



# Work Safely With a Chain Saw

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## *Danger—Always think safety*

As you begin to implement your backyard woods plan (See the Backyard Woods Tip Sheet on Make a Master Plan for more information) you may want to remove some trees to give a favorite tree room to grow, or cut some firewood or fence posts, or remove a tree with a hazardous defect. A chain saw is the tool used most often to cut down trees. Cutting down a tree is one of the most difficult and dangerous activities you can do in your woods. In 2000, chain saws caused 40,000 injuries and deaths in the United States—and most could have been prevented (About, Inc. 2002). From the moment you take a chain saw out of storage to the time you put it back, you can be hurt by it or by whatever you are cutting. To work safely in your woods you need knowledge, skill, and safe working habits.

### **What do I need to know?**

Learn how to use a chain saw before you take it into your woods. Books, Web sites, and videos can provide you the information needed to cut down a tree up to 8 inches in diameter that has very little lean, remove the branches, and cut the trunk into pieces. To become skilled enough to safely drop a tree in a desired direction, however, requires hands-on chainsaw training.

Skill and safe working habits are developed by training and practice. One way to obtain training is to learn from someone experienced with a chain saw. There are also hands-on chain saw training courses available. The local Cooperative Extension Service or local chainsaw dealer are a couple places to find training opportunities.

Never work alone in your woods with a chain saw. In the event of an accident or emergency, you have to have someone who can help or bring help. You can quickly get into trouble when working alone in the woods with a chain saw.

When you are in the woods where someone is operating a chain saw observe the safety zone rule: Never approach within 200 feet of a person using a chain saw until he or she sees you, stops work, and signals you forward. A person using a chain saw tends to be unable to hear anyone approaching or calling to them because of the high noise

level and their hearing protection. They tend to be concentrating on their work and not looking for other people. This rule also applies to two people operating chain saws in your woods. If you ignore this rule you are in considerable danger of being hit by a falling tree or flying debris.

Knowing your limitations and that something is beyond your capabilities is essential. If you are not sure you can do something, don't do it. **Hire a professional to do it for you.**

### **How do I choose a chain saw?**

Your local chain saw dealer should be able to advise you on the chain saw that will meet your needs. Before you select a chain saw—as a minimum—consider horsepower, bar length, chain type, and safety features.

**Horsepower**—Use a saw with a power head rated at 3.8 cubic inches or less.

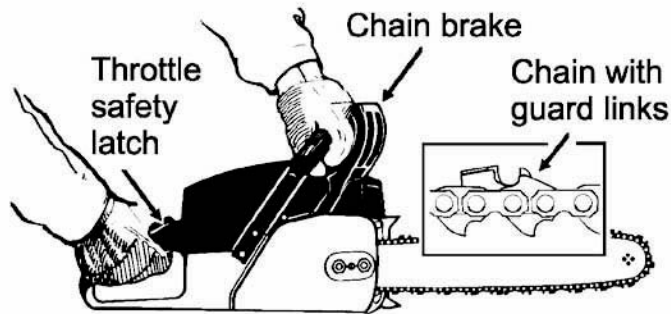
**Bar length**—Use the shortest bar possible to accomplish your tasks, to reduce the hazards involved. Finding a bar length that is suited for all your woods work means you can avoid adjusting your thinking and physical movements for different bar lengths, which should help you avoid mishaps. You should be able to perform all your tasks with a bar length between 16 and 18 inches.

**Chain types**—learn how to choose the right chains for your saw and how to sharpen and maintain them. This knowledge will improve your productivity and help you avoid wear and tear on your body and the saw. Some chain styles may reduce cutting time, which in turn may reduce your fatigue and result in fewer accidents. A dull chain saw will not cut straight, if it cuts at all.

**Safety features**—Chain saw safety features include these three:

- Chain brake—activated with a flip of the wrist to prevent the chain from moving.
- Throttle safety latch—mounted on the top of the throttle handle, it must be depressed by your thumb before the throttle can be engaged.

- Chain with guard links—designed to reduce the incidence and severity of kickback.



All chain saw safety features should be in good working order.

### What personal protective gear do I need?

You need to protect your head, hearing, eyes, face, hands, legs, and feet.

A hardhat outfitted with earmuffs and a screen type full-face shield is the best protection for your head, hearing, eyes, and face. Not only does it protect you from saw injuries and hearing loss, but also from getting particles in your eyes. You can use a hardhat, earplugs, and eye goggles, but a hardhat provides the added face protection and all the safety features in one piece of equipment.

You need to wear gloves or mittens when you operate a chain saw. You may want to consider additional protection by wearing gloves or mittens constructed with chain saw protection for the left hand if you're right handed or for the right hand if you're left handed.

Leg protection is absolutely necessary. Leg injuries account for nearly 40 percent of all chain saw injuries. Chaps, leggings, or protective pants are options. If you choose chaps, be sure to purchase a wrap-around style and a length that will protect the ankle. Pants provide greater comfort and avoid the problem of twigs catching behind the chaps.

Leg protection options are made with different types of fibers. Purchasing those with washable ballistic nylon fibers makes it easier to keep them clean, which is necessary for the fibers to do their job. Long-term protection depends on the types of fibers used. Oil soaked fibers will not explode and stall a rotating chain, which is how the protection occurs.

Chain saw protective boots or at least an above-the-ankle leather work boot is a must to protect your feet.



Wear all of your safety equipment every time you use your chain saw.

### What other equipment do I need?

Assemble these other necessary tools and supplies: wedges, ax, large hatchet or maul, properly mixed fuel, bar oil, bar wrench, chain file with protective handle, small screwdriver with magnetic head, minor maintenance tools, and a first aid kit.

### What should I do before I start cutting?

Carry the chain saw to the cutting site by holding it at your side with the bar pointing back. This will prevent you from falling on the bar if you trip.

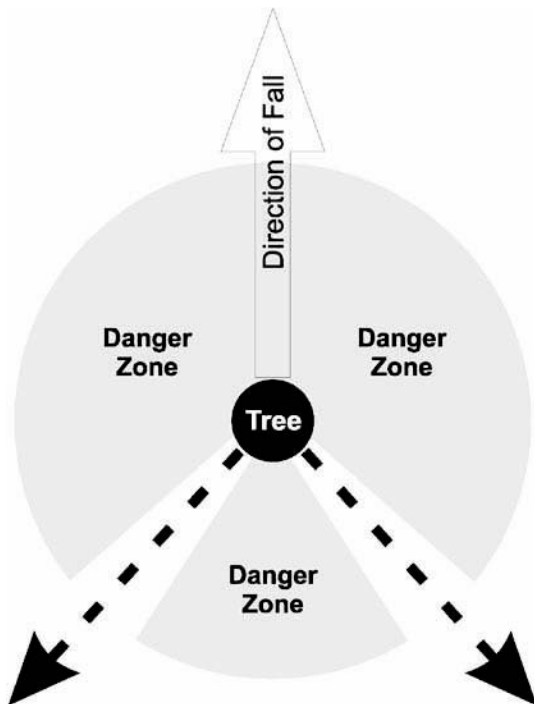


Carry the chain saw at your side with the bar pointing back and with the engine off or the chain brake set.

Be aware of weather conditions and your surroundings, the terrain, buildings, vehicles, power lines, livestock, and

other people. Always look carefully at what is around you and the condition of the tree, to develop a clear picture of what you intend to do. Determine the wind direction and approximate speed. Look at the tree from several directions to determine its lean, any excess branches on one side, broken or lodged material in the tree, and ice or snow in the branches. Look for tall dead tree trunks, leaning trees, and trees hung up in other trees within a distance equal to two tree lengths from the tree you are cutting, because they may fall at the same time as the tree you are cutting. Also look for vines, other tree branches, and other trees that may affect the direction in which the tree you are cutting will fall.

Based on these observations, you should be able to estimate the most likely direction the tree will fall, and be able to plan two escape routes. Be sure the escape routes are free from obstructions. Never move directly opposite the direction of tree fall, because the tree branches hitting the ground can cause the trunk to jump back. Never turn your back completely on the tree as you retreat. Before returning to the tree, wait at least 30 seconds after the tree hits the ground to allow debris to settle. If you can't easily remove the chain saw from the tree, leave it behind.



Plan and clear two escape routes (dashed arrows) before you begin cutting a tree.

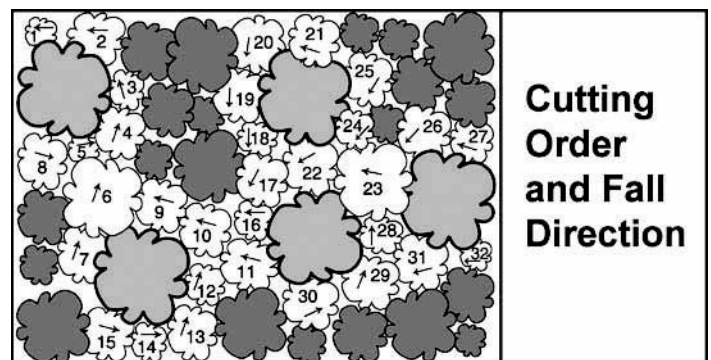
Finally, check to see if the tree you are cutting could land on a building, fence, power line, or your neighbor's property. It is not advisable to try to control the direction a tree will fall in order to miss hitting something. If you

have any doubt about hitting an object, use the following steps to determine how far the top of the tree will land from its stump.

1. Using your ax handle or a straight stick, place the end under your armpit and hold your arm straight and grab the handle or stick. Mark the point you grasp with a piece of tape.
2. Position yourself in a line between the tree and the object, such as a building, that potentially will be in the path of the falling tree.
3. Grasp the handle and, with your arm extended in front of you, raise or lower your arm until the bottom of the ax or stick lines up with the bottom of the tree or the place on the tree where your cut will be made.
4. Moving your eyes, but without moving your head, look at the place on the tree that is in line with the tape on the handle. That part of the tree will land where you are standing.
5. Go forward or backward until your mark is sighted on the top of the tree. This is the spot the top would reach if the tree falls in that direction.

If objects that can be damaged by the tree are within the range of its fall in any direction, give serious consideration to having a professional logger or tree removal service cut down the tree.

When you need to remove several trees in close proximity, develop a plan of action. Locate an open space for the first tree to fall. Mark an arrow on the tree showing the direction of fall. With each tree you drop, you are opening a new hole in which another tree can fall. Next to your directional arrow, place a number indicating the tree cutting order. This appears to be a lot of work, but the time and energy saved by not having a falling tree hang up in the branches of a standing tree will more than compensate you for the planning time.



To be safe, take the time to plan the direction of fall and cutting order for every tree you cut.

## How do I safely operate the chain saw?

Follow these safety procedures:

1. Always engage the chain brake at these times:
  - When you start the saw.
  - When you take one hand off the saw to do something.
  - When you take more than two steps with the saw running.
2. Start the saw safely by using one of the following two techniques:
  - Place your left hand on the front handle. Hold the back of the saw tightly between your legs. Pull the start cord (after engaging the choke, if necessary) using a fast but short stroke.
  - Place the saw on the ground. Place the toe of your boot through the back handle to hold the saw down. Hold the front handle with your left hand. Pull the start cord using a fast but short stroke.



Both starting methods are safe, but the leg lock method (a) is so fast and easy that it allows you to turn the saw off and restart it even when you walk a short distance.

3. Focus on the forces of the saw. Anytime you use a chain saw you need to be aware of the reactive forces created. When you cut with the bottom of the bar, the rotating, cutting chain can pull you into the work. When you cut with the top of the bar, it can push you away from the work. Your body stance and grip are determined by which part of the bar you are using to start your cut so you are physically prepared for the reactive forces that may occur.



Hold the chain saw with two hands anytime it is running and the brake is not on. Keep the thumb of your left hand wrapped under the forward handle so that the saw cannot easily be pushed back out of your grasp.

4. You can experience a kickback almost every time you use a chain saw. Most are mild and easy to control. A severe kickback can cause one of the worst accidents you can experience working with a chain saw. Most kickback accidents—in which the chain saw is suddenly thrown violently back towards the operator—occur while removing limbs from a tree that is on the ground and while cutting the trunk (bucking). Kickback occurs when the chain is suddenly forced to stop. The most common way this happens is when the upper tip of the bar touches a tree, log, or branch. Another way the chain can be stopped suddenly is when a log or a limb pinches the top of the bar and chain while cutting from below with the top of the bar. Kickback can be prevented by:
  - Making sure the upper tip of the bar touches solid wood
  - If you have to cut a log from below, do it in two stages: first cutting from above, then making another cut from below to meet the first cleanly
  - Holding the chain saw with both hands
  - Gripping the handle by putting your thumb around it

- Keeping your elbow locked
- Never cutting above shoulder height
- Keeping the saw close to your body and not reaching out with it
- Using a saw equipped with a chain brake
- Starting every cut under full throttle
- Keeping the chain sharp.

## In the Forest

Trained professional loggers cut trees in public and private forests. Cutting the tree is probably the most difficult and dangerous part of the logger's job. To emphasize this point, the following quote was taken from the Ontario Forestry Safe Work Place Association handbook "The Cutting Edge":

"To achieve the goal of working safely, you need three things: knowledge, skill and safe working habits.

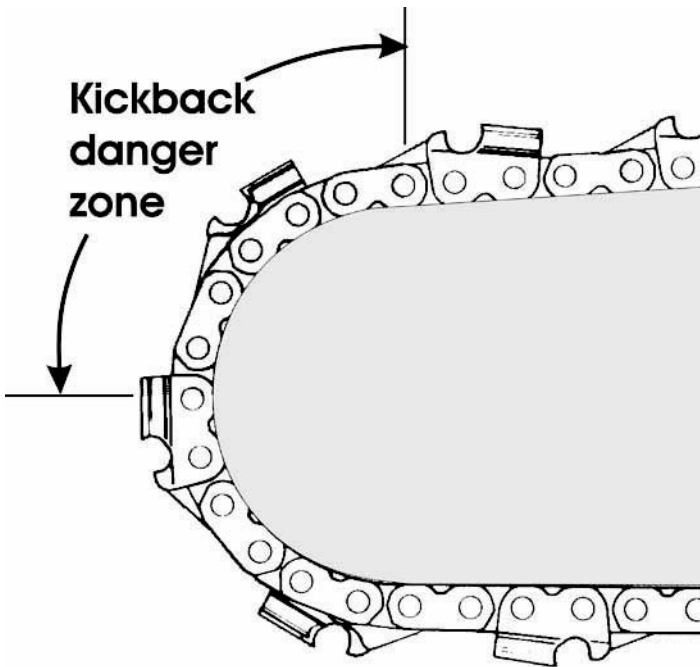
"Knowledge: You need to know what each task consists of, you need to know how to do it and you need to know what hazards are involved.

"Skill: you need to have the ability to physically perform the task in the right (safe) way.

"Safe Working Habits: Most of all, you need to have (or to develop) safe working habits that means you automatically do the job right—every time—without having to think about it.

The Cutting Edge is designed to give you the first of those three ingredients for chainsaw safety. You can gain knowledge and understanding by studying this book. You can gain skill by practicing the techniques and procedures described. But to acquire the safe working habits you need, you have to make a conscious effort to make yourself do every task the right way. After a relatively short time—if you do every task the right way every time—doing it that way will start to become automatic.

That is when your knowledge and your skill will add up to the safe working habits you need to protect yourself."



To avoid kickback, don't let the upper tip of the chain saw blade come in contact with solid wood.

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