



A Tree Services® Feature

Tree-Felling Safety for Outdoor Professionals

Why tree felling safety preparations and taking safety measures are imperative.

By Chris Larson

As a former municipal forester, currently working as a forensic expert in tree-related cases, I frequently investigate felling and tree failure incidents that result in serious injury or death. I am consistently reminded why tree-felling safety is a MUST. Arborists and Loggers are sure to have felled many trees, while landscape and turf professionals likely range the gamut of tree-felling experience, from having never felled a tree to very experienced. Consider this a refresher for the experienced feller, and encouragement with a healthy dose of caution for the uninitiated.

Tree-felling safety is important because most tragic incidents can be prevented by following industry accepted standards of care.

Relevant standards for tree-felling are:

- ANSI Z133 Safety Requirements for Arboriculture Operations
- OSHA 1910.266 Logging Operations.

Get to know these standards and regulations if you are going to be tree-felling.

TRAINING

If you are thinking about engaging in tree-felling, proper training and direction is essential. A reasonable foundation is a tree-felling and chainsaw procedure and safety course. Most courses consist of both classroom and field training. Many university forestry programs offer training through extension services.

It is also critical to match the sawyer's skill level and training with

the subject tree to be felled. The completion of a training program does not qualify a new sawyer to handle all trees/scenarios. Tree-felling is a skill that will continue to develop with experience and direction.

PERSONAL PROTECTIVE EQUIPMENT (PPE) & EQUIPMENT

Once you have completed your training in tree-felling and chainsaw safety, make sure that you are outfitted with the proper personal protective equipment (PPE). PPE for tree-felling consists of a hard hat, safety glasses, chainsaw protective chaps, hearing protection, sturdy footwear with steel toe or safety toe, and gloves. The chainsaw selected for felling trees must be the appropriate size (bar length) for cutting the subject tree and must be properly sharpened, fueled up, and in good repair. Having the appropriate equipment like tree-felling wedges, taglines, and other tree-felling gear may assist in the efficient and safe felling of trees.

INSPECT THE TREE

The first step is to inspect the tree and the site and decide whether the tree is a candidate for manual tree-felling. Consider your skill level and experience as you assess the size and degree of difficulty for each tree-felling candidate.

Inspect the tree for decay, cracks, or damage. Trees with structural defects are potentially dangerous candidates for felling. Trees with spiraling of the bark indicate spiraling of the interior wood grains,



Tree workers wood chipping infested oak. (Photo Credit: Chris Larson)

which may make it difficult to control the direction of the fall. Trees with dead branches or pockets of rotten wood are also difficult to fell by conventional notch and drop operations. Other danger trees in the area must also be considered.

If you find yourself unable to identify if these conditions exist, you may be in over your head, and you should consult with someone more experienced before proceeding.

The sawyer should examine the base of the tree. If the base is hollow or one side of the tree has rotten wood, it may not be a suitable choice for felling operations since the rotten wood can affect the direction that the tree falls. If the tree is leaning or has a slight lean the sawyer should use the bubble level on their phone or a hand level to determine the degree and direction of the lean.

The sawyer should also consider the balance of the tree's crown to estimate the tree's center of gravity in combination with its lean to determine where gravity will take it. Where possible, the sawyer should plan the felling operation in the direction of the tree's existing lean and where the tree wants to go.

APPROPRIATENESS/PRACTICALITY OF THE FELLING SITE

After inspecting the tree(s) as candidate(s) for felling, it's essential to assess the area surrounding the trees, extending at least two times the height surrounding any tree to be felled. Is the location remote or heavily trafficked? Are there obstacles, structures, people, or property that will affect the ability to safely fell the tree? How much help do you have? Not all trees can be safely or practically felled. When in doubt, rely on experts with the appropriate equipment to perform the job safely.

I have felled many trees in my career but that does not mean I will attempt to fell a large tree in my residential yard near my house, roads, and many other obstacles. In a situation as such, it would be safer to have the tree pieced down in a controlled fashion by a tree climber or aerial lift operator. However, the same tree on an open piece of land with no traffic might be a perfect candidate for manual tree-felling.

FELLING OPERATIONS

The next step is to plan an escape path, free of obstructions, to retreat from the tree as it begins to fall. The pathway of escape should be at a 45° angle in either opposite direction of the intended direction of the felling path and at least 20' from the base of the subject tree being felled. The sawyer should always assume that the tree

will fall in EVERY possible direction and take measures to ensure nothing can be harmed regardless of which way the tree falls. The tree sawyer must plan two retreat routes to use when the cut tree begins to fall.

Once the site is safe and clear and a retreat path is planned, the sawyer can initiate the felling-cuts. The most common technique used in felling a tree is a multi-step process that first involves the creation of an open-faced notch in the trunk. The notch consists of three precise and strategically made cuts: the sloping cut, the horizontal cut, and the back cut. In properly executed cuts, the notch positions the static load of the tree such that the sawyer, through the back cut and the remaining hinge, can reliably control the direction the tree will fall.

The typical notch used is called a "conventional" notch, but other notch styles are utilized depending on the circumstances. Properly performing and aligning the three strategic cuts is where I see the most mistakes. What may seem like a minor detail here can be the difference between a safely felled tree and a tragedy. If these cuts are not properly executed, it is possible to have the tree go the wrong direction and fall in an uncontrolled manner. I can't stress enough the importance of perfecting the execution of these three cuts.

Start by sighting a downward sloping cut at a 45° angle towards a point that is approximately 1/3 the diameter of the tree. Then make the second horizontal cut to be level and meet the bottom of the sloping cut. These cuts should meet perfectly, and a 45° wedge should come out of the tree easily.

After this is complete, make sure that the notch is aimed in the intended direction of fall. Then give a warning to "stand clear", and when assisting workers affirm "all clear" make the back cut. The back cut should be level and positioned slightly above the horizontal cut. Leave a strip of holding wood approximately 1/10 the diameter of the tree. Care must be taken to avoid cutting too deep or cutting through the hinge wood. If the hinge wood is intact, it will keep the tree on the stump and will guide the direction of the fall. As the tree begins to fall, keep visual contact with the tree with momentary exceptions for safely navigating your retreat path.

Even after the tree is down, there are still many hazards associated with limbing and bucking the tree, and the majority of the physical work remains.

Just remember to stick with the tried-and-true techniques that have become standard, and don't substitute online tree-felling videos for formal classroom and hands-on training. Work within your skill level and graduate to greater degrees of difficulty over time as you gain experience and improve your skills. Happy/Safe felling! ■



Christopher Larson is an International Society of Arboriculture Board Certified Master Arborist with over 25 years of experience in urban forestry, arboriculture, and landscape design/maintenance. His work with Robson Forensic applies his expertise to a broad range of disputes related to the health, failure, and removal of trees, including injury, death, and financial claims.

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