



**U.S.D.A. FOREST SERVICE
PACIFIC NORTHWEST REGION (R6)**



**Snag Felling Incident
Facilitated Learning Analysis (FLA)**



Narrative: Two employees were removing winter debris from a ten mile section of road in preparation for a grading project when they noticed a standing dead tree beside the road. Upon further examination it was determined the tree needed to be removed. During the initial felling process the tree became hung-up in an adjoining tree at which time the employees decided to pull the hung tree out with a rope attached to their pickup. This resulted in the tree being pulled over onto the truck with the driver inside.

The employees had performed road clearing and inspection as part of their normal work activities for several years and had received training in hazard tree identification and chain saw operation for this type of project work. This type of work is necessary forest-wide and often times requires several hours of drive time from the employee's duty station to each respective project site and then back to the duty station each day.

Sequence of Events:

- Employees identified danger tree along side the road.
- Crew examined the snag and determined it was an imminent hazard that should be felled.
- Assessed snag, determined the lean and prepared to fall it in the direction that it leaned.
- Used pickup to physically block road to the North and driver positioned himself to the South side to stop any oncoming traffic.
- Faller faced tree in direction of perceived lean.
- Faller back-cut tree and it only moved slightly before becoming hung in an adjoining tree.
- During back-cutting, faller cut all holding wood in attempt to get tree to fall.
- Faller then attempted to wedge the tree but could not get the tree to move or accept wedges.
- At this point the snag was free standing on the stump.

and pull the snag in the original felling direction.



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Sequence of Events Continued:

- The rope was attached to the tree a couple feet above the felling cut and out in the intended felling direction to the snatch block which was attached with rope to a small tree in the intended lay. It then came back in about a 160 degree run.
- Standing behind a green 18" Douglas Fir and to the side of the snag the crew attempted to hand-pull the snag with the rope but could not get it to move.
- The decision was then made to use the truck to pull it over.
- The rope was attached to the plow on the front of the pickup.
- Because of the rope's length the pickup was within a tree length of the snag.
- Faller (now a spotter) positioned himself in his original escape route behind the green 18" Douglas Fir to watch progress of the snag and to verbally communicate with driver the snag's movement since the driver could not see the snag while driving in reverse.

Type of review: Facilitated Learning Analysis

Lessons Learned - Participants:

- 1) When conditions change unexpectedly-such as when a tree felling operation becomes a tree-pulling operation, completely reassess the situation. Without stopping for reassessment in this scenario, efforts were made to pull the tree in the original felling direction and the faller/spotter stayed in the original safe area used during the original falling direction. This placed both crew members in the snags final lay and the tree ultimately fell onto the truck and right next to the spotter.
- 2) As conditions degrade, call for help - whether for more equipment, personnel, or staffing a road closure. Road security was compromised when the road guard became the driver of the pulling vehicle. Although traffic is very light this time of year, there was some evidence of recent use and anyone could have driven into the work area during the pulling phase.
- 3) Always carry enough supplies to securely block traffic for contingency purposes. Items like flagger paddles, Class II ANSI approved high visibility vests, traffic cones, and "Tree Falling Ahead" signs are a good idea. Two workers were not enough once the tree became hung and other actions became necessary.
- 4) If rigging and pulling hung-up trees or logs is going to be done then purchase and carry rigging equipment appropriate for this sort of operation. Cable or synthetic line made expressly for this purpose should be of sufficient length to allow personnel and pulling equipment to be a distance of 1 1/2 times the height of the tree being pulled. Yellow poly rope was used and broke during the pulling phase. Other rigging equipment such as short straps, shackles, snatch blocks, and winches should be on hand for this type of work.
- 5) Personnel need to be trained in the principles of rigging and the use of rigging equipment for this application. The focus on continuing to pull the tree in the original direction without stopping to completely reassess caused workers to rig the tree in such a manner that it could not have fallen as intended and it went the opposite direction.



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Lessons Learned – Participants, continued:

- 6) Always carry enough radios so that all personal can communicate with each other. This includes road guards, spotters, fallers and equipment operators. The absence of a hand-held radio contributed to the decision of the spotter to be very close to the tree being pulled so that he could yell progress to the truck operator.

Lessons Learned – Facilitator:

- 1) Make every attempt to fall trees into openings. An adequate opening existed for this tree, but with the lean perceived to be in the direction of the neighboring green trees, it was then fell in that direction and hung. This being predictable (thus preventable), sawyers must be trained that complexity may include diameter, but that diameter is only one factor used to determine the complexity of any felling situation. This 10 inch diameter snag was in a “C” complexity situation. These workers were operating within their certification level, yet a call for assistance prior to tree getting hung would likely have changed the outcome.
- 2) When felling operations are going to be included in road clearing projects, sufficient personnel and equipment must be assigned to the project prior to the start so that felling area safety and security can be adequately addressed.
- 3) It’s imperative to ensure that when conducting a Facilitated Learning Analysis that appropriate subject matter experts are assigned to the team to enable a detailed and accurate review of the events and procedures in order to provide constructive feedback to event participants.