

Chapter 27 - “Logging/Harvesting”

Tree planters don't really need to know anything about logging. If you're a first-year planter, you're better off skipping this chapter and re-reading other chapters that will help you learn to plant, because that would have a positive effect upon your production and earnings. However, after the season is over, and you're looking back on everything that you saw, you can come back to this chapter if you're curious about how logging and harvesting is approached in BC.

Hand Falling vs. Machine Harvesting

In some parts of BC, trees are still cut by hand, by fallers using chainsaws. If you think back to the mental image of a wild lumberjack that you had as a child, that image basically fits real-life fallers to a T. These guys are usually incredibly fit and strong, and they work hard and play hard. You may decide after a season of planting that it's the hardest job in Canada. Nope. Being a professional faller in BC is definitely harder. Climbing up and down the steep slopes that machines can't access, carrying a chain saw, gets you into shape very quickly. And BC fallers make ridiculous amounts of money, sometimes three times what a good planter makes. I was living beside some coastal fallers one time and one of them said, “I don't get out of bed for less than a thousand dollars a day.” Yup.

The drawback with being a professional faller is that the job is very dangerous. It's typical for a couple of fallers die on the job every year in BC, and there aren't a lot of fallers. The Globe & Mail published an article in 2014 about the most dangerous jobs in Canada, and being a logger/faller came out as the most dangerous. A similar study in the US in 2017 also had falling/logging as the most dangerous occupation in that country. Also, getting certified as a hand faller in BC is a tough challenge, since you need about \$10k and six months of training/on-the-job mentoring.

Most certified fallers in BC do one of two things: They either do professional harvesting work on the coast or in other areas with steep slopes, or they do danger tree assessment and mitigation. Some of the very biggest trees in BC are worth literally thousands of dollars per tree, so these trees are felled very carefully so as not to damage the timber. Danger tree mitigation involves looking for potential danger trees, doing a DTA to determine the best approach, then if necessary, cutting the tree. This type of work may be necessary around block edges and through residual patches of blocks that are about to be planted, or it may be necessary in regular sweeps through hundreds of kilometers of roads on the provincial Forest Service Road network.

Although it is rare, there is still some horse logging happening in various parts of Canada. In this type of operation, hand falling is common. Horses are then used to drag logs out of the woods to nearby roads.

Roadside vs. Stump-side Processing

A fallen tree can either be processed at the stump (which means that it is delimbed and top removed in the middle of the block where it was cut), or it can be processed at the road. Stump-side processing is commonly used for tree-length logging, where the full length of the tree is taken to the mill. Stump-side processing is also practiced when forwarders are used, which is common on wet ground or contracts where ground disturbance is of concern. Tree-length logging can also involve roadside processing. At other times, trees are cut up into various standard lengths (16-foot, 8-foot, etc.) before being hauled to the mills. This is called cut-to-length processing. Cut-to-length processing is very common in the BC Interior and especially up north. It's also very common in every other province across Canada.

Stump-side processing makes for a messier block. If there's a forwarder being used, the machine usually tries to use this slash as a mat to drive on, to keep from creating unnecessary ruts in the wet ground. You may occasionally see blocks where the slash piles are spread out all over the block, rather than only being located beside roads. If this is the case, these are referred to as dispersed slashpiles, and the block probably used stump-side processing. It's a requirement to return blocks to certain standard levels of "replantable area" within BC, so if there's a lot of slash, this is why it is raked up into slashpiles and then burned. When all the piles are roadside instead of dispersed, it's likely that the loggers were practicing roadside processing. It wouldn't be economical in most cases to move slash from all over the block so it is only piled beside the roads.

In recent years, an argument has been made that it's better to create piles and subsequently burn the slash than it is to leave it spread out on the block. People who argue in favour of piles and pile burning support the reduction of fuel loads on cutblocks, which may contribute to wildfire severity. Other people favour leaving slash spread out across the blocks due to the ecological benefits that slash provides as it decomposes.



Figure 27.01
Roadside Processing.

The processor in this photo is working on trees that have been dragged close to the road.

Bunching

A feller buncher is a machine that can cut down trees. It can grab a tree by the base of the trunk and cut it at the bottom, then it swivels and lays the tree down on the ground. A feller buncher is always a tracked machine rather than one with wheels. This makes it easier for the buncher to move around on the block, across slash and uneven ground. The feller buncher is the dominant machine used for harvesting trees throughout Canada. It can move quite quickly, mowing down a forest much more quickly than fallers with chainsaws could. Of course, if the slope gets to be too steep, a feller buncher cannot be used safely.



Figure 27.02
Feller Buncher.

A feller buncher often looks a lot like an excavator, although it has a very different attachment at the end of the arm.

In some ways, a feller buncher looks a bit like an excavator. On an excavator, you'll see an arm with a bucket, but on the buncher, you'll see a boom and a stick. The boom is the arm that extends from the machine to the first joint. The stick is the arm that extends from the boom to the felling head. A feller buncher is much beefier than an excavator. It has to be, because it works in rougher conditions. Excavators don't typically work around trees that accidentally fall onto the machine, and they lift/move lighter payloads. If you look closely at a buncher, the hydraulic cylinders that power the boom and stick and felling head are located underneath the boom and stick. Conversely, the hydraulic cylinders on an excavator are located on top of the arm. This is because the two machines have different mechanical requirements. The excavator needs to generate a force that allows the

bucket to curl in toward the machine, whereas a buncher needs to be able to push out and support the weight of the wood that it has collected in the felling head.



Figure 27.03
Feller Buncher Head.

This attachment does all the work, grabbing the trees near the ground and then cutting them off at the base.



Figure 27.04
Feller Buncher Cutting Blade.

This rapidly-rotating disc with teeth can chew through the base of any tree quite quickly.

The feller buncher has a lot more horsepower than an excavator, and usually operates on single growser pads. If you look carefully at the steel tracks under either machine, a buncher has one growser or traction point, whereas an excavator will have two grousers in the bush or three grousers if working on pavement.

Feller Bunchers and other types of logging equipment are typically certified as having FOPS or ROPS. FOPS is a Falling Object Protective Structure certification. It is a system or structure designed to protect an operator of heavy equipment in the event that the cab of the equipment is struck by a heavy falling object (such as a tree). ROPS is a Rollover Protection System. It is a system or structure intended to protect tractor and heavy equipment operators from injuries caused by vehicle rollovers.

Skidding

Skidding is the process of dragging or carrying a load (presumably fallen trees or cut-to-length logs) from one part of a block to another part. Wood is usually dragged from where it is fallen to a separate location or locations where it is processed and/or loaded onto logging trucks. Not surprisingly, the machines that are often used for skidding are called skidders.

Skidders are used extensively in forestry and logging operations, just like conventional farm tractors are the mainstay of a farmer. A skidder has four very large wheels (about the height of a person, plus very thick and round), and the front and back end are held together by a universal joint, which effectively allows all four wheels of the machine to tip in different directions and angles. Incidentally, skidders aren't just used to move logs around. Skidders can also handle lots of scarification attachments, such as disc-trenching blades and ripper hooks and donaren scoops, which allows them to drive around the block to perform site preparation work.

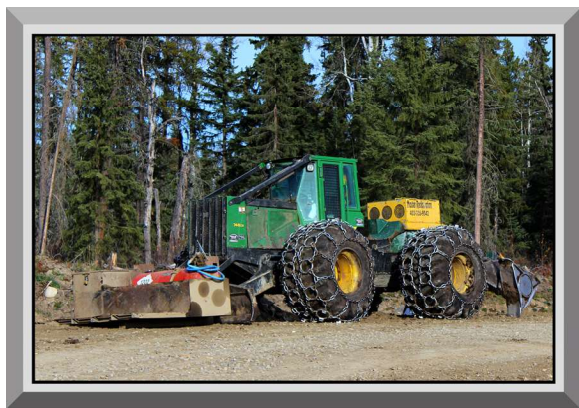


Figure 27.05
Skidder.

This skidder is pimped out with a site prep attachments on the back and a tidy tank mounted on a carrying rack on the front.

Yarding

Skidders don't always bring wood out of the blocks. As the slope of a block gets steeper, it becomes more dangerous to use a skidder. A yarder can be a safe alternative. Sometimes a yarder uses chokers to grab logs off the slope, and sometimes it uses a grapple. If it uses a grapple instead of chokers, it's called a grapple yarder.

The yarder machine typically sits on a road, looking somewhat like a construction crane. In fact, it often looks like it could tip over at any minute. Once the yarder is in place, it gets anchored down in several points by using long and extremely strong steel cables. The yarder then has another cable called a lead which wraps around a pulley. The pulley is attached to a strong stationary object at the top of the hill or bottom of the hill, ie. on the slope above or below the yarder. On the coast, the pulley is often anchored onto massive trees which are strong enough to take the pressure. If that isn't an option, it may be possible to anchor the pulley onto another piece of heavy equipment at the top or bottom of the slope. Either way, the yarder operator is then able to run the lead cable in both directions, or to let out slack. With a choker system, a chokerman on the hill can wrap a choker around a log on the hill when the yarder operator slacks the lead and drops it down to the chokerman. Once the log is attached, the operator reels in the slack and the attached log, dragging the log down to the yarder. At this point, another piece of equipment can pull that log out of the way and start processing it.



Figure 27.06
Yarder, Anchored on a Slope.

The yarder on the left side of the photo is anchored by cables to the two excavators down the slope. This is so it won't topple over as it pulls logs off the slope above it.



Figure 27.07
Close-Up of Grapple Yarder.

This photo shows the yarder in more detail.

A grapple is a large jaw-like clamp. When a grapple is used instead of chokers, the operator lowers the grapple onto logs and as the slack is reeled in, the clamps close around the log and pull it off the hill. This type of system may be a bit slower and less effective than using a ground crew on the hill, but it is also safer.



Figure 27.08
Lead Cables from the Yarder.

These cables help pull logs off the hill.



Figure 27.09
The Grapple.

These are the giant hooks that pick up logs from the hill and carry them down to where the machine is sitting.

Processing

The processor, not surprisingly, processes trees. For the most part, the machine just sits in one spot, but the fascinating part about this machine is the processor head. The head can pick up a full-length tree and spin it back and forth with the rollers on the head. This process cleans the branches off the trunk. The feed rollers themselves break off some of the limbs, although their primary function is to move the head up and down the tree. Two delimiting arms wrap around the tree with knives welded to the leading edge of each arm. Additional knives are mounted on either end of the processor head, to aid in the delimiting process.

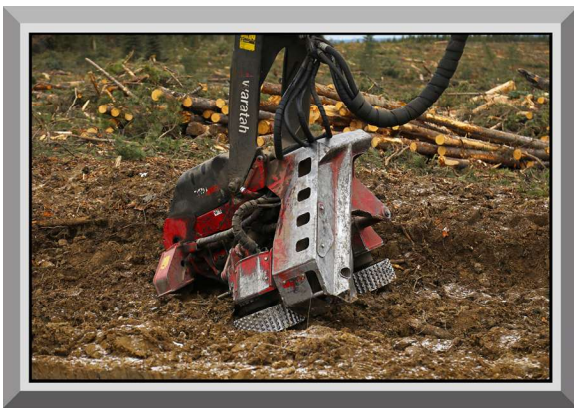


Figure 27.10
Processor Head.

This is the piece of equipment that does all the work, by grabbing the trees, rolling them back and forth, and cutting them into the correct lengths.

The processor head has a spiked measuring wheel attachment, which calculates the head's length of travel of the head along the trunk of the tree. The operator is able to program pre-set configurations, which allows the operator to simply press a button and the head will do the rest of the work in finding the proper size to cut. There is a chain saw on the head too, so once the correct length of trunk has been shifted laterally, the chain saw swivels down and cuts the trunk. The cut piece, which is often 8-foot or 12-foot or 16-foot, then drops onto the pile of cut-to-length logs, where a logging truck will eventually pick it up.

Log Loader & Logging Trucks

Log Loader is a rather generic term. Many loggers describe their equipment in more specific detail, referring to them as Butt Loaders or Top Loaders. Regardless, this piece of equipment loads logs. Loggers like to stick to tried-and-true basics when naming machinery.

A log loader picks up logs from road-side log decks, then loads them onto logging trucks. It will also unload the trucks when they arrive at the mill. The log loader can also lift up the back half of the “trailer” of the logging truck. Often, the logging truck will load the rear trailer onto the front trailer to save on wear and tear while rolling empty. Once in the bush, the log loader picks up the piggybacked rear trailer and sets it down on the ground. The driver can then hook the rear trailer to the front trailer through a flexible cabling system, so the rear trailer has brake lights, etc. After the loaded logging truck arrives at the mill, and the logs are offloaded, the truck moves to the mill’s trailer station, which is a small crane. This crane puts the rear trailer back into the piggyback position again, for the drive back out to the bush.



Figure 27.11
Log Loader.

This machine can pick up logs and load them onto the trailer of a logging truck.

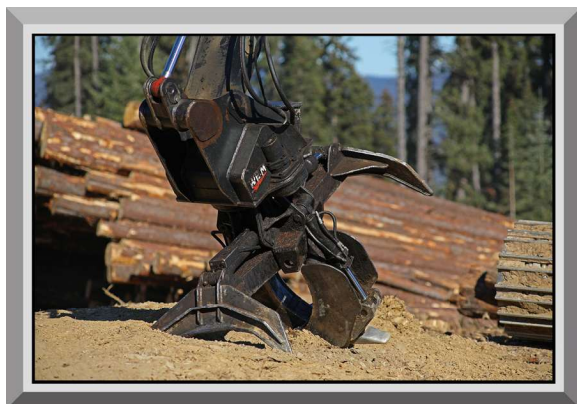


Figure 27.12
Close-Up of Log Loading Head.

Here’s a better view of the loading head that is able to grab and hold the logs while the machine swings them out onto the logging truck.

Self-loading trucks can be used for tree length or cut-to-length logging. Self-loading trucks are often used by smaller operators that may not have a need for a log loader. In these cases, the self-loader may show up onsite, load another truck that doesn’t have self-loading capabilities, and then load themselves before heading back to the mill.



Figure 27.13
Interior Logging Truck.

This truck is carrying cut-to-length logs rather than full trees.



Figure 27.14
Coastal Logging Truck.

The trees on the coast are frequently fairly large compared to trees anywhere else in Canada.

Due to timing of shifts and operational scheduling, logging trucks often travel in groups between the mill and the blocks. These groups are called rounds. Between rounds, to avoid sitting idle, the log loader will sometimes keep occupied by piling slash.

With respect to logging trucks, there are a lot of regulations for trucks that travel on public highways. For this reason, logging trucks can be loaded to different standards. An “off-road load” is typically very heavily loaded, and this type of load is ideal for when the truck restricts its travel to logging roads. A “highway load” is typically loaded to a lighter weight so that it adheres to regulations for travel on publicly-maintained highways.

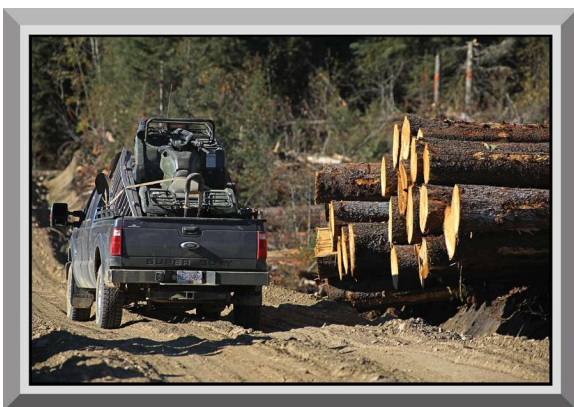


Figure 27.15
Pickup Beside Log Decks.

Some of the logs don't really seem that big when you see them sitting on a logging truck. However, when you see them beside a pickup truck, you can better appreciate their true size.



Figure 27.16
The Hammer.

The hammer is a tool which has a special series of numbers and letters, unique to each harvesting location. The log truck drivers can use the hammer to stamp the location into a couple of the logs on the load, so the mill knows the exact source of the wood.

Mulching

Mulching work is generally not a typical logging-related activity. Mulchers are typically used to clear power lines or pipelines of overgrowth. In contrast, when cutting the right-of-way and roads that lead to a cut block, the preference is to use a buncher and then process the wood. It would be unfortunate to let good timber go to waste.

If an actual mulcher is needed, there are two common options. One is to put a mulching head on the arm of an excavator, where the bucket is usually mounted. The other is to mount a large mulching unit (such as a Bull C600) on the front of a John Deere or Cat. Bron also makes mulchers that are very popular.



Figure 27.17
Mulching Machine.

This type of machine is typically used more frequently for clearing right-of-ways on pipelines and transmission corridors, rather than being used in actual harvesting operations.

This has been a quick overview of the logging and harvesting side of forestry, but at least it should give you an idea of the basics. The online media page for this chapter has a large number of photos to further illustrate what various types of logging equipment looks like.

For more photo and video resources associated with this chapter of the book, visit:

www.replant.ca/training/logging