

Chapter VI

Sawmilling

I was asked, “Why are you devoting a separate chapter for this adjunct business? What is so important here that it needs to be seen on his own?”

Actually, this is a very excellent question and deserves a well considered response... of all the businesses we’ve discussed to date, there are two I would also be most willing to undertake on my own, were health and age such that I could be an active participant!

Unfortunately, these portable bandsaw mills I will be suggesting and promoting did not yet exist when I was yet young enough to consider such a project. If they had been, I can guarantee you, knowing what I know of the wood products industry, how to procure and market wood, how to deal with entities like the US Forest Service and state forestry departments that within two years, my mill would be generating a six-figure income for me... Net income.

I included a description of this business in my recent book, “Mac Brae” and was severely admonished by my business agent at the time for allowing others to learn of this for free... As I explained to her at the time, “I am too old and too infirm to do this myself... I can find no one with the combination of an entrepreneurial spirit, personal work ethic, personal integrity and financial resources to affect this plan! Therefore, I offer it in the hopes that someone will catch a vision and move forward on their own to do this.” The service performed under this plan is of tremendous benefit to the health and well-being of the forest... A benefit to the American people and extends the life of the trees harvested

through many more generations of people... And it is 100% legal, moral, ethical and even non-fattening!

To further differentiate between the scheme I was proposing then and that which will be applicable to our homestead, the difference is legion... But it is mainly a difference in the level of production. That set up required a five man team, some subcontractors and a minimum budget of some \$150,000. This was a full-blown, industrial effort... That which I propose for us could be operated by one person alone... Although two or even three would make it much more profitable and productive and our initial budget is less than 1/10 of that gone before. Even that budget need not be entirely in cash as much of the required equipment can be rented or leased. Even that purchased can be done with as little as 10% down.

I am so sure of this business that I would not hesitate to be a partner in another's venture. Therefore, if we have need of a knowledgeable person to serve as an advisor, trainer or teacher, let me know.

Nature of Mills Available

These small, portable mills range in size (and cost) from the small, all manual mill designed with the hobby sawyer in mind. The Wood Miser LX 25 is a prime example of this type of machine and might be of interest to us as a start up mill if we have trees of sufficient size and the correct species for our needs on our homestead that are in need of thinning or clearing. Or, perhaps we might have a ready source of raw logs that can be transported to us.

Although this saw's sale price of from \$2000-\$3000 is attractive and certainly affordable, the inability to move it easily or generate higher volumes of output make it a very limited asset... Even at that low price.



My first choice for a fully manual, non-hydraulic mill would be the LT 15-GO Wide version. This mill will nicely handle a log up to 32 inches in diameter and 18 feet in length. Extra length can be added to accommodate any size long we desire. This mill comes with the trailering package that allows us to travel to our customer's site, set up in less than twenty minutes and begin sawing lumber.

Since there are no power requirements, there are no power lifting devices associated, so logs must be



placed on the mill either manually or with a separate piece of equipment. Usually, a farm tractor equipped with a front loader attachment can be made to perform this task for us. I have seen instances where an RV winch was mounted on the rail and the cable was used to winch the log up the ramp to the log deck and into place for sawing... This was slower, but it worked well.

Once on the deck, the log had to be rolled into position for cutting manually... A chore, to be certain, but with the use of a Peavey (a long handled, hook equipped tool, named for its inventor Edward Peavey, of Maine, I believe) this task, well not easy is eminently doable.



From here our next step up would be to a fully hydraulic machine. Everything from the log lifting arms to the log rollers that rotate the log while on the mill, to the toeboard's (devices used to lift one end of the log or the other to compensate for the natural taper of the tree and keep the pith, the very center of the tree, level to maximize the volume of lumber that can be cut from a particular tree. We have four basic models to choose from



each with its own particular set of features and resulting benefits and... Ultimately, price.

The minimum mill I would never consider for anything more than a couple of strong young men working together and wanting no more than a part-time business to merely supplement what they are doing on the homestead, would be the hydraulically operated LT 35... This particular mill can be a real asset to us and can do all we need done... Albeit a bit more slowly than I would consider efficient.

To me, the LS 40 super hydraulic wide set up would be a wonderful start up mill. This unit sports optional diesel engine, dual hydraulic pumps for lifting power against large logs and high speed operation. It can be fitted it out with all the bells and whistle's that would provide us with a thoroughly professional set up.

If we later decided to step up to the even more powerful and speedy LT 50 or even the LT 70 models, the resale on these machines is fantastic.



We could easily start with medium priced LT 30 or LT 40 and when we have established ourselves, we could sell this machine and move up effortlessly into our dream machine.

Log Sources

OK, we have our mill... How do we get the logs is we need to operate it? After all, there are no "Logs R Us" stores in the mall... At least not any mall near me!

First of all, we could operate efficiently and profitably without ever having a log of our own. We could advertise our services and exclusively travel to another's property and mill their logs for them, either on shares, or charge a fee per hour and every stick sawn belongs to them. This, of course, would relieve us of the necessity of marketing the lumber we produce.

In today's market, I would charge a minimum of \$80 per hour for my LT 40 and myself. They would need to have a machine there to move logs and lumber and a man to handle the sawn lumber. They would end up with their lumber stacked, with stickers in between each layer to allow airflow to dry the wood evenly... And they would also get a large pile of slab wood with which they may do as they choose... From a giant marshmallow roast to selling the slabs as barn siding... it can be rendered down to firewood or simply chipped for mulch.

How would this work out for our landowner? Would it be economically feasible for him to do this? Let's take a quick look at this and see shall we? To begin, we must understand how as lumber is measured for sale...

Many years ago the term "board foot" was proposed and accepted as a standard for measuring lumber... A board foot is simply a piece of wood that is 12 inches wide, 12 inches long and one inch thick... Or 144 in³. Therefore, a piece of lumber 2 inches thick that is 6 inches wide and 120 inches long (10 feet) would have 10 board feet in it. Today, that piece of wood will sell at Home Depot for in excess of \$23! That would mean, in the vernacular of those who use lumber, it sells for \$2.30 per board foot or, more commonly,

with those who buy and sell lumber in quality, \$2300 per thousand (M) board feet. Remember this number as we go through the steps to determine how much he is paying us to mill it for him.

With our LT 40 Super Hydraulic we would expect with decent size logs that aren't filled with rot or disease, to mill ten thousand board feet in a 10 hour day or, 1000 board feet per hour. Since our mill is costing him \$100 per hour and he is getting 1000 board feet per hour he is paying us \$100 per thousand for a far superior lumber product... far less than out building supply store... From his logs from his own land.

If one factors in the effects realized by creating a far superior product to anything sold at Home Depot, the difference becomes even more graphic... The high-quality woods our mill would produce would sell, not for the meager \$2.30/M that Home Depot's low-grade wood brings, but in excess of \$3.50 per board foot. I would think it becomes evident that this is a win/win situation for both people involved.

If we decide that we don't like giving away 2/3 of our potential profit and want the whole shebang, how do we go about it? Where do we get our own raw product to turn into profits? Believe it or not, as you wish, but I know sawyer's who have never bought a log nor a tree. Their mill is running steadily on logs acquired for free. How can they do this?

The answer is fairly straightforward...



They used what I call “distressed logs.” For example, in the area where I live, we were hit this week with a major winter storm... From Coos Bay on the southern coast of Oregon, north to British Columbia, Canada, storm winds reeked havoc with trees standing in soils super saturated by so heavy winter rains... The results were predictable... Trees everywhere were blown down on roads, across power lines and on peoples homes. Ninety percent of these trees would be available to our mill at no charge if we would just get them out of the way of crews trying to clear lines and get utilities restored... Just show up and ask them to “cut the trees into twelve or fourteen foot lengths and load them onto my trailer and I’ll get them out of your way for you!”

My friend Jason did this and soon the repair crews were not only doing that, but stacking them safely off the roadway where he could return to get them at his leisure. He hauled those he could get loaded immediately and left a stash to return to when the crisis had passed and power was back on. Believe it or not, as you will, but he filled his log storage area and had to find more space...

Next, he approached homeowners who had trees blown down in their yard or across their roof. These we can easily guess, were an easy sale... “I’ll cut that tree up and get it out of there for you, no charge!”

“Oh my gosh, would you please? I would be forever grateful... When can you get to it?”

It really was that simple...

Oh, and what did he do for more space,? His neighbor had a small field he sometimes ran a beef on, but had not for a few

years now, so my friend leased it from him for \$30 per year! He now had almost 2 extra acres of log storage for less than the price of lunch for he and his wife.

The west has been plagued with wildfires for the past several years, mostly due to mismanagement and carelessness. No matter the cause, the result is thousands upon thousands of acres of dead, standing trees... Dead trees that, for the most part, perfectly fine for sawing into high-quality lumber. The only damage to the tree being that the fire killed all its needles and maybe singed the bark. Ecologically speaking, it is highly beneficial to the forest to remove this dead growth and allow a new generation space and sunlight to germinate.



Oh yes, there are those who deny this saying, “Oh but those must be left to fertilize the soil for succession... The critters that dwell in the cavities of old trees need a home too”... And, in the strictest sense, they are correct... these are important details... But what these well-intentioned if under-informed people don’t realize is that, as was proven by studies done by the University of Washington school of Forestry, virtual no nutrients are found in the wood of the tree... All of the nutrients in a tree are found in the leaves and the roots. There is only one thin layer of living tissue... a single layer of cells that girdle the tree. That layer, called the phloem, is just inside The bark and carries the sugars created by the leaves down to the roots for storage. The leaves, or needles

in conifers, is where the magic happens... Where the green of chlorophyll can interact with water lifted from the ground to, in some cases three-hundred-fifty feet into the air, requiring some one-hundred-fifty pounds per square inch of pressure by some method we cannot begin to emulate, and the carbon dioxide found in the air... CO₂ that we have generated... added to the light of the sun and this produces complex sugars and wonder of wonders an element most life finds essential for that life... Oxygen! Truly, it is all green, growing things that sustain us here and not just the trees. In



fact, trees are the in the vast minority when the production of oxygen is concerned. All of the green plants working precisely in the same manner do this same process we call photosynthesis.

Another great source of raw materials came from a fellow he had met and cultivated a business relationship some years prior. This fellow cleared lots for the installation of mobile and manufactured homes. He had no use for the trees that had to be moved, and in fact, they were an impediment to him. The fellow would call when logs were coming available and they'd be picked up and hauled home...



Probably, at this point, the distinction between hardwoods and softwoods needs to be explained... In general if a tree has leaves which it drops each fall, it is deciduous... And classified as a hardwood species. If it has needles instead of leaves and does not lose them annually, with a couple of exceptions such as larch or tamarack, it is a softwood.

Don't be fooled by the general categories. There are hardwoods, like some poplars that are as soft as any fir or pine. Likewise there are softwoods harder than many maples or birches. While this is an important factor to know and understand, far more important are the uses or applications of each type.



Generally speaking, soft woods are structural woods, used in the framing and siding of our homes and other structures. Hardwoods are more commonly used for such things as furniture making, etc. Typically, the soft woods are much stronger than the hardwoods while the latter have much more attractive grain patterns than do their pointed needle cousins.

Again, of course, there are exceptions. The eastern white oak was, and is, used extensively across its range as a structural wood where it is plentiful and the softwoods or not. Many homes and structures, especially barns, in the eastern US, utilize white oak structurally.

In the west, hardwoods are more sparse with only a few species growing there naturally. In Western Washington, for example, where Douglas fir is king, there are only two major hardwood species milled, red alder and bigleaf maple.

It is essential that we know our market... If we plan to sell only furniture grade wood, then we should not be stockpiling fir and pine. Likewise, if we intend to market to home builders the opposite would be true.

Quite often, where we live will decide our direction as to species of wood. In the eastern half of the US, hardwoods predominate, while in the west, softwoods hold sway almost exclusively in many areas.

What Do We Saw?

Again to a large degree, where we live will dictate species... But what do we cut within species? Which is our most sought after cuts within particular wood types?

To understand this, we must first understand how wood is measured. We have described a board foot, the standard in the wood products industry, but how do we in turn determine the volume of a log? Unfortunately, logs are cylinders not squared lengths... And they are not even perfect cylinders, but they taper, sometimes significantly over their length.

All logs are, therefore, scaled (measured) as if they were a perfect cylinder. This is achieved by



measuring the diameter of the log at the smaller end and using this as the standard. The scale within the cylinder of that log is determined by mathematically determining the area of the end of the log and multiplying that by the length of the log. We then take that cubic volume and divide it by 144... The number of cubic inches in a board foot (12 x 12 x 1).

Now, since we cannot cut all square boards out of a round log, this is again multiplied by a factor of from .4 to .6, determined by the diameter of the log, understanding that

the larger the diameter the less loss due to this roundness factor.

Diameter of log, small end, inside bark, inches	Length of Log, Feet						
	8	10	12	14	16	18	20
	Content of log, Board Feet						
13	55	70	85	100	115	135	150
14	65	80	100	115	135	155	175
15	75	95	115	135	160	180	205
16	85	110	130	155	180	205	235
17	95	125	150	180	205	235	265
18	110	140	170	200	230	265	300
19	125	155	190	225	260	300	335
20	135	175	210	250	290	330	370
21	155	195	235	280	320	365	410
22	170	215	260	305	355	405	455
23	185	235	285	335	390	445	495
24	205	255	310	370	425	485	545

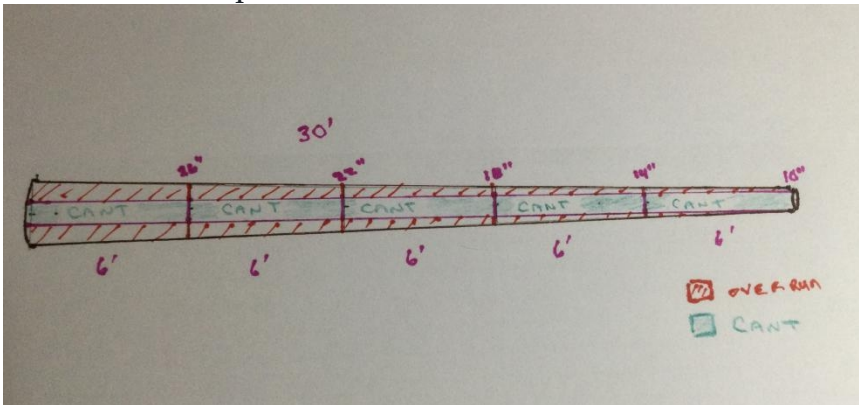
Sound confusing? Fortunately there are volume tables available to us that, when we tell it the diameter and length, it tells us the volume.

One point of measurement that will pertain to us as sawyers is the maximum size of square timber, called a cant, that we can extract from a given diameter of log. In a perfect world, where the end of a log is a perfect circle, the maximum cant will be 7/10 of that diameter. Thence, a 16 foot long log that measures 20 inches in diameter inside the bark will yield a perfectly square 16 foot cant of 14 inches on the side.

Of course, nothing can remain simple for us and when we introduce the taper in our log, we can take advantage of this factor. Western red cedar is a tree in my area that grows

quickly, hence with a heavy taper. I have a friend who cuts this wood for fencing material as it is very popular for that due to its natural beauty and extreme resistance to rot.

This tree will taper as much as 4 inches in 6 feet of log length, therefore when he buys a red cedar log 30 feet in length, with a 10 inch top diameter, the scaler expects him to cut five logs from it that are 10 inches in diameter, which would yield him five cants 6 feet long and 7 inches in diameter. By making his individual logs first, what he comes out with is one 6 foot cant 7" square, the next 6' cant is 10"... the third cant will be 6' long and 12.6" square... The fourth cant 6' will be 15.4" square, over two times the size of the first



one... And the last 6' cant will be 18.2" square. In addition to this overrun, one or two narrow boards can be cut from the slab created on each of the four sides of the cant. All of this is at the profit of the mill, when we bought the log, we only paid for that 7" cant 30 feet long that the scaler told us was there!

Virtually all logs taper, though most not as severely as the red cedar. This overrun factor is something the prudent log buyer looks for and takes advantage of!

What Do WE Cut?

The answer here is another question... What is our market? Who are our customers? What raw logs are available to us?

If I have only softwoods available to us, all else becomes moot... Softwoods are predominantly structural wood due to the extra strength of the wood due to the extra long cellulose fibers that make up that wood... Up to 2 1/2 inches in length, while fibers from hardwoods are less than a half inch in length. This simple fact means that we will be cutting predominately dimension lumber... 2 x 4, 2 x 6, 2 x 8, 2 x 10 or 2 x 12. The same woods are also in demand at one inch thickness, though not in demand in the quantities of the 2 inch stock.

Also, we will find ourselves cutting heavy timbers, but usually only by special order for these special purpose products. Some, like 4X4 or 4X6 should be sawn and an inventory kept of them, but anything much larger than those should simply be cut as needed.

It must needs be noted here that all dimension lumber purchased from the lumber yard or a store like Home Depot is not the dimension stated... i. e., a 2X4 it is not 2" x 4", but is merely 1 1/2" x 3 1/2"... A full half inch less than the advertised size. This is so because the lumberyard sells a board that has been planed to a finished dimension. We can do the same thing with our lumber and even have it kiln dried and graded. In fact, it would need to be if it is to be used in a structure that must meet a building code and be inspected. Unplaned, ungraded, full dimension lumber may only be used in structures that will not need such treatment. It would be great for the outbuildings on our homestead, but not for our home, in most places.

If we want to manufacture our lumber for official use, we can do that also, but it requires a couple of more steps... The simplest, though not the most cost effective would be to hire space from a larger mill that has kilns and a planer with a certified lumber grader on site. We would deliver our lumber, wait some days and pick it up and bring it home...

A second, more cost effective method, would be to have our own planer and contact the local scaling and grading bureau to hire a certified grader for the times that we would need him. I have done this by setting my work up on a Saturday and offering an extra day's pay for him... The chance to earn a little extra money is often incentive enough... especially if you can promise a short day!

The operational goals are a bit different if we are cutting hardwood for furniture makers. In this case, drying our wood is essential as furniture cannot successfully be made from lumber that still has more drying to be done. It is subject to further twisting, cracking or checking. In this phase a dry kiln somewhere along the line is essential! It can be a two year process to air dry lumber and even then, it will be no drier than the ambient air. If we are in Arizona or Nevada this would not be much of a problem, but if we are in the east, air drying is not going to get us below 12 to 15% moisture while the furniture builder will require it to be under 8 to 9% moisture... That is where the kiln comes in.



Today's trend towards the popularity of live edge slabs (slabs with only the top and bottom surfaces sawn and the edges debarked, but otherwise untouched) affords the savvy sawyer with a great opportunity to manufacture some very beautiful pieces from logs that have been rejected by a regular sawmill. I have seen especially well-grained slabs, two inches thick, 24 inches or so wide and 8 feet long sell for over \$1000 each! That's a board containing 32 board feet for selling more than \$30 per board foot... Made from a log that was free because no mill wanted it and they wanted it gone!



While it's true that these are not the rule, they do happen often enough to make life interesting. It is something that

can be done if we are diligent in our quest for logs.

This is the concept of our adjunct sawmill business for our homestead... Our homestead is our first concern! It would be highly beneficial to have the facility to manufacture the lumber we will need for our buildings and structures on our farm. To be able to saw some logs for a neighbor might make it a bit easier to borrow his bigger



tractor when we have a bigger chore pop up unexpectedly or maybe help him look favorably if we hire him to mow and bale the hay on the five acres we have set aside for that... If nothing else, it makes us a good neighbor... Never to be thought of as a bad thing!

Before leaving the subject and moving onto our homestead itself I wish to present a scenario for a major operation in saw milling that is only possible with a modern, portable bandsaw.

Doing It Big

It was mentioned earlier that the massive fires across the west have left millions of acres of standing dead timber. Add to that, the further millions of acres of bug killed trees also dead and standing and we have the makings of a first rate opportunity for the ambitious business with the correct model.

This dead timber can be purchased from the states or from the US Forest Service, depending on who owns the ground, for clearance prices! I have made such purchases for as little as \$50 per thousand board feet! There are literally hundreds of tracts like this waiting for someone with a plan.

This scope of business will require a greater investment in start up cost and it will take six people... In a partnership arrangement, as described prior. The table shows the major equipment needed an approximate cost of each as can be seen,

As can be seen, this is a sizable investment... But the rewards are great as well. The sawmill itself is larger, faster

and more capable than anything done heretofore. The Woodmiser LT 50 Super Hydraulic with all the bells and whistles with the largest diesel engine option as well as the debarker and board return systems is the minimum to be considered here.

In the Northwest, raw logs cannot be exported off Federal National Forest, nor off State Forest land. However, after it has been milled, it is perfectly legal to export the milled product. This is our plan... We will purchase salvage at "fire sale" prices, saw slabs off four sides and load the cants on a flatbed trailer for transport to the nearest export facility.

It would take an average of 100 logs per load. This means it would be necessary to cut one log every six minutes... That is to load it on the mill, cut four slabs off and move it out... It's easily doable... In fact I would make that my standard... One trailer fully loaded constitutes a days work... 35,000 board feet per day!

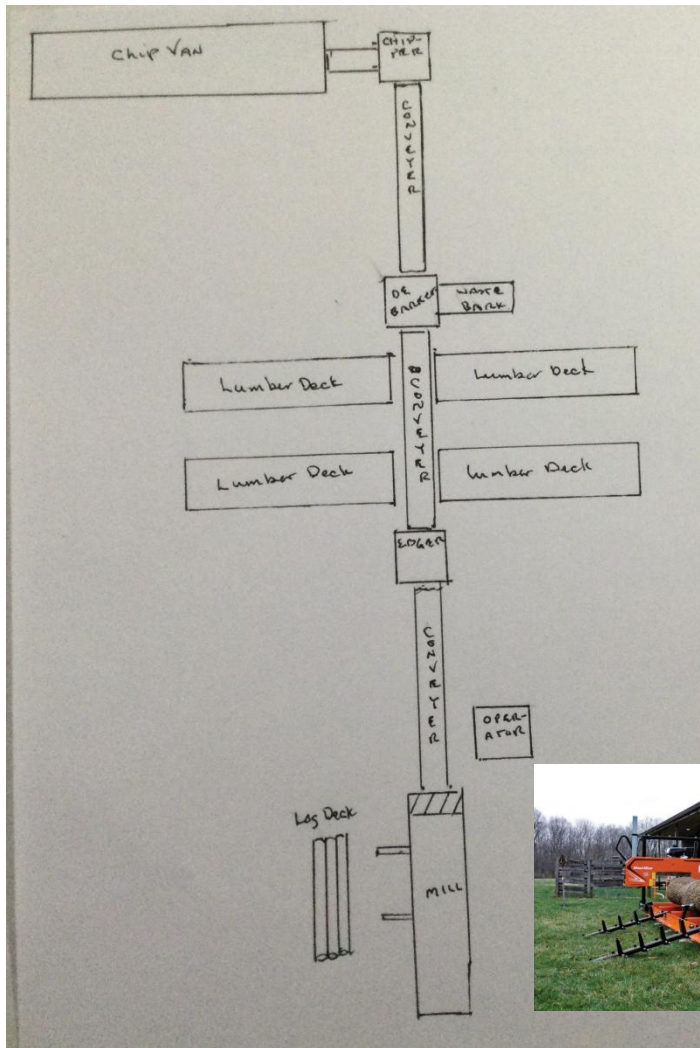
There is our main product... But what about those 400 slabs we've generated today that have a potential for profit as well? We have options here as well... Perhaps the easiest is to just send them to a chipper on site where they will emerge as garden mulch. The second option would be to reduce them to firewood which could be sold at a profit... Or, lastly, remove the bark with a debarker and run the clean slab through the chipper and into a chip trailer for transfer to the nearest papermill... The bark removed could even be marketed for garden bark.

The ultimate result would be when we are done, there would be no waste left in our work area! What began as a burned stand of black and dead timber is now cleared,

cleaned up and ready for re-planning... Ecologically and environmentally, this is totally sound management. We have provided a great service and then made a substantial profit doing so!

This type of operation has the potential to generate a six-figure income for all six people involved... it is huge!

To the equipment listed below, add chain saws, hand tools and safety equipment totaling \$2,750 and the entire package, set up and ready to run is under \$136,000!!



Needed
Equipm
ent and
Cost





LT 50 Sawmill
\$65,000

Flat Bed Trailer (2)
\$6,000



Jobsite Fire Trailer
\$2,500

Skid Steer
\$25,000



Skidder \$25,000

Chipper
\$4,500



Shop Van
\$2,500



Saw Filer
\$750

