Idaho Department of Lands

USDA, Forest Service

Serious Accident Investigation

Tinker Bugs Prescribed Fire

September 26, 2025
Nez Perce–Clearwater National Forests
Tree Strike Fatality

Photo courtesy of Terry Zufelt

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Appendices

Figure 1.—*Isabella Oscarson*

In memory of Isabella “Bella” Oscarson (1999–2025)

Isabella “Bella” Oscarson devoted her life to service, learning, and lifting those around her.

Born in Watertown, Minnesota, Bella carried her boundless energy and compassion into every endeavor, from her early years with the Minnesota Conservation Corps and Department of Natural Resources to her role as a Crew Module Leader with the Idaho Department of Lands. She brought both technical skill and a teacher’s heart to wildland fire, mentoring others with patience, humor, and genuine care.

Her colleagues remember her as a steady leader—hardworking, knowledgeable, and quick to share her experience. She was the kind of person who made a crew feel like family, who celebrated small victories, and who believed that every challenge held a lesson worth sharing. Bella’s life outside of work reflected the same warmth and vitality: she loved adventure, good food, gardening, crafting, and the simple joy of dancing with friends. She found meaning in service, faith in action, and joy in community.

At just 26, Bella had already left an extraordinary mark: as a firefighter, mentor, partner, daughter, sister, and friend. She approached life with purpose and heart, and her legacy endures in the lives she touched and the knowledge she passed on.

This report is dedicated to her memory, her service, and the spirit of leadership and kindness she embodied.

Through learning, we honor the fallen.

The family of Isabella Oscarson wishes to express our deep gratitude to everyone involved after the accident for the extraordinary care, teamwork, and physically demanding efforts on Bella's behalf.

Investigation Process

On Monday October 6, 2025, the United States Forest Service and the Idaho Department of Lands assembled a six-person Serious Accident Investigation Team (SAIT). The team was mobilized and reported for a virtual in-brief on October 6, 2025.

Because this incident is interagency in nature, this report was written under a joint delegation of authority between Idaho Department of Lands (IDL), Jake Strohmeyer and the United States Department of Agriculture (USDA) Forest Service, Robert Velasco. This document provided the joint delegation authority to Donald Meadows, North Carolina Forest Service and Jason Brey, USDA Forest Service Idaho Panhandle National Forests.

The review product meets the IDL requirements for a Factual Report and Wildland Fire Serious Accident while also applying the Facilitated Learning Analysis (FLA) process.

The intent of this narrative review is to provide a series of events, as recalled by participants, along with initial reflections/lessons learned from those who were involved. We understand that the timeliness of this information is critical for learning, but importantly, this report does not represent all of what can be learned from this event. Reflections and sensemaking contained within this narrative are initial and field focused.

Accident Investigation Team

Team Leader Donald Meadows, Law Enforcement Agent, North Carolina Forest Service

Deputy Team Leader Jason Brey, Deputy Forest Supervisor Idaho Panhandle National Forests, U.S. Forest Service

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Subject Matter Expert Terry Zufelt, Mica Fire Warden, Idaho Department of Lands

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Executive Summary

Incident Overview

Friday, September 26, 2025, at approximately 1600: Idaho Department of Lands (IDL) firefighter Isabella Oscarson was struck by a fire weakened tree causing fatal injuries while conducting prescribed fire operations on the Nez Perce-Clearwater National Forests, Tinker Bugs Unit 12. Another IDL firefighter was also struck by the same tree and suffered non-life-threatening injuries.

The incident occurred during handline construction, while responding to a "slop-over[1]" on the lower slope of the Tinker Bugs Unit 12. Isabella "Bella" was working alongside a sawyer as he sat down in the green to work on his chainsaw when a Grand Fir snag silently broke off and struck both firefighters. The tree struck Isabella directly and then glanced off the sawyer, knocking him down and ripping the top part of his fire pack off, separating it from the rest of the pack.

Immediately following the tree strike, multiple on-scene qualified Emergency Medical Technicians (EMTs) responded and Incident within Incident (IWI) protocols were established. Isabella was extracted from the accident site via short-haul helicopter to a nearby helispot where an agency helicopter then transported her to a ground ambulance. She was taken to Syringa Hospital in Grangeville, Idaho where she was pronounced deceased at 1844.

Introduction

The Nez Perce-Clearwater National Forests have a long history with prescribed fire. The Forest's prescribed fire program is a complex mix of management ignited prescribed burns and natural ignitions across a variety of forest vegetation regimes, with the intent to meet multiple land management objectives. The Forest on average completes approximately 5,000 to 7,000 acres of management ignited burns annually. Management ignited burns are conducted to reduce fuel loading post timber harvest, for site preparation prior to reforestation, to reduce hazardous fuel loading, and to restore fire adapted landscapes that have departed significantly from historic natural fire return intervals. These prescribed burns are conducted in accordance with the Nez Perce-Clearwater Forests Land Management Plan, and U.S. Forest Service policy regarding prescribed fire.

1 Term used to refer to fire that has crossed a control line or natural barrier, moving outside the area that was intended to contain it. Sometimes synonymous with the term "spot fire."

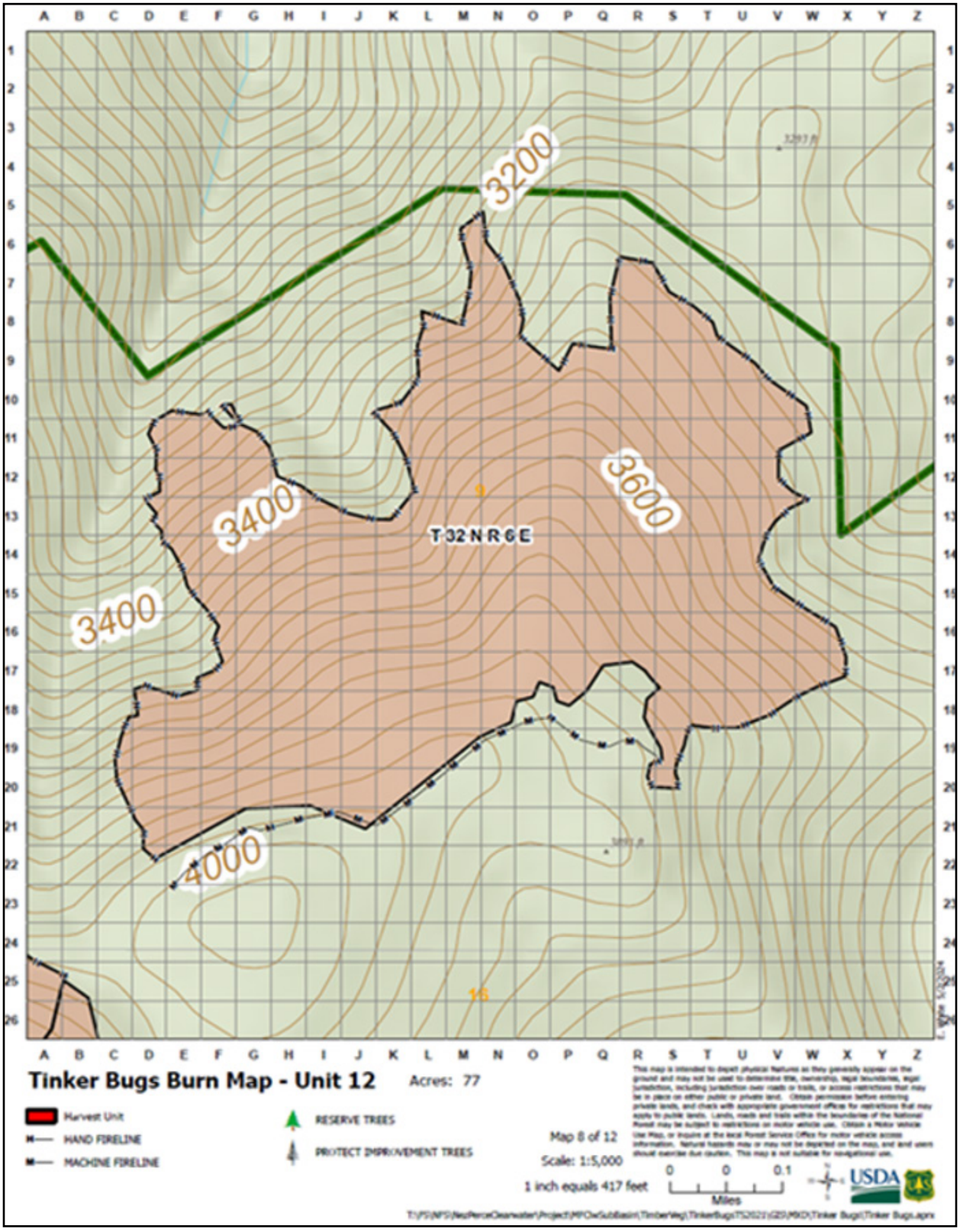


Figure 2.—*Tinker Bugs Burn Map*

Agency Alignment

Consider: Sometimes there is a significant delay from when a burn plan is approved to when it is implemented. In addition, at times the people who sign the burn plan aren't the ones actually implementing it on the ground. Agency Administrators change and wildland fire personnel staffing shifts continuously.

The day of the burn: What influence do you have to help ensure real alignment between the Agency Administrator and all prescribed fire personnel? It is vital that the Agency Administrator and the folks on the ground have a discussion on risk management.

Ask: Does the Agency Administrator understand the operational risk to firefighters? Do the firefighters understand the strategic risk informing why they're there? Do the firefighters accept this risk to accomplish the Forest objectives?

The Tinker Bugs prescribed fire project is part of a fuels treatment project on the Moose Creek Ranger District on the Nez Perce-Clearwater National Forests. According to Resource Objectives listed in the Tinker Bugs Prescribed Fire Template, "the overall purpose of the Tinker Bugs project is to restore vegetation species composition, structure, and distributions to early seral species (Ponderosa pine, western larch, and white pine); reduce ladder fuels created by shade-tolerant species and create more natural patch sizes by emulating mix-severity fire; improve big game habitat for winter range; and utilize timber outputs produced through forest management activities to support the economic structure of local communities, and provide for regional needs."

The Nez Perce National Forest Land Management Plan[2] also provides further Forest-wide management direction, "This burning project enables the Nez Perce-Clearwater National Forests to move closer to one of its goals of protecting forest resource values through cost-effective fire and fuels management, emphasizing fuel treatment through the utilization of material and using prescribed fire."

The project area is located in Idaho County south of Syringa, Idaho. The Tinker Bugs project area encompasses approximately 7,636 acres in the Big Smith Creek and Middle Fork Clearwater River sub watersheds.

The burn area was determined to be low complexity with limited impacts to the public and many barriers to utilize in case of an escape. A Type Two Burn Boss was recommended to address safety concerns and complete the burn.

The local Forest Service unit Moose Creek was assigned to work the prescribed burn on Tinker Bugs Units 11 and 12 over a several day span that week. One Forest Service Arkansas

2 This references the Forest plan prior to the Nez Perce and Clearwater administratively combining in 2013. The Nez Perce Forest Plan was referenced to provide management direction to acres in this area.

severity module, two Alabama (State) Forestry Engines and an IDL Engine (Alpha) worked alongside Moose Creek during the project. Both units had been prepped previously by the Montana Conservation Corps. When resources started burning Unit 12 on Thursday afternoon, September 25, they experienced high winds (approximately 15mph) which caused heavy smoke inundation, snags to fall and spots to become established. “Our units are really steep and tough, so we were tired,” noted one individual when recalling the arduous nature of the Tinker Bugs units.

When recalling Thursday one individual reflected, “When we were burning, we got a spot (fire) really far[3] outside the burn area. That was when I first started thinking, oh crap if we had a medical what would we do? I don’t know what our plan is. I brought that up to my coworkers around me. It’s 7pm and I don’t know what we’d do right now. It is what it is, and it will be done soon. We worked late and were exhausted.”

That night, resources on Units 11 and 12 worked to approximately 2200 chasing spot fires and working to secure hotspots[4] before leaving for the evening.

Background

Island Creek Fire

The Island Creek fire started on August 1 on the Nez Perce-Clearwater National Forests and was burning in an area with high snag[5] potential. The fire was burning actively but chugging along slowly and displayed the ability to hold at live timber wall features. Live fuel moistures were enough to slow the fire spread. Due to the high snag potential, an original strategy was developed that employed direct suppression tactics, utilizing heavy equipment (bull dozers). The thought was to use an existing road and the live timber features to directly contain the fire. After consideration, the Forest ultimately made the decision to go indirect, citing the direct strategy carried too much risk. The indirect strategy was then utilized throughout the rest of the summer, rotating multiple Incident Management Teams (IMTs) into the incident.

The Roll-over

A Forest Service engine from Arkansas was assigned to the Nez Perce - Clearwater National Forests and was on day 13 of their assignment. On Thursday September 25, the Arkansas engine unit rolled their chase vehicle around 0800 while driving to Units 11 and 12. The chase

3 The spot fires on Tinker Bugs unit 12 were not far outside of control lines, however this statement reflects the perception of this firefighter at the time.

4 Areas of concentrated heat in the wildland fire environment. They can be found both within control lines or outside of control lines.

5 Defined as a standing dead tree or tree that has been weakened by the impacts of fire. Can present a significant hazard to wildland firefighters.

vehicle[6] was following the engine down a curvy and dusty Forest Service Road when the truck caught a soft shoulder caused by a new logging road. This caused the truck to do a slow rollover, and it landed back on all four wheels. Despite the slow nature of the rollover, the vehicle was severely damaged. Airbags were deployed but luckily there were no injuries. Due to the Arkansas module (comprised of 8 individuals) being out of service, a request was made through dispatch to utilize another IDL Engine (Bravo) and their module.

Factual Narrative

Friday September 26, 2025

"Felt like a nice fall day. It was warm but not like sweating your ass off," reflected one Moose Creek Ranger District crew member when recalling the weather for that Friday.

IDL Engine/Module Bravo[7] arrived at the office that day in Kamiah around 0830 and started on their daily vehicle maintenance checks and began to prepare their gear to assist the neighboring Moose Creek Ranger District with a prescribed burn. They arrived on the burn between 1030-1100 and got assigned to take care of slop-over #1.

Figure 3.—*View looking up the slop on Tinker Bugs Unit 12. This view captures the steep nature of the slope and burn conditions. Photo courtesy of Jason Brey.*

6 A secondary vehicle that is attached to a specific firefighting resource. In this case, the chase vehicle was an extension of the Arkansas engine.

7 IDL did not have a qualified Engine Boss that day, only an Engine Operator. They operated under the resource terminology of Module but did have an Engine onsite.

The terrain on Tinker Bugs Unit 12 was incredibly steep and inhospitable to easy hiking with a slope greater than 60 percent. "It was a God-awful unit…", "Super under slung[8] burn" and "snags were everywhere and not feeling good for a prescribed burn," stated resources on Unit 12 attempting to describe the challenging conditions on the ground.

When resources arrived on scene that Friday morning, it was observed that the official prescribed fire overhead[9] weren't out there due to the Island Creek transition back to the local unit. Even the prescribed fire holding boss, RJ was absent that day, supporting the transition. Therefore, tactical leadership defaulted to Lane, one of the Moose Creek engine crew members who had lots of time on the District. The initial plan on Unit 12 was to use an Unmanned Aircraft System (UAS) to run infra-red (IR) to map for hot spots and ensure nothing had rolled out due to the under slung nature of the terrain.

Additionally, there were conversations about why they (Moose Creek) were even out there in the first place. Firefighters had the perception that this unit didn't need to be burned because the slash height (less than knee height deep) indicated it was plantable without fire treatment. One experienced firefighter stated, "Honestly this burn was a Swiss cheese model from the start. The day before when the burn actually happened, we didn't have the correct number of people…No one even knew why were burning it."

Upon completing initial UAS operations, it was discovered that the IR map didn't match the actual perimeter so one of the more senior firefighters and wildfire module leads, Brittany went down to ground truth[10] at about 1430. Walking the line, she discovered a larger slop-over, approximately 10 acres at the bottom of the drainage.

Ground Truthing

Ground truthing is an essential part of what wildland firefighters do to help manage risk. It's how we gather 'SA' or situational awareness.

Does what's on the map actually match up with what we're seeing on the ground?

So, when what was planned doesn't align with what is really playing out on the ground, how do you communicate this?

This is a moment to consider risk communication. How might you go about communicating the new hazards? Does this warrant a new discussion about a change in tactics based on the new risk and associated mitigations?

8 A fire line below a fire, usually found on a steep slope. The handline should be constructed in a trench fashion in order to catch rolling material due to the steep nature of the fire on the slope.

9 Wildland fire term used to describe operational firefighters who operate in leadership or key decision-making roles on the fire line.

10 Term used to describe validating what is on paper and what is actually occurring on the ground.

The area was severely under slung, and it wasn't a surprise to Brittany it had rolled out and caused a slop-over. This was referred to as slop-over #2. Brittany worked with the designated Unit 12 point of contact Lane to discuss what to do. They talked about the number of people on scene that day and if they should tackle this slop-over given the under slung nature and number of snags present. Ultimately it was decided that it would be best to try to go down and work the slop-over to button things up for the day.

The Moose Creek and IDL resources had just taken a lunch break and geared up to go down and work slop-over #2.

The Slop-over

Slop-over #2 was located down at the bottom of the unit, on the skier's left[11] flank of the unit footprint. IDL Module Bravo and the local Moose Creek crew broke into their respective units and began line construction and snagging operations. Brittany briefed her Moose Creek resources on the plan and "gave a hard conversation about heads up when cutting (due to the high snag potential)". The module hiked about 250 yards down to the bottom of the horseshoe, dropping in elevation approximately 500ft. Fire behavior of slop-over #2 was described to be hot, slow moving and low intensity. Both crews anchor at the top of the slop-over and proceed clockwise around it, establishing direct fire line with saw operations and handlines. "It was so steep, we were sliding down, (the hill)" expressed a 4th year Moose Creek firefighter.

11 A descriptor used to help describe where left is as you're facing downhill.

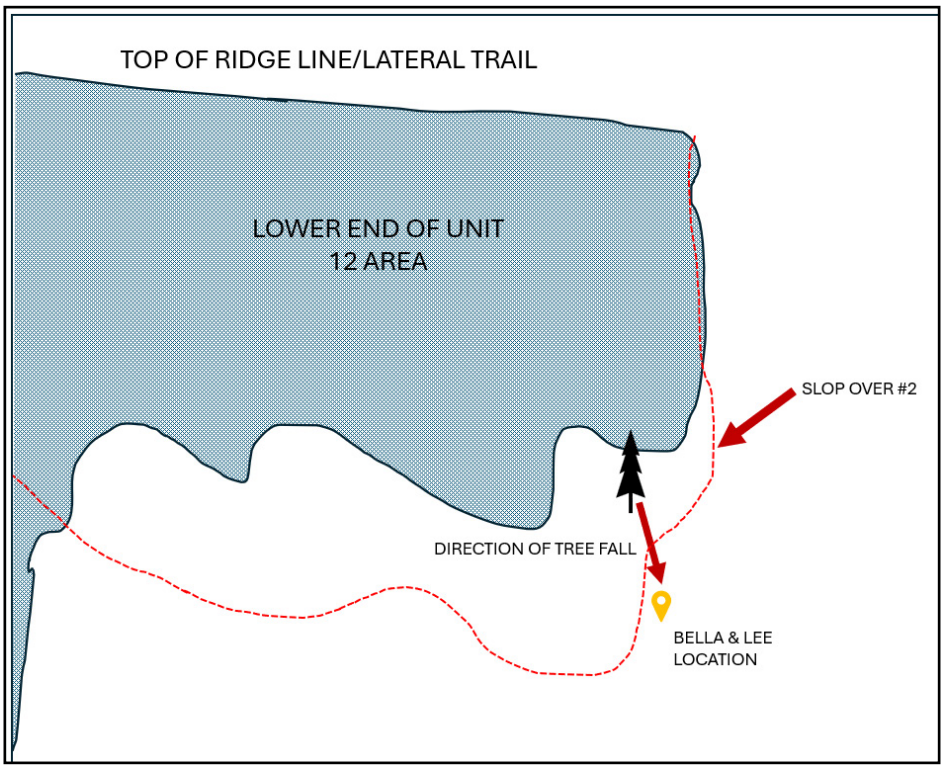


Figure 4.—*Conceptual illustration of the slop-over and general accident location. Image not to scale and geography depicted meant to convey general information about accident site.*

Resources were all talking about how tired they were from working so late the night before and everyone hoped they'd get out before 2100 that night.

Lee, a 1st year firefighter with IDL and member of Bravo module volunteered to run the saw. The two saw teams (IDL and Moose Creek) were utilizing a "leapfrog" tactic to brush out the thick vegetative area. The IDL team stopped to look at a snag (not the strike tree) and the Moose Creek team passed them.

As Lee worked around the slop-over, he threw his chain. Lee stopped and decided to move roughly 10 yards off the line (downhill) into the green[12] and sat down on a downed tree to start repairing the saw. At this time, Bella approached and offered her assistance and waited while he put the chain back on. They worked together for about 10 minutes.

Meanwhile, the Moose Creek crew had also moved downhill, and their saw team began looking for snags in the area. They noticed Lee was off the line in the green, working on his saw with Bella.

12 An area outside of the fire control line that has not burned.

No Cracking, No Warning

It happened in an instant. One moment Lee was sitting on a log putting his bar nuts[13] back on, the next he was violently thrown to the ground. At approximately 1600, within the slop-over perimeter, a fire weakened Grand Fir tree suddenly broke off 12 feet up and glanced Lee and knocked his hard off. It struck with such a force to his back, it ripped the "brain"[14] portion of his line gear right off, strewing the contents of his pack on the ground. The tree was approximately 30 feet upslope in the slop-over and out of view[15] of Bella and Lee. Upon being hit, Lee then rolled down the hill. Lee was still conscious but needed a moment to regain his bearings and stand up.

> ***"My last convo with Isabella was that I hope we get outta there before 9."***
>
> **—Izzy, Moose Creek firefighter**

13 Bar nuts are a type of fastener that secures a chainsaw's guide bar to the body of the saw. They hold the guide bar in place and provide stability for cutting. Essential for keeping the chain properly tensioned.

14 According to Mystery Ranch, the brain is a detachable, external pouch on the top lid compartment, used for quick access to small essential items like sunglasses, snacks, lighters, and other small items.

15 Due to the position of the Grand Fir in relation to where the strike occurred, it is theorized that the tree was out of view from the Bella and Lee. The Grand Fir was located just above them, on a small geographic feature that likely obscured their view. Additionally, the cat face damaged caused by the fire was on the opposite (uphill) side from Bella and Lee.

Figure 5.—*Strike tree was a Grand Fir. Numbers indicate the breakage sequence: 1) tree breaks off 12 feet up the bole. 2) broken segment 2 falls into green and strikes Bella and Lee (orange icons). 3) third segment breaks off upon hitting the top of a small ledge, breaking near the fulcrum. Notice how the green brushy vegetation obscures view from above.*

As he looked around, he immediately identified Bella, lying seriously injured on the ground. Lee noted he did not recall seeing a potential snag nor hearing any cracking or warning sounds prior to being struck.

At the same time, the Moose Creek crew members Brian and Brittany, who were part of the line dig, looked over to observe that a snag above them had fallen and struck Bella. Brian saw her getting "compressed, folding, collapsing" and roll limply down the hill. Brittany recounted both Lee and Bella "flying through the air".

> ***"Actions that are interpreted as 'bad decisions' after an adverse event are, at the same time actions that seem reasonable—or people would not have taken them."***
>
> **—Sydney Dekker and Shawn Pruchnicki (Safety and Human Performance Experts)**

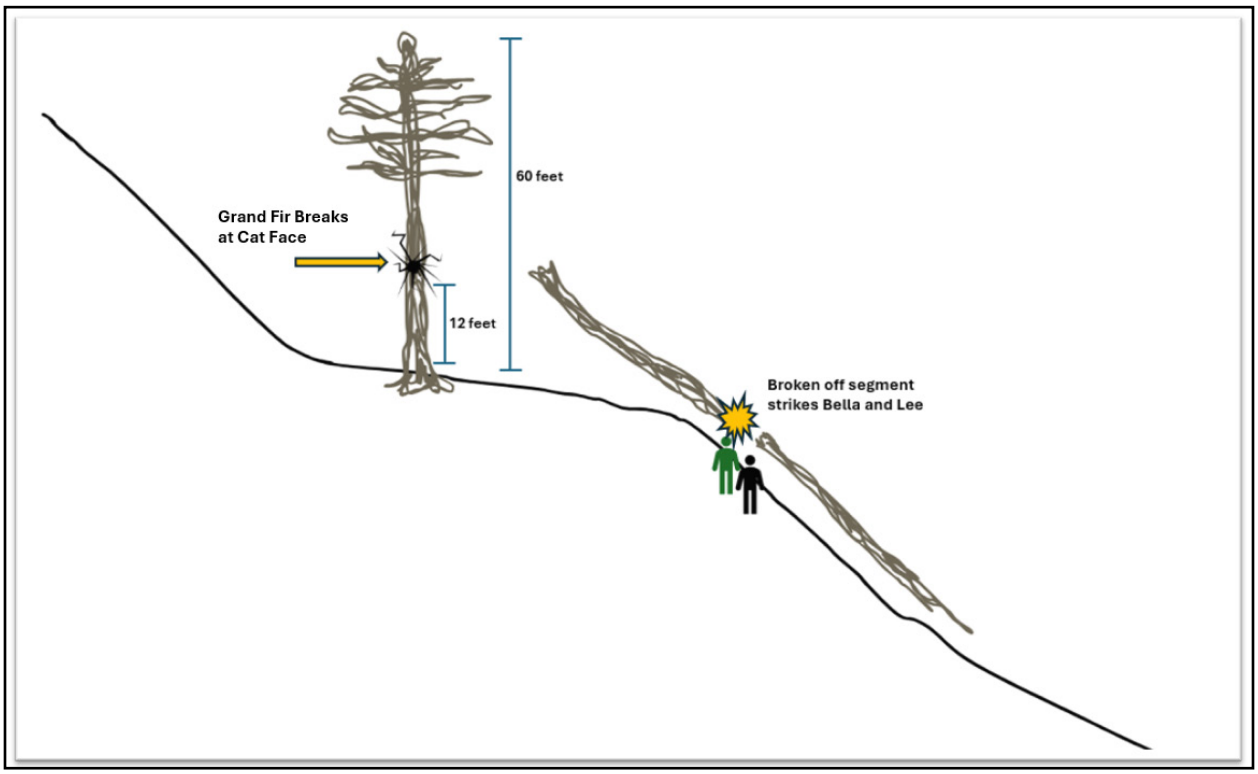


Figure 6.—*Alternative view of strike tree progression. Note that Bella and Lee were downslope, below a small bench when the tree struck them.*

Lee came to and frantically looked around for his radio, but it was missing due to his pack being ripped when the tree struck him, so he began screaming up to his team that he needed help and there was a "MAN DOWN!" situation. Disoriented and severely shaken, he made his way up the hill to where others were watching and directed them where to find Bella. "I had to get outta there. On my way out I would only stop and sit at the base of trees (out of fear of another tree strike), I wasn't going to sit in the open." said Lee.

Brian, a crew member from Moose Creek was the first person on-scene. He immediately saw Bella's hardhat was knocked off and noticed the color of her skin was off, "when people die, they change color." Bella had rolled 20 feet down a steep embankment and came to rest against a large Douglas-fir.

Upon witnessing Bella, Brian yelled up to Brittany who was just behind him in the line dig configuration and she began initiating Incident Within an Incident (IWI) procedures and notifications.

Izzy, one of the Moose Creek EMTs had hiked up the hill to get a dolmar[16] just prior to the tree strike. She heard a tree fall and then heard Brittany assertively calling for her on the radio. She immediately threw the dolmar and grabbed her 10-man medical kit and got down there "as fast as I could."

Figure 7.—*Douglas-fir tree where Bella came to rest after rolling down the hill. Orange flagging indicates where she was found by EMTs. Photo courtesy of IDL Chris Lile.*

Ground Medical Response

Two IDL firefighters were working up top on the road at their engines, working to swap hose between IDL Engine Alpha and IDL Engine Bravo when the call went out over the radio alerting resources to a tree strike. The two firefighters immediately dropped what they were doing and grabbed the SKED[17] and trauma bag from the engine and sprinted "too fast" laterally across the top of the burn and quickly started downhill to the edge of the black. During that time, they also acquired a backboard from one of the Moose Creek resources.

Medical care was there almost immediately following the tree strike. Brian, who was first on scene had a lapsed EMT qualification. Another IDL EMT came on scene with two other

16 Two compartment fuel/oil containers. Can carry 1 ½ gallons of gasoline + ½ gallon oil or 2 ½ gallons gasoline + 1 gallon oil.

17 Brand of rescue stretcher than can be dragged across various terrains. It is a flexible, durable stretcher used in technical rescue, confined spaces and high-angle situations.

individuals who then started holding Bella, trying to prevent her from rolling further downhill. Two Moose Creek EMTs (Izzy plus one) arrived next and everyone helped move Bella into a more "natural" position, against the Doulgas-fir tree.

> ***"I was listening to the radio traffic updates and my goal was to beat the helicopter there."***
>
> **—RJ, Moose Creek Module Leader**

A picture of the severity of the injury began to emerge. It was noted that Bella was still alive when medical care started but she sustained a large laceration to the forehead and exhibited symptoms of significant head trauma including a weak pulse, dilated pupils and trouble breathing. The Medical Incident Commander Brittany declared a "Red" medical as per the 8-Line Medical Incident Report and requested a medevac transport at 1608. Shortly after, a ground ambulance was dispatched from the nearby Island Creek fire, miles away.

Brian quickly integrated into the fast-paced medical response and held C-Spine. He knew in his heart there was not a lot that could be done for her based on the nature of the injury and her current status. Izzy and the other EMT worked to stabilize with oxygen and consistent breathing with the Bag Valve Mask (BVM)[18] every 10 seconds.

Meanwhile, the effort to start the packaging of the patient for transport began.

An Air ambulance (fixed wing) was also requested at 1627 and was enroute to Grangeville, ID.

Back on the Island Creek Fire, the Tinker Bugs 12 holding boss RJ was part of the transition of the fire back to the local unit (Moose Creek). He heard the emergency traffic over the radio and immediately knew something was going on with his crew. "When I first heard Brittany, I thought they were calling enroute back to the office. Her second transmission I heard Red Medical – Tree Strike… I texted the duty officer to tell him I was going to the burn."

> ***"I kept telling myself I have to get there safe so that I can help. I don't need to be a second IWI."***
>
> **—RJ, Tinker Bugs 12 holding boss**

18 Manual resuscitator or "self-inflating bag". It is a handheld device commonly used to provide positive pressure ventilation to patients who are not breathing.

Packaging the Patient

"We started collecting people and got a backboard and SKED," said Brian. While information was being communicated on the radio, it is discovered that a short-haul ship was available, and efforts are then focused on moving Bella to an extraction site.

The medical team moved Bella onto a backboard and then onto a SKED. With multiple people on scene and due to the chaotic nature of the event, it is discovered some people were not familiar with how this particular SKED buckles functioned.

Some of the on-scene firefighters removed their yellows to help pack Bella and provide insulation. One firefighter completely removed all his shirts in an effort to help support Bella. The movement of Bella in the SKED up the slope is extremely strenuous, operating at an incredibly steep slope with active fire and tangled brush. About 42 minutes had passed since the initial tree strike to when the patient was moved up the 65 percent slope, packaged and ready for transport.

Every 10-15 seconds the SKED was stopped so EMTs could provide ventilation.

Figure 8.—*Resources on scene moving Bella up the steep slope (60 percent slope) in the SKED. Note: individuals without yellow Nomex shirts removed their PPE in order to properly package Bella.*

Short-haul and Helicopter Transport

Meanwhile, at the local Forest Service helitack base in Grangeville, a helitack squad leader hears over the radio that there is a medical emergency taking place on the nearby Tinker Bugs prescribed burn and notifies her supervisor. Almost immediately, the helicopter manager

notifies the pilot for 22H and starts directing the helicopter personnel to begin configuring the helicopter litter and for the squad leader to grab the trauma kit.

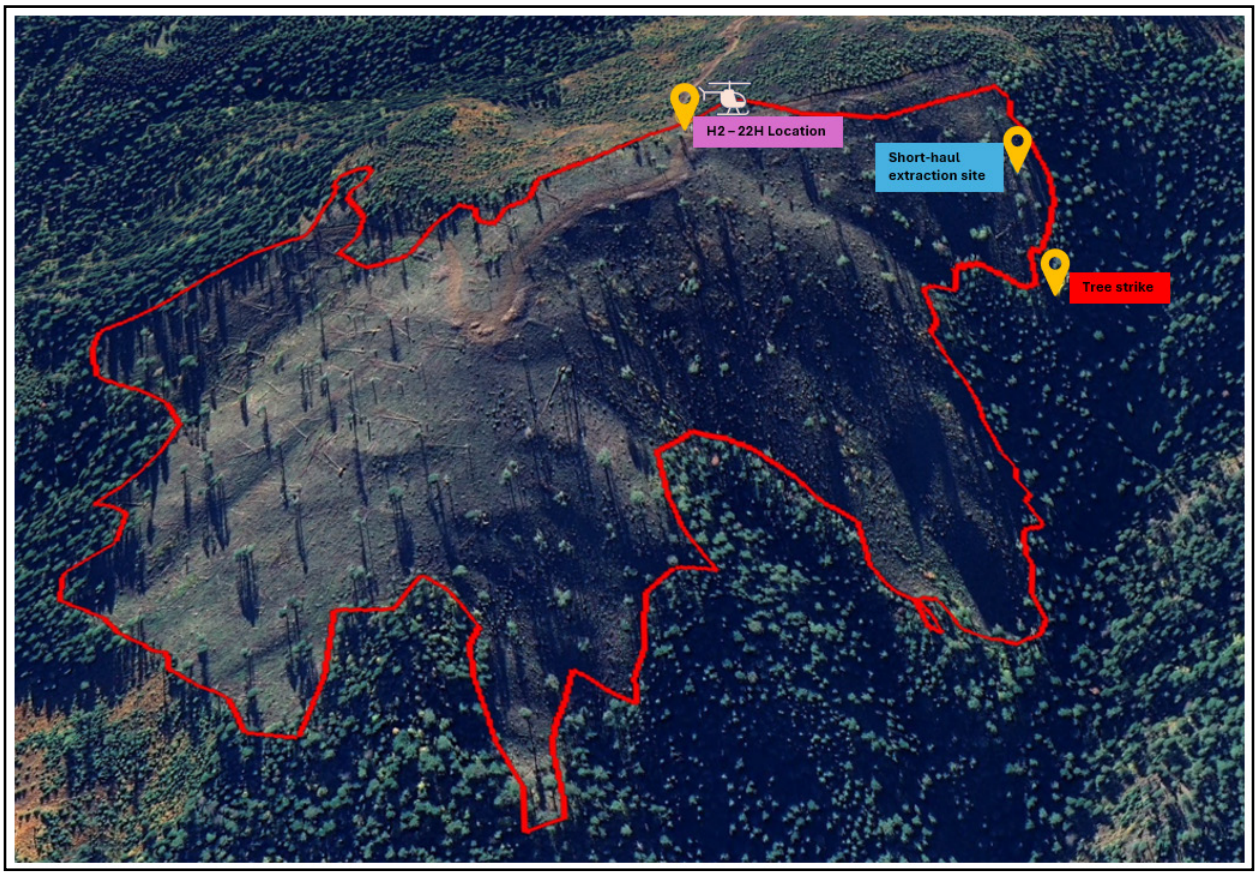


Figure 9.—*Google Map image depicting the original Tinker Bugs 12 perimeter (red), the tree strike location, the Short-haul extraction site and H2 where 22H was located for patient transport. Oriented South.*

Within 14 minutes from getting the initial request from dispatch, 22H is enroute to the incident with helicopter manager and helicopter crewmember (squad leader who initially heard the call). A few minutes later, Grangeville dispatch calls and notifies 22H to divert to Cedar Flat helispot to pick up a paramedic that was available on the Island Creek Fire. Twelve minutes later, they are on the ground at Cedar Flats helispot but are advised that the paramedic has a 280lb flight weight. A quick reconfiguration of the helicopter takes place with the intention to offload the helicopter crewmember, her gear and trauma kit in order to make room for the paramedic. After a few minutes, the pilot advises the helicopter manager that the paramedic is just too heavy to comply with helicopter's weight and balance flight requirements with the litter configuration installed. Upon consideration of this information, the helicopter manager then made the decision to then unload the paramedic and reload the helicopter crewmember and her gear. This whole situation took approximately 10 minutes to complete and did not impact patient care. They are off again enroute to the helispot on

the incident and orbiting the medical within minutes and the helicopter manager began formulating the final medical extraction and transportation plans.

Middle Helitack, a US Forest Service qualified short-haul program received the request for a short-haul extraction on the Nez Perce-Clearwater National Forests at 1710MDT. It's about a 40-minute flight from Missoula, MT to Grangeville and the crew diligently but expeditiously planned for fuel and lifts off. During the flight, they start to pick up radio traffic about another Forest Service helitack in the area, 22H, and get initial information about helispots and current conditions (dust abatement).

Due to similar helicopter call signs of 22HY (short-haul) and 22H (Forest Service helitack) there is some initial confusion. It is cleared up prior to getting on scene through 22HY being designated "short-haul" instead of their call sign.

Figure 10.—*Brown-out conditions at H2.*

An initial landing was attempted by 22H at Helispot 2 (H2) but due to brown-out conditions[19] it had to be aborted and instead they land at Helispot 1(H1) a ½ mile air distance away. Both the helicopter manager and helicopter crewmember unload and make contact with RJ. The trauma kit and automated external defibrillator (AED) are unloaded and RJ and the helicopter crew member head down to the medical site via truck with additional oxygen. The helicopter manager loads back into 22H and lifts off from H1 to reposition at H2 after dust abatement was performed by responding resources.

At this time, short-haul ship (22HY) arrived on scene and began a quick reconnaissance of the extraction site. Due to smoke and dust, it was initially difficult for short-haul to locate the ground personnel, and they asked for some sort of signaling. Luckily, Brittany had a mini strobe light in her line gear, and she used it to show short-haul where they're located on the hill. The short-haul helicopter then flew to H1 to begin reconfiguring for short-haul operations. The two helicopters are in good communication.

19 A visibility hazard in helicopter operations that occurs when rotor downwash kicks up fine particles of dirt or sand during landing or takeoff, creating a blinding, dust-filled cloud that obscures vision and distorts depth perception.

Back on the ground, Bella has been moved up the slope to the extraction site. Medical care continued, and a distal pulse was still present. Breathing assistance was still provided every 5-6 seconds as they waited for the short-haul extraction. All non-EMT responders moved up hill, away from the extrication site to reduce the risk of additional injuries.

The short-haul helicopter took off from H1 and within 1.5 minutes is hovering over the extraction site. The short-haulers were inserted within 7 feet of the patient. At this time, a member of the short-haul helicopter and EMT, Davis, is now on the ground contacting the ground medical team. It is established that Bella still had a pulse but needed breathing assistance.

Figure 11.—*Short-haul extraction site. Depicted is the Short-hauler coming in at the top of the photo and the small group of IWI personnel huddled at the extraction location.*

When it was time to move Bella into the Bauman bag with the backboard and SKED, everyone worked together to package, and she was lifted off the ground with the short-haulers assuming patient care. Respiratory support by the short-haulers through the BVM with supplemental oxygen was continued during the short-haul operation. The short-haul was completed as the short-haulers and Bella were delivered to H2 where 22H was waiting to transport her to Grangeville.

Figure 12.—*Bauman Bag. Photo courtesy of: USFS Technology and Development Program.*

While patient transport was taking place, Brittany noticed Lee down by the tree strike location. "I went down and asked him if he was okay. He was forming sentences and didn't appear injured, just really shaken up," reflected Brittany. Brittany gave him her water bottle, and he was quickly assessed onsite to see if he had any bleeding. It was discovered that he had minor scratches, but Brittany had him hike back up to H2 to get evaluated by EMTs.

22H received Bella and they took off from H2 en route to Grangeville. The primary Short-haul contact, Davis, transitions into 22H to assist the helicopter manager with patient care. Vitals were called into dispatch. In flight, it became evident that the pulse had faded or was fading. The original pulse oximeter used during the response fell off sometime during the extrication process and the pulse oximeter on 22H had a dead battery, so the pulse had to be obtained manually, through the carotid artery. The helicopter manager tried to get his fingers back to the carotid, within all the packaging to detect a pulse but couldn't find one. (It is unknown if the pulse was truly absent at this time or if the vibrations from the helicopter made detection difficult).

Upon detecting no pulse, Davis instructed the helicopter manager to start CPR. Between Davis and the helicopter manager, multiple rounds of CPR were performed but it proved difficult in the back of a vibrating aircraft on a fully packaged patient. "CPR was a weird situation because I was in the back seat of a helicopter. I was caught off guard and the first round of CPR was poor. I didn't know if my hand placement was correct or how the depth was." reflected the helicopter manager (referring to the challenging circumstances in the back of the helicopter). After three rounds of compressions, Davis thought a pulse was detected but

was unsure. The helicopter manager had the idea of using the pads on the AED to detect a heartbeat. He went to grab it under the litter, but it was not there as it was not returned to the aircraft from the extraction site. It was about a 7-minute flight from H2 to Grangeville airport.

It was decided the patient transfer on the ground in Grangeville, 22H would stay "hot"[20]. When awaiting medical personnel arrived at the aircraft, things were a bit chaotic. "This transfer was poor – things were being dropped. Someone put a backpack behind the skid." With the commotion and help ensure a safe transfer, the helicopter manager stood behind the door to prevent folks from walking back into the tail rotor.

Back on the ground, the extraction crew was exhausted. Brittany, the wildfire module leader reflected and hoped, "I thought she was going to be ok just like on Coffee Can Saddle[21]." After they finished decompressing, everyone gathered their gear and hiked back up the vehicles. Izzy, one of the EMTs noticed someone had grabbed her gear for her. "The walk back up even without a pack was pretty difficult."

Grangeville

Bella was transferred from the care in 22H to the awaiting ambulance in Grangeville around 1803. 22H repositions back to the station helipad and shuts down at 1810.

Bella was taken to Syringa Hospital via ambulance in Grangeville, ID and was pronounced deceased at 1844.

A note to the reader: This report was synthesized and developed using a systems model perspective, acknowledging that wildland firefighters operate in an inherently complex system with vast uncertainty. In attempt to acknowledge the complex system of wildland fire, this report considers the question, what can we learn from reflecting on what goes right and what goes wrong?

20 Refers to the helicopter maintaining power with engines and rotors still on.

21 Coffee Can Saddle was another tree strike incident that took place in 2024 on the same Forest.

Team Observations

Team Observations: These observations were based on the weight of evidence, professional knowledge, and judgment. Observations listed in chronological order.

- The slopover was not snagged prior to putting firefighters on the ground.
- The Prescribe Fire Plan Complexity Analysis recommended a Type Two Burn Boss to be present during ignitions to address safety concerns. However, at the time of the accident because ignitions were not taking place, the burn boss was not required and there was not a burn boss on site.
- The fire damage/cat's face found on the strike tree was located on the uphill and opposite side of the tree from where personnel were located. The cat face fire damage likely occurred Friday early morning after the fire rolled out of the under-slung containment line, on the lower slope.
- There was active, low-intensity fire and smoldering within the slop-over at the time of the incident.
- The SAIT performed a site visit on 10/07/25. Physical observations were made during similar daylight conditions minus the smoke which would have been present during the incident. The area was found to be mostly shaded and determining live trees v/s dead snags was difficult when looking up-slope.
- The location of saw repair was below a small bench type geographic feature that obscured the view of the base of the strike tree.
- The strike tree was identified as a standing, dead, Grand Fir. The diameter at breast height was approximately 15". The total tree height is estimated to be approximately 65'. At the time of examination there was evidence of decay both on the stump portion of the tree and at the location at which it broke off. There were also burn indicators present on both the stump and tree trunk. The burn indicators and loss of matter in the area where the tree broke off appear to indicate that there was damage and decay on the uphill side of the tree. The tree was broken off at approximately 12 feet above ground level.
- There was no evidence of human interaction with the strike tree prior to it falling.
- The strike tree was found to be located within the slop-over, not from interior of the burn unit.
- Bella and Lee and were utilizing appropriate wildland fire PPE at the time of the accident.

- Medical Aid Kits on IDL and Forest Service engines on scene were effectively stocked and exceeded Agency requirements. Responders were able to monitor patient vitals through use of a pulse oximeter throughout the rescue process. Responders were able to provide rescue breathing even while the patient was in transit from the injury site to the short-haul extraction site. The C-Collar and SKED device were also invaluable in stabilizing and transporting the patient.
- The use of Agency (Forest Service) Helicopter 22H in conjunction with the Forest Service Short-haul Helicopter 22HY shortened the time from patient extraction to arriving at advanced medical care by approximately 10 minutes. This 10-minute timeframe was identified as the time that it would have taken for short-haul 22HY to land with the patient after extraction and reconfigure for the flight to Grangeville.
- The SAIT understands that the extent and combination of the injuries from the tree strike carries an extremely high mortality rate, even when they occur within minutes of a trauma center.

Field Focused Lessons Learned

As shared by Tinker Bugs Responders

The reflections listed below are not meant as after–the–fact judgements of right or wrong. Instead, they are meant to explore opportunities for learning. This framing tends to draw learning opportunities away from “fixes” and towards questions that support reflection. Some of the reflections captured below will be the foundations for future learning products. Please read this section with this framing in mind to support your own reflection and learning.

Actions to sustain: Identified actions which lead to efficient IWI response.

- Prioritize patient transport to higher care. Minimize long term field care and get them transported ASAP.
- Identify primary and secondary helispots, even if secondary spots seem far away. Knowing where alternates are ahead of time reduces idle time if ships need to sit to save fuel or multiple ships need to land at once.
- Keep a helicopter Manager or similar focused on aerial supervision to coordinate ships, help identify helispots, and manage air space.
- Utilize nearby or contingency engines for dust abatement at helispot in anticipation of helicopter use.
- Park vehicles and equipment so that helispot viability isn’t impacted.
- Identify and begin multiple transport plans. Ground, air, and short-haul were all considered, and responders began moving patient by ground towards parking area rather than wait in place for short-haul. Short-haul was able to pick them up along the route to the trucks/H2.
- Sending multiple agency ships (helitack and short-haul) worked really well. Both used common terminology and are used to off-airport landings. Having one configured for short-haul and one configured for transport reduced time on the ground to reconfigure from one mission to the other.
- Utilizing SKED rather than just a backboard made for easier patient transport by hand and provided some additional protection.
- Check with IC when en route to patient to ask if any additional items are needed. Bringing additional O2, AED, etc. before it’s needed may reduce delay if there is a need. Even if it’s not part of the initial response. Better to have extra than none.

- First Aid Kit/Trauma/Oxygen/AED stickers that visibly identify where equipment is on vehicles helps with a rapid response when grabbing gear from unfamiliar apparatus.
- Utilize MIR/8 line and ensure all information is provided in a timely manner. Dispatch will request additional patient info if needed for air/ground resources.

Training: Continued and additional training at the local level

- Practice communicating ground locations aircraft, especially in low light or heavy canopy areas.
- Practice BVM connection and use and ensure non-EMT crew members know how to use them.
- Practice connecting O2 regulators to bottles in varied situations. (low light, w/ gloves, timed, etc.) as well as connecting to masks.
- Continue to practice massive bleeding care but put equal focus on airways/oxygen.
- Additional training for non-EMT employees (Stop the Bleed, O2/Airways, etc.).
- Cross train between resources to practice diverse working groups, share knowledge, and become familiar with interagency equipment/capabilities (USFS/IDL/VFDs/ Helitack/Jumpers/others)
- Additional practice with Medical Incident Reports and communicating patient vitals.
- Practice medical skills like CPR, splinting, and bleeding control in non-standard places (truck bed, in the woods, confined spaces, not just classroom).

Equipment: Items identified to improve response/care.

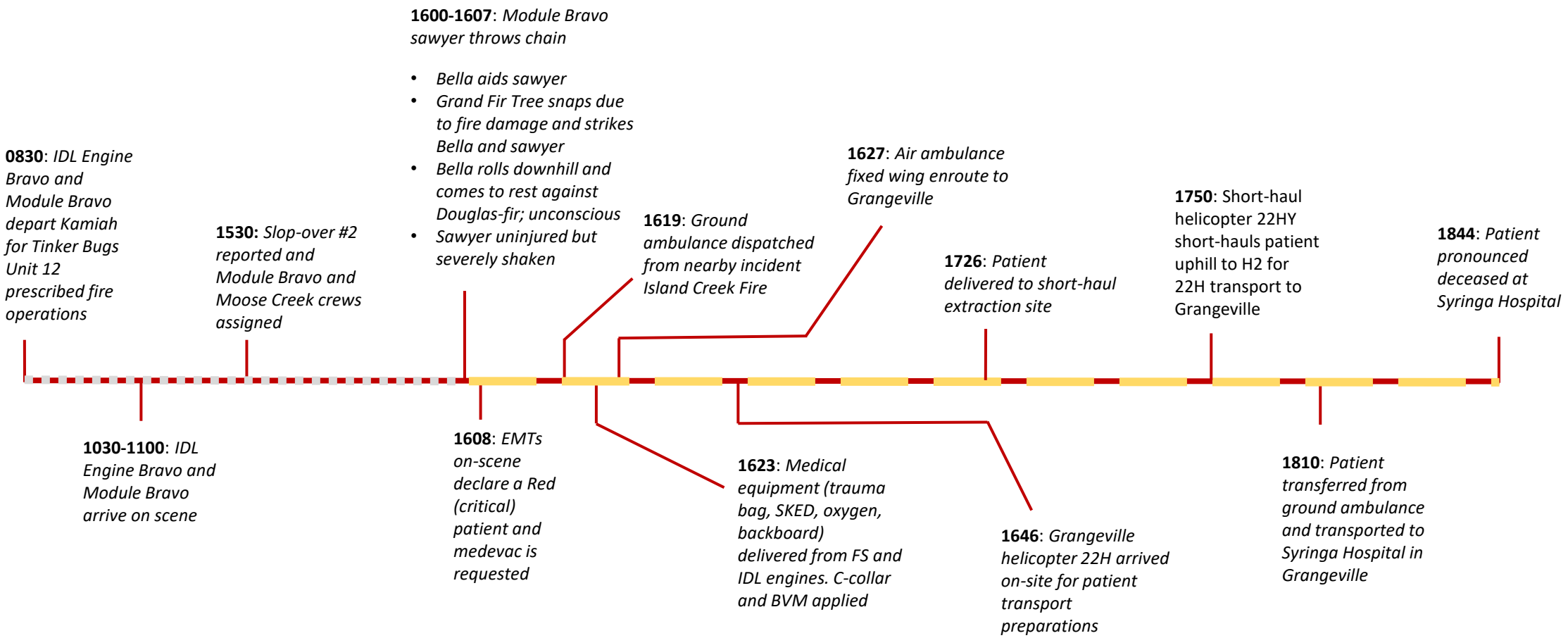
- Strobe lights. Small/lightweight rechargeable or standard (AA/AAA) battery configuration that can be carried in a pocket or line gear for signaling aircraft/ground resources. Possibly add to trauma kits.
- Small BVM. Compact BVM that can fit in line gear or EMT kit.
- American Rescue Cyclone Pocket BVM or similar.
- OPAs/NPAs. OPA kits have multiple sizes. Could be spread between crew members to reduce weight. NPAs have several sizes, light weight enough to carry a couple in individual first aid kits or EMT/20-man kits.
- Lightweight suction devices. One time use, light weight, small size for assisting with airways. Can be carried easily in Trauma kits or EMT kits.

- SKED. Prioritize SKED or similar device over single backboard. Better for patient carry or drag. Not all non-ambulatory patients need immobilized w/ backboard, but sked can also help with immobilization. And “burrito style” adds additional protection to patient from bushes, sticks, etc.
- Lucas Device. Automated CPR unit that can be used for long term or in tight/awkward locations. Likely too large for day-to-day carry, but maybe something that could be staged at GAC for aerial delivery when needed.

Programmatic actions that can improve emergency responses.

- Incentivize EMT or other advanced medical certifications.
- Identify avenues to gain additional EMT endorsements such as IGEL, advanced airways, etc.
- Update EMT kit lists to include airway tools.
- Look into options to utilize UAS as a short range, rapid delivery system for emergency items (trauma kits, oxygen, etc.)
- Standardize trauma kits within local area.
- Identifying aircraft as a contingency resource on burn days and ensuring availability similar to having contingency ground resources identified.
- Provide project aviation maps to GAC as part of preplanning so that they have the maps available immediately if needed in an emergency.
- Normalize the culture of turning down assignments when doing so is necessary for safety. Decisions about whether to take on a task should be guided solely by risk assessment, training, and safety protocols. Identify concerns, suggest alternatives. Ask questions and be amiable with those conversations. Push it up the chain of command for discussion.

APPENDIX 1-TINKER BUGS TREE STRIKE TIMELINE



APPENDIX 2-TINKER BUGS HELMET EVALUATION

Introduction

A falling tree struck and killed a wildland firefighter with the Idaho Department of Lands while assisting on the Tinker Bugs prescribed fire, Nez Perce – Clearwater National Forest, on September 26, 2025. Subject matter experts from the Forest Service National Technology and Development Program (NTDP) conducted a visual inspection of the firefighter's helmet and gathered additional information from the Learning Review team.

Helmet Inspection Information

Polycarbonate helmets can receive several different types of damage. Scratches, scuffs, crazing, and cracking are the most common.

Scratches and scuffs: Can be felt on the surface of the helmet and can occur during normal use. Minor scratches and scuffs do not affect helmet performance, while deeper scratches may weaken the helmet's performance.

Crazing: Small hairline interconnected cracks or microvoids that can be seen on helmets. Crazing can be caused by impacts, stress, chemicals, or prolonged ultraviolet light exposure. Loads or stresses can be transmitted along/through crazing because the voids created still contain fine polymer fibrils that bridge the gaps. Crazing is often a precursor to cracking and can indicate material weakening.

Cracking: Fissures or cracks in the material are caused by stress, impacts, and chemical or environmental exposure. Cracks can penetrate partially or completely through the material. Cracks differ from crazing in that loads and stress cannot transmit through cracks because there are no polymer fibers that bridge the gap. Cracks can lead to material failure under stress or impact and are weak points in the helmet.

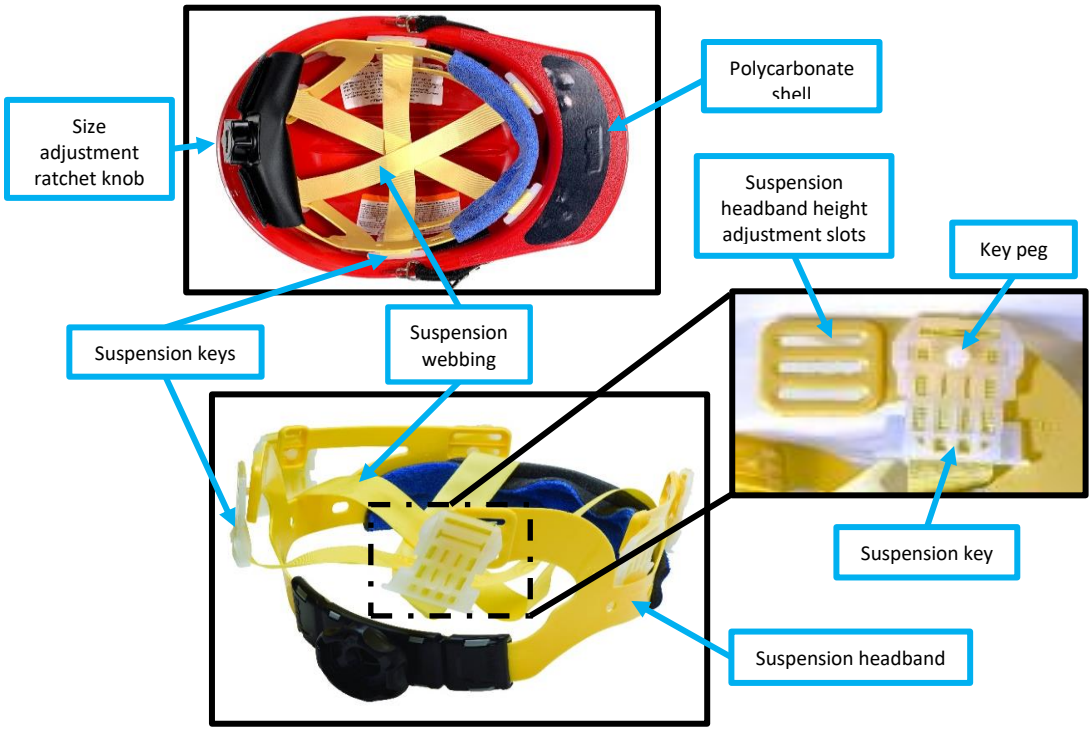


Figure 1: Description of helmet and suspension components. Helmet pictured is not from the Tinker Bugs incident.

Background Information

The standing dead fir was approximately 65-feet tall with 15-inch diameter at breast height (DBH). The tree fell downslope, striking the firefighter with the approximate mid-point of the tree and a diameter of about 11-inches. The force of the strike knocked the firefighter down the steep slope 15-20 feet before their fall was arrested at the base of a 30-inch DBH tree.

Helmet Evaluation

NTDP conducted a visual inspection of the helmet. The information and locations described reference the helmet in the position worn.

Helmet shell material: Polycarbonate

Date of manufacture:

Polycarbonate Shell: September 2022

Suspension: January 2022

In service year: 2025

Helmet certifications: National Fire Protection Association (NFPA) 1977 Standard on Protective Clothing and Equipment for Wildland Firefighting, 2022 edition; American National Standards Institute/International Safety Equipment Association (ANSI/ISEA) Z89.1-2014, Type 1, Classes E and G.

Helmet, General Appearance

Minimal wear and tear from use, shell remains mostly shiny.

Shell Condition, Outer Surface

Front-- White scratching, dark grey/black scuff on helmet midline, and an indentation on the left front brim with a dark scuff above. See figure 2.

Right—Lighter grey scuff above the reflective striping running posterior and towards brim. The scratching becomes more pronounced on the posterior edge. Dark scuffing and light scratching/scuffing top 1/3 of helmet.

Left—Below lateral ridge, midline, top 1/3 of helmet, scuffs and scratches present. Dark scuffs posterior of goggle clip. Rear reflective stripe moved downward with dark discoloration on border. A bubble is present on the stripe on the front aspect from the downward movement.

Rear—Dark scuffs and smaller scuffs/scrapes present. Gouge in goggle clip with discoloration behind clip. Brim left center has white gouges, scratches, and indentations in helmet shell. Reverse L-shaped indentation in shell above brim/cap margin. Slight brim deformity and downward deflection left of center. See figure 3.

Top—Scuffing removed shine from helmet. General dust and dirt present, with dark scuffs, and generalized scratches.

Figure 2: Helmet front showing white scratches (circle), dark scuffing, and brim indentation (box and inset image).

Figure 3: Rear aspect showing dark scuffing, scratching, white gouging, and indentations present. Arrow indicates reverse L-shaped indentation above the brim/cap margin.

Suspension Condition—Suspension Keys

Released Keys—Left front suspension key released from the helmet key slot. See figure 4.

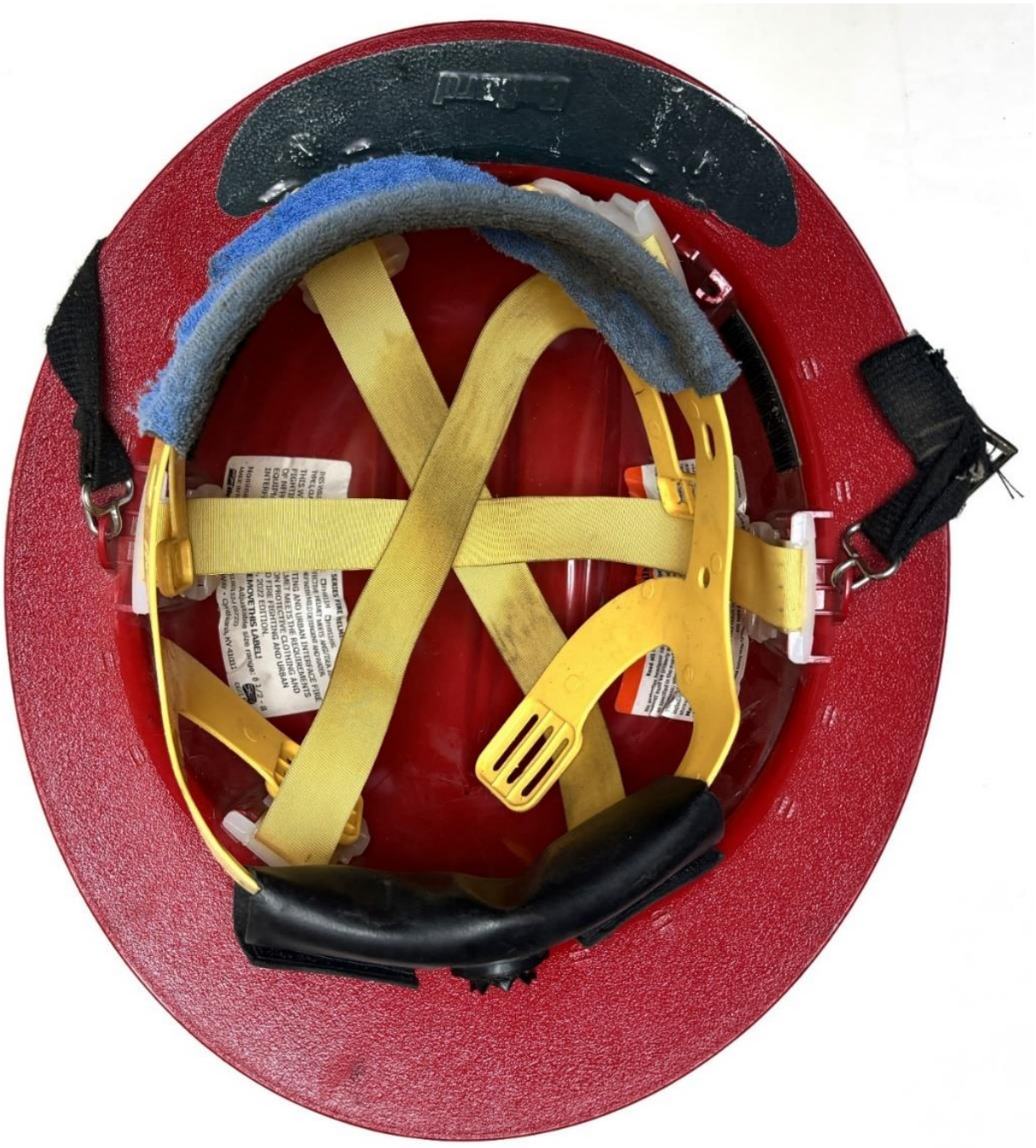


Figure 4: Helmet suspension as provided to NTDP.

Damaged Keys—The left rear key was forced deeper into the key slot. This caused damage to the suspension key right ear and deformations and indentations to the key from the key slot. See figures 5 and 6.

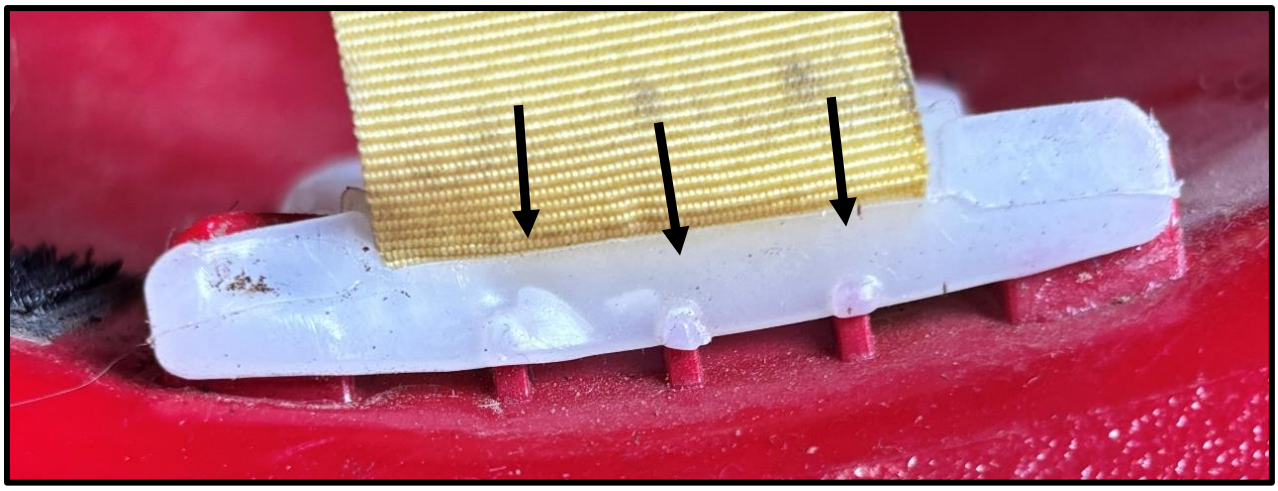


Figure 5: Black arrows point to deformities and indentations where suspension key was forced deeper into key slot.

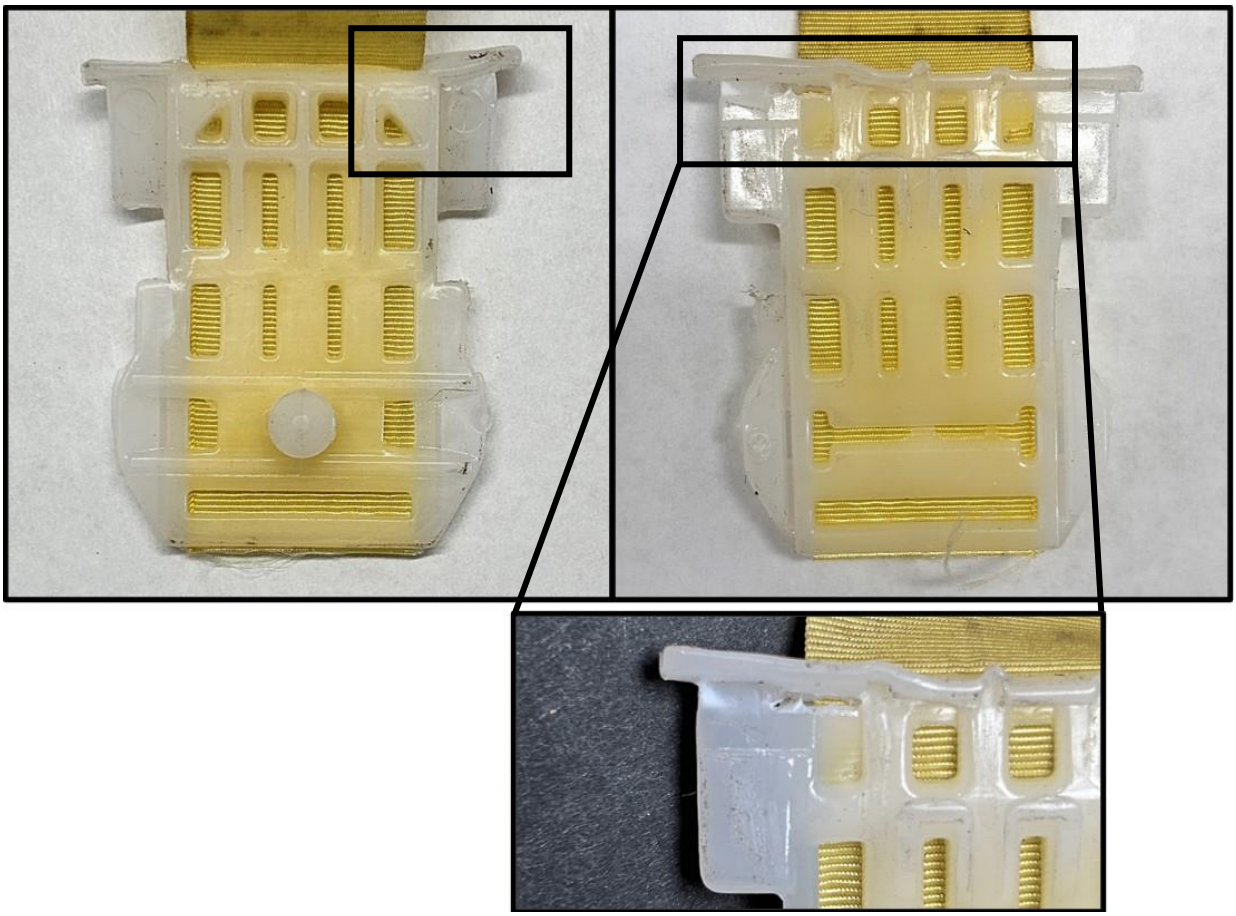


Figure 6: Front and back view of the rear left key. The left black box shows key ear deformation. The right black box indicates key damage and indentations. Inset image shows close up of tearing damage to key ear and hole created.

Height Adjustment Slots Released from Key Peg—The left lateral, left rear, right lateral, and right front height adjustment slots were released from their key pegs. The right rear and left front height adjustment slot remained attached to their key pegs. However, the left front key was released from the helmet key slot. See figure 4.

Suspension Condition — Headband, Brow Pad, Adjustment Ratchet Knob, Webbing

Adjustment Ratchet Knob—Broken free and not submitted for evaluation. The remaining ratchet mechanism has gouges present at nine and two o'clock, and one ratchet tooth, at twelve o'clock, has the tip broken off. See figure 7.

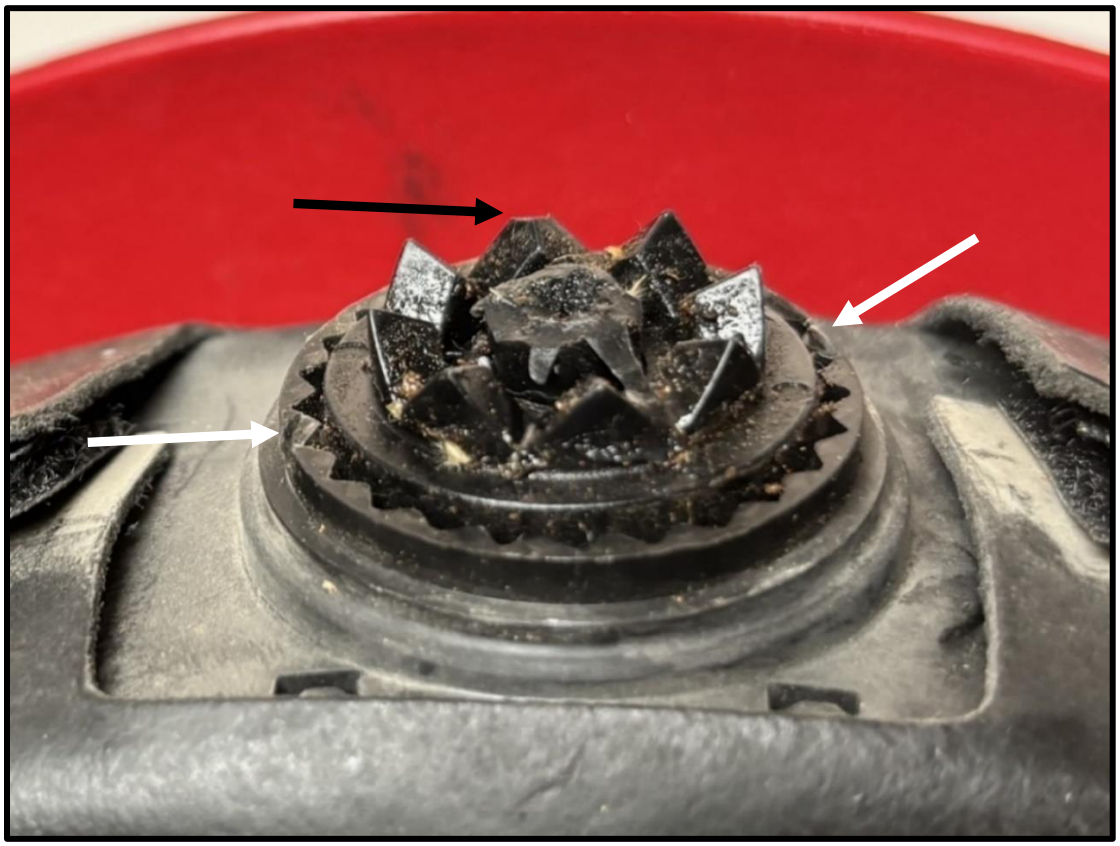


Figure 7: Showing missing ratchet knob, broken tooth (black arrow), and mechanism damage (white arrows).

Headband and Brow pad—The wearer side (inside) of the headband, posterior to the front left height adjustment slots, a small area of brow pad material transfer to headband plastic is present.

Suspension Webbing—No damage noted.

Shell Condition, Inner Surface—(Suspension removed for inspection)

Scratches, scuffs, dirt, and mud present.

Right front key slot – Crazing present above and below the key slot. Crazing found along left side where key slot attaches to helmet

Right lateral key slot **–** Slight crazing present above the key slot. Crazing found along both sides where key slot attaches to helmet. See figure 8.

Right rear key slot – Crazing present above and below key slot. Crazing found along both sides where key slot attaches to helmet. See figure 9.

Figure 8: Right lateral key slot crazing where key slot attaches to helmet shell. Shown by rectangle.

Figure 9: Crazing found above and below the right rear key slot.

Conclusions

Notable inspection findings:

Shell

- Rear left-center gouges and indentations to the helmet brim and the reverse L-shaped indentation above the brim/cap margin.
- Crazing present on front, lateral, and rear right suspension key slots.
- Deformation and downward deflection of the rear left-center brim.

Suspension

- Left front suspension key release.
- Left rear suspension key damage.
- Multiple releases of headband height adjustment slots.

These inspection findings indicate that the helmet received a significant lateral impact to the rear left-center aspect. A substantial amount of impact force is required to cause the damage found during the inspection of the helmet. The tree that struck the firefighter on the Tinker Bugs prescribed fire delivered impact energy exceeding the protective capabilities of the helmet.

Helmet Information

Refer to the National Wildfire Coordinating Group (NWCG) "Interagency Standards for Fire and Fire Aviation Operations" (Red Book), Chapter 7, Safety and Risk Management for Federal wildland fire incidents and agency-specific helmet requirements.

Helmet Certification, Testing, and Protection Limitations

A helmet certified under NFPA 1977 meets standard ANSI Z89.1-2009, Type 1, Class G. Type 1 helmets are intended to reduce the force of impact resulting from a blow to the top of the head. Class G helmets are intended to reduce the danger of contact with low-voltage electrical conductors. Compliance with NFPA 1977 ensures that helmets used in wildland firefighting meet minimum design, performance, labeling, testing, and certification requirements.

> Protective helmets reduce the amount of force from an impact blow but cannot provide complete head protection from severe impact and penetration– (ANSI Z89.1).

Helmets with NFPA 1977 and ANSI Z89.1 certifications pass a series of tests. Among these is the force transmission test. This test simulates the force an 8-pound object creates when falling 5-feet and impacting the helmet crown. The falling object generates 54 joules of energy on impact with the helmet. The force transmitted to the headform from the impact cannot exceed 4,450 newtons or 1,000 pounds of force for an individual helmet. For all the helmets tested (12 minimum), the average force transmitted to the headform cannot exceed 3,785 newtons or 850 pounds of force.

Reminders

- Helmet components require inspection and maintenance throughout the season. Follow the manufacturer's instructions for helmet shell and suspension inspection and maintenance.
  - For information on inspection, maintenance, and replacement of Bullard helmets, refer to their Industrial Head Protection User Information Guide.
- Chemicals and insect repellants may damage polycarbonate helmet materials.
- Please refer to the National Wildfire Coordinating Group (NWCG) Fire Shelter and Personal Protective Equipment Subcommittee (FSPPE) webpage for information specific to PPE. Select helmet tab on the FSPPE webpage for the following information:
  - Wildland Firefighter's Helmet Serviceability Guide
  - Helmet Inspection and Safety video
  - Determine Date of Manufacturing
  - Inspect the Helmet: Helmet Notice: Summer 2012 by the Missoula Technology and Development Center (MTDC) regarding reports of cracking, delamination, and broken suspension keys in helmets.