Kelley Fire – Short Haul-Medevac Rescue Case Study

PURPOSE:

The purpose of this effort is to evaluate this case study to compare medical response incidents that occurred on the Kelley Fire, Idaho 2013. The importance of the U.S. Forest Service development, approval, and execution of a short haul capable helicopter operations program for a timely extraction of injured firefighters in terrain and conditions where other rescue options are extremely limited and short haul may be the only option is paramount

THE SITUATION:

The Kelley Fire started on August 24, 2013 as a lightning strike on the Sawtooth National Forest, approximately 7 miles southeast of Featherville, ID. The Kelley fire occurred in remote areas of the forest with steep terrain with narrow drainages. The fuels were primarily Douglas fir with a heavy component of dead & down fuels and some beetle kill tree mortality. Through the time period of the two medical emergencies, the fire was being managed under a local type 3 organization. In both of these rescues the same A-Star B-3 helicopter was used. The 1st extraction was short haul rescue with the interagency (USFS/NPS) helicopter crew was staffed with NPS employees that were certified for short haul missions and for the 2nd rescue these short haul certified NPS employees were not available..

Short-Haul Rescue

On August 27th an Interagency Hotshot Crew (or IHC) made the hike from Kelley Helibase/ICP and began making a direct attack on the fire on "Division Z" – the northeast flank (see attached map). A crewmember from the IHC was injured by a falling snag and was extricated from a remote area of the fire with the aid of an interagency helicopter and crew, trained and equipped for "short haul".

Medevac Rescue

On August 29th 2013 a firefighter with the incoming team was walking to the fire via an ATV trail. The firefighter was beginning to feel fatigued and weak. A medical emergency/incident was declared for a victim of dehydration. An agency medevac transport of the victim from an unimproved helispot was executed by the same interagency helicopter.

KELLEY FIRE – SNAG INJURY SHORT HAUL EXTRACTION INCIDENT

During the early assessment of the extent of injuries, the crew "sprayed the injured firefighter with a "Fedco" (a backpack pump), in an effort to keep the fire off him." EMTs from the IHC involved were soon joined in their rescue mission by two smokejumpers, one an EMT, the other a Paramedic, as well as members from another IHC assigned to the incident. The IHC Superintendent requested the crew's SKED Rescue Stretcher and medical bag to be transported to the incident via helicopter as the EMTs assessed the patient's injuries, provided stabilization and prepared him for transportation.

- 1400 hour-Emergency is declared.
- 1410 hour-ATGS orders a ground ambulance, air ambulance and a hoist ship. Helibase advises ATGS that Interagency Type 3 Helicopter is short haul capable. ATGS orders aircraft.
- 1411 hour-Short Haul aircraft lands helibase, prepares ship for short haul recon.
- 1415 hour-Ship departs with short haul spotter for recon.
- 1425 hour- On-scene resources order a backboard to be long lined into scene.
- 1430 hour-Short haul aircraft lands at helibase to configure for short haul.
- 1440 hour-2nd helicopter lifts with backboard and medical equipment in net.
- 1450 hour-Ground ambulance arrives at helibase.
- 1454 hour-2nd Helicopter delivers SKED and medical equipment to ground rescuers.
- On scene resources package patient for extraction
- 1504 hour-1st aircraft lifts for short haul mission.

- 1510 hour-Life Flight lands at helibase.
- Short Haul aircraft lowers Hauler/Medic into site
- Short Haul aircraft orbits area until requested to extract patient and hauler.
- 1532 hour-Short Haul aircraft inbound with patient.
- 1535 hour-Short haul mission complete.
- 1550 hour-Life Flight lifts with patient.

Within 1 hour 50 minutes of the injury, the patient had been transferred to Life Flight and was in route to Saint Alphonse Hospital in Boise, ID, where the patient was treated for a head wound and eventually released back to full duty.

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KELLEY FIRE - DEHYDRATION MEDEVAC INCIDENT

On August 29th 2013 Division Supervisor (DIVS) trainee with the incoming Incident Management team was walking to the fire with the person's trainer via an ATV trail. At approximately 1637 hour a medical emergency was declared as heat exhaustion with potential for heat stroke. Kelley Helibase was contacted and requested the helitack crew to configure and launch the A-Star 350 B-3 helicopter to the medical emergency. The incoming DIVS was identified as the ground point of contact. This medical emergency occurred approximately one mile from the wildfire in the unburned.

- The aircraft was reconfigured to accommodate the rescue litter.
- A-Star 350 B-3 with pilot, Helicopter Manager, and Paramedic launched to incident
- Aircraft personnel were able to locate the patient which was located near the ATV trail.
- 1654 hour-A-Star 350 B-3 landed above the patient with medic, Helicopter Manager, and litter 75 feet from patient.
- Paramedic made contact with the patient, initiated care, and determined the patient was unable to walk and would need to be carried.
- The paramedic also determined that the medical emergency was dehydration which can exhibit the some of the same sign and symptoms as a heat related injury.
- Initial unimproved helispot was located on steep terrain and determined be a difficult uphill carry of the patient.
- Helicopter Manager scouted, located, and confirming a secondary unimproved helispot that was identified on the initial flight. This helispot was a superior to the initial spot which was 300 yards from the victim and slightly uphill.
- The Helicopter Manager identified the need for additional personnel to carry the patient to the new helispot plus a chainsaw to open access. This was due to the size of the patient the difficulty with the terrain to carry the patient.
- The A-Star 350 B-3 reconfigured for passengers and transported two of the additional responders and dropped them off at the 2nd helispot where they were directed to the patient's location.
- The 4 personnel on scene initiated the transport of the victim.
- The A-Star 350 B-3 transported an additional 4 responders from a 2nd helitack crew.
- When the 4 additional responders met the patient carry they had traveled nearly 75% of the distance.
- With all 8 personnel together navigated the remaining distance to the helispot. It was noted that this was a difficult maneuver. This included:
    - Rotating people to carry the litter.
    - Rest breaks occurred
    - One person was always in the lead to find the best of routes.

- During the patient transport the Helicopter Manager reconfigured for patient transport.
- It took the rescuers 30 to 45 minutes to carry the patient the 300 yards
- The patient and paramedic were transported by the A-Star 350 B-3 from the 2nd helispot to Kelley Helibase to meet the awaiting Medevac helicopter with ALS support.
- A-Star 350 B-3 reconfigured for passenger transport
- During this period the fire had crossed the drainage to the east of this site and was burning in grass and sage. This operation was not immediately threatened by the fire but there were concerns with visibility and future Arial extraction of the responders if the smoke were envelop the area.
- 2nd Helicopter for responder extraction requested by Helicopter manager
- 1756 hour-Patient loaded onto Life Flight Helicopter
- A-Star 350 B-3 Helicopter returned to helispot and extracted 4 responders.
- A 2nd Type 3 Helicopter extracted 2 responders
- A-Star 350 B-3 Helicopter returned to helispot and extracted Helicopter manager
- Division Supervisor hiked back to his truck
- 1815 hour-All personnel off the hill, mission complete.

The duration of the rescue transport was completed in 1 hour and 30 minutes, from the time the emergency was broadcast over the radio, until the patient was aboard the Medevac helicopter and in route to Saint Alphonse Hospital in Boise ID where the patient was treated for dehydration and eventually released back to full duty.

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CONTRASTING RESCUE MISSIONS:

Both emergency rescues previously cited occurred on the Kelley fire. Although both were potentially life-threatening and both involved the use of the A-Star 350 B-3 Helicopter, they were executed differently. Short haul was utilized for extricating the snag victim, while the dehydration patient was carried out to the Landing Zone (LZ) on foot. The common threads between these conditions are that they can both could have been deadly.

The following discussion will focus on comparisons between the two aerial rescues to evaluate the pros and cons of a short haul rescue helicopter operation, versus using a partially ground based operation with people-power to package and carry a victim to a helicopter LZ. In both incidents the same A-Star 350 B-3 helicopter was used. When the traumatic injury occurred, involving the snag, this helicopter was staffed with NPS employees that were certified in Short Haul Rescue. The definition of Short-haul is to transport one or more persons suspended beneath a helicopter (HEC- human external cargo). These same employees were gone as a result of a crew swap when the dehydration emergency occurred; which meant that this helicopter and pilot although carded for short haul, could not be used for that type of mission.

Although the outcome of the medical emergencies were both positive, in either case, a matter of a few variances in the circumstances and or rescue may well have produced different results. For the contrast of the two rescues it comes down to criteria of timing, the level of medical care available, and risk. How long does it take to get a victim to appropriate medical care? What is the level of life support, Basic Life Support (BLS)/Advance Life Support (ALS) and future access to the appropriate care for the patient? What is the risk vs. gain to the responders and the victim?

Timing:

Snag victim- This extraction operation took approximately 1 hour 50 minutes to treat, package, transport, and transfer the victim to a hospital facility.

- There was no helispot, road, or trail access in the vicinity of the accident site.
- Access to the nearest trail was approximately ¼ mile cross-country and in heavy vegetation.

Dehydration- This extraction operation nearly matched the medical emergency with regards to transporting the patient to a hospital facility. The key aspect of this operation was the close proximately to the 1st and 2nd unimproved helispot:

- The distance between the location of the victim and the helispot was approximately 300 yards.
- Also of note is the rapid intervention with the timely delivery of the paramedic and initial ALS intervention.

Level of Medical Care:

Snag Victim-The initial time of the accident was 1400 hours.

- The initial medical care was provided by basic life support (BLS) EMTs from the IHC Crew.
- The next level of care being the advanced life support (ALS) paramedic and the EMT from the other IHC who arrived on scene within 20 minutes.
- However, the level of care provided at this juncture was limited due to the lack of ALS equipment at hand.
- The short-haul rescue ship was launched from the helibase at 1502 with delivery of paramedic with trauma equipment soon after.
- The victim was packaged, extracted, and in route to the helibase at 1523 hour.

Dehydration - When the patient started feeling the symptoms and showing signs of heat stress a medical emergency was declared. The location of this emergency near the trail with multiple helispots provided for the timely advanced life support that was provided along with IV intervention by the paramedic.

Risk Management:

Snag Victim – The initial flight was a recon and risk assessment (GAR) for viability for a Short-Haul Rescue mission.

- This was followed by the initiation of the rescue with the Hauler/Paramedic with equipment insertion into the accident site.
- During the packaging of the patient A-Star 350 B-3 Helicopter exited the area and was airborne and waiting for communication to return and initiate the extraction.
- Upon the "Good-to Go" call to extract the patient, A-Star 350 B-3 returned to the site and initiated the rescue, returning to Helibase with patient and Hauler/Paramedic.

Total personnel involvement: 2-pilots, 6-IHC EMTs/Medics (ground based), 1-Hauler/Medic

Dehydration - The pilot and Helicopter Manager of the A-Star 350 B-3 searched and located a better helispot with improved access for the crew who carried the victim on a backboard. The additional number of responders required to carry the patient required multiple flights to shuttle the personnel to where the victim was located and to extract the same personnel. The following is a listing of all the flights:

- Initial mission with Helicopter Manager, paramedic, and emergency equipment to the 1st helispot
- Flight to transport 2 additional responders

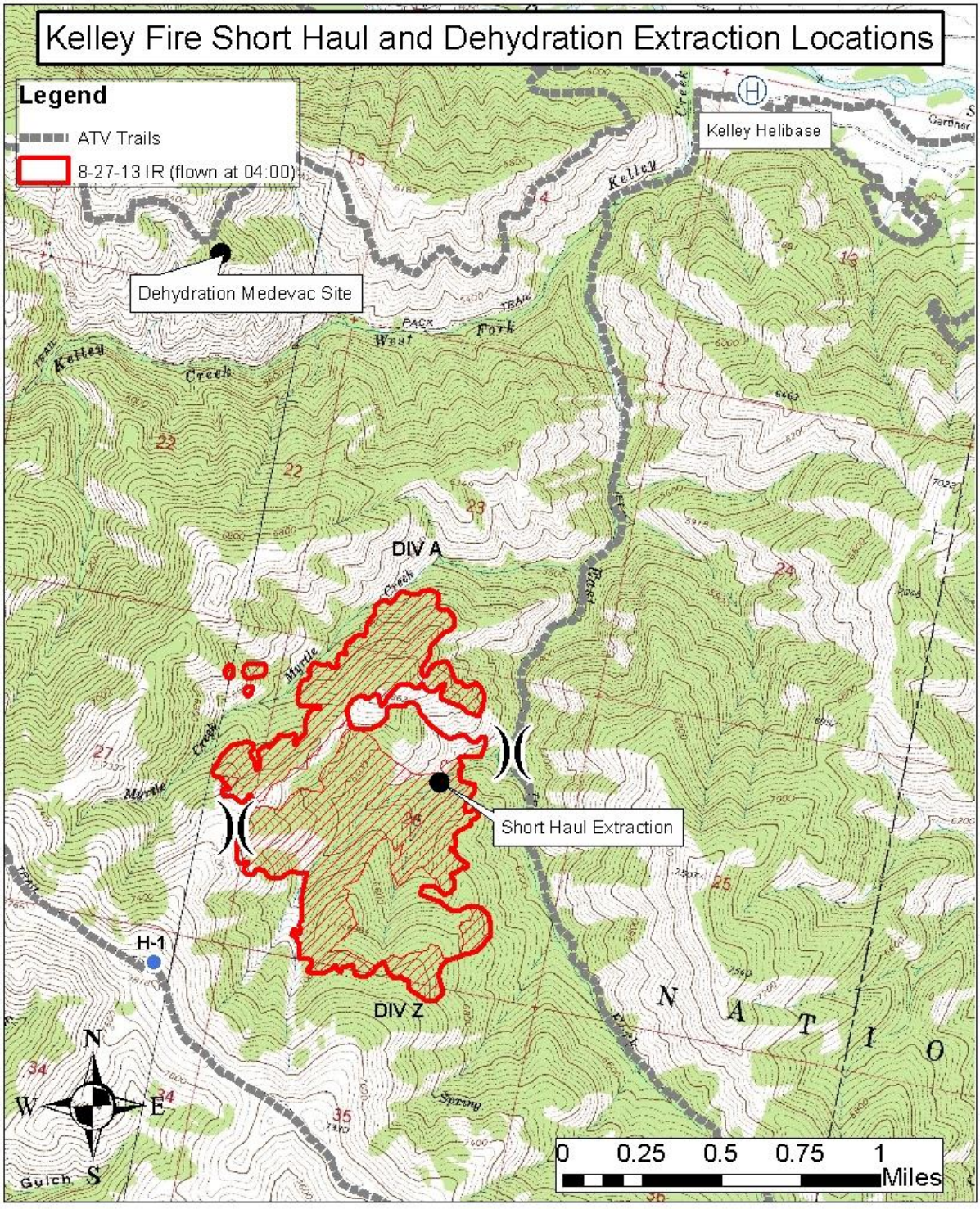
- Flight to transport 4 additional responders
- Retrieval flight of the patient with Paramedic
- Flight to retrieve 4 responders
- 2nd Helicopter to extract 2 responders
- Last flight to retrieve the Helicopter Manager

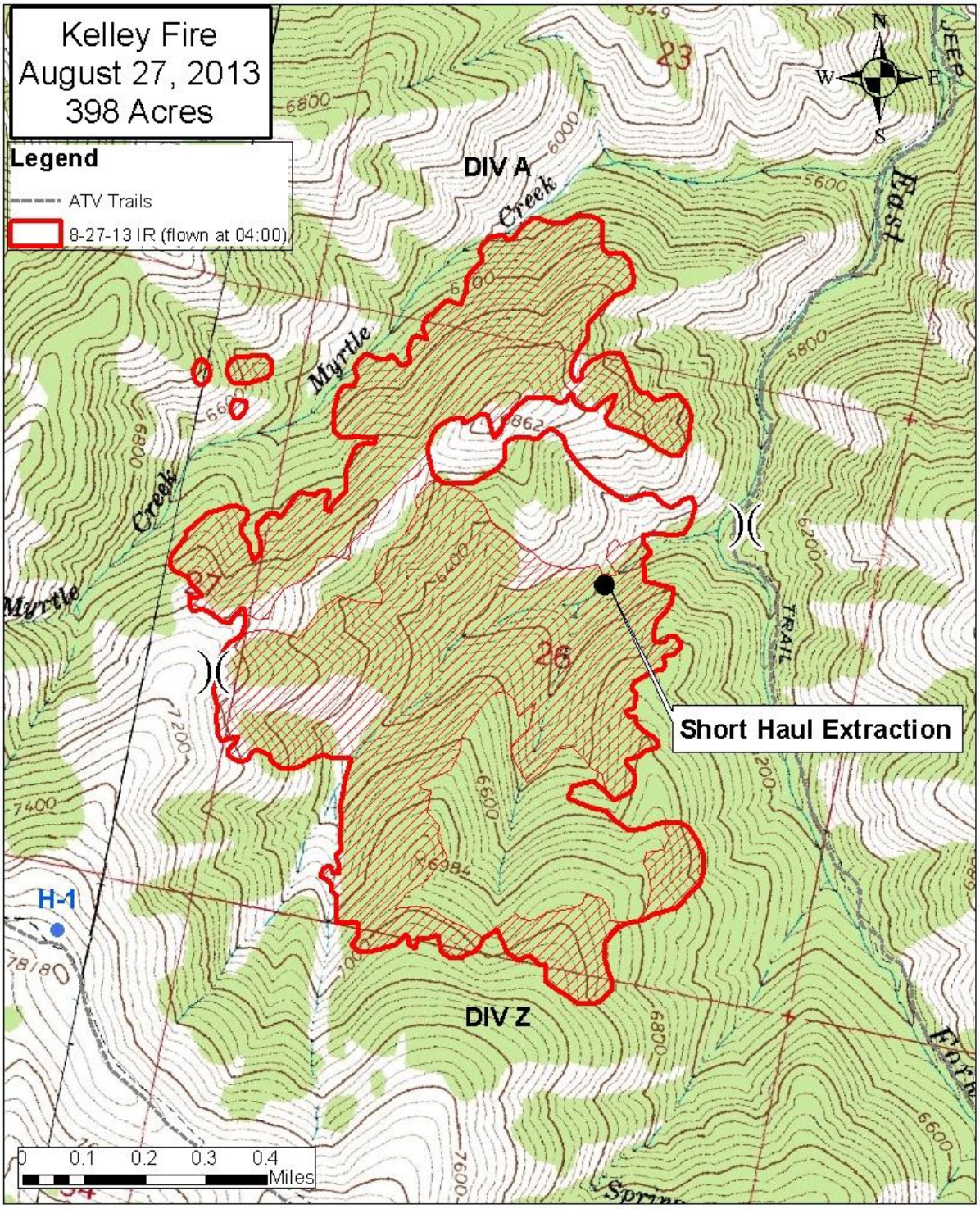
Total personnel involvement: 2-pilots, 1-Helicopter Manager 6-responders, 1-Paramedic, 1-DIVS (ground based)

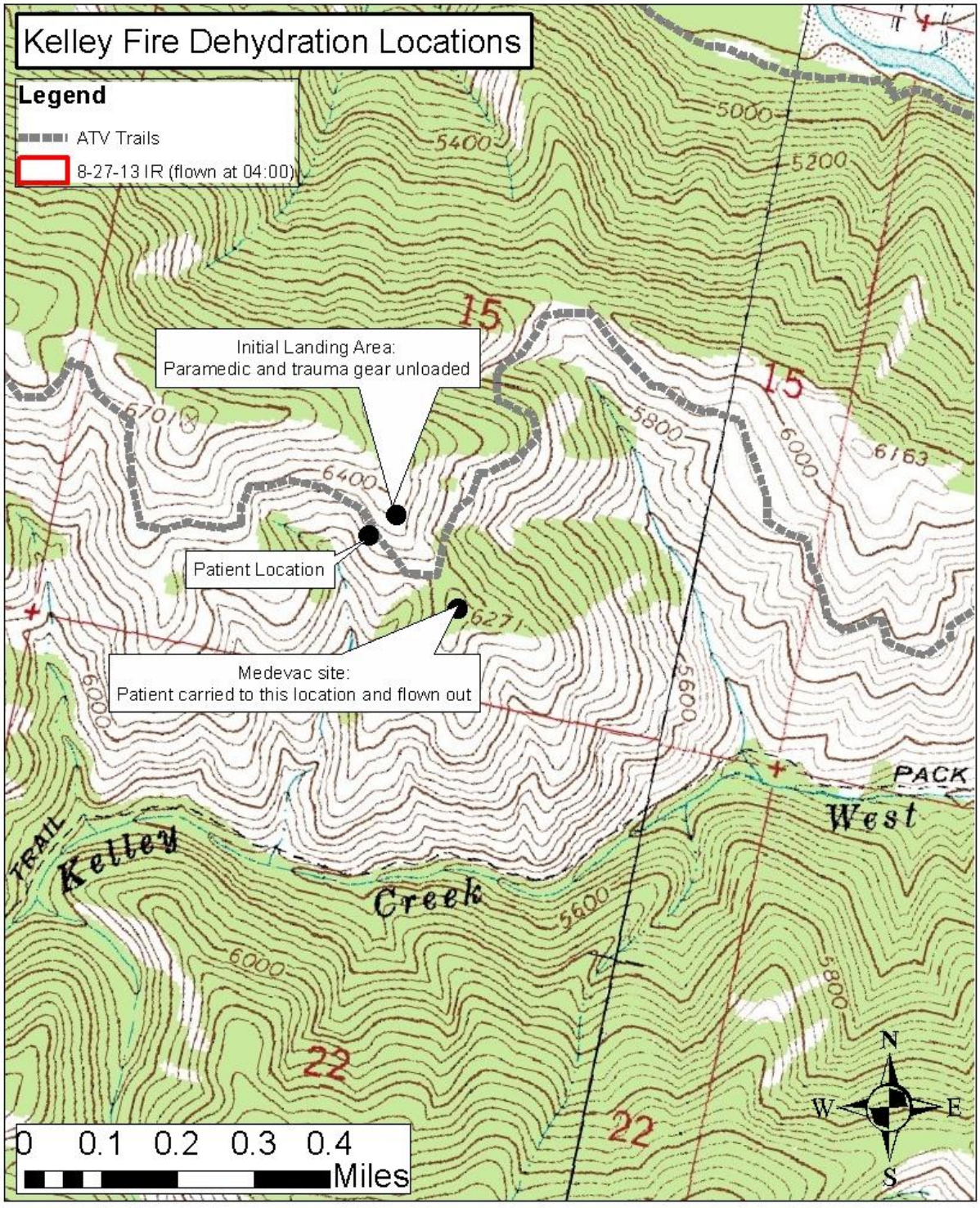
Conclusion

There are many factors and conditions that contrast the two incidents within this case study. With injuries to firefighters in remote locations to helicopter mishaps there are apparent "risks" that should be assessed through the tiers of the organization from "Time Critical" to "Programmatic". Short haul operations can be perceived as extremely dangerous. With the inclusion of a comprehensive Emergency Helicopter Extraction (EHE) program and guidelines, the consequences will remain catastrophic but the probability of a bad outcome may be remote. The probability of a firefighter being injured falls into the category of occasional. We know that a firefighter will be injured and requiring timely intervention and transportation to the applicable level of care. With limited capabilities to address traumatic injuries or medical emergencies the probabilities of a bad outcome increase.

For further questions or comments contact:
Dan Kleinman
Operations Section Chief
National Incident Management Organization (NIMO)
208-559-5373
dkleinman@fs.fed.us


Kelley Fire Short Haul and Dehydration Extraction Locations
Legend
ATV Trails
8-27-13 IR (flown at 04:00)
Kelley Helibase
Dehydration Medevac Site
DIV A
DIV Z
Short Haul Extraction
H-1
N
W
E
S
0 0.25 0.5 0.75 1 Miles


Kelley Fire
August 27, 2013
398 Acres
Legend
ATV Trails
8-27-13 IR (flown at 04:00)
DIV A
DIV Z
Short Haul Extraction
H-1
Myrtle Creek
Myrtle Creek
JEEP TRAIL
0 0.1 0.2 0.3 0.4 Miles
N
S
E
W


Kelley Fire Dehydration Locations
Legend
ATV Trails
8-27-13 IR (flown at 04:00)
Initial Landing Area:
Paramedic and trauma gear unloaded
Patient Location
Medevac site:
Patient carried to this location and flown out
15
15
22
22
5000
5200
5400
5800
6000
6400
6163
6271
5600
PACK
West
TRAIL
Kelley
Creek
N
W
E
S
0 0.1 0.2 0.3 0.4
Miles