

## Woodcutting and Firewood

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### **Woodcutting is dangerous**

Cutting firewood is an activity that few non-rural people have much experience with. It can be such a dangerous activity if not done correctly that it warrants discussion. Even if you are not interested in heating with wood, it is a good idea to understand the tools and techniques of safe woodcutting. This will allow you to know how to remain safe when you are near someone who is cutting wood.

The best way to learn about woodcutting is to have an experienced person teach you. Don't be shy about asking your rural neighbors and friends for lessons or information. They will respect your decision to learn from them and not simply blunder along on your own.

Let's start with woodcutting tools and then move on to techniques. Remember, of course, that even after a decade of woodcutting, I am not an expert.

I will include references below to additional sources of information. Use them. A single chapter in a book on rural retirement can provide only a tiny introduction to the subject.

### **Chainsaw**

You will need a good reliable chainsaw. This will be a primary work tool during rural retirement. There are two trains of thought on buying work tools for rural property. One says, buy cheap and replace as needed. The theory is that you can buy

several cheap tools for the price of a good one. The other says buy the best so you always have good tools to work with. For retirement, I believe the second is the better choice. Buy something that works well now and will keep on working until we are too old to use it.

A professional model saw like the Stihl MS-261 or Husqvarna 346XP costs about \$500. They are great saws, very light, and with plenty of power for serious firewood cutting. They start easily and reliably. The MS-261 is well balanced when equipped with a 16-inch bar. 16-inch bars are common for Midwestern hardwood use. 20-inch or longer bars are more common in the western pine and softwood forests. They are made to run all day, every day, for many years. In normal retirement land clearing and wood cutting service, these saws are probably immortal.

For contrast, Poulan 2100 series saw is usually available at Wal-Mart for around \$150. It is somewhat underpowered and less reliable. It is unlikely to last more than a season or two cutting firewood. To most folks, not having to deal with the aggravation of deciding when your saw is no longer repairable each time you need to use it is probably worth the additional price for a professional model.

There are many professional category saws to choose from. The MS-261 and the 346XP are among the lightest. For retired woodcutters I would recommend these lighter saws over heavier, more powerful models. The lighter saws require a little practice to be able to keep their RPM up when cutting large logs but will handle most anything you will ever want to cut. The advantage to them is that they are much less tiring to use. You must hold the weight of the saw when you use it. An extra two or three pounds for a more powerful saw will often seem like a bad tradeoff at the end of a long day of woodcutting.

## **Safety Gear**

Never forget that using a chainsaw is dangerous. A momentary lapse of attention or a slip due to bad footing could bring a chainsaw chain against one of your legs. Wood splinters thrown off by the Chainsaw chain can spray into your face and eyes. The end of a tree branch as you walk through the woods could poke your eyes. Chainsaw or wood splitter exhaust noise could damage your hearing.

Protection from chainsaw cuts to your legs is available in the form of padded chaps or pants. They contain a mass of cut strings. If a chainsaw chain cuts into the padding, a wad of string is pulled out, jamming and stopping the chain before it can cut you.

For eye protection, buy and use good quality, comfortable safety glasses or goggles. Non-fogging metal screen face shields are available to wear over glasses.

Ear protection is available in many forms. Full earmuff style protectors are available but tend to be hot and sweaty during warm weather. Individual ear plugs or plugs mounted on U-shaped bows are available for warm weather.

Gloves are something to also consider. Slivers and cuts are a constant problem anytime you are handling wood. I have found that firewood can be so rough and abrasive that I have completely worn through a pair of leather gloves in only a day or two of heavy use. I have had better luck with the latex coated knit work gloves when handling hardwoods. One or two pairs last me through an entire season of woodcutting.

## **Additional woodcutting tools**

In addition to your chainsaw and safety gear, there are other tools commonly used in woodcutting. Unless you will be working only a short walking distance from where you store your tools, it is a good idea to take them along when you begin a day of woodcutting.

Wedges and a sledgehammer for driving them are often useful. Wedges are handy for holding a chainsaw cut open to keep the chain from getting pinched and stuck. They are also used to tip over trees that need a little help falling.

There are two kinds of commercially available wedges. There are inexpensive plastic wedges that may be used near a chainsaw's chain. There also are heavy duty steel splitting wedges. Both have their uses. Accidentally touching a plastic wedge while cutting with your chainsaw will not hurt the chain. Carry one in your back pocket to use when you are cutting and there is a danger of the chain becoming pinched.

Hitting a steel wedge could destroy your chain. The larger steel wedge, though, can withstand much more abuse when extra force is required when wedging a tree over. However, wedging trees over is a technical job and is more difficult than beginners realize. Until you have experience felling trees, limit your wedging to keeping your chain from getting stuck and tipping over trees that require only a slight nudge.

Another handy tool is a Cant Hook. This is the tool most people call a log roller. It is a wooden handle with a large hinged hook. This tool is handy for rolling logs when they are laying flat on the ground so you can finish a cut. Chainsaw chains go dull

instantly if they touch dirt or rocks while cutting. Rolling a log brings the uncut part of the log up off the ground.

It is always a good idea to also take along an axe. An axe is often a good alternative to using your chainsaw for removing the limbs from a downed tree. If the limbs are thin and easily cut, using an axe will let your arms and shoulders relax from holding the weight of your chainsaw. Your axe may also be your last resort for recovering your chainsaw bar if you get it stuck in a cut.

A Srench, a spare chain, and a chain-sharpening file should also be part of your cutting tool kit. A srench is a chainsaw tool that has a screwdriver blade at one end and a wrench socket pair at the other that fit the saw's spark plug and bar nuts. The spare chain allows you to continue cutting in case you accidentally hit a rock. The sharpening file allows you to sharpen the cutters on your chain without having to take time out for a trip back to the shop.

## **Wood splitter**

Next, you will need a wood splitter. I recommend you buy a good gas powered log splitter. Old timers will tell you that all you need is a good splitting maul. Some of the professional woodcutters can actually split wood faster with a maul than can be done with a homeowner hydraulic splitter. Of course, they have been doing it all their lives.

Folks like me who have spent the previous couple of decades working in an air-conditioned office will not do nearly so well. In fact, permanent physical harm would likely to be the result of too much maul swinging.

Splitting firewood with a good maul is actually not that hard, after a few months practice. Wood splitting is a matter of technique, not strength, though just swinging a maul for a few hours will wear anybody down. I chose to buy a gasoline powered hydraulic wood splitter.

A good hydraulic wood splitter normally cost somewhere between \$1000 and \$1500. Professional woodcutter hydraulic splitters tend to provide relatively rapid ram cycle times with moderate ram force. Homeowner splitters tend to have slower ram cycle times for safety and higher ram forces to handle oddball chunks of wood. Stick with the homeowner version. Anything over about twenty-four tons ram force and twenty-five inches travel will probably do just fine.

Get a unit that allows both horizontal and vertical splitting. A vertical splitter stands the hydraulic cylinder vertically and pushes the splitting wedge down into the

wood. This allows you to stand the wood upright at ground level instead of having to lift it onto a horizontal bar. Wood is heavy, especially big un-split log sections. I sit on a short stool in front of the splitter a bit like I am milking a cow. I just slide the log sections under the ram and toss the split chunks over my shoulder onto a pile. Working at a leisurely pace, with plenty of time off for breaks, I usually split and stack about half a cord per day.

## **Firewood measurement**

That brings up another subject: wood volume measurement. The standard wood volume measurement is the cord. A cord is one hundred twenty eight cubic feet of wood, stacked tight. That is normally described as a pile four feet wide, four feet high, and eight feet long. It weighs about two tons, depending upon the kind of wood and its moisture content. That is a big pile of wood.

People are incredibly bad at guessing how much wood they cut and stack. I had a friend in town proudly show me the 'ten cord' load of firewood he had cut and split over the previous weekend. It didn't look much larger than one of my measured two cord firewood storage bays. I really was impressed that he had cut and split even that much wood. I didn't, however, feel the need to point out his estimation error. He was happy with it so I was too.

There is a measurement often used that confuses the uninitiated. It is the Face Cord. This is a four-foot high by eight-foot long stack of wood. The depth of the stack is simply whatever length the wood is cut to which is usually sixteen or eighteen inches. It's still a lot of wood but usually only about a third of a real cord.

Accurate measurement of your own firewood is not essential unless you are buying it. It is handy, though, when you are cutting your own to know whether you have enough ready for the coming winter. Firewood should be seasoned (dried) for over a year before burning it in a woodstove. That means that you should always have at least a winter's worth of wood stacked and shielded from the rain. How much you burn in a winter is a good number to know. We burn about four cords per year.

## **Wood cart**

As mentioned above, firewood is heavy. Hauling it around in a wheelbarrow is not fun. You will need some sort of motorized wood transport scheme. I tow a fifteen cubic foot capacity cart behind my lawn mower. It holds about an eighth of a cord. My mower is actually a garden tractor model, which means that it has a transmission rated for towing stuff, unlike regular mowers. A few hundred pounds of

wood in the cart is not a problem for it. During the winter, I take the mower belly off the machine and just use it for towing the cart. There are all sorts of other options for wood hauling. You will simply have to find a combination that works for your situation.

## **Starting your chainsaw**

Starting a chainsaw is not particularly difficult. It often doesn't seem that way to beginners. Once you learn the sequence, you should have little trouble starting any chainsaw that is in good working condition.

The first step, of course, is to make sure there is sufficient fuel and bar oil in the saw. Remember that essentially all chainsaws have two-stroke engines so require a specific gasoline/oil mixture as fuel. Check in the saw's owner's manual for the correct oil type and oil to gasoline ratio. Bar oil is necessary for bar and chain operation but its brand or type is usually not critical. Most anything labeled as chainsaw bar oil will do just fine.

There are now two different kinds of chainsaws available. There are models with computerized carburetors and models with traditional screw adjusted carburetors. The computerized chain saws are great because the both starting and operating them is easier.

For the non computerized chain saws, you set the throttle at a fast-idle position with the choke engaged. This is usually done by first squeezing the throttle trigger to the full throttle position and then flipping the choke lever on. This action usually engages a latch that holds the throttle partly open for starting. Release the throttle trigger. The ignition switch in most modern chainsaws is integral to the choke/fast-idle lever.

If one is provided on the saw, pump the primer bulb several times. Many of the higher quality and professional saws do not use primer bulbs.

Also, if one is provided on the saw, engage the chain brake. This prevents the chain from moving during the starting process.

With the saw on the ground, your left arm straight and holding the top handle and the back of the saw held down with your right foot, rapidly pull the starter rope. Within two or three pulls, you should hear the saw's engine fire once. Once you hear that, flip the choke off and continue pulling the starter rope. Within one or two pulls, the chainsaw engine should fire up and run.

Once the chainsaw is running, squeeze the throttle trigger once to release the fast-idle latch and allow the engine speed to drop to a normal idle. Do not leave the saw running at fast-idle with the chain brake engaged for more than a few seconds or excess centrifugal clutch wear will result.

Starting sequence is simplified with the computerized models. You simply move a control lever to a start position while squeezing the throttle trigger and then releasing the trigger. You simply pull on the starter rope until the saw starts. You then blip the throttle to let the saw idle.

There are variations on the above sequences such as using the compression release valve found on some larger saws or starting smaller saws while in the standing position but the sequence described above is the basic and most common procedure.

Starting a chainsaw while stand upright is not difficult but should be attempted only after becoming familiar with both the saw's operation and having practiced ground starts. The saw is held with your left hand on the top bar and left elbow straight. The rear handle of the saw is firmly trapped under your right thigh and against your left. Done correctly, this keeps the saw solidly held in place while pulling the starter rope with the right hand. Obviously, this maneuver should only be performed with the chain brake engaged.

Once a chainsaw has been run for a while and is warmed up, restarting it should take little more than flipping the ignition switch on and pulling the starter rope. The choke should not be needed though sometimes latching the throttle in the fast idle position is helpful if the saw has started to cool down.

Always keep in mind that chainsaw operation is dangerous. All of us have smacked a finger while using a hammer or pinched ourselves using a pair of pliers. These minor injuries are common. Equivalent mistakes with a chainsaw usually require a rapid trip to a hospital emergency room. Use personal protection equipment and work carefully and deliberately. The arm or leg you save may be your own.

## **Tree felling**

Probably the most dangerous part of cutting firewood is tree felling. There are many ways that felling a tree can go wrong. Once a tree starts to fall, it is almost impossible to get out of its way unless you are prepared and moving in the correct direction when it starts to come down. Every year experience professional loggers and arborists die from felling accidents.

If possible, have someone with experience give you lessons on felling trees. It is also something that you really should read about. A good source for tree felling information is the “Tim’s Tips” section of Tim Ard’s “Forest Applications” web site:

<http://www.forestapps.com/tips/tips.htm>

I try to remember to follow the rules discussed in those web pages. They have worked well for me.

There are four steps to felling a tree: Figure out which way you want to direct its fall, notch it, back cut it leaving a proper hinge, and **RUN**. That last step is critical to your survival. You need to have an escape route worked out before you start cutting. You need to move at least twelve feet away from the base of the tree at a forty-five degree angle from a line opposite the direction of the tree’s fall. Make your escape as soon as you detect that the tree is starting to fall. Tree butts can kick and roll as the tree is going down. Remember, trees fall too fast for a person to dodge them.

A critical component of tree felling is producing a proper hinge to control the direction of fall. That is, you do not cut all the way through a tree when felling. You must leave some un-cut wood at the back of the wedge cut. How wide this strip should be depends upon the size, weight, and species of tree you are cutting. For typical home-owner wood cutting this hinge is usually about two to three inches wide.

Avoid those schemes often shown on "America's Funniest Home Videos". Do not try to pull a tree over with your pickup. If you insist on attempting it, make sure the rope is longer than the tree is tall. Also, make sure that there is nothing that the truck will hit as it is dragged backwards when the tree falls the wrong way. Remember too, that simply because you cut the notch on the uphill side of the tree, it will not fall that way. Felling a tree in a direction opposite its natural lean is a technical job involving the judicious use of wedges along with a carefully sized hinge.

## **Lessons learned while cutting firewood**

Now, for some of the lessons I have learned cutting firewood on our property. Keep in mind that this is for the conditions here in the Ozarks. Some, or all, of these items may not apply to firewood work in other places.

### ***1. Keep the chain sharp***

Keeping the chainsaw chain sharp is critically important. I keep track of the size of the chips thrown off by the saw. When the chain is sharp, they are usually fairly



large. As the chain gets dull, the chip size drops until it looks like sawdust. Ideally, the chain should be resharpened before it reaches the sawdust stage.

The best tool I have found for sharpening the chain is the one from Pferd, called the Chain Sharp. It holds both a round file for sharpening the cutters and a flat file for setting the height of the depth gauges. Professionals and experts don't like them, claiming they are for beginners who don't know how to properly sharpen a chain. Well.... Guess what.... I am unlikely to ever be a professional or expert at chain sharpening so it is just right for my purposes. The tool is also available from Husqvarna as their "Sharp Force" product for about \$15. I recommend it.

Unfortunately, the Pferd tool works only on Full Comp chain. That is chain with a full complement of cutters as commonly sold with professional saws. Some chains, called Full Skip and Semi Skip have extra non-cutter links between cutters to reduce the cutting load on the power head and improve wood chip clearing. For these chains, a two step sharpening process can be used. A round file mounted in a guide frame is used to sharpen the cutters. Another guide is used with a flat file to set the cutter tooth depth gauge heights.

Of course, you can simply take your chains to a chainsaw repair shop for professional sharpening. A good compromise might be to take your chains in to the shop after sharpening them several times manually. The shop's grinder will even up the cutters for you.

## ***2. Proceed methodically***

I treat tree cutting as a four-step process: Felling, Limbing, Bucking, and Cleanup. I try to complete each before going to the next. I've found that I work safer and more efficiently if I concentrate on one task at a time.

## ***3. Cut wood to stove length***

I cut everything to final firewood length right where the tree fell if at all possible. I found that reduces on the number of times I have to handle the wood. The professional woodcutters around here even try to do all their splitting at the fall site also. Of course, they have been swinging a splitting maul all their lives. Much of the work in cutting firewood is in handling it to move and stack it. Anything that reduces that helps reduce the total amount of work.

#### ***4. Mark log for bucking***

When bucking a log, which is cutting into firewood lengths, I use the chainsaw bar as a ruler and make shallow grooves across the log at the desired firewood length with the chain by blipping the throttle. Our small basement woodstove accepts lengths up to sixteen inches. I marked my bar at fifteen inches. Mark the entire length of the log before starting to cut. The log sections come out more even that way. Repositioning myself as I am making the bucking cuts is easier if I can see exactly where my next cut will be. (I learned this one watching a local woodcutter.)

#### ***5. Bucking technique***

Bucking a log on the ground is easy. As I make each bucking cut, I hold the chainsaw horizontally and stop before the chain touches the ground. Depending upon which way the pressure on the log is, the cut may start to close before you get all the way down. I stop cutting when I see the cut starting to close and pull the bar out of the log while keeping the chain at full cutting speed. I sometimes place a wedge in the top of the cut to keep the log from pinching the chain. I've used a wedge to open a cut enough to extract the bar when I have accidentally gotten it stuck (fortunately, not often!).

Once I have gone down the length of the log making cuts, I roll the log so the uncut wood is exposed and complete the cuts. Typically, one or more of the original cuts will sever the log before I have to roll it, allowing me to roll chunks smaller than the full log length. (I learned this one from a neighbor.) Just remember to never let the chain cut dirt or rocks. Even a little dirt on a log will rapidly dull the chain.

#### ***6. Bucking thick logs***

When bucking a log thicker than the length of the chainsaw bar, I start with the chainsaw power head sitting on the top of the log. I roll the saw forward so the chain cuts into the far side of the log. I continue the cut until the tip of the bar gets close to the ground or is nearly vertical. This is simple motion. I then continue the cut by dragging the power head towards me around the top of log. When the bar reaches horizontal, I continue the cut as for thinner logs. The saw cuts with the bar tip extending into the slot on the far side of the log.

A log with a diameter up to twice the bar length can be cut by making horizontal bar cuts from opposite sides. The chain will cut even out to the tip of the bar. So far, the technique above has handled everything I've had to deal with.

## ***7. Stack wood on its side***

I always stack wood on its side. Wood left standing with the grain vertical absorbs moisture from the ground and collects rainwater.

## ***8. Extracting a stuck chainsaw***

Sooner or later everyone gets a chainsaw stuck. This is usually the result of the cut closing and pinching the bar and chain. If the cut is deep enough, you can drive a wedge into the cut to relieve the pressure on the saw and extract it. All is not lost if that is not possible or does not work.

The most common method used to free a stuck saw if wedging does not work is to attack the tree with another chainsaw. With careful thought, it is usually possible to find a way to release the pressure on the first saw. If a second saw is not available, an axe may be substituted.

Don't get panicky if you are having a tough time freeing your saw. Most of the cost of your saw is in the power-head, not the bar and chain. Simply unbolt the power-head from the bar and remove it. Once the power-head is removed from the bar, it may be possible to slide the bar out of the chain. It is normally the chain's cutters that are pinched. With the power-head and bar removed from the tree, you may install your spare chain and continue cutting. If you have a spare bar on hand, even extracting the stuck bar is not critical.

## **Work safely**

When cutting and splitting firewood, work safely. Learn how to use your tools properly. Take your time and do it right. Have someone nearby who can keep track of you when you are using your chainsaw. If at all possible, have someone with you when you are felling trees – two tree lengths from where you are cutting of course.

Performing your firewood tasks safely is not an OSHA issue when you are retired. It is the way you keep from abruptly truncating your rural retirement.