

WDSC 422 Lab 5 - Assignment
Chainsaw Safety and Felling on the WVU Research Forest

Chainsaw is the major felling tool used in the region. This field lab will be conducted and demonstrated by Mr. Bob Driscole, Mr. Mike Boyce and Mr. John Howell on WVU Research Forest. He will especially present the safety features of chainsaws and show you how to use chainsaw safely for felling.

I would like you to visit this operation and describe the chainsaw safety and the basic procedures for chainsaw felling. For some of you who would like to try to use chainsaw, you might be allowed in this lab.

Please provide me one-page typed report on what you have seen and experienced for chainsaw felling by the beginning of lab next week.



Felling Trees

(Source:

<http://www.osha.gov/SLTC/etools/logging/manual/felling/felling.html>)

More people are killed while felling trees than during any other logging activity.

These accidents CAN be avoided!

To "fell a tree" means more than just cutting it down. Felling means to cut the tree in such a way that it falls in the desired direction and results in the least damage to the tree and those surrounding it.

To safely fell any one tree, you must:

1. Eliminate or minimize exposure to potential hazards found in the tree and in the surrounding area
2. Determine an appropriate felling direction.
3. Plan and clear a retreat path.
4. Use a proper felling technique in making the cuts

Potential Hazards

The safe felling of any tree includes evaluating out the surrounding area to identify potential hazards. These hazards should be avoided or eliminated before attempting to fell trees.

Hazard

Ways to Eliminate or Avoid

Throwback

As the tree falls through other trees or lands on objects, those objects or branches may get thrown back toward the logger.

If possible, avoid felling into other trees or onto objects. Don't turn your back on the tree as it falls, and look up as you escape along the retreat path.

Terrain

If the tree falls onto stumps, rocks, or uneven ground, a hazard may be created.

If possible, move the obstacle, or change the felling direction.

Lodged Tree

A tree that has not fallen completely to the ground because it is lodged or leaning against another tree.

Do not work in the presence of lodged trees. Have these death traps pushed or pulled down by a machine.

Widowmaker

Broken off limbs that are hanging freely in the tree to be felled or in the trees close by.

Knock them down or pull them down with a machine. Avoid working underneath them.

Snag

Standing dead tree, standing broken tree, or a standing rotted tree to be felled or nearby.

Use a machine to bring it down.

OR

It must be felled or avoided by at least two tree lengths, unless the employer can demonstrate that a shorter distance will not create a hazard for an employee.

Spring Pole

A tree, segment of a tree, limb, or sapling which is under stress or tension due to the pressure or weight of another tree or object.

Use a machine to release the tension or release it with a chain saw, using proper method.

Extreme Weather

Strong wind.

Do not fell trees during high winds.

Entanglement

Vines or limbs of other trees intertwined with the limbs of the tree to be felled.

Undo the entanglement if possible.

OR

Use a machine to fell the tree.

Resources

Other workers or machines in the immediate area.

Request the workers or machines to be moved.

Identifying the Appropriate Felling Direction

This planning step is very important because it determines the type of cut as well as possibly identifying more potential hazards.

Factors to Consider

Clear Fall Path

Along with a clear landing, this is the most important factor in deciding what direction to fell a tree. Visualize the fall path in all directions and identify those directions that are free of other trees. Finding a clear path will eliminate [lodged trees](#), [throwback](#), and damage to the tree being felled as well as the other trees.

Clear Landing

Avoid felling a tree onto stumps, large rocks, or uneven ground. This will prevent cracking and other damage to the tree.

Lean of Tree

It is generally easier and safer to fell a tree in the direction that it is already leaning. This makes for a cleaner fall and eliminates the need to use [wedges](#), allowing gravity to do the work.

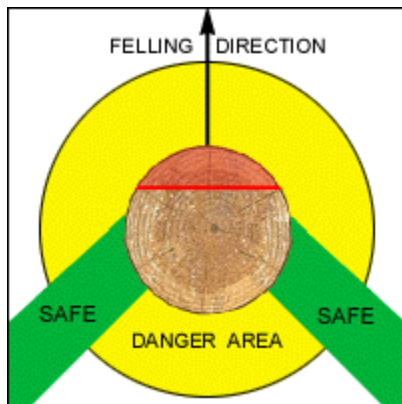
Ease of Removal

When possible, fell the tree so the butt faces the skid road. Also, fell the tree consistent with the felling pattern of other trees. This also makes for efficient limbing and removal.

Slope of Ground

Fell in a direction that will minimize the chance that the tree will roll or slide.

Retreat Path



You must plan your escape route and clear a path BEFORE you begin cutting.

Direction of Safe Retreat

- 45 degrees from the sides and back on either side
- NEVER move away directly behind the tree-you can be seriously hurt if the tree butt [kicks back](#) off the stump during the fall

How to Retreat

- Using a bore cut and a release cut will make it easier to retreat in plenty of time
- Don't turn your back on the falling tree
- Walk quickly away to a distance of 20 feet from the falling tree
- Position yourself behind a standing tree if possible

The Open-faced Top Cut

The top cut is the first of two cuts that result in an open faced notch. The notch is made on the side of the tree that faces the direction you want it to fall.

The Correct Cut

1. Starting Point

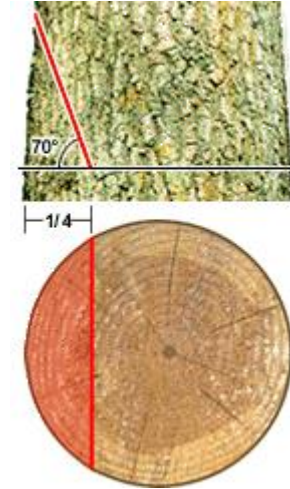
Important -- begin at any height as long as you allow enough room for the undercut

2. Angle of Attack

Important -- cut downward at an angle of 70 degrees

3. Ending Point

Stop when the cut reaches 1/4 to 1/3 of the trunk's diameter or when the cut reaches 80% of the tree's diameter at breast height



The Open-faced Bottom or Undercut

The undercut is the second of two cuts that result in an open faced notch. The notch is made on the side of the tree facing the direction that you want it to fall.

The Correct Cut

1. Starting Point

Very Important — begin at the level that will create at least a 70 degree notch opening

2. Angle of Attack

Important — cut upward at a 20 degree angle

3. Ending Point

Very important — stop when the cut reaches the end point of the face cut. Ideally, you have created a 90 degree notch opening.



The Open-faced Back Cut

The back cut is the third and final cut and is made on the opposite side of the notch. The back cut disconnects almost all of the tree from the stump leaving a [hinge](#) that helps to control the tree's fall.

The Correct Cut

1. Starting Point

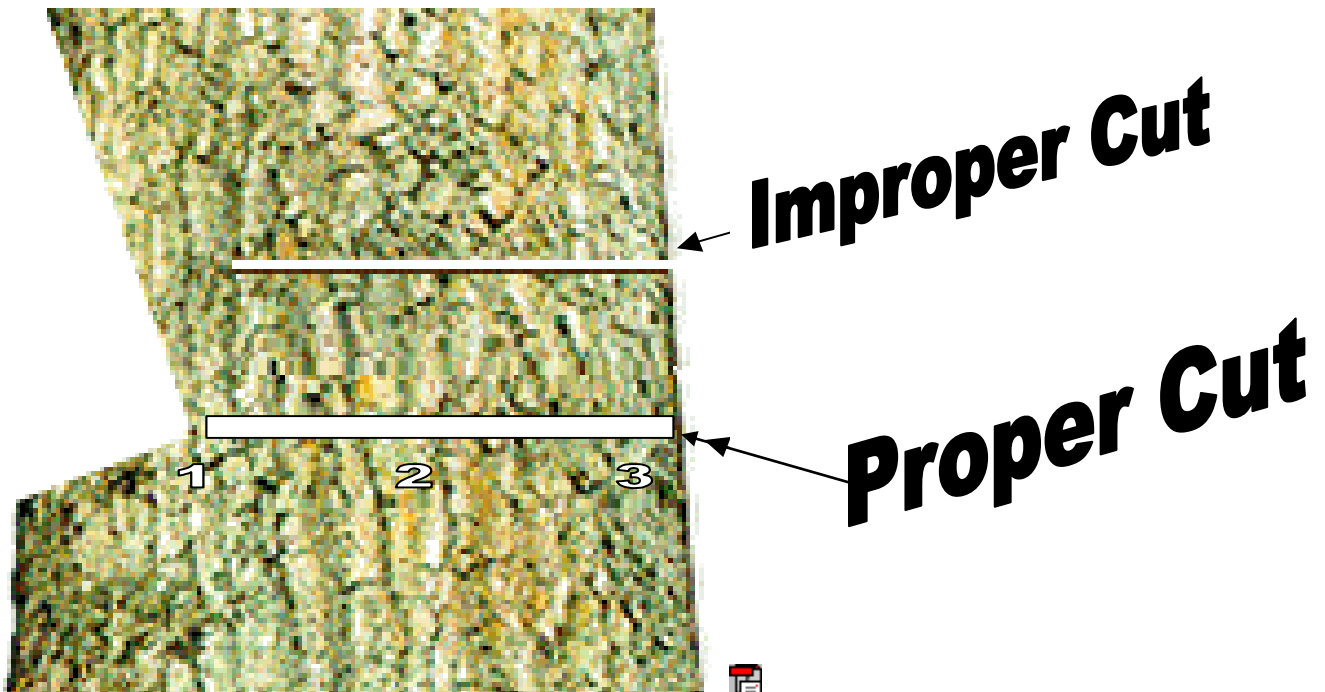
Very important - start at the point that will leave a hinge width that is 1/10 the tree's diameter. Using the attack portion of the saw chain, bore into the tree being sure to stay parallel and level with the hinge.

2. Angle of Attack

Important - Once your hinge is set cut flat along a horizontal plane toward the back of the tree taking care not to cut the hinge with the tip of the saw bar and leaving enough wood on the back side of the tree to prevent it from releasing or setting back on the saw.

3. Release Cut

Important - If the tree requires wedging, which should have already been determined, drive wedges now. Once wedges are driven, double check for any potential hazards and be sure escape path is clear. If all clear remove remaining wood which will release the tree and allow it to fall in the intended direction.



Making the Cuts

The safe felling of a tree includes making three precise and strategic cuts and having a proper hinge.



1. Top Cut



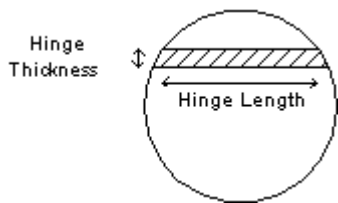
2. Bottom or Undercut



3. Back Cut

Felling Hinge

The hinge is the wood between the undercut (face cut/notch) and the back cut. The purpose of the hinge is to provide sufficient wood to hold the tree to the stump during the majority of the tree's fall, and to guide the tree's fall in the intended direction. The position of the hinge will affect the direction of fall. The size of the hinge is important to prevent splitting, fiber pull, barber chairs, and other undesirable and unsafe actions.



The following describes a proper hinge: (items listed below are recommended good work practices, not OSHA standards)

- The length of the hinge should be 80% of the diameter of the tree at breast height.
Example: For a 12-inch diameter tree the hinge should be 9.6 inches long (12 inches \times 0.8).
- The width of the hinge should be 10% of the diameter of the tree at breast height.
Example: For a 12-inch diameter tree the hinge should be 1.2 inches long (12 inches \times 0.1).
- The hinge on a tree should be perpendicular to the intended direction of fall.