hold it would work, so his initial thinking was to not bring that plan up again for now, and to see if they could check the fire’s spread on their own.

They also firmed up plans to set up a remote automated weather station (RAWS) that the SOPL had previously requested. The SOPL and the FBAN (t) wanted to put the RAWS into the drainage bottom to monitor the influence of the drainage winds on the fire. This would help determine the probability of fire spread to the south towards homeowners, and help them predict smoke drift that could affect the nearby landowners. This location for the RAWS was discussed with the Regional Fuels Specialist because of what happened on the Spring Creek Fire in 2002 with unexpected drainage winds driving the fire toward the urban interface. Neither Terry nor Hayden remember discussing with the SOPL the ZFMO’s instruction to not go into the drainages.
At the end of shift, incident command was transferred from Module 1 (Terry) to Module 2 (Hayden) with Adrian identified as an ICT4 trainee (ICT4(t)). This was Adrian’s first ICT4(t) assignment. After receiving information from the SOPL and Module 1, Hayden and Adrian developed a tactical plan and scheduled a briefing for the modules at 0700 hours the next morning at the Cow Camp. At this point the chain of command between those on the fire and the ZFMO had changed. The ZFMO had delegated oversight of the fire to the SOPL, with whom the IC was to report, to collaborate, and to use as their point of contact for information exchange with the District. But Hayden and Adrian first wanted to scout and validate their plan for the following day before sharing it with the SOPL.

**July 5 – Day of Accident**

Adrian led the morning briefing. By then, all but three members of Module 2 had been reassigned to the Water Creek Fire: Hayden, Adrian, and Tony, a seasonal firefighter new to the module. The plan for the day was to scout the possibility of securing the south flank of the fire, so that the fire would not move down drainage towards the private structures.

As one of the tasks for the day, Module 1 was asked to set up the RAWS at the confluence of Deep Creek and Main Elk as previously identified by the SOPL and FBAN(t). Module 1 was also told they could scout access up the drainage to the bottom of the fire. If they could get there, they were to scout the feasibility of burning out to tie the heel of the fire into the creek. Hayden told them to “see if you can go up to the bottom of the fire and determine what can be done…handline or burnout.” Hayden wanted to get good black established all of the way down. He remembers saying that if it was too difficult to make the hike up to the fire, to “forget it.”

Module 1 squad leader, Joe, and FFT1 trainee, Robin, were assigned to Rock Goblin Lookout that had been identified by Module 2 on the previous day. As the ICT4 trainee, Adrian accompanied them. The 9200 feet elevation offered good radio coverage and a view of the fire. It was also a place with a strong enough cell phone signal to enable Adrian to speak with the SOPL during the day, if needed.

To put in the RAWS, Terry, Shannon, and the rest of Module 1 drove down the mesa to the Hadley Gulch trailhead at the bottom of Elk Creek drainage. They
hiked about a mile up the trail around private land and reached the confluence of Deep Creek and Main Elk to await helicopter delivery of the RAWS. Alex, a qualified helicopter crewmember and a member of Module 1 for 5 years, marshaled the sling load into the tight drainage just before 1000 hours.

As the module members began setting up the RAWS, Shannon suggested to Terry that she scout up the drainage to the bottom of the fire. Terry agreed with the mission and asked for a volunteer to accompany Shannon. Alex stepped forward. Shannon and Alex began hiking up the Main Elk drainage towards the bottom of the fire. As they worked their way up the drainage, they radioed Joe at Rock Goblin Lookout and told him of their plan to scout access to the bottom of the fire. Joe acknowledged their message and said that Adrian, who was sitting at the lookout, was okay with that.

**Up on the Mesa**

While Module 1 was carrying out these actions in the drainage, Module 2 was still up top on the mesa. Their plan was for Hayden and Module 2 member Tony to ride ATVs across the mesa to the top of the fire. The goal was to get in early before the heat of the day and see if there was access from the top and see how far down the hill they could get. Tony stayed up top and slung weather while Hayden scouted down the south flank of the fire. As he proceeded, he cold trailed, chinked in some line, and used limited ignitions to fill in and widen the black. The fire was burning mostly in duff. It was mostly underburning the timber but had also torched a few trees. Eventually, Hayden reached the bottom cliff band. At this point, even though he thought he could make it all the way down, he decided it was too dangerous and was just not worth the risk. Hayden also noticed that trees were falling over and sliding down from the top of fire, nearly 1,400 vertical feet above him, and funneling down a chute all the way to the creek bottom.

**Down in the Drainage**

Meanwhile, Shannon and Alex continued up Elk Creek. The hike was difficult and required frequent wading in the creek, occasionally up to their waists. Although they felt that the access and terrain would not be suited for less experienced firefighters, neither Shannon nor Alex felt it was too dangerous for them. Their goal was to reach a log jam located below the fire. This feature was commonly referred to as the “beaver dam” from aerial reconnaissance, but it is more accurately described as a log jam.

The hike in took about 2 hours. They arrived near the fire around 1240 hours. As they were hiking up the creek, Shannon and Alex thought they heard shots from a Fire Quick pistol. Shannon radioed Hayden on TAC. “Hey we can hear you up there,” she said. They asked Hayden how much further to the fire. He replied that they were almost there. Once they arrived at the log jam, she looked up and saw Hayden on top of a cliff band about 150 feet above the creek. Hayden was glad they were able to reach the bottom of the fire. They discussed a plan to complete the burnout that Hayden had started in order to “pull the fire” to the creek. Shannon and Alex would
try to burn out a pocket of fuel above the creek and adjacent to the rock scree. They thought that this would secure the heel of the fire and prevent down-canyon spread to the south.

Shannon and Alex ate lunch while Hayden hiked back up the hill before they began burning. Using their fusees, they lit whatever would take in the conifer, brush, litter, and down logs. The fuels did not burn "clean" as they were still wet from rain the previous day. As he arrived back on top of the mesa, Hayden regarded the area that he had scouted as not viable or safe to put any firefighters in there from the top, and relayed this to Adrian. But he was curious to hear what Shannon and Alex would tell him about access from the bottom.

![Figure 4: Images of Meadow Creek Fire from webcam on July 5, 2010.](image)

At 1400 hours, after the attempted burnout, Shannon and Alex surveyed the area near the log jam. They talked about some hazard trees uphill from them in the fire. Although there were no significant winds in the canyon at the time, they were still concerned about burned trees and agreed that “we should leave soon.” Shannon identified trees that were likely to fall, and they discussed two in particular that would probably fall that afternoon.

They described the tree closest to the creek as about a 12-inch diameter Douglas fir. It was located 60 to 75 feet above the creek and had a prominent sidehill lean downstream. The tree had a burning log that was lying against its base. In retrospect, Shannon and Alex could not agree whether the log was on the uphill side of the tree or the downhill side of the tree. In any case, both firefighters had no doubt at the time that this tree would fall side-hill with its lean.

*The Tree Cracks*

Because the log jam was a common reference point for the heel of the fire, Shannon thought it would be a good idea to get GPS coordinates for it before they left the area. As she would describe later, “one of the really important missions of a fire use module is always to make better maps.” She climbed 5 feet up onto the log jam with her handheld GPS unit. Alex was just up the creek, about 20 to 30 feet away. Shannon was looking down at the GPS unit when they both heard a tree crack. Shannon looked up and saw the Douglas fir they had just talked about falling
90 degrees off its lean and coming straight toward her. She quickly jumped off the log jam on the upcreek side. Alex, also hearing snaps and pops, saw the tree falling and yelled, “Shannon!!”

Shannon was hit in midair by the tree and fell onto the large river rocks five feet below. According to Alex, she was hit by the bole of the tree. He saw the branches envelope her, and she momentarily disappeared from view. Alex saw the tree spin her completely around before she came down very hard on her right side onto the rocks below.

Immediately after hitting the rocks, Shannon was thinking about how glad she was to be alive, that it had been a good instinctual reaction to jump out of the way of the tree. She realized that a split second hesitation probably would have meant that she would have been “smushed.” Shannon felt relieved. Because of her jump, she figured, she probably avoided paralysis and even death, but she was surprised that the tree had fallen so soon, and that it fell in the direction that it did. As she was lying there, Shannon also wondered if there would have been an investigation if she had been hurt worse. After all, she did know that it was a “big deal” to get hit by a tree. She dismissed this thought because as she would come to describe it later, she viewed the accident as: “a tree fell, I jumped out of the way, I got hit a little bit, and I fell onto some rocks.”

Alex ran to where Shannon was lying. He said, “I’m here. What hurts? Are you okay?” He began an injury assessment on Shannon’s upper body. Part way through, Shannon asked to be left alone for a minute. As she sat up, she studied the fallen tree, which was now lying across the top of the log jam about 6 feet away. She asked Alex, “What part of that hit me?” Alex replied, “That was close! We need to get out of here.” He took their gear and staged it on a sandbar downstream. He then helped Shannon over to the sandbar. As she moved toward the sandbar, Shannon felt like she had not been hurt that badly, just a little banged up and bruised. Her experience with other injuries and sprains was that they just got better with time. Later, she would admit that she probably has a high tolerance for pain as compared to other people.

In Alex’s view, as a former EMT, this was a “high alert” accident. He knew that the mechanism of injury could cause serious complications, although watching her move around put him more at ease. He saw that Shannon had blood from a scratch on her ear, for which he gave her some gauze. Alex would later describe that Shannon seemed in control, competent, and confident.

Hiking Out

As they sat on the sandbar, they talked about how they had just been discussing what a great assignment the 14-day roll had been. It had not hurt that the fire was in such a beautiful area. However, Shannon later described that once the accident happened, “it was like, so much for that!” They both marveled at how the tree had come down much sooner than they thought it
would, and not in the direction that they had expected. They supposed that the log lying against
the base may have caused the tree to burn hotter on one side, which altered the direction of the fall.

Shannon was adamant that she could hike out without calling for help. She was limping, but she
felt that, as long as she could walk on her own, it would have been “weird” to ask someone to hike
two hours in, in order to help her hike 2 hours back out. She had already decided that the accident had
been “no big deal,” and she did not want people to blow it out of proportion. On the other hand, Alex
felt he could push Shannon, who was his supervisor, only so far into accepting medical
assistance. They radioed the lookout, but only to tell him that they were starting their hike out.
Shannon wondered if there was still time to get that GPS point. Alex teased her about it and said
“we should really get moving.”

Alex helped Shannon with the walk out, offering to let her lean on him at times and even cutting
footsteps into the sidehill for her. As she stepped over logs, Shannon needed to grasp her pant leg
in order to lift her right leg. Alex carried Shannon’s pack for a while until she convinced him to
give it back. As they were walking, Alex tried to keep the conversation light and positive. They
talked about whether a helicopter could have been brought in if the accident had been more
serious. They decided that a helicopter would have been too high a risk in the drainage, even
with a longline and basket. The best anyone could do, they concluded, would be to walk or pack someone out.

The lookout continued to call Shannon to check on their progress because it was taking twice as long for them to hike
out as it had for them to hike in. Shannon answered the radio and told them they were “going slowly.” At one point, Alex
radioed the Module 1 senior firefighter Jamie to ask for help carrying gear. Jamie was staged at a log across the creek above
the RAWS site. She radioed back, asking what gear they needed help with since all they had taken in were their packs.
Instead of answering the question, Alex canceled the request on his reply transmission.

Shannon and Alex reached Jamie’s location around 1730 hours. By then, the rest of the module
had already hiked out to the trailhead. When Shannon saw Jamie, she debated whether or not to
tell her the whole story. Ultimately, Shannon told Jamie, “A snag fell, I jumped out of the
way, I don’t know if the whole module needs to know.”

How common is the attitude to “walk it off” or “tough it out” when an injury happens
where you work?

Where do those pressures come from, and what can be done about them?

“A snag fell, I jumped out of the way, I don’t know if the whole module needs to know.”
As they hiked in from the RAWS site, Jamie could see that Shannon was limping, but Shannon kept insisting she was okay. Alex and Jamie exchanged looks and Jamie kept watching Alex to see his reaction. Once they were closer to the trailhead, Jamie and Alex hiked ahead to get a vehicle. Alex found a road through private property where they could drive. He dropped his pack and ran ahead, flagging trees on his way out to help him retrace his steps to Shannon’s location.

At the Trailhead

From the trailhead, Terry saw Alex running across the private land toward him without his line gear. He spread his arms as if to gesture, what’s going on? When Alex reached the vehicle, he shouted, “I need to use the truck. We’ve got to get Shannon.” They climbed into the truck and drove off. Once in the truck, Alex remembers telling Terry, “a tree fell and hit Shannon. She is waiting at the trail.” The two of them drove down the spur road following Alex’s flag line across the private land towards the trail.

Jamie continued on the main trail that skirted the private land and arrived at the trailhead where another module vehicle was parked. When she arrived at the rig, two other crew members, Logan and Jackie, were waiting. They all loaded into the rig. As they sped away, Logan asked, “What’s wrong?” Jamie told them that they needed to pick up Shannon because she had gotten hurt. When they asked what had happened to her, Jamie told them, “Don’t worry about it.” Logan asked if Shannon needed to go to the hospital and Jamie answered, “I think she does, but...”

Alex and Jamie went to the private residences to ask for permission to use the roads. Terry hiked down the trail to meet Shannon. When they met up, Shannon described to Terry how she had been standing on a log, had seen a tree fall, “jumped out of the way, got hit a little bit by it, and fell on some rocks.” Terry asked Shannon if she was okay. Shannon told him, “Yeah, Alex checked me out.” As they walked toward the truck, Terry could see that Shannon was limping.
and in pain. He told her, “We are going to the Rifle Hospital. I’ll call the IC, and we’ll go.” Shannon refused. “Give me a day or two. I will be fine. The tree barely got me,” she replied. She continued, “You don’t need to tell everyone. I probably won’t even fill out a CA-1.” Terry asked her again, “Are you sure you don’t want to go to the hospital?” Shannon insisted they wait to see how she felt in the morning.

![Figure 6: Map showing location of the accident.](image)

**Back at Camp**

Around 2000 hours, Module 1 returned to camp and made dinner. It had been a long day setting up the RAWS and waiting for Shannon and Alex to hike out. The rest of the module was told that Shannon had “taken a digger off a log deck and into some rocks.” They understood that she was a little sore and that she just wanted to be left alone. Terry pressed her again, saying “Shannon, are you sure? Do you want to go to the hospital?” He said that she indicated that she was just sore, and to give her a day or two to recover.

Around 2030 hours, Hayden and Adrian ATV’d over to the Module 1 camp to say goodbye because Module 1 was demobing the next morning. They discussed the day’s events on the fire, including the installation of the RAWS, the access to the fire from below, and other topics. As part of this conversation Hayden and Adrian remember Terry telling them that one of his module members “had slipped and fallen...
into the creek, bruised her hip and side, and might be filling out a CA-1.” “Did you fill out a CA-1?” Hayden asked. Terry indicated that he had not. Hayden told Terry to fill it out that night and to drop a copy in the firebox in Rifle the next day along with their timesheets and fire data.

Sometime during their visit, Shannon limped over to participate in the conversation and leaned against the truck. After seeing Shannon favoring her arm, Hayden recalls, he asked Terry if she needed to go to the hospital to maybe get x-rays, whether that evening or the next day in Rifle. Terry told him that they were going to wait and see how she felt in the morning and then decide. Today, Shannon does not recall hearing any discussion about going to the hospital. Hayden and Adrian said their goodbyes with handshakes all around and returned to their camp.

**July 6 – End of Assignment and Travel Back to Home Unit**

On the morning of the 6th, Terry checked on how Shannon was doing, and again she convinced him that she did not need to go to the hospital in Rifle. Terry told her she did not need to stay behind, and that she could head back to Vernal instead. Shannon joined Alex, Jackie, and Joe in one of the crew trucks. There was no discussion of the accident as a few of them napped on the 3 ½ hour ride home. Terry and Robin went to the Rifle office to finish demobing and to present their final package to the SOPL.

In Rifle, Terry saw the ZFMO in the hallway, and he thanked him for the assignment. The ZFMO, who was on his way out, remembers asking Terry to submit his paperwork, but he does not remember Terry mentioning anything about an accident. Terry does recall that the ZFMO was in a hurry and that they discussed paperwork. But Terry also recalls that he told the ZFMO that there had been an accident. He remembers saying that “Shannon was banged up and bruised. We’ll see how she does, but she walked out 4 miles.”

Once back in Vernal, Shannon called her husband, Andy, and told him that she had been hit by a tree. He expressed concern and said he wished she had called earlier. He encouraged Shannon to fill out a CA-1 in case she would later need to see a doctor. Shannon and Alex completed what Shannon called a “precautionary” CA-1 and left it on Terry’s desk before Andy took her home. The rest of the module finished gear rehab and were excited for their long weekend: their 2 off-duty days followed by their regularly scheduled days off.

When Terry returned to Vernal he noticed Shannon had left a CA-1 on his desk. Later, when Terry stopped in at the District office, he found that several people had already heard about Shannon being injured. The District Ranger told Terry, “I saw Shannon. She looked hurt, and she went
home.” (Shannon had initially gone to the District Ranger to give him the CA-1 to sign, but he told her to “take it to Terry to sign.”) Terry did not discuss any details with the District Ranger, thinking that he had already heard the whole story from Shannon.

**July 7 – First Medical Evaluation**

The next day, Shannon went to an urgent care clinic. No x-rays were taken and the diagnosis was just bumps and bruises. Shannon asked about fractures and was told by the medical provider that “if you had fractures, you wouldn’t be able to walk.” That same day the District Ranger shared at the Forest Leadership Team meeting that one of their firefighters had been in an accident on a fire, but provided no other details.

**July 8 – Discussions Continue**

On Thursday, Terry called Shannon late that evening. He had received an urgent text and a few phone calls from other module members. The word “coverup” was floating around. He wanted the two of them to talk with the District Ranger to make sure the Ranger understood what had happened. Shannon agreed and said she would go with him. She was still pretty sore and not recovering as well as she expected.

**July 9 – Meeting with District Ranger**

On Friday, Shannon and Terry met with the District Ranger. This was the first time the District Ranger clearly understood that Shannon had been hit by a tree. Shannon told him she had downplayed the accident but she had been to a doctor and she was okay. Terry later admitted that he wished he had been more assertive and had made her go to the hospital. Although he had trusted her, he said that he wished he had “trumped” her decision. Later he admitted that he felt “absolutely horrible” about helping to downplay it. At the time, he asked the Ranger if he had done what he should have done as a supervisor. According to Terry, the District Ranger said, “If you filled out the CA-1, you have taken care of it.”

**July 11 – Second Medical Evaluation and Crew Briefing**

On the first day back for Module 1 after 4 days off, Terry pulled the module together after physical training and shared the whole story of the accident with them. Some of the members seemed surprised, but others had already heard the story over the weekend. A few people appeared upset that they had not been told sooner. “Sorry guys, Shannon didn’t want to make a big deal about it,” Terry told them. “She went to the doctor and she is okay. She is bruised up but nothing is broken.”

“*Terry later admitted that he wished he had trumped Shannon’s decision to downplay the accident.*

> How comfortable are you at reporting an accident on your unit?

> As a leader, how do you encourage open reporting?
By July 11, Shannon was not feeling better and consulted a family member who is a nurse. She recommended that Shannon come to Provo, UT to get a second opinion. Shannon visited a Provo hospital on July 11. After a pelvic x-ray, the medical provider told her that nothing appeared to be broken. Shannon returned home but was still limping. She worked the rest of that week. When she saw her supervisor at work on July 14, they talked about her injury. He noticed that she avoided sitting down and seemed to prefer to stand.

**July 13 – Documentation of the Injury**

The incident was entered into SHIPS. Once entered, the SHIPS software sent an automated message to several recipients on the White River National Forest stating “incident reported in SHIPS” with no further details. The next day the Ashley Forest Safety Officer accessed SHIPS to update the entry to a “reportable accident” due to the medical costs.

At this point, two different medical providers had given the same medical diagnosis – no broken bones – but Shannon was still not feeling better. Shannon’s family member recommended a sports medicine specialist, and the Provo hospital gave her a referral. Shannon set up an appointment in Provo for July 16.

**July 16 – Third Medical Evaluation**

Shannon took annual leave and again traveled with Andy to Provo. The specialist’s office contacted the Office of Workers Compensation Program (OWCP) for approval of a CT scan. After OWCP said it would take 3 days for an approval, the specialist called Shannon’s case worker and insisted they approve it that day. OWCP agreed and the doctor conducted the CT scan. While waiting for the results, the specialist reviewed the previous x-rays and diagnosed Shannon with possible hip fractures, a possible fractured pelvis, and three broken ribs. The specialist instructed Shannon to take a week off and to return for a follow-up visit on July 23.

After Shannon left the specialist’s office, the results of the CT scan were read. The specialist called Shannon and confirmed that her injuries included a pelvic fracture, a hip fracture, and three broken ribs. The specialist also mentioned that the fractures had actually been evident on the July 11 hospital x-rays. At this point, Shannon’s specialist revised her earlier instructions and told Shannon to take two weeks off work for bed rest and to return for a follow up appointment on July 30. Shannon agreed, and planned to use more of her sick leave in order to take the 2 weeks off.

Shannon knew that the District Ranger would be on annual leave until July 21. Over the weekend, Shannon called her supervisor, at that time also the Acting District Ranger, and left a message about her condition, expecting the District Ranger to be informed when he returned. In the message to her supervisor, she explained that the specialist had diagnosed several breaks in her ribs, hip, and pelvis, that she would be off her feet for “a week or so,” and that she would be on crutches for 6 weeks. Shannon also called Terry and left a message regarding the updated
medical diagnosis, noting that it would be a while before she could go out again with the Module.

**July 21 – Conversation about Injuries**

When the District Ranger returned from annual leave, Shannon’s supervisor asked him if he “knew about Shannon’s condition,” including that she would be off for at least a week. He said that, yes, he knew. However, they did not have a detailed discussion about her diagnosis, including any mention of broken bones. At this point, the District Ranger, having heard about the two previous doctor visits, was unaware of any fractures.

**July 26 – Communication Clears Up on Extent of Injuries**

Even though it had only been a week, Shannon tried to drive to work. However, she still felt unwell and turned around and returned home. Andy called in to her office to say that Shannon would be out for the rest of the week at the recommendation of her doctor. At about this time, the District Ranger learned the true extent of Shannon’s injuries including multiple broken bones. On July 28th the District Ranger sent an email to forest employees about the extent of Shannon’s injuries. The email included information about the multiple confirmed fractures, as well as Shannon’s contact information for anyone who wanted to send a card.

**July 30 – Medical Follow-Up**

Shannon returned to Provo on July 30 for her follow up appointment with the specialist. Noticing a still swollen right knee, the specialist ordered an MRI and discovered that Shannon also had a torn meniscus. That day, Shannon called the District Ranger to discuss coming back to work the following Monday. After she returned to work on August 2, Shannon scanned in the paperwork from the specialist and emailed it to the District Ranger and to her supervisor, with a copy to Terry and to the Forest Service’s worker’s compensation liaison in Albuquerque. In a follow-up email exchange, the Forest Safety Officer also received a copy of the documentation. On that same day, the annual and sick leave that Shannon had taken was reclassified as worker’s compensation leave.

Near the end of July, the news of Shannon’s accident was starting to make its way around Region 4, along with the mechanism and extent of her injuries. Surprise was the first reaction because many had been
unaware that the accident had taken place at all. Meanwhile, in Region 2 crew members from Module 2 started to compare accounts and to search their memories of the incident to identify any information that would square with what they were hearing. Hayden called Tony and asked if he remembered the firefighter who had slipped and fallen. Tony said yes, he remembered. Hayden added, “She actually got hit by a tree!” which Tony would later describe as “mind boggling.”

In R4 management was concerned that the injuries had not been properly reported. In Region 2 management had set a policy that any tree strike must be reported at the regional level. Region 4 does not have that same policy. However, Region 4 does require upward reporting of serious injuries, including those with broken bones. One Region 2 leader expressed his disbelief by saying, “We report a near miss from a falling tree in this Region if the dust gets in your eye!” The report itself became suspect. On August 2nd, when another Region 2 leader read the CA-1, he said “it seems fishy to me. I’d like to see the GPS track and see the tree. It may add validity, it may not.” On a conference call between Regions 2 and 4 on Monday, August 2, leaders agreed to conduct an Accident Prevention Analysis around the circumstances of the accident and reporting.

Figure 7: Mouth of Main Elk

Did you notice?
The APA team used gender neutral names but preserved gender pronouns.
What effect, if any, did this have on your read of the story?
IV. Lessons Learned By Peers – Shared by the APA Participants

The following is a listing of lessons learned by those affected by the Meadow Cr. fire incident. The people that were interviewed shared these lessons learned with the APA team as important lessons that they learned for themselves and/or that they thought others should learn from this event. The team has organized the lessons into two main groupings. The first grouping is Risk Management, and the second grouping is Reporting.

Additionally, some lessons were passed on as something for a specific level or position in the organization. We have added a key to help the reader interpret who the lesson learned could apply to:

**KEY:**
- Individual (I) Employees at any level.
- Small Unit (SU) A group of employees, such as a module or an engine crew.
- Small Unit Leaders (SL) Leaders of 1 to 25 people including any single resource boss position.
- Management (M) Leaders holding district or regional management positions and agency line officers.

**Risk Management**

**Leadership Engagement**
- About FS Fire: “This organization is too big and has way too many people so folks have to do stuff to stay busy. We have so many gadgets and feel like we have to use them all on 50 acres or 5,000 acres. It doesn’t matter.” (M)
- “I waited for things to get going a little more before getting engaged.” Wished he had engaged earlier and more often. Wished he had been onsite/engaged more day to day. (M)
- “I want what I need, I don’t care what they want” (regarding NIMO and Type 3 teams). (M)
- “I want trainees pulled out of the costs” I want to know the true cost. (M)
- Risk management and exposure: line officers should be more involved in making those decisions. The Forest Supervisor came to him earlier and talked to him about risk management vs. fire safety. (SL,M)
- Hire the best people, mentor them, and give them the tools to be successful. (SL,M)
- On managing job creep: “Have local leadership check on them every day.” (SL,M)
- Need to have other oversight. (SL,M)

**Communicating and Validating Leader’s Intent**
- “We need to do a better job of pinning down objectives on MMO fires.” (M)
- “Not sure if we do a good enough job briefing incoming resources.” (M)
- Clear leader’s intent to stay out of the drainage didn’t turn out to be so clear. (M)
- “When people are going to be around an uncontained fire there needs to be clear direction when moving from monitoring to tactical behaviors.” (SL,M)
Operational Risk Management

Mission criticality/risk vs. benefit

- Is this mission necessary? (ALL)
- The IC conferring with them was a good thing. (SL,M)

Knowing yourself and your capabilities

- Don’t do stuff outside of your capabilities. (I,SU,SL)
- Don’t do stuff outside your scope. People get hurt. If you don’t feel good about it, don’t do it. Turn down assignments beforehand. Work within your means. If they felt it was unsafe… There were cliffy, steep walls in there. (I,SU,SL)
- This macho attitude in the fire world of “gotta do this” gets people hurt, gets people killed.” (ALL)
- Don’t be afraid to turn down assignments if you feel it’s not safe. (I,SU,SL)

Safety briefings

- Review the safety plan, JHAs, RAs, LCES ICS 215A, at each morning briefing, especially when there is not a printed Incident Action Plan. (SU,SL)
- Fire Use – Often do not have a formal Incident Action Plan but still important to go through safety plan. (SL,M)

Identifying potential hazards

- Mesh bark beetle protocols with all fire crew briefings. (M)
- Good situation awareness can save your life. (I,SU)
- Establish safety circles around hazard trees. (I,SU,SL)
- In general “extra heads up.” Working with firs at any time of year. They have “rotten hearts” and can be “punky.” (I,SU,SL)
- “Snags get a lot of attention” in safety briefings and training but perhaps live trees need attention too. (SL,M)
- Trees don’t always fall where they are leaning once they’re burned. (I,SU,SL)
- Listening was an important lesson here because “the crack was a big deal. Trees don’t always crack.” (I,SU,SL)

Standards

- Positive lesson that it is good to work in pairs. (I,SU,SL)
- Consistency on the small unit- on the product that they use and consistent approaches on how they train, fitness program, mental fitness. (SL,M)
- Increase medical skills on wildland fire modules. (M)
- “Fire management modules do not seem to have much medical support while out there.” (M)

Reporting

Documentation

- The importance of documentation in the unit log was reinforced by this incident. (SL)
● It is good to fill out a CA-1 as a precaution. (I,SL)
● Anything dealing with the government? Document. (ALL)
● The CA-1 should have been left with the Meadow Creek Fire, and White River. (SL)
● As an IC, follow up to ensure that the CA-1 was filed and that the person went to the doctor. (SL)

Reporting and Cultivating a Reporting Culture

● There is inherent risk. (SL,M)
● Try to promote better reporting of accidents for subordinates. Tell them “you won’t get in trouble. We understand things happen, we just want to take care of you”. (So, report accidents and fill out CA-1s). If someone is hurt, the appropriate management response is to “get you better. We’ll work the lesson later.” (ALL)
● Need to be straight up with management so we can help you. (I,SU,SL)
● CA-1 from the Ashley should have been sent down much sooner to the White River side – better communication between managements. “It had to go through someone!” Keep the line officers informed especially if “they’re touting this fire as accident free.” (M)
● Notification from one Management to the other should have been timelier. (M)
● Procedures could have been followed better. (ALL)
● Always follow protocol. (ALL)

Upward Voice

● It is not simple to find the line between one’s personal autonomy and the ability to require them to seek medical help. (I,SU,SL)
● When an accident happens use the chain-of-command to report the accident and get that outside perspective. (I,SL)
● Call the IC, let them know about the accident, tell the IC she can walk out and ask if there was something else that we should do. (I,SL)
● If this was a seasonal I would never have given them the choice to not report or send them to the doctor. (SL)

Information Sharing

● The communication within the crew needs improvement. (I,SU,SL)
● Communication could have been better. (ALL)
● Make lessons learned analyses more accessible to everyone. i.e., not only on a website. (M)
● “Honesty is the best policy.” (I,SU,SL)
● Withholding information damages trust. (especially leaders withholding from crew members) (I,SU,SL)
● “I went from no one needs to know, to now, EVERYONE needs to know”; Her perspective on reporting has changed 180 from “nobody needs to know” to “everyone needs to learn about this because there is useful info.” She admits “in retrospect, we should have” told the crew; better advertising and telling,” and “better communication.” (I,SU,SL)
● Communicate near misses for the learning aspect. (I,SU,SL)
● Need to communicate near misses and accidents. (I,SU,SL)
- As a supervisor, I need to recognize how my reactions to crewmembers may either encourage or discourage full communication. (SL,M)
- I should have communicated more about the accident. (ALL)
V. APA Team Lessons Learned Analysis

Every person who was involved or had a role in the Meadow Creek Fire accident was interviewed. At the conclusion of each interview, each person was asked a series of questions regarding what they learned for themselves from this accident and what they believe the greater wildland fire community needs to learn from the event.

The Lessons Learned Analysis (LLA) is a display of relevant facts of the accident and analysis of the firefighter and management’s lessons learned and the APA team’s analysis of the conditions that led to the outcomes. The LLA assesses the key conditions composed of the important decisions, actions, behaviors, and latent conditions of the accident. The APA team identified conditions that facilitated the failure to manage at-risk behaviors and the normalization of risk at the organizational level of the Meadow Creek Fire accident.

During this analysis, the Review Team had access to Incident Qualifications Certification System (IQCS) master records of the individuals interviewed. The APA Team reviewed and determined both modules involved in the Meadow Creek fire met minimum individual and module qualifications.

Summary

Condition 1: Cultural, Organizational and Workplace Conditions:

- The APA Team found the modules were implementing what they thought was leader’s intent, but without the leaders’ full understanding of the hazards and risks being accepted on their behalf.
- Module autonomy - The mission of Wildland Fire Modules is to develop and provide nationally self-sufficient, multi-skilled fire professionals with a primary commitment to fire operations and planning.
- Social influences – Peer pressure and competitiveness – fire management modules feel great pressure to perform and continually demonstrate their competence.
- Mission focus – Sense of security – the modules are comfortable taking and managing risks related to recurring tasks. They believe they have developed defenses against these risks, and, so far, they have been able to handle everything that has come their way without negative consequences.
- Optimism bias – We assume that nothing bad will happen; that things will work out.
- Attachment- The Modules were attached to a new plan. They felt their plan had a higher probability of success than the district’s plan of burning off the mesa.
- The Gap– The term “gap” represents the difference between work as imagined by leadership and work as performed by the practitioner.
- Chain of command – Having an IC work for a SOPL can lead to confusion of responsibilities and lack of clarity as to who is in charge of the fire on a day to day basis.
- Competing Objectives – The WFM accepted additional risk on behalf of leadership in order to accomplish critical protection objectives.
**Condition 2: Reporting**

- A general lack of understanding of reporting an accident as an opportunity for organizational learning about risk leadership caused a delay in reporting and even allegations of a cover up.
- Confusion over Reporting – There is confusion by line officers as well as the modules and crews that if a CA-1 is filled out and the accident is entered into SHIPS then the reporting responsibility has been met. But has it?
- Inconsistent Notification Requirements – Firefighters and line officers were both confused about reporting the accident. To whom to report an accident is determined by what type of accident it is, where the accident happened, and the mechanism of injury.
- Disincentives for Reporting Accidents – Employees of the home and host unit and other Forest Service employees have offered their motivations for not reporting an accident.

**Condition 3: Human Factors in Sensemaking about the Accident and Subsequent Reporting**

Individual and collective sensemaking about the accident and about the injuries contributed to delays in accurate information becoming widely shared. They also account for varying reactions to news of the tree strike and injuries once this information became more widely known.

**Individual Sensemaking:**

The self-perception of the wildland fire module firefighter, coupled with recent managerial emphases on the dangers of hazard trees, helped the injured firefighter to initially frame the accident as a successful near miss, and later to minimize and even obscure the mechanism of injury. It is important to consider how factors that might be labeled “personality” traits might be representative of a broader culture that reinforces some traits and discourages others.

- Positive Self-conception – To preserve a positive self-conception as competent firefighter, and against a backdrop of emphasis on hazard trees and the worst case scenario, the injured firefighter focused on the larger tragedy that had been avoided, and initially made sense of the accident as a successful near miss.
- Cultural influences – A potential unintended consequence of emphasizing the worst case scenario with hazard trees, the injured firefighter wondered about possible investigation at the time of the injury, but dismissed it (and possibly the need to report) after assessing her injuries as relatively minor.
- Confirmation bias – At the log jam, the injured firefighter did not believe she was badly hurt, and on the hike out she and her fellow crew member continued to look for evidence to confirm that belief, but also ignored evidence that might have contradicted it.
- Concern about risks to others – A desire to not put others at risk shaped the injured firefighter’s decision to not call for help over the radio.
- Desire to avoid the spotlight – The injured firefighter minimized the accident in an attempt to deflect attention from herself and to control the story to have it better match her perceptions.

“If you are hit by a tree you are hit by a tree, you are lucky you are not dead.”
• Personality and culture – Although many we interviewed made reference to “personality” traits, it is important to recognize how these may be manifestations and indicators of culture as well.

_Collective Sensemaking:

Group and Local Unit Dimensions – The injured firefighter’s status among the crew and the timing of the accident enabled partial information sharing within Module 1 and defused any initial insistence to go to the hospital.

• Influence over subordinates – The injured firefighter’s high status among crew influenced lower level firefighters not to share details of the accident, at her request.

• Influence among peers – Based on work history and rapport, the injured firefighter was able to defuse discussion of immediate medical care with the module leader and others, who deferred to her judgment.

• Timing of the Accident – The timing of accident (adjacent to off-duty days) facilitated the injured firefighter’s preferences to avoid the spotlight, to go home and recover on her own, to share only partial information with the crew, and to defuse any talk of going to the hospital in Rifle.

• CA-1 Delay – The injured firefighter delayed filling out the CA-1 until the return to the home unit based on the belief that she only needed to do so if seeking medical care.

• Control over the Story – When required to tell the story to others, the injured firefighter purposefully ducked “trigger words” as a way to control the story that others understood, so that it matched her own perception of the accident and injuries.

Institutional Dimensions—The same confirmation bias about how to identify broken bones led to a series of medical misdiagnoses which obscured the extent of Shannon’s injuries for nearly two weeks. Once accurate information became widely shared, the reactions varied between the home unit and the host unit from ambivalence to hurt feelings and outrage.

• Medical Misdiagnoses and Cognitive Dissonance – In part due to institutional confirmation bias, a series of medical misdiagnoses delayed knowledge of the extent of the firefighter’s injuries. But cognitive dissonance and social support compelled her to continue to seek treatment.

• Reactions in the home unit—The injured firefighter’s absence from work, coupled with overlapping annual leaves, phone messages instead of face to face conversations, and lack of clarity in conversations, all contributed to a delay in the accurate diagnosis being widely shared in the home unit.

• Reactions in the home unit – Even after the medical diagnosis was fully understood by the home unit, the response was personalized to the injured firefighter and not immediately viewed as an organizational issue requiring attention, leading to further delays in reporting.

• Reactions in the host unit – Simultaneous notice of both the accident and the injury, accompanied by definitive trigger words like tree strike and broken bones, was met with initial surprise, then bafflement, indignation, and even allegations of lying from those on the host unit, as if those details had been definitively known (and had been purposefully hidden) since the day of the accident.
Condition 1: Cultural, Organizational and Workplace Conditions

The APA Team found the modules were implementing what they thought was leader’s intent, but without the leaders’ full understanding of the hazards and risks being accepted on their behalf.

The modules understood the leader’s intent to be “It’s okay for the fire to go north but keep the fire from going south in the drainage,” and they took steps to implement that. The UCR was pleased with the outcome on this event – until the circumstances of the accident became known almost 30 days later. They were surprised to hear later that people had been in the drainage and of a firing operation that had occurred around the time of the accident.

The dilemma is to find the balance between autonomy and collaborative risk management. On the one hand, the WFM feel a sense of autonomy and leaders defer to their expertise. Indeed, this might be a leading example of doctrine in practice.

On the other hand, risk management is most effective when it is a collaborative process between leaders, adjoining forces and practitioners. In this case the lack of shared awareness of the risks being taken in the field prevented the firefighters and leaders from benefiting from each other’s perspectives on risk management.

To fully understand this Condition, the reader needs to understand the history of the WFM and their culture. Second, the reader needs to understand the gap between work as imagined by leadership and work as performed by the practitioner.

History of Wildland Fire Modules

In 1995, the National Park Service founded the first fire use modules (FUMs), and hosted them in five different park units across the United States. Later other agencies and land management organizations developed WFM.

The modules were developed with the primary purpose of assisting the units with fire use. The modules were to be used to monitor fire effects and manually reducing hazard fuels on various units. Most recently, these modules are viewed as highly qualified and extremely effective in a variety of fire ground operations including full suppression, structure protection assessments and plans, fire behavior analysis, and other tactical predictive services.

WFM are locally established and locally managed. Individual home units provide direction, support, and review processes that ensure module operations are safe, effective, and meet module operation standards. Home units oversee and coordinate the initial module’s certification process and ensure the module is in compliance with the 2008 Interagency Fire Use Module Operations Guide. When not engaged on assignments, modules work on home unit projects.

The dilemma is to find the balance between autonomy and collaborative risk management.
Module autonomy – The mission of Wildland Fire Modules is to develop and provide nationally self-sufficient, multi-skilled fire professionals with a primary commitment to fire operations and planning.

Due to their self-sufficiency, WFM.s are a very appealing resource type to order for supporting wildland fire management. The perception by many line officers, fire management officers and others is that modules are highly skilled, cohesive, stand-alone crews that can operate with little oversight. Crews prefer autonomy and the freedom to be reactive to what they perceive needs to be accomplished on the ground.

It is essential for the ordering/receiving unit and the incoming module to have a thorough in-briefing and dialogue regarding safety management, incident objectives, to meet expectations and objectives of the unit.

WFMs are accustomed to operating with a high degree of autonomy. Indeed, this has been reinforced by leaders that don’t fully understand the capabilities and standard operations of WFM.s. Additionally, leaders who lack extensive “fire use” experience take a certain amount of comfort from having a WFM on their fire, as the module brings a high level of expertise and experience that the local leadership may not have.

Social influences – Peer pressure and competitiveness – fire management modules feel great pressure to perform and continually demonstrate their competence.

Firefighters have a variety of motivations on which they base their decisions. These motivations are constantly moving up and down a mental priority list throughout the day.

A chief focus of modules is not only to perform well throughout each assignment but to deliver the highest quality package of analytical data of the incident to the ordering/receiving unit. WFM.s feel that the package they provide defines the quality of the module and plays a large part for future assignments and whether the module will be requested again over other modules. WFM perceive that as fewer fires are managed for full suppression, a variety of resource types are being used and performing roles traditionally performed by WFM.s. Module members feel a great sense of ownership in their craft as well as competitiveness with other modules and types of resources.

Mission focus – Sense of security – the modules are comfortable taking and managing risks related to recurring tasks. They believe they have developed defenses against these risks, and, so far, they have been able to handle everything that has come their way without negative consequences.

On June 21, Module 1 checked into Rifle, CO, assigned to the Water Creek Fire. They received a local directory and they were sent to the fire, where they received a briefing by the ICT3. As they worked the fire over the next several days, they were able to acquire maps and local information.
regarding local hazards and risks, phone numbers, etc., from other crews. It is not uncommon for modules to gather this kind of information through the course of a fire.

Also, it is not uncommon for these modules to work independently and autonomously on these fires. In fact this is what they prefer to do and have normalized over the years. For example, as Module 1 moved from the Water Creek Fire to the Meadow Creek Fire, they began performing duties that they normally attend to during many of their assignments: setting up fire, fuels, and weather monitoring devices such as cameras, weather stations, fuel moisture ovens, developing structure protection plans, and monitoring fire behavior, weather, and fire effects.

These crews had performed similar tasks in the past and had acted independently over the years, managing risks by determining mitigations and defenses while conducting operations to meet planned objectives. Because these crews have been successful through time in these types of situations utilizing similar strategies, they had every reason to believe they would be successful. They were not likely to think that the results would lead to an unintended outcome. We get so used to an activity that our brains go on autopilot and we pay less attention.

*Optimism bias – We assume that nothing bad will happen; that things will work out.*

The modules felt that they could safely implement the new plan successfully. The district’s plan for the Meadow Creek fire was to allow the fire to burn the entire mesa top, along with allowing the fire to spread to the north in the Main Elk drainage. This would accomplish numerous resource objectives. As part of this plan, the ZFMO was considering aerial ignition of the mesa top. The fire would be prevented from coming off of the mesa top by using helicopter bucket drops. This information was presented to Module 2 as part of their in-briefing. The modules had concerns that the district’s plan to burn the entire mesa top would jeopardize meeting one of the incident objectives which was to keep fire away from private land and structures. After observing the fire behavior and then a helicopter recon of the fire, a new plan was agreed to by the leaders from the two modules.

The initial actions on July 5 demonstrate how, as Modules 1 and 2 started to execute their plans for the day, they incrementally took on more and more risk in the process. Initially, the assignments were to staff lookout positions and to set up a RAWS up the Main Elk drainage to monitor drainage winds and weather. They were to have several members of Module 1 hike up the drainage and determine what the opportunities would be to secure the heel of the fire by tying in the fire that was upslope from the drainage, down into the drainage, by burning out whatever was needed. This shows how wildland fire modules are expected to take actions, to assess the risks, and determine how operational productiveness can be accomplished. Indeed, this is what the agencies have allowed, accepted, and even encouraged through time.

This may be an example of optimism bias: We assume that nothing bad will happen and that things will work out. See the Appendix C Discussion Point on Optimism Bias.
The Modules were attached to a new plan. They felt their plan had a higher probability of success than the district’s plan of burning off the mesa.

The attachment to the strategy that they had developed and their perception of their ability to mitigate risk due to their experience led the Modules to take on more risk than the agency administrators imagined. For example, as Module 1 was hiking into the Main Elk drainage, the IC Hayden, was hiking down from the rim rock as far as he felt he could safely go towards the drainage, even though others had been told the cliffs were dangerous. Hayden’s assignment of hiking down towards the drainage from the rim rock, and Module 1’s assignment of hiking up the drainage to set up a weather station, provided a sense of security that being in the drainage was okay, or that hiking from the top down was okay. But after Hayden came out from the top, he recognized the significant hazards on the upper part of the hillside and told Adrian that nobody else should go in. However, he had already taken on that risk himself. See the Appendix C, Discussion Point on Attachment.

The Gap—The term “gap” represents the difference between work as imagined by leadership and work as performed by the practitioner.

Leaders give their intent; practitioners interpret the intent and carry out the work. A gap between intent and implementation will always be present; the magnitude or specific details of the gap are important when determining the significance of the outcomes that may result from the gap. Ideally, the IC and the Line Officer/Duty Officer would communicate fully, such that this gap is nonexistent or very small.

In practice, there are several reasons or conditions that contribute to the magnitude of the gap:

- Line Officers (LOs) are very busy, and fire is just one of many high priority items.
- LOs are usually not highly knowledgeable regarding fire incident management.
- LOs are often more than happy to delegate management of an incident to the “fire experts.” This can result in the LOs not being fully aware of the hazards and risks associated with the IC’s strategy and tactics.

We accept that the gap is tolerable due to positive reinforcement of repeated acceptable outcomes. Only when the outcome is unacceptable to the LO, is there an examination of why the gap was tolerated.
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<th>Leader’s intent</th>
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<td>Leader’s perception of strategy and tactics being performed</td>
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<td>Leader’s understanding of risk being accepted on their behalf</td>
<td>IC’s objectives, strategy, and tactics actually being implemented</td>
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<td>Actual hazards and risks being accepted to implement IC’s plan</td>
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By the time the third IC to be in charge of the fire was in place, the actions occurring on the fire did not line up with the original leader’s intent. District leadership and the IC had different perceptions of how much risk was acceptable in terms of staffing the steep south flank of the fire.

On July 1 with 5 days left of their 14 day tour, Module 1 moved to the Meadow Creek Fire. That evening the module leader, Terry, was asked by the zone fire management officer (ZFMO) to be the incident commander (IC) of this type 4 fire. There was little written information provided to the new ICT4, regarding written objectives and or strategies. It can be typical of a type 4 fire not to have an incident action plan, delegation of authority, or written incident objectives. Terry recalls verbal directions to continue monitoring fire and fuels data, and to perform structure assessments. He was cautioned not to walk the perimeter of the fire for it was too rugged, and not to hike down from the rim rock into the drainage for it was too hazardous due to cliff bands and steep slopes. He was also told that the fire could burn to the north and to the east, but that the Rifle Ranger District did not want the fire to move to the south toward private land. A long term plan was to be developed with objectives and strategies by a strategic operations planner (SOPL). The goal was to have this plan completed by July 8.

“**No one was to go off the top into the drainage**”

“I don’t remember hearing any specific instructions to stay out of the drainage.”

Later, on July 3, after a second WFM, Module 2, was assigned to this fire, Module 2 had been in-briefed by the SOPL, and transfer of command of the IC position occurred July 4 to the Module 2 leader, Hayden. Module 1 was timing out and traveling back to their home base on July 6. So, the evening of July 4, the new IC and IC(t) Adrian, met with the module 1 leaders, Terry and Shannon, and discussed an opportunity to secure the heel of the fire. Objectives had been provided to the IC by the SOPL and now the modules were developing strategies and tactics to meet those objectives.

The District Ranger and the ZFMO thought they were explicit in their discussions and instructions to not put people onto the steep slope or into the drainage. Various Incident Commanders, however, do not all agree that this was given as explicit guidance. Furthermore, the SOPL directed them to go into the drainage to set up a RAWS. Conversely, all concerned
were in agreement that a clear and important objective was to keep the fire from impacting private ground and structures to the south.

The specific details of the in-briefings that various resources received were not uniformly the same. Even though the District Ranger and the ZFMO felt that they had been clear on the point that “no one was to go off the top into the drainage,” this was not universally understood by the resources on the ground. Some resources didn’t remember this being mentioned at all during their in-briefing.

*Chain of command – Having an IC work for a SOPL can lead to confusion of responsibilities and lack of clarity as to who is in charge of the fire on a day to day basis.*

The SOPL that was supporting the Meadow Creek fire worked directly for the ZFMO. Furthermore, the IC reported directly to the SOPL. So, on July 5th the chain of command was ZFMO to SOPL to IC.

*_Meadow Creek fire chain of command:*

*ZFMO → SOPL → IC*

The SOPL was primarily focused on completing the long term implementation plan which was due in three days. The IC’s perspective was that the SOPL was therefore not keenly interested in detailed discussions of their day to day plans. The SOPL was looking ahead, looking at the big picture, how all of that would be accounted for in the plan, and wasn’t really focused on looking at “today”; that was the IC’s responsibility. This was a critical and dynamic period of planning for both the short and long term for the Meadow Creek fire. The SOPL serving as the point of contact for the IC during this period contributed to a diverging gap between the IC and the ZFMO. (See Appendix C: Discussion Point, “Chain of command; where do SOPLs fit?”)

WFMs thrive in an unstructured environment. Wildland fire modules are comfortable with receiving briefings that may not include a lot of detailed direction. This is fairly normal for the types of fires they are assigned to. They are skilled and experienced in staffing fires that have a lot of unknowns. They are used to performing assessments, devising plans or recommendations, and then implementing plans that meet the unit’s objectives. The autonomous nature of wildland fire modules is valued by both management and the modules themselves, but it can contribute to a large initial gap between what management thinks is happening on the fire and what the module is actually finding needs to be done. The valuing of
autonomy or self-sufficiency can then cause this initial gap to be perpetuated. This high degree of module autonomy and leadership’s deference to their expertise can exacerbate the gap by further reducing full communication between the module and leadership.

One reason this happens is that modules feel that a big part of why management wants a WFM on their fire is precisely because they know what to do and do not need a lot of oversight. This is a key cultural component of modules, and is something about which they are particularly proud. Both leaders and modules place a high value on modules’ self-sufficiency, but this reduced need for oversight creates a disincentive to close the gap of work as imagined versus work as performed.

*Competing Objectives – The WFM*s accepted additional risk on behalf of leadership in order to accomplish critical protection objectives.*

Once in place on the Meadow Creek fire, the assessments of the ICs on July 4 and 5 were that in order to accomplish the protection objectives, they would need to accept the risk of scouting the steep south flank of the fire. This would need to be done on foot in order to determine the feasibility of getting firefighters in place to implement tactics to halt the fire’s southward spread.

A large gap had developed between the hazards that management thought the firefighters were facing and the hazards the firefighters were actually facing. The District Ranger and the ZFMO thought that the fire was being monitored from afar. Instead, the steep cliffy south flank was being staffed both from the top down and from the bottom up. Firefighters were scouting, cold trailing, cutting scratch line, and burning out.

Of note, the IC and firefighters at this point didn’t have any feeling that they were drifting outside of the direction they had been given. In fact, they felt that they were following the pattern that had been successful for WFM*s in the past. Namely, they were assessing the situation, and designing and implementing a plan that would accomplish what they understood to be the most important objective of the fire – to keep the fire from impacting private land and structures to the south.

Implementing the WFM plan included putting three firefighters on the steep cliffy hillside that management expected would be unstaffed. The plan included tactical activities that added exposure to hazards.

Incomplete risk/benefit discussion and lack of risk sharing – The IC and the Module Leaders discussed the risk/benefit tradeoffs of attempting to secure the south flank of the fire. They made a deliberate choice to adopt a new plan that was higher-risk than the original. By not including the SOPL or the ZFMO in the discussion, the IC prevented the SOPL and the ZFMO from having an opportunity to weigh in on the new plan.

After observing the fire from the mesa top and after a recon flight, the module leaders and assistants from both modules agreed on a new plan. They had concerns that the district’s plan to burn the entire mesa top would be biting off more than they could chew, and could jeopardize their ability to meet the objective of keeping the fire from private land and structures. Their plan was to scout the south flank on foot. They would take direct actions if feasible to halt any further
southward spread of the fire in Main Elk, and use a road on the mesa top to minimize the burned area on the mesa top in order to prevent eventual fire spread off of the mesa. They were focused on this strategy because they felt there was a higher probability of success than the original plan to burn off the mesa.

Instead of directly proposing this new plan to the SOPL and the Zone FMO, the modules decided to go ahead with the initial scouting. This made sense to them at the time, given the autonomous culture of modules, the deference to expertise that managers have traditionally given to modules, and the positive reinforcement of repeated agreeable outcomes. Also, plans for such fires are often dynamic, subject to change as conditions change and new information is incorporated.

On the Meadow Creek fire, the incomplete communication regarding a change of the plan resulted in the IC and the firefighters accepting a high risk plan for July 5, the day of the accident. There was daily communication about intelligence, but minimal collaboration regarding the strategy and tactics for July 5 between the IC and employees in the office (i.e., the SOPL, ZFMO, and the District Ranger). By not discussing the strategy and tactics with leadership, there was no opportunity for leadership and the IC to collaborate on what the hazards and risks of the new plan would be, and then to either agree that the benefit of the plan was worth the risks or to decide that it was not.

**Condition 2: Reporting**

A general lack of understanding of reporting an accident as an opportunity for organizational learning about risk leadership caused a delay in reporting and even allegations of a cover up.

In this incident, the APA Team found that people in different levels of the organization had a different understanding of how to report and the purpose for doing so. They were also working with inaccurate or missing information and even when they did have accurate information, it was not shared clearly enough to trigger the appropriate response.

*Confusion over Reporting – There is confusion by line officers as well as the modules and crews that if a CA-1 is filled out and the accident is entered into SHIPS then the reporting responsibility has been met. But has it?*

Confusion appeared to be present around the completion of the CA-1 (report of injury to employee) and the entry of data into SHIPS. The purpose of the CA-1 was to collect limited information to document the injury for regulatory compliance and to be able to cover medical expenses for the employee. Although the CA-1 is good for documenting an injury and securing worker’s compensation for the employee, the overemphasis on this purpose tends to overshadow the importance of viewing an accident as a weak signal about potential hazards that should be addressed for organizational learning. Good evidence of this is provided by the assumption of management that if you complete the CA-1, you have taken care of everything.
Some believe that the CA-1 is a way of reporting an accident for risk management purposes, when this is not its purpose. Employees like Shannon, for example, may feel that filling out the report makes the information public even though this is technically inaccurate. The act of completing the CA-1 has little to do with the needs of upward reporting beyond the local level and is not designed to provide information for organizational learning.

The SHIPS database was intended to be a replacement for the manual CA-1 but it is not fully available for this purpose at this point. The employee and supervisor are still required to complete a paper copy and to submit it to the worker’s compensation section in Albuquerque in order to cover medical expenses and to comply with regulation. The actual entry of data into SHIPS collects the accident information at the local level and sends it to the safety officers for the relevant units. Thus, when this incident was entered into the database on July 13, automated notices were sent to the home forest safety officer and the forest safety officer where the accident occurred, along with a few others that were designated to receive these notices. Although SHIPS data are available for accident trending at higher levels, upward notification is not automatic. Nevertheless, many erroneously perceive that SHIPS accomplishes upward notification and risk management reporting.

What if You are Injured on the Job?

In addition to immediately seeking medical care for a work related injury or illness, you and your supervisor should keep two things in mind: Notification and Documentation.

- **Notification:**
  - Employees: Notify your supervisor immediately of the accident.
  - Supervisors: Be aware of your local upward reporting requirements. If the accident occurred away from the home unit, the supervisors should contact that unit with the basic information of the accident.

- **Documentation:**
  - Employees: Enter the injury into SHIPS (an on-line system for recording safety accidents and can be accessed through Dashboard). If you are unable to access or complete the form in SHIPS then complete a hard copy with your supervisor and fax the form to the WC Section at 866-339-8583, and enter it into SHIPS later.

Supervisors: You can print the CA-1/2 form from SHIPS that the employee will need to submit to the workers compensation section at HCM.

Inconsistent Notification Requirements – Firefighters and line officers were both confused about reporting the accident. To whom an employee reports an accident is determined by what type of accident it is, where the accident happened, and the mechanism of injury.

National Forest Service policy sets two different thresholds for reporting of accidents involving employees to the national safety office. One section requires a region to report any fatality, and
another section requires notification of any accident that results in a serious injury. This policy inconsistency continues at the regional levels. The policy in Region 4 requires a forest to report accidents that include broken bones, whereas the policy in Region 2 requires a forest to report any accident or near miss involving a falling tree.

Disincentives for Reporting Accidents – Employees of the home and host unit and other Forest Service employees have offered their motivations for not reporting an accident.

At least one of the units involved in this accident has well intended safety recognition programs that may create a disincentive to reporting accidents. If an employee works through the entire field season without having an accident, they are rewarded with some type of recognition. This action does little to reward and reinforce safe behavior but instead may lead to underreporting of accidents. This disincentive to report accidents continues at higher levels of the agency with the behavior of how leaders tie performance to trailing indicators and less on the proactive actions being taken to appropriately manage risk.

Conflicting policies and official reporting procedures were not the only reasons for the delays in reporting in this incident. There were also numerous points where specific messages were distorted (intentionally and unintentionally) and where lack of clear communication failed to convey a sense of urgency and thus delayed the appropriate response.

Many factors affect the accuracy of employers' injury and illness data, including disincentives that may discourage employees from reporting work-related injuries and illnesses to their employers and disincentives that may discourage employers from recording them. For example, workers may not report a work-related injury or illness because they fear job loss or other disciplinary action or are reluctant to jeopardize annual rewards based on having low injury and illness rates. In addition, employers may not record injuries or illnesses because they do not want to increase their workers’ compensation costs.

Condition 3: Human Factors in Sensemaking about the Accident and Subsequent Reporting

Individual and collective sensemaking about the accident and about the injuries contributed to delays in accurate information becoming widely shared. They also account for varying reactions to news of the tree strike and injuries once this information became more widely known.

In this section, we use the concepts of individual and collective sensemaking to unravel, in slow motion, how people made sense of what was happening to (and in front of) them on the Meadow
Creek Fire. Specifically we examine how it possibly could have made sense to those involved to hike out, to decide not call for help, to minimize the nature of the accident and injuries. We also use the concept of sensemaking to explore subsequent delays in reporting of the accident and injuries, and to explain the various reactions that occurred after more precise information about the accident, and more accurate information about the extent of the injuries, became more widely shared.

“Sensemaking” refers to how we draw on past experiences, interactions, and collective language to select and to name what seems important about the present. We then take action based on how we have “made sense” of the world in that way. Many past APAs have addressed human factors related to the individual mind, but this APA provides a good opportunity to explore collective sensemaking as a truly social process that requires the input of many different people working together. (See Appendix C Discussion Point, “Collective Sensemaking”)

Sensemaking is neither a pejorative nor a celebratory term; it is a descriptive one. The purpose of the kind of analysis in Condition 3 is not to suggest that everyone involved did everything right and that there is no room for improvement. Indeed, in the lessons learned from peers section of this report, crewmembers and leaders make recommendations about what they and others should do differently next time they are faced with similar circumstances.

But neither is the purpose of this analysis to find fault or to suggest punitive action. The purpose of this kind of human factors analysis is not to pass judgment or to suggest a conspiracy but rather, to show how this darker side of collective sensemaking can occur among even well intentioned people simply based on how the mind (and in this case how group dynamics) works. Hopefully this analysis will provide the reader with new “slides” to be on the lookout for occupational, peer, organizational, and cultural pressures that provide incentives and disincentives for behaviors, as well as individual and group factors like confirmation bias, oversimplification, and groupthink.
Individual Sensemaking

The self-perception of the wildland fire module firefighter, coupled with recent managerial emphases on the dangers of hazard trees, helped the injured firefighter to initially frame the accident as a successful near miss, and later to minimize and even obscure the mechanism of injury. It is important to consider how factors that might be labeled “personality” traits might be representative of a broader culture that reinforces some traits and discourages others.

Positive Self-conception – To preserve a positive self-conception as competent firefighter, and against a backdrop of emphasis on hazard trees and the worst case scenario, the injured firefighter focused on the larger tragedy that had been avoided, and initially made sense of the accident as a successful near miss.

As Karl Weick describes in his book Sensemaking in Organizations, people are driven to maintain "a consistent, positive self-conception" (p. 23), and sensemaking assists with this. Consider the production emphasis of the wildland fire module (discussed in Condition 1). They are known for producing a good product. Moreover, they describe their craft as “suppression plus,” to where they may have a dual mission: to actuate the mode of suppressing fires but also to monitor fires as they spread and grow. On the day of the accident, Shannon and Alex were in the drainage to scout whether suppression action was feasible and safe. While they were there, two opportunities had come up: to try to pull the black down to the creek bed (“suppression…” and to get a GPS point on this “valuable” position at the log jam (…plus”).

However, at the moment of the accident, as Shannon was lying on the rocks, she had just failed at all three tasks: scouting (she was now miles away from help and the environment had just proven to be unsafe), burning out (it had been too wet to make a solid black line), and GPSing (she had been standing on the log trying to get the GPS point when the tree fell). Her status as a supervisor was also suddenly in question: she was in charge of the other firefighter who was with her, yet here she was now lying on the ground, injured.

At this point, she had every reason to preserve a positive self-conception, and mentally pick herself up to make the situation better in some way. Specifically, to take positive steps to get back to feeling competent and in control, and even back in charge. This would be particularly salient to someone who wanted to get called out on a detail again with the crew. Recall Patrick’s observations that as she started to move around, Shannon seemed “confident, competent, and in control.” When asked what was consciously going through her mind at the time of the accident, Shannon said that her first reaction was a sense of relief that she had not been hurt worse.

Recent national and regional initiatives about the dangers of all kinds of hazard trees (and not just snags) had apparently made an impression on many of the firefighters working on the Meadow Creek fire. In interviews with the APA team, some indicated a heightened sense of awareness of the worst case scenario. For example, one of the firefighters we interviewed put it this way: “If you are hit by a tree you are hit by a tree, you are lucky you are not dead.” Thus,
from Shannon’s point of view, when she landed on the rocks she had actually avoided the worst case scenario (and many other scenarios in between, including paralysis). Her thought to grab the GPS point before leaving also reinforces the commitment to the work identity discussed above, and is part of this desire to get back up and get in control.

Cultural influences – A potential unintended consequence of emphasizing the worst case scenario with hazard trees, the injured firefighter wondered about possible investigation at the time of the injury, but dismissed it (and possibly the need to report) after assessing her injuries as relatively minor.

Aside from having just escaped a potentially deadly physical hazard, Shannon was also immediately thinking about potential reactions to news of a tree strike. Her awareness of both official and cultural reactions to tree strikes also helped to shape how she viewed the severity of the accident. As she would describe later, in firefighting culture “it’s a big deal to get hit by a tree.” Indeed, one forest leader we talked to thought that “we talk about dead trees a bit more than I would like.” Immediately after the fall, a question was going through Shannon’s mind: “I wonder if they always investigate it when someone gets hit by a tree.” Reasoning to herself, however, Shannon concluded: “I was just hit by a tree, I’m still alive, I don’t feel that badly injured. I don’t think this counts as that kind of tree strike.”

Shannon thus began to formulate her understanding of the accident as “a tree fell, I jumped out of the way, I was hit a little bit, and I fell onto some rocks.” In her view, this was not a story about a tree strike; it was about avoiding a direct hit (a successful near miss). It was not about a tree falling on her; it was about jumping out of the way (evidence of good situational awareness). The final phrase “I fell onto some rocks” also indicates that she viewed the mechanism of the injury as not stemming from the tree strike but rather from the fall, which occurred from a jump that she herself had initiated. In her view, the tree strike was coincidental and regretful, but also an unavoidable midair collision on the way down, and it became an inconvenient fact in the story that she would tell later.

Confirmation bias – At the log jam, the injured firefighter did not believe she was badly hurt, and on the hike out she and her fellow crew member continued to look for evidence to confirm that belief, but also ignored evidence that might have contradicted it.

Confirmation bias refers to the human tendency to notice things that confirm our existing beliefs, and to actively ignore details that threaten those beliefs. Assumptions about how to identify broken bones led to confirmation biases about the extent of the injury, from the initial hike out through the return to camp that evening.

When a limb is unable to support any weight, most people reasonably assume that it is likely to be broken. In this case, Shannon, Alex, and later others flipped this assumption around to assess Shannon’s injury: they used the fact that Shannon could walk at all as evidence that no bones were broken.

The more she walked that day, the more this assumption was confirmed in Shannon’s mind. The decision to continue hiking the drainage was reinforced by
their conversation where they concluded that had she been hurt worse, it would have been too risky to negotiate a helicopter rescue in the drainage. Weeks later, Shannon would also point to four pieces of evidence to show how, at the time, she had not thought she was hurt that badly: “I was limping, I hiked out, I camped that night, and I did not even call my husband right away.”

Confirmation bias also contributed to Alex’s sensemaking about the injury. Alex, a former EMT, was initially on high alert due to the mechanism of injury. This meant that he was watching for evidence of potentially hidden injuries. However, recall that he said that watching her move around at the accident site put him more at ease, and that to him Shannon seemed “confident, competent, and in control.” Later on the hike out, she also took her pack back from after Alex after he had carried it for a while. These observations tended to disconfirm any suspicions he might have had that she might have been hurt worse and helped to reestablish her as an authority figure.

Why do we do this? Sensemaking involves working with “enough” information to continue on. As Weick puts it, “sufficiency and plausibility take precedence over accuracy” (p. 62). However, once we become attached to an interpretation of events that we have selected, confirmation bias can be so strong that we might actively ignore evidence in the environment that might disconfirm our belief if we were to pay attention to it.

Consider all the details in the story that otherwise would have indicated to Shannon and Alex that they were in danger, and that Shannon might have been hurt worse than she thought: She had to lift her right leg to climb over rocks, she had to lean on Alex, he had to create cutouts in the sidehill for her to walk, it was taking twice as long to walk out as it took to walk in, etc. Although they radioed ahead to say that they were moving slowly, at one point Shannon told Alex to go on ahead without her (to which he refused). In retrospect these kinds of details seem obvious but that is because we have the benefit of hindsight: we know the outcome, so we can see the details that led up to it. For those in the situation that day, the outcome was not known. It was “wishful thinking” in the literal sense: They hoped that that she was not badly injured and that they could make it out successfully. Their attachment to this plan was so strong that they sought evidence that confirmed this belief and discarded evidence that might have disconfirmed it.

Thus far the analysis has focused on individual sensemaking about the accident and the injury. The prospect of hiking out of the canyon, and rejoining the crew caused Shannon and Alex to think about what to tell the others, and how exactly to do so.

Concern about risks to others – A desire to not put others at risk shaped the injured firefighter’s decision to not call for help over the radio.

This refers to Alex and Shannon’s conversations on the hike out of the drainage. (See the Appendix C Discussion Point on “Leaders Taking Risks.”)
Desire to avoid the spotlight – The injured firefighter minimized the accident in an attempt to deflect attention from herself and to control the story to have it better match her perceptions.

When faced with what to tell others, and how to do so, fear of potential embarrassment and unwanted attention when people would react to a phrase like “hit by a tree” contributed to Shannon’s choice not to call for help on the radio. Desire to avoid the spotlight also contributed to later decisions to shield the rest of the Module 1 crew, and the Module 2 crew leaders, from knowing the full extent of what had happened in the drainage.

Aside from the issue of whether there would be an investigation, Shannon dreaded the embarrassment that might result once others found out that the mechanism of injury had been a tree strike. Precisely because hazard trees had received so much attention, she worried that people might only focus on the fact of a tree strike and might fail to understand how she viewed the accident. She explained, “it sounds so stupid to say ‘I got hit by a tree’ because that is such a big deal. People get hurt or killed. But I felt I wasn’t that seriously injured.” In service of preserving positive self-concept, she may want to be perceived as a competent firefighter, but given the emphasis on hazard trees, being hit by one threatens that.

Second, Shannon personally dreaded the spotlight that would result from the accident and injury. She knew people would ask about the accident, and she felt it would be irritating to have to tell and retell the story, particularly if she would have to continue to correct misunderstandings about it. As she explained later, Shannon describes herself as someone who does not like to draw attention to herself. She and others called this a personality trait. For example, she contrasted her own style with others in the culture who might want to “play the hero” and talk up their story to anyone who would listen.

As part of her private nature, Shannon also wanted to avoid the spotlight so that she could get better on her own. Using her own past experiences with injuries as a guide, she expected that these injuries would just get better with time. She planned to use her upcoming off-duty days to recover. Thus, toughing it out, taking on the burden herself, and wanting to avoid the limelight may also be part of her personality. Shannon also supposed that she might have a high tolerance for pain compared to other people.

These desires to avoid embarrassment and to avoid the spotlight led to the decision not to announce the accident over the radio, even though Shannon and Alex had been acting as radio relay throughout the day, and even though they had been in touch with the IC by radio when he was above them on the cliff. This reluctance to make the story public also set into motion a process of selective reporting among the Module 1 crew. The only members of the crew who would come to know the full story were those Shannon interacted with directly: Alex, who witnessed the accident, Jamie (who Shannon debated telling at first), and Terry, her supervisor, who picked her up in the truck.

“It sounds so stupid to say ‘I got hit by a tree’ because that is such a big deal. People get hurt or killed. But I felt I wasn’t that seriously injured.”
Later, Shannon admitted that in hindsight she should have told the crew for the sake of identifying hazards for everyone’s safety on the fire. But at the time she regarded it as an individual matter she would just deal with on her own.

Personality and culture – Although many we interviewed made reference to “personality” traits, it is important to recognize how these may be manifestations and indicators of culture as well.

Even if dreading the spotlight and wanting to get better on her own are indicators of Shannon’s personality, it is important to consider how those traits might also be representative of other firefighters in the culture. People self-select into occupations, but cultures also reinforce certain traits and discourage others. People who are adventurous and hardy may self-select to join the culture of wildland firefighting. They may have a tendency to take on challenges, but they may also tough it out without complaining even when they are in pain.

And the culture may reinforce these tendencies. Around the office people praised Shannon’s toughness with phrases like, “she walked out. What a trooper.” One of the module members we interviewed wondered aloud, “what or where is that place that a firefighter gets to where they are uncomfortable accepting help?” Although it was beyond the scope of this APA to answer this question, the work culture may hold some clues.

Collective Sensemaking

Thus far this analysis has focused on sensemaking as an individual process, but sensemaking is also a collective process in that people take cues from one another about what to attend to and how to make sense of it. This process of influence can occur as people work closely together day to day, but it can also be informed by the institutional context in which they work. Thus, in this section we examine group and local dimensions of collective sensemaking (the sensemaking co-workers do together) and institutional dimensions of collective sensemaking (the sensemaking that is shaped by institutional practices and constraints).

Group and Local Unit Dimensions – The injured firefighter’s status among the crew and the timing of the accident enabled partial information sharing within Module 1 and defused any initial insistence to go to the hospital.

Influence over subordinates – The injured firefighter’s high status among crew influenced lower level firefighters not to share details of the accident, at her request.

While hiking out of the drainage, Shannon instructed Alex and Jamie “we don’t need to make a big deal out of this” and told them not to tell the rest of the crew. It is possible that they listened because Shannon was in a supervisory position over them. However, because she was a fill-in (i.e., not a permanent member of the crew), we cannot look solely to chain of command (formal dimensions of leadership) to explain this. Rather, it is also likely that they heeded this instruction
because Shannon had prior work experience with the module, and enjoyed a high status among the crew (informal dimensions of leadership). (See Appendix C Discussion Point on Expectations for Leader Transparency.)

Their acquiescence to Shannon’s instruction was reinforced when Terry, the Module leader, also went along with this plan. Notice how Jamie self-silenced when peppered with inquiries by the rest of the crew about whether Shannon needed to go to the hospital: She said, “well I think she does, but—” and then refused to share any more information with the lower level crew members. At camp that evening those three (Alex, Jamie, and Terry) shielded Shannon from the rest of the crew members, who did not approach her or ask her about her injuries.

Reflecting on it weeks later, Shannon remembers thinking that she “didn’t know if the whole crew needed to know” at the time, but in retrospect she recognizes that they needed to for the sake of hazard identification and their own safety.

*Influence among peers – Based on work history and rapport, the injured firefighter was able to defuse discussion of immediate medical care with the module leader and others, who deferred to her judgment.*

Shannon’s position and experience with the Module also defused any initial insistence among peers closer to her leadership level that Shannon go to the hospital. Recall that Alex did not know how far to push his superior on calling for medical help while they were hiking out. Once they were out of the drainage, Terry’s gut reaction was to call the IC and to take Shannon to the hospital. He initially told her “we are going.” But Shannon insisted that they take a wait and see approach and reassess the next day. Terry, trusting her judgment agreed, although he would regret doing so later.

The role that status and authority play in this dynamic is evident in the fact that many people we interviewed insisted that had someone they supervised gotten hurt, they would have made them go to the hospital. For example, Jamie said, “If this was a seasonal I wouldn’t have given them a choice.” Yet, when it comes to people who have higher status or authority on a crew, or even among people who have worked together a lot in the past, firefighters like Jamie find themselves asking, “how much can or should a person do or say to another person who is hurt about making them seek medical care?” In other words, subordinates may drop the issue but those closer to one’s level may identify with the person and defer to their judgment. (See the Appendix C Discussion Point on “Leaders Taking Risks.”) Alex later noted

*When groupthink is happening, group members are failing to challenge the leader or the emerging consensus. The group may be actively suppressing dissenting views. Members witness high social costs and they silence themselves. The group tends to seek outside information that confirms its existing point of view. What emerges is an increasing “illusion of invulnerability.”*
that once it was decided that she was not going to go to a hospital, the “mindset” seemed to change like the matter had been “settled.” (See Appendix C Discussion Point, “Groupthink”)

Timing of the Accident—The timing of accident (adjacent to off-duty days) facilitated the injured firefighter’s preferences to avoid the spotlight, to go home and recover on her own, to share only partial information with the crew, and to defuse any talk of going to the hospital in Rifle.

The crew coming up on off-duty days also contributed to the decision to not go to the hospital. This delay began with the initial “wait and see” approach, which was also discussed with Hayden and Adrian when they came to the Module 1 camp to say goodbye. Although Shannon does not recall any discussions at camp about going to the hospital, Hayden says that he told Terry about a hospital and a clinic in Rifle where they could take Shannon the next day if needed. However, the next day was also the travel day home. Rather than take Shannon to the close out in Rifle, Terry suggested that she go back to Vernal, and he used the opportunity to take a FFT1 trainee instead to Rifle. Consistent with wanting to get better on her own, Shannon planned to use the upcoming off-duty days to continue to recover.

The crew coming up on off-duty days may also have contributed to the fact of the accident not being widely shared among the Module 1 crew, or between Modules 1 and 2. Reflecting on the incident later, Shannon and others believe that since she was having difficulty walking, Shannon would not have been able to work if the accident had happened earlier in their 14-day assignment. She either would have had to remain in camp or she would have been sent home. Note that this also means that others on the fire such as Module 2 members would have become aware of the accident and injuries. But the fact that the two modules were camping separately, were using different crewnets aside from the TAC channel, and by this point they had largely separate assignments, aggravated this information gap.

CA-1 Delay – The injured firefighter delayed filling out the CA-1 until the return to the home unit based on the belief that she only needed to do so if seeking medical care.

Once back in Vernal, Shannon’s husband came to pick her up, and he persuaded her to see a doctor. In order to see a doctor, according to Shannon, it would be necessary to fill out a CA-1. It was Shannon’s view that if one was not planning to go to a doctor “what would be the point?” of filling out a CA-1 because it would only bring unwanted scrutiny. It was also her understanding that after she filled out the CA-1, the information would become public and everything would be out in the open. She said that later, after she filed the CA-1 she told Terry that it was okay to tell the rest of the crew because “everyone will know anyway.” These are perceptions that may not be accurate due to medical privacy rules. But they were assumptions that Shannon acted upon nonetheless. In her mind, the full details of the accident were out in the open once the CA-1 was filed.

Control over the Story – When required to tell the story to others, the injured firefighter purposefully ducked “trigger words” as a way to control the story that others understood, so that it matched her own perception of the accident and injuries.
The challenge remained how to tell others what happened in a way that matched her perception of the accident and the severity of the injury as she understood it at the time, and in a way that avoided calling attention to herself. She attempted to control the story in order to not activate the “worst case scenario” response. In her explanations around the office, Shannon purposefully ducked trigger words like tree strike which she minimized with phrases like “I got hit a little bit.” Others would describe later that they understood that Shannon had been “brushed by,” “tagged,” or “swatted” in the course of jumping off the log jam. She even conveyed the positive near miss story at a district meeting the following week, of having avoided a more serious injury due to good SA. Being invited to speak and being praised for her “good SA” is another example of cultural reinforcement of personal traits. (See Appendix B Migration of the Message)

Based on individual and collective sensemaking, Shannon and others expected the injuries to get better with time. Shannon in particular hoped the story would go away. Unfortunately, neither one happened. As people take cues from one another about what to attend to and how to make sense of it, this can also be informed by the institutional context in which they work. There were differences between the home unit and the host unit that influenced how they reacted to the news of the injury and the accurate details of the accident. Thus, in the next section, we discuss the institutional dimensions of collective sensemaking first on the incident, and then back in the home unit, and finally in the host unit.

**Institutional Dimensions**—The same confirmation bias about how to identify broken bones led to a series of medical misdiagnoses which obscured the extent of Shannon’s injuries for nearly two weeks. Once accurate information became widely shared, the reactions varied between the home unit and the host unit from ambivalence to hurt feelings and outrage.

**Medical Misdiagnoses and Cognitive Dissonance** – In part due to institutional confirmation bias, a series of medical misdiagnoses delayed knowledge of the extent of the firefighter’s injuries. But cognitive dissonance and social support compelled her to continue to seek treatment.

Shannon visited a medical professional the day after the accident. This person used the same reasoning that Shannon, Alex, and others had initially used in assessing her condition: when Shannon asked why she was having trouble walking, she received the reply, “if you had broken bones you would not be able to walk.” The implication was that since she was able to walk, this meant that she did not have broken bones. Shannon accepted this explanation (after all, it reinforced her perceptions of the injuries as “no big deal”) and returned to work after her off-duty days.

**How different would your reaction be to hearing someone on your crew was “hit by a tree,” as compared to hearing someone “slipped and fell”?**
However, as others observed, Shannon was having trouble sitting, and she was starting to wonder why she was not feeling better. At this point Shannon was experiencing cognitive dissonance. Cognitive dissonance refers to the tension experienced when new pieces of evidence do not match previously held convictions. In this case, the fact that she was still not feeling better was starting to conflict with her previously held assumptions that her injuries were minor and that she would get better with time. Shannon began to seek outside perspectives by discussing her lack of medical improvement with other people, including people at work. Family and friends also urged her to go back to the doctor, even if that meant traveling out of town.

At a second medical visit, this time at a hospital out of town, she asked the medical provider why she might still be having trouble walking. A set of x-rays was taken, and no evidence of fractures was noted (in part due to the confirmation bias that if you have broken bones you would not be able to walk). Although this confirmation of the initial diagnosis did not resolve the cognitive dissonance (“if…, then why…?”), people back at the office agreed the medical evidence was what it was, and that Shannon would just have to give it more time. However, a family member in the medical profession urged her to seek a third opinion and to go to a specialist out of town. For this Shannon took annual leave (instead of sick leave or worker’s compensation leave), which indicates that she may have expected the same answer and would be back at work the following Monday.

This collective sensemaking about walking and broken bones was finally disrupted by this third medical professional, who ordered a CT scan. After seeing the results of the CT scan, the specialist went back and reread the original x-rays, and now confirmed the multiple fractures. This too is an example of confirmation bias (finding evidence of something one already believes) but now in a direction that actually helped to alleviate Shannon’s cognitive dissonance. On July 16th a full 11 days after the accident, Shannon finally had medical confirmation that was squaring with her physical experience: she had multiple fractures and would not get better without bed rest.

Reactions in the home unit—The injured firefighter’s absence from work, coupled with overlapping annual leaves, phone messages instead of face to face conversations, and lack of clarity in conversations, all contributed to a delay in the accurate diagnosis being widely shared in the home unit.

“Well, how broken are they? Was it some kind of hairline fracture?”

Despite the certainty of the diagnosis which was known to Shannon on the 16th, people were in and out of the office on the Ashley during July (including Shannon herself) which contributed to further delays in sharing important information. Various people took annual leave at different times in July, and Shannon herself was out of the office for two weeks after the diagnosis on July 16th. Her time off was initially classified as annual leave and then sick leave which might not have raised as much attention as if it had been classified as worker’s compensation leave. Communication was happening via phone message and in some cases messages were not received until people came back to town. There were very few in-person meetings where people actually discussed Shannon’s situation. When those did occur, people did not share enough details to realize that they were working with different information about her condition during those conversations.
Reactions in the home unit—Even after the medical diagnosis was fully understood by the home unit, the response was personalized to the injured firefighter and not immediately viewed as an organizational issue requiring attention, leading to further delays in reporting.

Once the final diagnosis was known to the District the week of July 26th, the primary reaction on the Ashley was one of personal sympathy for Shannon. The District Ranger sent a note around on the 28th to that effect. People had seen her struggling with her injuries in the office, and now the phrase “multiple fractures” helped Shannon’s physical experience to make more sense to many people. It also elicited sympathy for the medical misdiagnoses which might have unnecessarily aggravated her pain.

The important point is that even when the fractures were known, the accident was still personalized to Shannon rather than be immediately regarded as a module or an incident concern. The CA-1 process and one on one case management by worker’s compensation may contribute to this personalizing of one’s injuries. Newer medical regulations probably only heighten this sense of privacy about an injury. When Shannon made phone calls about her injuries, she included Terry on the list. But her reason for calling was to say that it would be a while before she could go out with the Module again. Terry, having “taken care of it” in his District Ranger’s view by filing the CA-1, would have had his own incentives to avoid revisiting feelings of failure and regret.

Because many people on the Ashley had seen Shannon around the office, they were making sense of the information in light of what they already knew about the accident, including that Shannon had been “brushed” or “tagged” by a tree but that the injuries were likely caused by the fall on the rocks. Having seen her around the office, some on the Ashley experienced cognitive dissonance about it. One wondered, “well, how broken are they? Was it some kind of hairline fracture?” The point is that personalizing the accident and needing to reconcile this new information may have caused a delay in the recognition of the injury as an incident or regional concern.

Reactions in the host unit—Simultaneous notice of both the accident and the injury, accompanied by definitive trigger words like tree strike and broken bones, was met with initial surprise, then bafflement, indignation, and even allegations of lying from those on the host unit, as if those details had been definitively known (and had been purposefully hidden) since the day of the accident.

The reaction in Region 2 was initially one of surprise because many had been unaware that the accident had taken place at all. For many, puzzlement followed this sense of surprise because they learned about the accident through words like “tree strike” and “broken bones.” These phrases

Is minimization and trying to control the story so that people do not overreact to trigger words, the same thing as "lying"? If not, what is the difference, and why is the distinction important?

For a detailed look at specific messages communicated about the injury and their cultural effects up and down the chain of command, see Appendix B on Migration of the Message.
may have conveyed a sense of certainty about the accident and the injuries as if those details had been known so definitively by everyone all along. Thus these words triggered very perplexed reactions, and crew members from Module 2 started to search their memories of the incident and to compare accounts to identify any information that would square with what they were hearing.

The supposition that followed was that if those very certain details had been known all along, then they were purposefully being withheld. Institutionally, the policy in Region 2 is that all near misses involving trees are to be reported to the regional office. Given that the accident had not been reported other than through the CA-1 (although not a R4 rule), these initial reactions of bafflement also led to anger and indignation. Having an ostensibly clear cut accident and injury and not knowing about it threatens perceptions of their competence and self and others’ perceptions of how they take care of their people.

The reactions also included allegations of lying. On August 2\textsuperscript{nd}, when one forest leader read the CA-1 that described the task of GPSing the fire, he said “it seems fishy to me. I’d like to see the GPS track and see the tree. It may add validity, it may not.” This may be an instance of hindsight bias, however: had the story been understood as a “tree strike” and the injury as “broken bones” on day 1, for R2 not to hear about it until July 31, it would make sense that something had gone wrong in the reporting and that there might be a cover up. But the story received on July 31 was not the story experienced and understood on July 5, in part because not all details of the injuries were known. (See Appendix C Discussion Point on “Hindsight Bias”)

Until this APA, many will not have had access to the intervening information like the individual and collective sensemaking, the medical misdiagnoses, and the other delays in information sharing that took place. Hopefully the APA process will help to fill in some of that information for anyone who felt like there was a gap between what happened and what should have happened. For those who find the intentionality of the actions difficult to digest, our hope is that exploring the individual and collective sensemaking that went on (according to what the participants told us) might shed some light on how people made sense of their actions at the time even if they would do things differently in hindsight.

Highly reliable organizations regard accidents as opportunities to determine if similar actions may be going on, undetected, more frequently than previously thought. HROs know that there is a danger in saying that a particular accident was an isolated incident because, under the right circumstances, the underlying conditions could lead to even worse consequences in the future. Hopefully this analysis can provide the reader with a new “slide” to be sensitive to occupational, peer, organizational, and cultural pressures and incentives, as well as individual and group factors like confirmation bias, oversimplification, and groupthink.

VI. Recommendations

In a just culture an organization learns and improves continuously by openly identifying and examining its own weaknesses. To promote organizational learning, we recommend the following actions:

1. Share this report throughout Regions 2 and 4. Ask each forest supervisor to conduct a facilitated discussion with their line officers and key fire personnel around the conditions identified in the report, paying specific attention around leader’s intent, “gap”, and accident reporting from line officers to employees including their roles and responsibilities. Recommend that these sessions emphasize the tenets of a learning and reporting culture.

2. Request that Wildland Fire Lessons Learned Center post the report and develop a video or podcast based on this incident and the lessons learned. Recommend that the Region work with the Center to develop a discussion guide to stimulate individual and organizational learning through a series of questions, exercises, and discussions points that put the reader in the place of the participants in this incident.

3. Recommend that the theme for next year’s fire refresher be the “gap.” Integrate the lessons learned from this report into the annual fire refresher for all line officers and fire fighters.

4. Recommend a review of the Wildland Fire Module program to ensure alignment with Federal fire policy and to finalize the 2010 Standards for Interagency WFM operations.

5. Recommend NWCG amend the existing memo “NWCG#041-2010” to more accurately and fully describe the differences between the previously used term of fire use manager and strategic operational planner (SOPL). Also clarify where SOPL fits within the Incident Command System.

6. Recommend that NWCG add an additional element to the Type III, IV, and V Incident Complexity Analysis that reads, “Fire managed to achieve one or more resource objectives, and staffing may need to be increased, and no long term implementation plan in place.”

7. Recommend to the National Director of Safety to revise the agency’s policy on notification and upward reporting that provides uniform direction to the regions. Include in this direction the mechanics and meaning of reporting through SHIPS and CA-1s and coordinate with the National Director of Fire and Aviation Management to amend the Red Book to reflect this direction.

8. Recommend forest or fire management units review their safety programs including safety award programs, for any unintended or paradoxical effects on underreporting of accidents. Suggest progressive alternatives that encourage reporting of accidents and near misses.
### Appendix A: Chronology

<table>
<thead>
<tr>
<th>DATE (2010)</th>
<th>TIME (Approx)</th>
<th>EVENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/21</td>
<td>07:30</td>
<td>Wildland Fire Module 1 left Vernal 0730 hours and arrived at Water Creek Fire 1500 hours and received a briefing by the ICT3 team.</td>
</tr>
<tr>
<td>6/28</td>
<td>15:14*</td>
<td>Meadow Creek Fire discovered.</td>
</tr>
<tr>
<td>6/28</td>
<td>16:15*</td>
<td>Meadow Creek Fire jumped by 2 Smokejumpers responding from the Grand Junction Air Center.</td>
</tr>
<tr>
<td></td>
<td>16:30*</td>
<td>Acting ZAFMO advises SMJ IC to not suppress the fire and to gather intelligence on the fire.</td>
</tr>
<tr>
<td></td>
<td>19:15*</td>
<td>Meadow Creek Fire is 1/3 acres, creeping in oak brush.</td>
</tr>
<tr>
<td>6/29</td>
<td></td>
<td>Acting ZAFMO and District Ranger recon the fire and discuss with ZFMO managing the fire to meet multiple management objectives.</td>
</tr>
<tr>
<td>6/30</td>
<td>10:12*</td>
<td>Meadow Creek Fire has grown to 2 acres; becoming more established with active flames.</td>
</tr>
<tr>
<td></td>
<td>15:21*</td>
<td>ZFMO orders Module 1 for Meadow Creek Fire for 7/1/10</td>
</tr>
<tr>
<td>6/30</td>
<td>18:15*</td>
<td>ZFMO name requests the SOPL and SOPL(t)</td>
</tr>
<tr>
<td>7/1</td>
<td>09:52*</td>
<td>Meadow Creek Fire is 4 acres and creeping. It is located on the upper 2/3rds of Elk Creek drainage.</td>
</tr>
<tr>
<td>7/1</td>
<td></td>
<td>Module 1 is re-assigned to Meadow Creek to install a Google earth camera, led by Shannon. Terry travels to Rifle for briefing regarding the needs for the camera.</td>
</tr>
<tr>
<td>7/1</td>
<td>19:23*</td>
<td>ZFMO leads Terry to Clinetop Cow Camp and picks up Smokejumpers. Shannon is in charge of Module 1 at Meadow Lake.</td>
</tr>
<tr>
<td></td>
<td>20:09*</td>
<td>ZFMO notifies dispatch that Terry, Module 1 Leader, will be ICT4.</td>
</tr>
<tr>
<td></td>
<td>20:14*</td>
<td>Terry joins the crew at the camp, located at Meadow Lake.</td>
</tr>
<tr>
<td>7/2</td>
<td>09:01*</td>
<td>Terry travels to Rifle. Terry met with the Unit SOPL and ZFMO to cover fire strategy and to recon the fire via helicopter. Shannon and Module 1 remain at Meadow Lake to scout.</td>
</tr>
<tr>
<td>7/2</td>
<td>14:39*</td>
<td>Terry drives to Meadow Creek Fire posting road closure signs along the way.</td>
</tr>
<tr>
<td>7/2</td>
<td>19:36*</td>
<td>Module 1 travels to New Castle to refuel and re-supply and then heads to Meadow Creek Fire.</td>
</tr>
<tr>
<td>7/2</td>
<td>21:05*</td>
<td>Terry and the rest of the Module 1 crew meet at Meadow Creek Fire Camp, located .25 miles from Clinetop Cow Camp.</td>
</tr>
<tr>
<td>7/3</td>
<td></td>
<td>The daily mission for Module 1 is to observe the Meadow Creek Fire from Hadley Point Ridge. The crew disengages due to 40 mph winds.</td>
</tr>
<tr>
<td>7/3</td>
<td>09:20*</td>
<td>AZFMO notifies dispatch that 1BH will move the RAWS from Water Creek fire to Meadow Creek fire around 1200. The Water Creek IC will coordinate the order.</td>
</tr>
<tr>
<td>7/3</td>
<td></td>
<td>Module 2 travels to Rifle where they receive a Meadow Creek fire briefing from the ZFMO.</td>
</tr>
<tr>
<td>7/3</td>
<td>16:51*</td>
<td>Module 2 arrives at the Meadow Creek Fire to shadow and transition with Module 1 before they time out. Terry, Shannon, Hayden, and Adrian travel to the top of the fire and discuss plans for the following days.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Module 2 sets up their camp 1 mile away from Module 1 and Clinetop Cow Camp.</td>
</tr>
<tr>
<td>7/4</td>
<td>0700</td>
<td>Module 1 and Module 2 meet at Cow camp for morning briefing. Module 1’s daily mission to continue fuel and fire monitoring. Module 2’s daily mission is to find lookout position.</td>
</tr>
<tr>
<td>DATE (2010)</td>
<td>TIME (Approx)</td>
<td>EVENT</td>
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</tr>
<tr>
<td>7/4</td>
<td>11:38*</td>
<td>Hayden and Adrian take recon flight of Meadow Creek</td>
</tr>
<tr>
<td>7/4</td>
<td>17:35*</td>
<td>Module 1’s crew boss transfers ICT4 incident command to Module 2’s crew boss and ICT4(t).</td>
</tr>
<tr>
<td>7/5</td>
<td>07:00</td>
<td>Both crews attend morning briefing, lead by the ICT4(t), at Clinetop Cow Camp. Module 1’s daily mission is to receive a sling load at the confluence of Deep Creek and Main Elk. The sling load contains the RAWS station which the crew is to assemble in the same location. Module 1 was to recon and to determine if there was access to the bottom of the fire and to see if there was a way to anchor the heel of the fire.</td>
</tr>
<tr>
<td>7/5</td>
<td>08:30</td>
<td>Joe and Robin go to Rock Goblin lookout location to act as lookouts. Hayden and Tony travel to the top of the fire by ATV. Tony stays above the fire to sling weather and Hayden scouts down the south flank.</td>
</tr>
<tr>
<td>7/5</td>
<td>08:30</td>
<td>The rest of Module 1 arrives at the Hadley Gulch trail head.</td>
</tr>
<tr>
<td>7/5</td>
<td>09:10</td>
<td>Module 1 arrives at the confluence of Main Elk and Deep Creek, for the RAWS sling load and installation.</td>
</tr>
<tr>
<td>7/5</td>
<td>09:40*</td>
<td>Alex marshals in the sling load. Alex and Jamie note that sling load was circling and close to trees.</td>
</tr>
<tr>
<td>7/5</td>
<td>10:00</td>
<td>Shannon and Alex start the hike up Main Elk to scout out access to the bottom of the fire.</td>
</tr>
<tr>
<td>7/5</td>
<td></td>
<td>Shannon radios the rest of Module 1 to tell them an abandoned mine is visible on the hillside.</td>
</tr>
<tr>
<td>7/5</td>
<td></td>
<td>Terry, Tracey, Logan, and Lee hike the trail up Main Elk to see the mine.</td>
</tr>
<tr>
<td>7/5</td>
<td></td>
<td>Terry radios Alex and Shannon to check in, they respond that the trail ended in river and everything was fine. The RAWS station is installed but not working properly.</td>
</tr>
<tr>
<td>7/5</td>
<td>11:00</td>
<td>Terry leaves Jackie, Lee, Tracey at RAWS site to go to the “Phone Booth” to call Boise about the RAWS.</td>
</tr>
<tr>
<td>7/5</td>
<td>12:40</td>
<td>Shannon made contact on the radio with Hayden who was above their location and clifled out. Hayden asked Shannon and Alex to tie the cold black to the creek bed in order to anchor the south flank of the fire.</td>
</tr>
<tr>
<td>7/5</td>
<td></td>
<td>Shannon and Alex stop for lunch at the “Beaver Dam” log jam.</td>
</tr>
<tr>
<td>7/5</td>
<td>13:00</td>
<td>Shannon and Alex begin burnout operation, lighting 150-200 ft of line from cold black to creek. Hayden assisted with a very pistol. Joe radios when he sees black smoke, inquiring if there was a burnout operation.</td>
</tr>
<tr>
<td>7/5</td>
<td>14:00</td>
<td>Shannon attempts to take a GPS of the lowest point of the fire while standing on the log jam. A fire-weakened green Douglas fir begins to fall in Shannon’s direction. Shannon hears cracks, leaps to her right, and is struck by the falling tree. The burnout is spotty. Shannon and Alex tell Hayden that he should try the burnout again when conditions were more favorable.</td>
</tr>
<tr>
<td>7/5</td>
<td>14:15</td>
<td>Shannon and Alex radioed the lookout that they are hiking out to the confluence. Alex carries Shannon’s pack for the first part of the return hike.</td>
</tr>
<tr>
<td>DATE (2010)</td>
<td>TIME (Approx)</td>
<td>EVENT</td>
</tr>
<tr>
<td>------------</td>
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<td>----------------------</td>
</tr>
<tr>
<td>7/5</td>
<td>14:15</td>
<td>Terry, at phone booth, has Joe tries to relay and check on Shannon and Alex but he cannot reach them.</td>
</tr>
<tr>
<td>7/5</td>
<td>14:30</td>
<td>Joe repeatedly radios to check on Shannon and Alex as they hike out. Shannon answers Joe that they are on the way out.</td>
</tr>
<tr>
<td>7/5</td>
<td>15:00</td>
<td>Alex calls Jamie asking for help to “carry stuff out,” Jamie asks what they have to carry, Alex replies “never mind.”</td>
</tr>
<tr>
<td>7/5</td>
<td>1730</td>
<td>Alex hikes ahead of Shannon digging and limbing a path creating better footing for Shannon</td>
</tr>
<tr>
<td>7/5</td>
<td>1800</td>
<td>Terry arrives back at Hadley Gulch Trail head.</td>
</tr>
<tr>
<td>7/5</td>
<td>1830</td>
<td>Terry meets Alex at the Hadley Gulch Trail head after Alex jogged back to the vehicles. Alex tells Terry that “a tree fell and hit Shannon. She is waiting at the trail.”</td>
</tr>
<tr>
<td>7/5</td>
<td>17/00</td>
<td>Terry walks up to trail and meets Shannon who tells Terry about the accident, “you don’t need to tell everyone, I probably will not even fill out CA-1.”</td>
</tr>
<tr>
<td>7/5</td>
<td>1800</td>
<td>Terry tells Shannon they’re going to the hospital. Shannon asks to wait until the next day and see how she feels.</td>
</tr>
<tr>
<td>7/5</td>
<td>20:05*</td>
<td>All personnel are back at Cow Camp.</td>
</tr>
<tr>
<td>7/5</td>
<td>20:30</td>
<td>Hayden and Adrian visit the Module 1 camp. Terry tells Hayden that Shannon was “had slipped and fallen in the creek, bruised her hip and side, and she might be filling out a CA-1.” Hayden asks them to leave a copy of the CA-1 in Rifle.</td>
</tr>
<tr>
<td>7/6</td>
<td>06:15*</td>
<td>Module 1 is released from the fire, enroute to Rifle then Vernal.</td>
</tr>
<tr>
<td>7/6</td>
<td></td>
<td>Module 1 leader takes paper work to central zone fire center in Rifle and speaks with ZFMO about assignment.</td>
</tr>
<tr>
<td>7/6</td>
<td></td>
<td>Module 1 returns to Vernal, UT. No one talked about the accident on the drive.</td>
</tr>
<tr>
<td>7/6</td>
<td></td>
<td>Shannon tells her spouse about the accident. He asks Shannon to submit a CA-1. Shannon fills out a CA-1.</td>
</tr>
<tr>
<td>7/6</td>
<td></td>
<td>Shannon takes the CA-1 to the District Ranger to sign and he tells her to have Terry sign it.</td>
</tr>
<tr>
<td>7/6</td>
<td></td>
<td>Terry visits the district office where the Ranger tells him he saw Shannon. They did not communicate any further about the accident.</td>
</tr>
<tr>
<td>7/7</td>
<td></td>
<td>Shannon visits an urgent care center where she is diagnosed with bumps and bruises. The medical provider tells her, “You wouldn’t be able to walk if you had fractures.”</td>
</tr>
<tr>
<td>7/7</td>
<td></td>
<td>The District Ranger shares with the Forest Leadership Team that there was an accident involving Shannon but does not have any other details.</td>
</tr>
<tr>
<td>7/8</td>
<td>1800</td>
<td>Carey hears a rumor and calls Terry after hours to ask about the accident. Joe receives text from Carey “hit by a snag. What??”</td>
</tr>
<tr>
<td>7/8</td>
<td>2130</td>
<td>Terry calls Shannon’s house and tells Shannon’s spouse “I’m going to talk to the Ranger tomorrow.” Shannon calls back and says that’s fine and she will talk to the Ranger with Terry.</td>
</tr>
</tbody>
</table>
| DATE  
(2010) | TIME  
(Approx) | EVENT |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7/9</td>
<td></td>
<td>Shannon and Terry talked to the Ranger. Shannon tells the Ranger she had “downplayed the accident but she had been to a doctor and she was okay.”</td>
</tr>
<tr>
<td>7/11</td>
<td></td>
<td>Terry shared the story of Shannon’s accident with the rest of the Module 1 crew.</td>
</tr>
<tr>
<td>7/11</td>
<td></td>
<td>A family member of Shannon is a nurse, and suggests Shannon get a second opinion.</td>
</tr>
<tr>
<td>7/11</td>
<td></td>
<td>Shannon visits a Provo, UT hospital. After a pelvic x-ray the medical provider told her nothing appeared broken.</td>
</tr>
<tr>
<td>7/11</td>
<td></td>
<td>Shannon returns home but is still limping. Shannon works rest of week.</td>
</tr>
<tr>
<td>7/13</td>
<td></td>
<td>The accident was entered into SHIPS. An automated message was sent via SHIPS to the White River and Ashley.</td>
</tr>
<tr>
<td>7/14</td>
<td></td>
<td>Shannon’s supervisor sees Shannon at work. Shannon appears to be in pain.</td>
</tr>
<tr>
<td>7/14</td>
<td></td>
<td>The case was marked recordable by Safety Manager for the Ashley NF.</td>
</tr>
<tr>
<td>7/16</td>
<td></td>
<td>Shannon is referred by the Provo Hospital to a specialist who was also suggested by Shannon’s family member.</td>
</tr>
<tr>
<td>7/16</td>
<td></td>
<td>A specialist conducts a CT scan on Shannon.</td>
</tr>
<tr>
<td>7/16</td>
<td></td>
<td>After reading the results of the CT scan the specialist calls Shannon and confirms her injuries to include 3 broken ribs, fractured hip and pelvis and instructs her to take two weeks of bed rest. Shannon uses annual and sick leave to take time off.</td>
</tr>
<tr>
<td>7/18</td>
<td></td>
<td>Shannon calls Terry and leaves a message with the updated medical diagnosis.</td>
</tr>
<tr>
<td>7/19</td>
<td>20:40</td>
<td>Shannon called her supervisor, who is also acting District Ranger, and tells him the updated medical diagnosis.</td>
</tr>
<tr>
<td>7/21</td>
<td></td>
<td>Shannon’s supervisor and the District Ranger discuss Shannon’s condition by conferring “did you hear about Shannon?” but they did not mention details.</td>
</tr>
<tr>
<td>7/26</td>
<td></td>
<td>Shannon tries to drive to work to “talk to people and make sure they know what is up” she feels unwell and returns home. Her husband calls in to notify that Shannon will not be at work.</td>
</tr>
<tr>
<td>7/28</td>
<td></td>
<td>The District Ranger sends email to all forest employees with information about the nature of Shannon’s injuries including multiple confirmed fractures and contact information to send a card.</td>
</tr>
<tr>
<td>7/30</td>
<td></td>
<td>Shannon returns to Provo for a medical appointment. The specialist orders a MRI on her knee.</td>
</tr>
<tr>
<td>7/30</td>
<td></td>
<td>The District Ranger tells the Forest Supervisor of Shannon’s injuries, including that Shannon had X rays that indicated a fractured pelvis and hip.</td>
</tr>
<tr>
<td>7/30</td>
<td></td>
<td>Shannon calls the district ranger and her supervisor to inform them of her plans to return to work the following Monday.</td>
</tr>
<tr>
<td>7/31</td>
<td></td>
<td>News of Shannon’s injuries and the mechanism of injury spread around Region 2 and Region 4.</td>
</tr>
<tr>
<td>8/2</td>
<td></td>
<td>Shannon goes into work and scans and emails documents to the District Ranger, her supervisor, Terry and another district employee.</td>
</tr>
</tbody>
</table>

* denotes times taken from dispatch records. Other times are approximate.
## Appendix B: Migration of the Message

This table, a subset of the Chronology, and shows the specific messages people remember hearing about the accident and about the injuries between July 5 and August 2. The purpose is to show how people were making sense of the accident and the injuries and where information was withheld, causing a delay in accurate information becoming widely shared until late July and early August.

<table>
<thead>
<tr>
<th>DATE</th>
<th>INTERACTION</th>
<th>PEOPLE INVOLVED</th>
<th>MESSAGES PEOPLE REMEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/5</td>
<td>Moment of injury</td>
<td>Shannon (S) and Alex (A)</td>
<td>Alex heard a tree crack, and saw it heading straight for Shannon. He saw her jump off the log jam, and he witnessed her being struck by the bole of the tree, with the branches enveloping Shannon and spinning her around. Saw Shannon come down hard on her right side onto the rocks below. Shannon “adamant that she could walk.”</td>
</tr>
<tr>
<td>7/5</td>
<td>Radio call about hike out</td>
<td>S, A, and Joe (Jo)</td>
<td>“On our way out” but “hiking slowly.”</td>
</tr>
<tr>
<td>7/5</td>
<td>Radio call for help packing out</td>
<td>S, A, Jamie (Ja)</td>
<td>“Need help packing stuff out.” (Request later canceled: “never mind.”)</td>
</tr>
<tr>
<td>7/5</td>
<td>Radio call (overheard)</td>
<td>Tony (To)</td>
<td>Remembers overhearing on Module 1’s crewnet “something about someone slipping and falling and hurting themselves”</td>
</tr>
<tr>
<td>7/5</td>
<td>Traihead and truck</td>
<td>A, Terry (Te)</td>
<td>“We need to go get Shannon.” In the truck: “A tree fell and hit Shannon. She is waiting at the trail.”</td>
</tr>
<tr>
<td>7/5</td>
<td>At RAWS site</td>
<td>S, Ja</td>
<td>“A snag fell and I jumped out of the way.”</td>
</tr>
<tr>
<td>7/5</td>
<td>In truck</td>
<td>Te, S</td>
<td>Adds, “I was hit a little bit and I fell on some rocks.” Also “You don’t need to tell everyone, I probably will not even fill out CA-1.”</td>
</tr>
<tr>
<td>7/5</td>
<td>“Phone booth” (place on the mesa with cell reception)</td>
<td>Te, other members of Module 1</td>
<td>S “took a digger off a log deck onto some rocks.” Others recall “slipped and fell on some rocks.” Ja to other crew members: “Don’t worry about Shannon, she is fine.”</td>
</tr>
<tr>
<td>7/5</td>
<td>Module 1 camp</td>
<td>Te, Hayden (Ha), and Adrian (Ad), possibly S</td>
<td>One of the crewmembers “slipped and fell in the creek, bruised her hip and side,” and was banged up. “Might be filling out a CA-1.” Ha said to leave a copy of the CA-1 in Rifle. Other Module 1 members notice S was limping and in pain but didn’t pester her.</td>
</tr>
<tr>
<td>7/6</td>
<td>Rifle office</td>
<td>Te, ZFMO</td>
<td>Te recalls saying, “We had an injury at the bottom and we’re checking it out.” Described it as “bumps and bruises” and noted “she walked out 4-5 miles.” ZFMO recalls hearing “thanks for having us” but does not recall any mention of an accident.</td>
</tr>
<tr>
<td>7/6</td>
<td>Ride home</td>
<td>S, A, Ja, Jo</td>
<td>(No conversations in the rig about the accident.)</td>
</tr>
<tr>
<td>7/6</td>
<td>Ashley office on day of return</td>
<td>S, Te, DR</td>
<td>“Had a little accident.” “Terry made me fill out a CA-1 but I didn’t want to.” DR ranger recalls hearing S had been “swatted by a tree.”</td>
</tr>
<tr>
<td>7/6</td>
<td>CA-1 filed</td>
<td>S</td>
<td>S tells Te it’s ok to tell the crew because “everyone will know now anyway.”</td>
</tr>
<tr>
<td>DATE</td>
<td>INTERACTION</td>
<td>PEOPLE INVOLVED</td>
<td>MESSAGES PEOPLE REMEMBER</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>7/7</td>
<td>First medical visit</td>
<td>S, 1st Medical Professional</td>
<td>“You wouldn’t be able to walk if you had fractures.”</td>
</tr>
<tr>
<td>7/7</td>
<td>Forest leadership meeting</td>
<td>DR and other leaders</td>
<td>“There was an accident involving Shannon.” No further details given.</td>
</tr>
<tr>
<td>7/8-</td>
<td>Text messages, phone calls, and conversations at</td>
<td>Carey (Ca), Jo, Te, others in Module 1, other</td>
<td>“Hit by a snag. What the…?” “There is a cover up going on in the Forest Service.” “Shannon is a tough gal who probably told the crew she could walk it off.”</td>
</tr>
<tr>
<td>7/10</td>
<td>a party.</td>
<td>friends</td>
<td></td>
</tr>
<tr>
<td>7/9</td>
<td>Meeting with District Ranger</td>
<td>S, Te, DR</td>
<td>Admitted they “downplayed the accident”; S had been “brushed by a tree.” “She jumped, a tree caught her in the air, and knocked her to the rocks.” But “had been to a doctor and was okay” DR: “If you filled out the CA-1 then you have taken care of it.”</td>
</tr>
<tr>
<td>7/11</td>
<td>Module 1 team meeting</td>
<td>Te, Ja, Jo, Ca, others in Module 1</td>
<td>Admitted S had actually been “brushed by a tree.” Apologized to the crew for not giving the “full story.”</td>
</tr>
<tr>
<td>7/11</td>
<td>2nd medical visit</td>
<td>S, 2nd Medical Professional</td>
<td>X-ray shows no evidence of a pelvic fracture. S: “I guess I’m fine.”</td>
</tr>
<tr>
<td>7/14-</td>
<td>At work in the Ashley office</td>
<td>S’s supervisor</td>
<td>Heard that “a tree fell on S while GPSing the fireline” and that she “walked off the line”; also had filled out CA-1 and sought medical treatment.</td>
</tr>
<tr>
<td>7/16</td>
<td>District meeting</td>
<td>District personnel</td>
<td>S recognized for her “near miss.” Held up as an excellent example of “good SA” (situational awareness)</td>
</tr>
<tr>
<td>7/16</td>
<td>3rd medical visit (specialist)</td>
<td>3rd Medical professional (Med #3)</td>
<td>Injuries include “three broken ribs, a fractured hip and a fractured pelvis”; S instructed to take “two weeks of bed rest”</td>
</tr>
<tr>
<td>7/18,</td>
<td>Phone calls, phone messages, and hallway</td>
<td>Various Ashley personnel</td>
<td>Buzz in the office at first: “Shannon has been to the doctor but they haven’t found anything.” Later in the week: “broken bones” were confirmed. “Shannon won’t be into work for a while.”</td>
</tr>
<tr>
<td>7/21</td>
<td>interactions</td>
<td>S’s supervisor and DR</td>
<td>“Did you hear about Shannon?” But no details were shared.</td>
</tr>
<tr>
<td>7/21</td>
<td>Phone call</td>
<td>Andy, DR</td>
<td>S would not be in to work for another week. Discusses diagnosis and recommendations of Med #3.</td>
</tr>
<tr>
<td>7/28</td>
<td>Email message</td>
<td>DR, Ashley employees</td>
<td>S had been “injured on a fire detail” “hit by a falling tree” while GPSing a fire perimeter. Injuries originally thought to be muscle injury and strains but “was found to have a few broken ribs, a fractured hip and tail-bone.” Would not be in to work for a while.</td>
</tr>
<tr>
<td>7/30</td>
<td>Follow up medical visit</td>
<td>Med #3</td>
<td>Knee still swollen; diagnoses a torn meniscus.</td>
</tr>
<tr>
<td>7/30</td>
<td>Meeting</td>
<td>DR, Forest Supervisor</td>
<td>Had heard that S. had been “glanced by a tree” but was now hearing more anxiety about her injuries.</td>
</tr>
<tr>
<td>7/31</td>
<td>Phone calls and emails</td>
<td>Around Region 2 including with members of Module 2</td>
<td>News of Shannon’s injuries and the mechanism of injury. ZFMO: “When I was standing in the hallway as these guys were leaving, there was no mention of an accident.” Hayden: “Yeah, there was something.”</td>
</tr>
<tr>
<td>DATE</td>
<td>INTERACTION</td>
<td>PEOPLE INVOLVED</td>
<td>MESSAGES PEOPLE REMEMBER</td>
</tr>
<tr>
<td>-------</td>
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<td>----------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>8/2-</td>
<td>At work in the Ashley office</td>
<td>S</td>
<td>S scans in medical paperwork and emails to Dr, supervisor, Te, others.</td>
</tr>
<tr>
<td>8/5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8/8</td>
<td>Phone call between Hayden</td>
<td>Hayden, Adrian</td>
<td>Ha: “Remember that injury we heard about on the Meadow Creek fire?”</td>
</tr>
<tr>
<td></td>
<td>and Adrian</td>
<td></td>
<td>Ad: “Yeah.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ha: “Do you remember what Terry told us?”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ad: “Yeah, she slipped and fell.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ha: “Well, that wasn’t the case: A tree fell on her.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ad: “Like a tree fell?”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ha: “Don’t know. All I heard is that a tree hit her.”</td>
</tr>
</tbody>
</table>
Appendix C: Discussion Points

The following Discussion Points, listed in alphabetical order, provide definitions and additional information of concepts or key points presented in the story or the lessons learned analysis.

Attachment – Upon attaching to an object it is only a matter of time until we experience a negative consequence from that attachment.

Attachment to objects, individuals, plans, and documents is an emotional bond or tie to somebody or something. Out of unawareness (of how our minds function) we attach to objects we find pleasant that meet our needs, and avert or avoid objects, ideas, and plans we find unpleasant or don’t meet our needs. Normally, it is only a matter of time until we experience a negative consequence from that attachment. For instance the attachment to food we find pleasant can result in the overeating with downstream consequences of added pounds and increased health risks. A person should make an effort under daily conditions to see the attachment effect in their own mind to be alert for it under stressful conditions.

Attachment to objects is a routine daily reality that can prove hazardous on the fireline. Recognizing the inherent “stickiness” of mental and physical objects is best done in times of quiet reflection rather than in the heat of the fire. For instance heavy packsacks can be dropped when safety is at stake-- when there is no mental attachment and the mind is resilient. A person must make an effort under daily conditions to see the attachment effect in their own mind to be alert for it under stressful conditions.

A way around our mental resistance to change is to set trigger points for when to move, when to take another action. It is easier cognitively to recognize the trigger to move later when confronted by pressing matters at hand. This is how to make a good decision from a mental perspective. For example Shannon and Alex had identified hazard trees near to where they were working and had determined a safety circle around them that would keep them away from the lean and probable direction that they would fall. Hayden also had determined that he would hike into the drainage in early morning before any active fire behavior occurred, and then leave before fire activity could increase. In their minds they had identified trigger points and action points. But they were all attached to their plans to go into these areas and take some actions.

Chain of command; where do SOPLs fit?

Before Strategic Operational Planners (SOPLs) existed, we had type 1 and type 2 Fire Use Managers (FUM1/2), which were command positions equivalent to an Incident Commander or Prescribed Fire Burn Boss. These were the three distinct types of commanders for the three distinct types of fire within wildland fire. (Wildland Fire Use, Wildfire, and Prescribed Fire)

With the elimination of Fire Use as a separate category of wildland fire, the positions of FUM1/2 needed to be eliminated. They were merged into the SOPL position, which also meant that they moved from Command to Planning in ICS. For more information, please see the Fire Use Working Team’s “Fire Use Manager 1 and 2 to Strategic Operational Planner Transition Plan” (April 1, 2009). This plan stated “The position will work under a qualified IC based on complexity of incident.”

Also, see the September 24, 2010 NWCG memo “NWCG#041-2010”. This memo states “…merged the Fire Use Manager Positions, FUM1 and FUM2, into one position now called...
Strategic Operational Planner.” The memo goes on to describe the various skills and products that a SOPL can provide in support of a single incident or multiple incidents. The memo does not specifically mention or clarify that the merging of FUM1/2 into SOPL also involved moving it out of being a command position and into the Planning Section of ICS. People who have a thorough understanding of ICS would understand that the move from command to planning was a key component of the merging, but the potential confusion or opportunity to clarify this point was not addressed in this memo.

So far, the various attempts to explain the differences between the Fire Use Manager and the new SOPL positions have not been adequate in regards to the changes in where SOPLs fit in ICS and the potential chain of command confusion that can arise in their use. The following is a display of the differences in primary duties and place in ICS:

**Difference between the Fire Use Manager and the Strategic Operational Planner Positions**

**Fire Use Managers** (FUM1/FUM2) had two primary duties:
- Command responsibility for fire use incidents.
- Development of a long-term risk assessment and implementation plan (the Wildland Fire Implementation Plan [WFIP]) for a fire use incident.

FUM1 and FUM2 were Command positions in the ICS structure.

**Strategic Operational Planners** (SOPL) have one primary responsibility:
- Development of a long-term risk assessment and course of action (as part of the Wildland Fire Decision Support System [WFDSS] decision) for any long duration fire.

The SOPL is a position within the Plans Section of the ICS structure; the position has no command authority over the incident.

In reality, Strategic Operational Planners (SOPLs) are used in a variety of ways. A SOPL most traditionally would work directly for the Planning Section Chief, the IC, or for a unit in support of multiple fires. But, they could also work as a combination IC/SOPL for a lower complexity fire. Depending on how the SOPL is plugged into the chain of command when there is a separate stand alone IC, there can be confusion as to who’s in charge. The SOPL that was supporting the Meadow Creek fire worked directly for the ZFMO and the IC reported directly to the SOPL. So, on July 5th the chain of command was ZFMO to SOPL to IC.

**Meadow Creek fire chain of command:**

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ZFMO
    ↓
SOPL
    ↓
IC
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There are pros and cons to adding a middle layer of management. One of the positives gained for the ZFMO was to improve his span of control and ability to focus on initial attack fires. A
negative for the SOPL and IC was that their roles and responsibilities had the potential to be unclear. Was the SOPL really in charge of the fire and supervising the IC, or just the district’s point of contact for the IC?

The SOPL was primarily focused on completing the long term implementation plan which was due in three days. The IC’s perspective was that the SOPL was therefore not keenly interested in detailed discussions of their day to day plans. The SOPL was looking ahead, looking at the big picture, how all of that would be accounted for in the plan, and wasn’t really focused on looking at “today”; that was the IC’s responsibility. This was a critical and dynamic period of planning for both the short and long term for the Meadow Creek fire. Having the SOPL serve as the point of contact for the IC during this period, contributed to a diverging gap between the IC and the ZFMO.

Generally speaking, it is probably confuses things for those involved to put a planning position (SOPL) over a command position (IC). This is opposite of how ICS has it ordered. The downside with this arrangement is that it has the potential to create an appearance of a double layer of command, and therefore potential confusion of who’s ultimately in command of the fire. At the risk of coming across as a bit of a Yogiism*, “If you have two Incident Commanders, then you don’t have one.”

*Yogiism – Yogi Berra is well known for his pithy comments and witticisms, known as Yogiisms.

Collective Sensemaking

“Sensemaking” refers to how we select events in the world to pay attention to, and how we use language to name those events. According to Karl Weick, who popularized the term

sembleaking in organizations, as humans we cannot possibly cope with all of the data and information that the world is throwing at us at a given moment. Instead, we use past experience to select and to name what seems important about the present. Rather than describe people as passive recipients of events in the world, Weick is describing a very active process whereby we literally make sense of the world around us using materials that have come before.

One objection people have raised to the idea of sensemaking is that is can sound like we can just decide in our minds what reality is. In response to this idea, Weick has been the first to say that the world does indeed present us with “brute facts.” One of those undeniable brute facts in this case involves the midair collision of a falling tree and a jumping firefighter. After all, the witness describes the bole of the tree hitting her (a fact which she disputes by saying side branches tagged her). Both also agree that her ear was bleeding from the strike.

Will the accident be described as a tree striking a firefighter? Or will this be described as a firefighting jumping out of the way of a falling tree?

The distinction means the difference between viewing the incident as a failure or a success – viewing the incident as a problem or a cause for celebration.
The sensemaking part comes in terms of how people collectively understand and talk about this brute fact of a midair collision between a firefighter and a tree. How the accident is described one of the main challenges of this case. Will this be described as a tree striking a firefighter? Or will this be described as a firefighting jumping out of the way of a falling tree? The distinction means the difference between viewing the incident as a failure or a success, viewing the incident as a problem or a cause for celebration.

Consider how Shannon describes what was going through her mind as she was lying there on the ground: she reports that she was relieved to have jumped out of the way of a falling tree. She was glad she had not been hurt worse. Our sensemaking about the world is informed by the social contexts to which we belong, a large part of which is the collective language we use. A few of those social contexts that seem relevant here include the wildland fire occupation, the local crew dynamics, the larger fire organization, and even the medical community. Condition 3 uses direct quotes from the firefighters and other personnel involved, and can help us to understand which contexts became salient that helped those involved to make sense of what was happening along the way.

In the experience of the APA team, we noted that when people first learn about this accident and subsequent delays in reporting, their responses can range from surprise to suspicion and even accusation. Some may express awe at how someone with multiple broken bones could have hiked out of a tricky drainage, some may wonder if the non-reporting of the accident indicates a cover-up, and yet others may use the delay in reporting to question whether the accident happened at all. In Condition 3 we also show how collective sensemaking may have figured into some of the strong (even knee-jerk) reactions to trigger words like “tree strike” and “broken bones” that emerged some weeks after the accident.

**Expectations for Leader Transparency**

The extent to which Shannon’s status as a fill-in might have influenced her decision to withhold information about the accident is a question that came up often during the APA process. Although we did not have enough information to answer that specific question, we did notice an interesting dynamic that may have played a role, and which may also have lessons for other small unit leaders.

At the time of this incident, Shannon was not a regular part of the team, and only did occasional rotations. Not only did she not see herself as a member of the crew, but she also did not seem to see herself as a leader of the crew when detailed into this incident. However, Module 1 crewmembers perceived her authority as legitimate when she was filling in for Carey. For example, one crewmember noted that although Joe and Jamie functioned as squad bosses, Shannon could “veto” their instructions and other module members would listen. Some pointed to the fact that Shannon was a full time district staff member as a reason why some of the seasonal Module members would heed her instructions.

Aside from role related authority, many stories from Shannon and from Module 1 crew members featured Shannon actually leading and influencing, and others following and being influenced by
her. For example, even though Jamie had more experience with the technical details of the webcam, numerous people described Shannon as leading the mission to set it up. It was understood that she was standing in for Terry since he was in interacting with the ZFMO and traveling to Rifle. Shannon herself described her role as, “I took the crew across the canyon to set up the camera.” Shannon’s leadership role was also evident to Module 2 members. The ICT4 and the ICT4(t)’s accounts placed Shannon at the initial scouting and brainstorming meetings that took place on the mesa. Tony, a member of Module 2, for example, described how he talked over the radio to the woman “leading the group heading up the confluence to check the edge.”

In short, Shannon’s perception of herself as a leader did not seem to match the crewmembers’ perception of her as an authoritative leader on the module. One consequence of this is that Shannon may not have realized how much influence she did have among the crew. As a result, she may have underestimated the impact that her actions might have on the other crewmembers when she withheld details of the accident and downplayed her injuries and encouraged others to do so. If she was seeing herself as an outsider and as a fill in, she may have felt justified in treating herself as an isolated individual: not wanting to draw attention to herself, wanting to just go home and get better on her own, etc.

But comments from the other crewmembers (and from the other module) reveal that they actually viewed her not only as part of the team but also as a leader whose actions affected the climate of trust among the rest of the crew. After the accident, Shannon asked Terry and Jamie not to tell the others about the tree strike believing that it was “no big deal” because she did not perceive her injuries to be that severe. She and Terry told the crew that she had “taken a digger off a log deck and fell into some rocks.” (Others remember it as she slipped and fell on to some rocks.) Reflecting on this later, Shannon noted that in camp the other crew members “didn’t really ask me about it. They kind of left me alone.” This would be consistent with perceiving oneself as an outsider. But as it turned out, it was a “big deal” to some of the other crewmembers at the time. They left her alone not because she was an outsider; rather, they left her alone because three authority figures on the crew told them to do so.

This caused a fair amount of agitation among the crew, who viewed their safety as a collective matter. Reflecting on their reactions later, many crewmembers expressed them in terms of “rights” to know. One relatively new crewmember said, “If someone is hurt on the crew I think I have the right to know about it.” Another who witnessed Jamie running toward the trailhead to retrieve the truck said, “If you see a fellow crew member running out with two packs and another missing, you want to know what’s going on.”

Some of the crew knew that something was being kept from them, but they did not know what or why. So, they started to fill in the blanks themselves. Some wondered if Shannon was covering up something that went on in the drainage. Eventually this blossomed into speculation about a larger coverup. Selected people having the full information caused friction over power plays...
among crew members junior to Shannon’s level. This too had implications for Terry, who was faced with some upset module members on the crew’s return from off duty days.

The point is that when leaders fail to address their subordinates’ expectations for transparency, it can damage trust among the crew. Although her characterization of the accident still remains “a tree fell, I jumped out of the way, I got hit a little bit, and fell on some rocks,” today Shannon’s thinking has changed in terms of the crew’s right to know. She noted that she has gone from not knowing if the crew needing to know about the accident to now “everybody needing to know,” as a safety issue.

Hurt feelings and resentments aside, another important reaction to capture is the compassion that people wished they had been able provide to Shannon had they known about the accident and the injuries. Multiple crewmembers asked if Shannon needed to be looked at by a doctor, and were put off by Terry and Jamie. One crewmember on Module 1 put it bluntly: “It sucks not knowing, we would have liked to know what to do to help.” A Module 2 member lamented that “the poor girl got hit by a tree and I didn’t know about it; if I had known she’d been hit by a tree I would have taken her to the hospital myself.”

Reactions from Module 2 and from the White River illustrate even worse consequences of leaders withholding information: it may make it more difficult for people to believe the truth later on when it does come out. Some moved immediately to challenging the fact of the accident per se, calling for photographs of the tree, etc. It may also damage perceptions of the leader’s competence. Hayden, for example, expressed difficulty understanding why Terry wouldn’t make his people go to the hospital? “You’d think you’d get someone taken care of. I don’t know why you’d not do that.”

Terry’s perspective on this issue reinforces the influence that Shannon had as a prominent and trusted member of the crew. Terry reasoned along with Shannon that all they would likely do at the hospital was give her Tylenol. Knowing that she walked out 4 miles, he trusted her judgment at the time. But he admitted later that he “wished he would have trumped her decision” not to seek medical care.

Supervisors at all levels on this incident readily admitted that they would not hesitate to require their people to seek medical care, in part because they see the one crewmember as part of a larger whole. But supervisors do not necessarily apply this same logic to themselves. Like Shannon, they may feel that they can assess their own injuries. Yet, people in supervisory roles also need to realize that they are part of a bigger picture as well, and that their actions (and wellness) have consequences for the rest of the crew. Hayden uses the following motivation with his own crew to fill out CA-1s and go to the doctor, “you need to take care of yourself for you
and your family, you need to CYA in case of future complications, and you need to keep yourself healthy so you’re available for assignments.” Perhaps crew leaders could apply this logic to themselves as well. Not only might this contribute to maintaining physically competent and healthy crews but it can also go a long way to avoid the “drama” that can result when leaders fail to live up subordinates’ expectations for transparency.

**Groupthink**

Many people first encounter the term “groupthink” in school or in training courses, or they may hear others use it in the workplace. The catchy connotation of a group of people putting their heads together on an issue seems to be shifting the meaning of “groupthink” toward a relatively benign description of group discussion in general. Specifically, today, some may use “groupthink” to refer to a generally positive process of collaboration that harnesses the thoughts of multiple people to make important decisions.

However, the traditional meaning of the term “groupthink” had a more negative connotation. In the 1970s political scientist Irving Janis coined the term groupthink to describe a destructive group process that can lead to faulty decisions. Janis used Kennedy’s handling of the Bay of Pigs invasion as one famous example of groupthink, but others have since used more updated examples like the collapse of corporate giants like Enron to illustrate the term. Perhaps the shenanigans in the bond market on Wall Street that recently threatened the global economy may become a new popular example for illustrating the term in the future.

In its classic (negative) definition, groupthink is a process that happens to a relatively cohesive and homogenous group where there is a clear leader. Groupthink describes both an internal dynamic of how the members relate to one another as well as an external dynamic of how the group relates to outsiders. Internally, when groupthink is happening, group members are failing to challenge the leader or the emerging consensus in the group. In some cases this may happen simply because group members think alike. In other cases, the group may be actively suppressing dissenting views as they emerge. Other members witness these high social or membership costs and they silence themselves. Unfortunately this becomes a vicious cycle because potential dissenters silence themselves before they find out if others feel the same way.

Externally, when groupthink is happening, the group is systematically rejecting outside information (and outside people) that might challenge the leader’s perspective or the emerging group decision. Instead, the group tends to seek outside information that simply confirms its existing point of view. What emerges is what Janis called an increasing “illusion of invulnerability” where the group members begin to think they can do no wrong as a group. Indeed, group members may believe they are making the best decision because they believe they know better than outsiders who may be contradicting them. Unfortunately, with such suppression of

Does your team have a constructive devil's advocate?
Are you comfortable expressing your viewpoint?
As a supervisor, how do you encourage expression of alternative points of view?
critical inquiry from inside and out, the group is not only fails its members, but it usually fails to make quality decisions that affect outsiders as well.

Many group process experts recommend that teams assign a devil’s advocate role, where it becomes one members’ job is to present contrary opinions and to seek contrary outside information. But experts also recommend that members take turns occupying this role to avoid one person in particular becoming a social outcast. Other leaders build structures for dissent into the group itself. Presidential historian Doris Kearns Goodwin entitled her book about Abraham Lincoln Team of Rivals in order to convey how our 16th President staffed his cabinet with people who represented multiple points of view. Perhaps Lincoln was trying to ward off groupthink by building in inevitably vigorous deliberation that would also be noticed by outsiders.

As described above, today, the meaning of the term groupthink may be stretching to include more positive and healthy senses of group cogitation and collaboration. It is the nature of language to change in this way. Perhaps this is even an indicator of an increasingly hospitable climate for vigorous group deliberation in general. Nevertheless, it is also worth preserving the pejorative sense of the term of groupthink as a warning from history: we should always be on the lookout for unhealthy group dynamics – both internal and external – that can lead to faulty group decisions.

Hindsight Bias and Outcome Bias

Considering the topic “human error” quickly led us to two different perspectives. “Human error” in one sense is a label invoked by stakeholders after-the-fact in a psychological and social process of causal attribution. Psychologists and others have studied these processes and in particular found a pernicious influence of knowledge of outcome, such as outcome and hindsight biases, that obscures the factors that shape human performance. Studying “human error” from this perspective is the study of how stakeholders react to failure. “Human error” in another sense refers to the processes that lead up to success and failure (or potential failures) of a system. Researchers, using techniques to escape the hindsight bias, have studied such work domains and the factors that influence the performance of the people who work in those systems.

People tend to believe that participants in an accident or incident knew more about their situation than they actually did. People also tend to think that participants in an accident or incident should have seen how their actions would lead to that particular outcome or failure.

There are popular beliefs that accidents are due simply to isolated blunders of individuals, but there are also popular beliefs that these beliefs mask the deeper story – a story of multiple contributors that create the conditions that lead to unintended outcomes. Reason (1990, p. 173) summarizes the results: “Rather than being the main instigators of an accident, operators tend to be the inheritors of system defects. Their part is that of adding the final garnish to a lethal brew whose ingredients have already been long in the cooking.” The empirical results reveal regularities in organizational dynamics and in the design of artifacts that produce the potential for certain kinds of actions and assessments by people working at the sharp end of the system (Woods, Johannesen, Cook and Sarter, 1994; Reason, 1998).

After the-fact, stakeholders look back and make judgments about what led to the accident or incident. Labeling a past action as erroneous is a judgment based on a different perspective and
on different information than what was available to the practitioner prior to the occurrence of the accident. Our reactions to failure as stakeholders are influenced by many factors. One of the most critical is that, after an accident, we know the outcome and working backwards, what were critical assessments or actions that, if they had been different, would have avoided that outcome. It is easy for us with the benefit of hindsight to say, “how could they have missed x?” or “how could they have not realized that x would obviously lead to y?”

One sense of studying “human error” then involves understanding how social and psychological processes such as hindsight and outcome biases shape our reactions to failure as stakeholders in the failed system. In general, we react, after the fact, as if the knowledge we now possess was available to the operators then. This oversimplifies or trivializes the situation confronting the practitioners, and masks the processes affecting practitioner behavior before-the-fact. As a result, hindsight and outcome bias blocks our ability to see the deeper story of systematic factors that predictably shape human performance. These types of perspectives are hardly uncommon. During this APA there were strong and steadfast beliefs, from practitioners that were on the fireline to local fire management and line officers and on up through Forest Management and the Regional management, that the participants of the accident should have been able to predict the multivariable conditions that led to the unintended outcome.

Studies have consistently shown that people have a tendency to judge the quality of a process by its outcome (Baron and Hershey, 1988; Lipshitz, 1989; Caplan, Posner and Cheny, 1991). In a typical study, two groups are asked to evaluate human performance in cases with the same descriptive facts but with the outcomes randomly assigned to be either bad or neutral. Those with knowledge of a poor outcome judge the same decision or action more severely. This is referred to as the outcome bias (Baron and Hershey, 1988) and has been demonstrated with practitioners in different domains. For example Caplan, Posner and Cheny (1991) found an inverse relationship between the severity of outcome and anesthesiologists’ judgments of the appropriateness of care. The judges consistently rated the care in cases with bad outcomes as substandard while viewing the same behaviors with neutral outcomes as being up to standard even though the care (i.e., the preceding human performance was identical.) The information about outcome biased the evaluation of the process that was followed.

Other research has shown that once people have knowledge of an outcome, they tend to view the outcome as having been more probable than other possible outcomes. Moreover, people tend to be largely unaware of the modifying effect of outcome information on what they believe they could have known in foresight. These two tendencies collectively have been termed, hindsight bias.

Hindsight biases fundamentally undermine our ability to understand the factors that influenced practitioner behavior. Given knowledge of outcome reviewers will tend to oversimplify the problem-solving situation that was actually faced by the practitioner. The dilemmas, the uncertainties, the tradeoffs, the attentional demands, and double binds faced by practitioners may be missed or under-emphasized when an incident is viewed in hindsight. Typically, hindsight biases make it seem that participants failed to account for information or conditions that “should have been obvious” or behaved in ways that were inconsistent with the (not known to be) significant information. Possessing knowledge of the outcome, because of hindsight biases, trivializes the situation confronting the practitioner, who cannot know the outcome before-the-fact, and makes the “correct” choice seem crystal clear.
Because hindsight biases mask the real dilemmas, uncertainties and demands practitioners confront, the result is a distorted view of the factors contributing to the incident or accident. In this vacuum, we can only see human performance after an accident or near miss or irrational, willing disregard (for what is now obvious to us and to the them), or even diabolical.

We always can look back at people, episodes or cases in any system and using one or another standard identify any number of "errors," that is, violations of that standard. Effective, robust "high reliability" systems are able to recognize trouble before negative consequences occur. This means that processes involved in detecting that a situation is heading towards trouble and re-directing the situation away from a poor outcome is an important part of human performance related to safety verses failure. Evidence of difficulties, problems, incidents is an important form of information about the organization and operational system that is necessary for adaptive and constructive change (Reason, 1998). Studying cognitive factors, coordinative activities, and organizational constraints relative to problems demands in a crucial part of generating this base of information. Successful, "high reliability" organizations value, encourage and generate such flows of information without waiting for accidents to occur (Rochlin, LaPorte, and Roberts, 1987).

**Leaders Taking Risks**

Leaders put themselves into situations where they would not put others. Interestingly, they do not take the perspective of their own leaders who might be concerned about their safety. This observation was confirmed by many of those interviewed by the APA team. They often feel their judgment, which is based on years of personal experiences in similar situations, provides them the ability to assess hazards and properly mitigate risks.

Some examples from this incident include:

- Against the strong caution from the local district about people coming off the top of the mesa into the steep canyons, Hayden decided to scout the fire, cold trail, and bring black line down from the top of the mesa. He came out of the drainage after scouting and chinking in line and concluded, “It was not viable or safe for anyone to be there.” Yet, he does not apply that same logic to himself that others might have thought it was not safe for him to be there in the first place.

- Assistant Module Leader Shannon, accompanied by experienced firefighter Alex, goes up Main Elk to scout access to the bottom of the fire and get a GPS point. She described it as “very difficult, technical terrain.” It was only right to send two experienced people in there, she said. You would never have sent someone who was inexperienced, she continued. Again, Shannon, as a leader, was not applying the same thought process that someone above her had used when they talked about not going in the drainage or GPSing the fire.

- Shannon also stated that as a supervisor she would make her people fill out a CA-1. But for herself, she concludes, not necessarily. As for first aid treatment, Shannon, Jamie, and others say that if it had been one of their crew members, they would have sent them to the hospital. Yet Shannon does not take the perspective of herself as someone else’s crewmember who might want to send her to the hospital.

- Shannon’s desire to grab the GPS point even after being injured reinforces the work identity discussed above. Yet, this was now a proven dangerous place to be, but she still wanted to take that risk.
Joe, a squad leader, put it this way: “As a supervisor, I need to know what is going on. I am responsible for everybody on the crew, up and down.” Understanding and sharing risks between supervisors and employees before an action is initiated is the best approach. In reality, the rapidly changing fire environment may prevent this. In the absence of understanding and sharing risks, leaders must ask themselves the question, is this mission I am about to undertake critical to meeting our objectives.

“As a supervisor, I need to know what is going on. I am responsible for everybody on the crew, up and down.”

“Multiple Management Objectives” (MMO) Fires on the UCR

MMO is a term used by the UCR as a descriptor or label for fires that would have been categorized as “fire use” fires in the past. With the reinterpretation of fire policy in 2009, there is no longer a distinct category of wildland fire that is equivalent to the previous fire use category. (See “Guidance for Implementation of the Federal Wildland Fire Management Policy”, approved by the interagency Fire Executive Council on February 13, 2009) Under previous guidance, we talked about “wildland fire” consisting of three categories: wildfire, wildland fire use, or prescribed fire. Now, we simply recognize all wildland fires to be categorized as one of two distinct types:

- wildfires -- unplanned ignitions or prescribed fires that are declared wildfires
- prescribed fires -- planned ignitions

Use of MMO or any other label that attempts to describe a third category or type of wildland fire causes continued confusion, both internally and externally, regarding current fire policy. For more information, see NWCG memo #030-2010 “Additional Guidance for Communicating about Managing Wildland Fire in light of Changes in Policy Guidance and Terminology,” dated July 8, 2010.

Optimism Bias –We assume that nothing bad will happen; that things will work out.

The Oxford English Dictionary defines optimism as having "hopefulness and confidence about the future or successful outcome of something; a tendency to take a favorable or hopeful view." The word ultimately means one expects the best possible outcome from any given situation

Perceptions of risk and safety are influenced by individual, social and organizational factors. In Perceptions of risk influence the motivation to encounter risk, control risk, or avoid risk altogether, and may be a powerful determinant of behavior related to safety (Powell, 2007). Perceptions of risk can be influenced by certain cognitive biases and other factors that influence behavioral choices. A bias is a process of influence that tends to produce results that systematically varies from reality (Shannon, 1999).

Cognitive biases include rare event bias, and optimism bias. Additional factors that influence the behavioral choices include the cost of safe behaviors and the conflict between the demands for safety and the demands for performance.
Rare event bias and optimism bias are similar in that they both result in a tendency to underestimate or minimize the potential impact of rare negative events associated with risk. Rare event bias is the tendency to under evaluate or minimize the likelihood of being adversely affected by a negative event that is known to occur only on rare occasions (Zohar & Luria, 2004; Luria, 2008). For example, within any individual fire department, a firefighter death is a rare event. Optimism bias results in the perception that the level of risk for an individual is lower than for others in the same situation (Powell, 2007, Weinstein, 1989).

**Incremental Acceptance of Risk - How it made sense on July 5th, for module members to take on more risks.**

Normalization of unsafe practices can also occur as a result of the fact that other individuals take the same actions. If, in general, nothing bad happens as a result of unsafe practices, and if everyone else in the organization participates in the same practices, or we have taken these actions in the past with successful outcomes, then these practices become part of the normal and accepted way of accomplishing tasks. Risk acculturation may then occur, which is the condition where greater and greater levels of high-risk activity provide greater and greater benefits, while the perceived risk of the activity diminishes in the absence of a negative event. As a result, individuals engage in increasingly higher levels of dangerous behavior while the risk becomes an accepted part of the activity.

If the costs associated with safe practices are compared to the benefits of unsafe practices and the low probability of a negative event, the result is an expected value for unsafe behaviors that is greater than the expected value of safe behaviors. Based on the assumption of value maximization, individual would rationally choose the unsafe course of action. The benefit of unsafe behavior is immediate and tangible, while the potential benefit of safe behaviors is long term and results in an intangible non-event.

**Scaling up and Span of Control**

The Zone Fire Management Officer (ZFMO) Recognition of increasing fire complexity and activity and the need to fill organizational support positions. He had been dealing with planning up to this point for the Water Creek Fire, the Meadow Creek Fire and at the same time dealing with oversight, coordination and facilitation of daily initial attack responsibilities. He did recognize towards the end of June that complexity in the Rifle fire management unit was becoming greater and he needed to bring in support to help with fire responsibilities. The zone was without a Zone Assistant Fire Management Officer at this time and the ZFMO was assuming these roles and responsibilities as well. The ZFMO ordered detailers to help with filling this position but also to fill ICS and organizational positions such as the strategic operational planner position (SOPL), the fire behavior analyst position (FBAN) and even brought in a SOPL(t). The ZFMO recognized that distractions from his primary duties were a factor to consider in maintaining focus on dealing with the larger fires in the zone. A person can only focus fully on about one thing at a time, and can only juggle about five things in your brain. When a person tries to track too many things, then vigilance suffers.
Appendix D: Team Members

Dave Bull, Team Leader; R1 Director of Recreation, Minerals, Lands, Heritage, and Wilderness.

Randy Draeger, Chief Analyst; R4 Regional Senior Safety Advisor.

Kevin Pfister, Chief Analyst Trainee and Peer; Uinta Wasatch Cache Fire Management Officer.

Ted Moore, Regional Liaison and Operations Specialist; Retired – R2 Regional Fire Safety and Training Branch Chief.

Sarah Altemus, Writer/Editor and Peer; Missoula Smokejumper.

Jennifer Ziegler, SME in Organizational Communication and Culture; Associate Professor of Communication, Valparaiso University.