



2022 Incident Review Summary



“Fear is not a good teacher. The lessons of fear are soon forgotten.”

–Mary Catherine Bateson

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Introduction

The information in this report comes from wildland fire incidents—from various entities—submitted to and gathered by the Wildland Fire Lessons Learned Center (LLC) in 2022. The primary source of this data is incident reports (Rapid Lesson Sharing, Facilitated Learning Analysis, Serious Accident Investigations, etc.). Most of these reports have been posted to the LLC’s Incident Reviews Database. SAFENETs and other data sources have been included when no full report was produced or could not be located.

For 2022 we collected information on 133 operational incidents.

We have examined these incident reports and learning documents, compiled a few numbers and extracted specific lessons. It is our aim to present this information in a way that empowers us all to improve future operations. We hope you turn these lessons into learning.

Exercises

This icon identifies specific discussion prompts related to the material.





Fatalities

Based on available records, the Wildland Fire Lessons Learned Center recorded **25** wildland fire-related fatalities in 2022, **two more** than 2021.



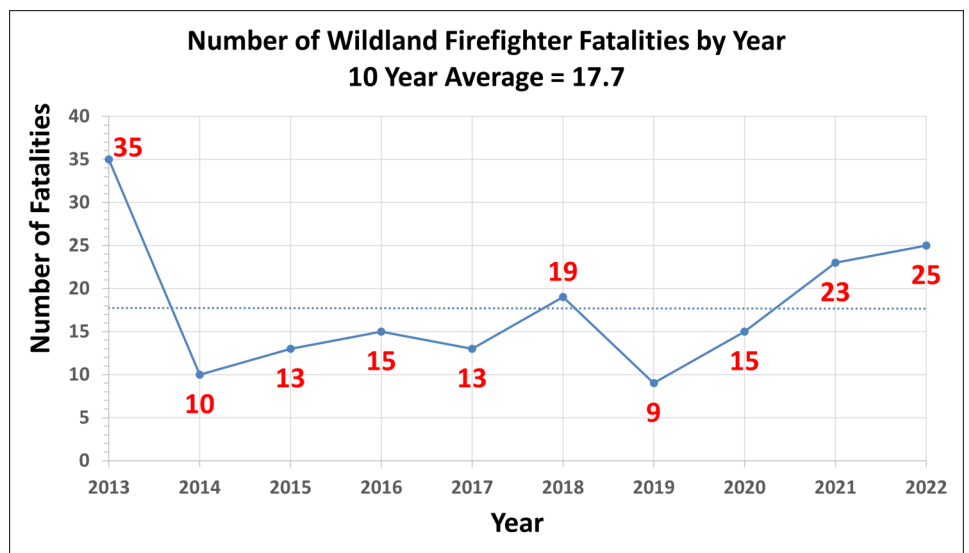
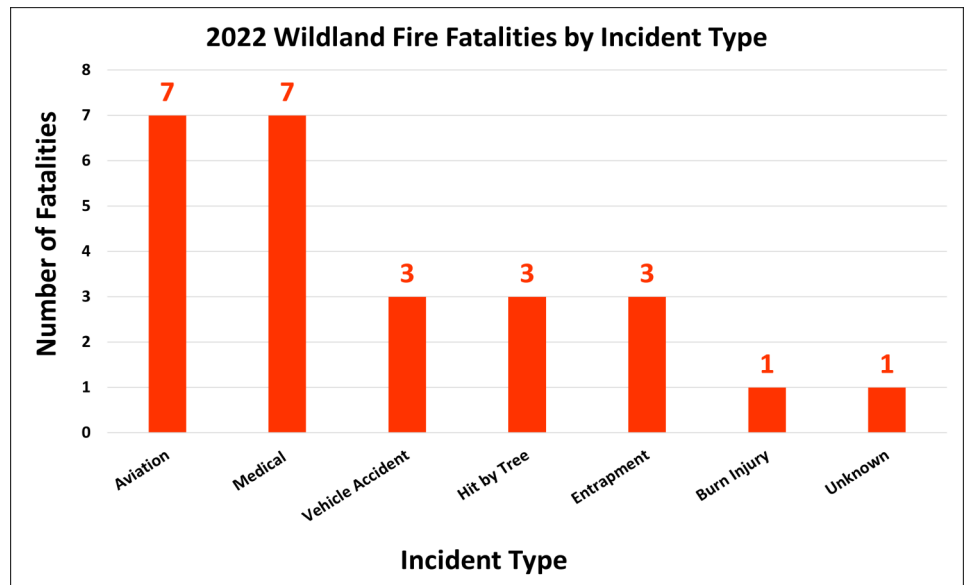
Exercise:

Discuss wildland fire fatalities using the following prompts:

- How are these graphs helpful?
- How are these graphs NOT helpful?
- Does talking about fatalities in a classroom help avoid their occurrence?



Word Cloud: This word cloud represents all the fatality incident types from 2022. The larger the word, the more often that incident type occurred.





Chainsaw Cuts

In 2022, we saw more reports on chainsaw cuts to swampers than any other year in recent history. Cuts to swampers are not uncommon (they are reported almost every year) but there are typically more incidents involving cuts to sawyers than to swampers.



Exercise:

Discuss chainsaw cuts using the following prompts:

- If we continue to use chainsaws, will there always be chainsaw cut injuries?
- Does being an effective swamper require getting close to the running saw? Discuss the risk trade off.



2022

Seven Chainsaw Cuts

- 2 to Sawyer
- 5 to Swamper

3" gash to wrist, damaged tendons
Laceration to left arm
4" laceration to the back of the leg
Cut to the shin & calf
Cut to the hand
8" long x 2" deep cut to the calf
Cut to shin

"The swamper was pushing on a small tree that was being cut when the saw tip kickback occurred—striking and cutting the swamper's left leg."

[Moose Fire Saw Cut RLS](#)

Previous Cuts to Swamper Incidents



2019

[South Dakota Chainsaw Cut](#)

Sawyer was cutting an 8 inch DBH tree. The swamper was helping push the tree over. As the sawyer brought the saw out of the back cut, the saw hit the swamper's leg.



2018

[Hendrix Fire Chainsaw Cut](#)

While bucking a 10" log on the ground, a violent and unanticipated kickback of the chainsaw occurred. The saw struck the swamper in the left forearm.

≡ Vehicle Accidents

The 12 vehicle accidents that occurred in 2022 is average when compared to other years. Accidents regularly involve visibility issues (smoke, dust, sun).



Exercise:

Discuss vehicle accidents using the following prompts:

- How much training does your unit dedicate specifically to driving?
- In what ways could your organization improve driver training?

FIRE VEHICLE DRIVER ORIENTATION BL-300



2022

Twelve Vehicle Accidents

- 4 of the reports describe limited visibility
- 2 of the reports describe a soft shoulder giving way

[Anderson Butte Fire Engine Rollover](#)

The driver of Engine 241, the last vehicle of the convoy, stated that “the dust kicked up, just hung in the air.” He said the visibility had become greatly reduced to the point where seeing the road was difficult.

[Beaver River Fire Engine Rollover](#)

Poor visibility conditions existed due to smoke and dust. Balko Engine 5, with two occupants, veered slightly off the road onto a gravel shoulder that collapsed. As a result, the engine slid off an embankment approximately six feet in depth and rolled over on its top into the side ditch.

[Moose Fire Vehicle Rollover](#)

The truck’s right front wheel caught the recently graded forest road’s shoulder. The tire was pulled into the soft dirt and down the embankment. The vehicle rolled over a stump and landed upright in a small creek.

☰ Hit by Tree Incidents

In 2022, more of the hit by tree incidents did NOT involve chainsaw operations than ones that did. This fluctuates year by year, but when looking at multiple years, it is consistently a nearly even split.



Exercise:

Use the following prompts for discussion:

- What does a good [helmet inspection](#) involve?
- What can be done to reduce the risk of being struck by a random falling tree?



2022

17 Hit by Tree Incidents

- 10 Non-Chainsaw Ops
- 7 Chainsaw Ops

"I didn't really think there was much to be concerned about as we were only falling smaller sized trees." FAL2 Trainee

The firefighter struck by the tree was wearing a headlamp that was turned on but was not facing the dozer's direction.

Consider using a strobe that can be seen from multiple directions for work with heavy equipment at night.

[Hermits Peak/Calf Canyon Fire Dozer Operations Hit by Tree](#)

Even though both saw teams were aware of the other's location, it was thought that their spacing was adequate—as long as everyone was looking out for one another.

Working within striking distance of "small" diameter tree felling is still dangerous.

[Cedar Creek Fire East Zone Hit by Tree](#)

The sawyer cut the tree from the top while the operator pushed the tree down with the backhoe. The tree split under the pressure and swung up striking the sawyer in the face.

Take time to fully evaluate the complexity of combining heavy equipment and chainsaw operations.

[Cherokee NF Tree Felling Injury](#)



Entrapments

Common elements with entrapments in 2022 were:

- Engine Initial Attack
- Disabled Vehicles
- Driving in Smoke



Exercise:

Use the following prompts for discussion:

- How do you decide if you can drive through smoke?
- What are the pros and cons of having a “standard play” for a disabled vehicle with an approaching fire front?
- What encourages or discourages you to speak up about risk concerns?



In 2022, the LLC recorded 12 different events that meet the NWCG definition of entrapment. Of note this year were multiple instances of vehicles becoming stuck or disabled and firefighters needing to retreat on foot as flame fronts overtake the vehicle.

Entrapments this year involved:

- 7 During initial attack engine operations.
- 2 While scouting by vehicle during initial attack—both poor visibility resulting in stuck/disabled vehicles overrun by fire.
- 1 Upon arrival on scene—poor visibility, soft shoulder rollover, overrun by fire.
- 1 During heavy equipment operations—dozers completed line, escape cut off while walking equipment out.
- 1 During extended attack hand crew firing operations.

“Perception checking” with those around you can be lifesaving. When your perception of a situation causes you to pause, speak up and consult with those around you. Trust yourself and voice that concern. This can be especially difficult when it seems like no one else is bothered by what’s bothering you.

[Williams Lake Entrapment](#)

In the moment, it is important to decide the point at which communication struggles warrant operational disengagement. We preach that workable coms are essential, yet we constantly tolerate bad coms. What is your communication “line in the sand”?

[Vantage Highway Entrapment](#)



Lessons from the Learners

This section includes quotes and lessons from those who were directly involved in the incident.



[Stuck Dozer Winching Incident](#)

During prescribed fire preparations a dozer became stuck. In the process of using the winch to free the dozer, the swamper's hand was crushed.

Lesson: Train on Winching

Set aside time to train on how winches work and what the risks are.

"He hadn't used this type of winch before. His normal equipment had a winch that had a 'let out' gear that did not use 'free spool.' Taking the time to verbally communicate all the 'small' steps as they went through this process could have significantly reduced the chance of a bad outcome."

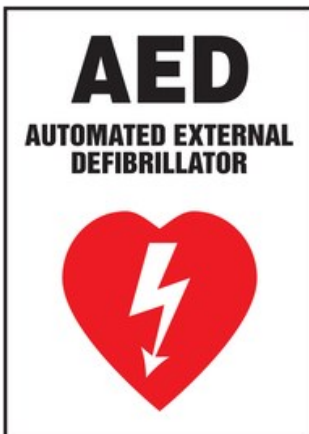


[Nighttime Dozer Ops Hit by Tree](#)

The Dozer Operator was not aware that the Squad Leader had moved in front of the dozer as they were unable to see the Squad Leader's headlamp. The Squad Leader was struck by a 40-foot/8-10-inch DBH ponderosa tree, knocking him unconscious and resulting in trauma to the head, body, a lacerated tongue, and chipped teeth.

Lesson: Consider Using a Helmet Strobe for Night Ops

A light or strobe to serve as a constant identifier 360 degrees, or at least front and back, would be ideal during nighttime operations. *"Our crew will be trial-running some additional lights and it will become crew SOP that HEQB use them during nighttime dozer operations."*



[Prescribed Fire CPR and AED Use](#)

After completion of a prescribed fire, a firefighter was found on the ground in a prone position. Agonal breathing was observed—no pulse or respirations were found. CPR and rescue breaths began. Shortly after, the engine arrived and an AED was put in place. Five shocks were advised and administered in between CPR rotations.

Lesson: Have an AED in Your Vehicle and Mark the Compartment

Local EMS arrived on scene and continued critical care, implemented three additional shocks with their AED, and gave the patient epinephrine. A pulse was indicated, and the patient started to breath on his own.



Lessons from the Learners

This section includes quotes and lessons from those who were directly involved in the incident.



[Red Rio Rx UTV Fire](#)

While traveling through the burn unit the UTV was driven over tall grass and brush. Vegetation became wedged between the UTV's bed and cab. While patrolling the fire's edge, this wedged vegetation caught fire and melted a corner of the UTV's bed.

Lesson: Periodically Check UTV for Accumulated Flammable Vegetation
"I smelled the melting plastic and quickly stopped the UTV. I was able to remove the gear and lift the bed. Once the bed was lifted, it took very little effort to extinguish the melting plastic."



[Davy Crockett UTV Fire](#)

While operating a UTV during a prescribed fire, the operator stops to investigate a possible fuel leak. As the UTV Operator begins to dismount the UTV, they are immediately surrounded by black smoke and flames coming from under the UTV between the driver's seat and the cargo bed.

Lesson: Mount the Fire Extinguisher in an Easily Accessible Location
The fire extinguisher assigned to the UTV was not used during this incident. The fire extinguisher was placed in a storage bin under the passenger seat. With fire intensifying and impacting the passenger seat, the UTV Operator was not able to access the extinguisher.



[ATV Training Rollover](#)

The operator started up the ramp but did not have enough momentum. The ATV started to roll backwards and the operator quickly depressed the throttle. The ATV's front wheels came off of the trailer deck as it continued forward on two wheels until it got hung-up on the other side of the trailer. *"The ATV was uncontrollable and I bailed off."*

Lesson: Practice Loading in a Variety of Scenarios
It is easy to avoid training on loading and unloading. Having the ability to utilize different types of trailers and ATVs is a critical skill we must train for routinely.



15 Years of Helicopter Incidents

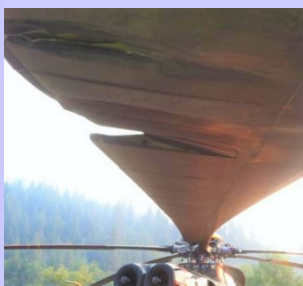
All of the injuries associated with helicopter water drop incidents occurred as the result of ground crews being directly struck by water. Injuries included contusions, concussions, a spinal compression fracture, facial fractures, patella fracture, lacerations to the head, broken arms, and a broken wrist.



Exercise:

Use the following prompts for discussion:

- What are some common scenarios resulting in ground resources getting hit by water drops?
- What parts of aviation related risk do ground resources have the ability to influence?



2022 involved an unusually high number of helicopter related fatalities (7). There was also an incident in which serious injuries occurred when firefighters on the ground were hit by a water drop from a helicopter. These events prompted us to review reports tagged “helicopter incident” in the LLC Incident Review Database over the past 15 years.



Image from the [2016 Spunky Fire Hit by Water Drop RLS](#)

2008-2022

46 Separate Helicopter Incidents*

*This review did NOT include incidents documented in SAFECOM or SAFENET.

Fatalities

10 Separate Events Resulting in 27 Fatalities:

- 4 of the events involved external loads (bucket, long line)
- 2 of the events occurred during aerial ignition operations
- 2 of the events occurred immediately after takeoff
- 1 event occurred mid flight enroute to the home unit
- 1 event occurred on final approach to a hospital (mid-air collision)

Water Drop Related Incidents

25 Separate Water Drop Related Incidents:

- 10 events occurred entering or exiting a dip site
- 9 instances of ground crews hit by a water drop (15 injuries)
- 6 events occurred at the drop site (bucket and rotor strikes)

Helispot Related Incidents

10 events (21%) occurred on or just off a helispot. These included crashes immediately after take off, tail and main rotor strikes, and hard landings.