

The Mortimores Juniper Log Factory

To most timbermen, the continuing invasion of the juniper tree is a problem; it consumes resources “intended” for pine. As a species, juniper is quite young. It has been around for only about 8,000 years. Contrary to what you may have heard, juniper grows throughout the world. In Oregon there are four separate species. People that study such things know that juniper is invading our forests and rangelands. Ranchers know that as juniper moves in grasses leave. So what do we do with these pesky trees? Throughout Oregon there is a growing juniper products industry. Those trees can be utilized to turn a profit.

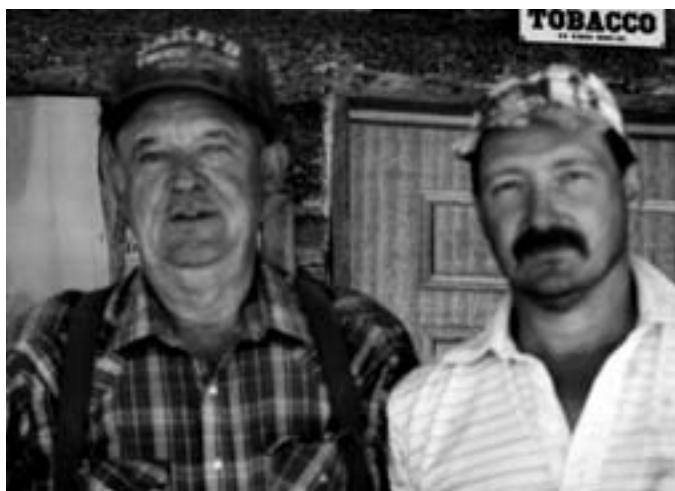
Earl and Richard Mortimore (son & father), together with the help of their wives, have such an operation in Twickenham. You don’t know where that is? Northeast of Mitchell, about 18 miles. The Mortimore’s convert raw juniper logs into finished building logs and they do a remarkable job.

I had never seen this type of log house before—a house constructed of logs of uniform diameter—so Richard’s wife, Nadine, gave me a tour of the house in which she and Richard live. Each log has been “manufactured” to a uniform 8-inch diameter. The fit of log on log appeared perfect. There is an insulation strip resting in a groove between each log and each log is bolted to its neighbor as the wall goes up. This gives the house an overall insulation rating of R19. Richard built the house “as he went”; there were no drawings from which to work. It is a wonderful house in which there were several examples of wood furniture also made from juniper.

The log processing site is not large. When I arrived the equipment was in operation. Richard runs the processing side of the operation while Earl looks after the logging part of the business.

At first glance this is not a very impressive operation. Looking more closely, the operation becomes very impressive. The equipment consists of a number of components, most of which

are driven by a single power source, a diesel engine. Manual labor is reduced wherever possible through the use of hydraulic lifting and holding devices. The logs are hoisted onto a bed (for



Earl & Richard Mortimore

lack of a technical term) prior to being fitted onto the “lathe”. Juniper logs are never very uniform and often very nonuniform. Since the goal is a uniform 8-inch diameter log, the raw logs must be at least 9 inches at the small end (10 inches is better) before milling starts. The logs are of various lengths as the building process contains ways of fitting logs together to form longer logs. For “commercial buildings”, logs up to 14-inch diameter can be produced.

The log is attached at both ends to devices that hold the log off the bed and rotate the log at a set RPM. Once the log is secured, the operator starts the log rotating. The device that is used to trim the log is similar to a debarking machine—but only similar. A set of knives (not a saw) “eat” away at the log as the cutting head passes down the length of the rotating log. Since the log, especially at the beginning, is far from uniform, there is more or less material cut away as the cutting device passes down the log. The process is similar to pole peeling.

When the cutting device reaches the far end of the log the cutting head is lowered another notch and the head starts back up the log; trimming occurs in both directions. This process continues until the log reaches a uniform diameter for its full length. The log is now transferred to the other side of the platform.

On the finishing side are a number of cutting devices that will convert the machined log into a log suitable for building. The logs are not manufactured for log home kits. The logs are used in custom-built homes where each log is fitted in place as the building is constructed; there is no pre-assembly. An insulation strip is inserted in a groove that runs the entire length of the log and then the log is bolted to its neighbor. The finished log may have a number of cuts made depending on the log and the function that it will serve in the house.

All logs receive a concave cut throughout its length for the insulation strip which also insures an air-tight fit. Some logs, ones that are to be used at outside 90-degree corners, are cut to accommodate the overlapping which gives a log house the appearance we are accustomed to seeing. One end of all logs, and both ends of some logs, get an additional rectangular “notch” cut into the butt end. This cut provides for the “connecting” of two short logs to make a longer one. When logs are so joined it is almost impossible to detect the joint.



The concave cut and vertical groove, both of which receive insulation strips between adjoining logs.

With all the cuts made, the logs are moved from the platform to the storage pile. Since Juniper Log Homes cuts only for orders received there isn't a lot of finished product stacked around. The logs are processed green and seem almost immune to checking and warping; they hold up very well and seem to dry without shrinkage.

The process of converting raw logs into building logs creates quite a pile of left-over material. Don't call it waste because all left-over material is converted to other products. Juniper chips, for example, are in demand as bedding for animals because the chemicals contained in the chips deters insects. The chips are also used in landscaping. The leftover pieces of processed logs are either chipped or sold for firewood.

Juniper is a very “dirty” species of tree and



The “left-over” ends of logs are sold as firewood. Sawdust and other trimmings are sold as mulch.

there is bound to be some raw logs (usually heavily deformed) that never finds its way to the processing platform. These logs are cut into firewood.

No log can be processed until it is harvested and brought to the processing site. This is Earl's part of the operation. Earl recently purchased a large delimeter. When he was talking about making this purchase he was told “it will never work on juniper trees.” I've seen it work, and work it does. Earl can process a load of logs in two hours using the delimeter where it use to take two days. That's improvement.

But not all of Earl's logging is high-tech. Trees are still felled by chain saw. A Timberjack skidder brings the trees to a landing where the delimeter cleans them up and loads them on a special log truck. (A second log truck, a self-loader, is now stationed at the sorting yard.) Then off to the processing site for sorting and some cleanup "knot-bumping".

Juniper trees don't limb as cleanly as, say, pine, thus the need for additional knot-bumping. The logs are also bucked to desired lengths and



If you've never seen a delimeter work, a brief description may help. The machine securely grabs a downed tree in such a way that its movable arm can slide out along the tree's bole from butt to top. The head is fitted with a series of cutters which remove the limbs as it moves. Sometimes the head is run in and out a number of times to achieve a cleaner log.

This task when done manually is known as "limbing" and is performed by loggers called "knot-bumpers." The lingo of the woods is a language unto itself.

stacked in piles.

Processing juniper logs has an advantage over other species. Because most people consider the juniper a "weed", most landowners will happily let you harvest the junipers free of charge. As the timber industry evolves that may change.

The Mortimore's operation contributes a valuable product to the building industry and helps rid the land of "those pesky juniper trees".

Additional photographs of the Mortimore's operation can be found at the end of this section.

Next, some additional material on juniper trees.



Those damn juniper trees (*Juniperus occidentalis*) are ruining my land!

Perhaps, but maybe not. Later in this section is an article from the April 1997 issue of *Ruralite*, which customers of Central Electric Cooperative receive, reporting on one man's attempt to utilize juniper. There is also a reprint of an article about Gary Gumpert's adventure into juniper processing.¹

As a coincident, I attended the Western Juniper Forum '97 held in Bend on April 21, 1997. The Forum was put together by the Western Juniper

1. The following three articles have been reprinted from *Timber History News*, May 1997, a newsletter that was published during the early phase of my research. I cannot locate the original authors to request permission but have assumed, whom-ever they are/were, would like to perpetuate this information.

per Steering Committee which is a group of individuals (government agency professionals, scientists, land owners, and others interested in “the juniper problem”) dedicated to learning more about the juniper tree.

The Forum was divided into two major focus groups: science and industry. I chose to attend the science presentations. Throughout the day original research results were presented. In some cases this research is still in progress. I learned some very interesting things about juniper—a few of which I’ll share with you. I didn’t take any notes since the Forum leaders promised to publish a summary document; they didn’t and another educational opportunity was lost to your’s truly.

The juniper tree (of which there are over 30 species) has existed for only about 8,000 years. In geologic time, that is less than a heartbeat. Junipers exist on every continent but two, of which Australia is one, and in every state of the United States but two, of which Hawaii is one (had I taken notes or the summary produced I could name the seconds; alas). Where junipers exist there is almost always more than one species present. In Oregon, there are four species. In Prineville the predominant species is western juniper (*Juniper occidentalis*).

The species of juniper that exist in Oregon originated in northern California, somewhere west of Redding. This fact has been carefully documented through DNA research.

Juniper trees live for as long as 800-1,000 years. But as you probably know, the juniper trees of our area have a problem: the heartwood dies leaving the center of the tree more-or-less hollow. This condition makes milling of the tree difficult. (The juniper found in eastern Oregon—called red cedar—does not have this rotting problem.)

There is little doubt that juniper is spreading and as it spreads stands tend to become thicker. If left unchecked the stands will become so thick that nothing else will grow. In fact, the junipers themselves suffer from their own success. As a stand reaches a certain percentage of overstory

coverage the trees ability to reproduce is restricted and the trees become less vigorous. By this time, however, the ground under the trees is bare of all vegetation and soil erosion is a significant problem.

Encroachment of juniper usually means a degradation in range forage conditions. There is some question whether or not this encroachment is harmful to the reproduction of pine forests. One silviculturalist told me that she was beginning to see some relationship to juniper encroachment and the spread of a pine forest *down* a mountain-side; the junipers seemed to be leading the pines down the hill (this is not research, just observation).

Junipers do consume a lot of water. They also consume other nutrients from the soil and their ability to “suck the earth dry” is significant.

I’ve been asked, “If they continue to cut all those juniper trees, the hillsides will slide down into the streams and onto the roads.” If the cutting of juniper trees is done correctly this will not happen. The juniper trees themselves do little to hold soil in place (they may even promote movement of soil). As grass and brush began to repopulate a site after juniper cutting the grass and brush has more holding ability than the trees.²

As with many subjects related to our forests there is controversy about reducing the number of juniper trees. NASA has funded a research project to determine the ability of juniper and sage to pull carbon dioxide from the air (and, through the natural process of trees, release oxygen into the atmosphere). This project is being done somewhere in the juniper-sage forests between Sisters and Redmond. The results of this project could cause us to look upon the juniper tree in a different light. Trees—all trees—have value beyond lumber

The following article, an interview of Earl Mortimore by Curtis Condon, appeared in the April 1997 issue of *Ruralite*, and is used with permission.

2. Off to the southwest of my house at the base of Pilot Butte (Crook not Deschutes) my property encompasses a hill that was heavily populated with juniper. As a test, I removed all of them and the resurgence of native grasses has been amazing.

Entrepreneur Discovers Juniper's Silver Lining

By Curtis Condon

Juniper has been a source of scorn for centuries. The tree is considered a nuisance by many, and of no good use other than for firewood.

However, Earl Mortimore doesn't necessarily agree with that notion. This Twickenham, Oregon, entrepreneur sees juniper's abundance in his region as an opportunity. "I've heard that a juniper tree will drink 87 gallons of water a day, if it has access to it," says Earl. "It's classified as a weed."

Earl has taken this "weed" and turned it into beautiful log homes and outbuildings, elevating the wood's status to prime building material.

For about \$11,000 [1997 value] he says he can provide the logs to build the exterior shell of a 1,400-square-foot, two-bedroom house.

Earl has only been in business for about a year, which began with the purchase of an old mill he uses to cut and shape the logs. He says that word about his juniper log houses is spreading and business is picking up. He has already built four structures and is working on a fifth, with more projects on the horizon.



"I've had the idea for about 10 years, but I guess I wasn't brave enough to do anything with it until now," says Earl. "I've been around the junipers all of my life and nobody was doing anything with them. So I thought, 'There's got to be something else they can be used for.'"

Juniper is not what most loggers would consider prime timber, since they are relatively small trees.

"The best junipers you'll find is in some of the draws, where they might grow to 60 feet or so," says Earl.

Earl gets most of the logs he uses from timber owners who thin their parcels by cutting the juniper, because of its voracious thirst. He also gets juniper from area ranchers, who are more than happy to get rid of them.

Earl is proud to point out that nothing goes to waste in the process. He sells logs that are too big for his mill to other mill owners, who cut them up for lumber. The smaller pieces are used for such things as fence posts and bed frames. The juniper chips are used as landscaping material or for horse stalls.

"Juniper is a beautiful wood," Earl says, noting that a coat of varnish brings out the full beauty of juniper's reddish-brown and blond color. "That's another reason I got started. Log homes have been a longtime fixture in rural areas of the West."

But Earl has put a new twist on an old idea: He has taken something scorned and overlooked by others and turned it into a beautiful, sought-after commodity.

You might say he's created a house of a different color.

The log home seen at left, shows how tightly the juniper logs fit. This home sits between U.S. Highway 26 and the Ochocos as you drive from Prineville to Mitchell.

There Was this Guy in Prineville

³It is rare to talk to anyone about western juniper without Gary Gumpert's name coming up. Gary owned and operated a mill in Prineville from the mid- to the late-1970s. He probably produced and sold more sawn juniper product than anyone ever did before him or has since. The mill was sold in the late-1970s and burnt down soon thereafter.

Gary did most of his own logging (90%). Major selection criteria for juniper saw logs were limbs (the fewer the better) and length (24-32 ft.). He did not necessarily want large logs because they were often rotten in the center. According to Gary, most of the costs involved with juniper happen before the log gets to the mill.

The head rig in Gary's sawmill was a 54-in. band saw with a .105-in. kerf and taper blocks. He spent a lot of time working-out best tooth and gullet angles, depths, and spacing. Gary used a "real spendy" 32-in. circular saw with the same kerf as the head rig for resaw. The resaw had close to 300 teeth, and required lots of water and close attention to tension.

For secondary processing, Gary had two moulders with a saw in the middle for making tongue- and-groove (T/G) paneling. He also built himself a machine to make end-match paneling. Lumber was finished with a large drum sander using 120 grit paper.

At the time the mill was sold, Gary said he was processing about two-thirds incense cedar and one-third juniper. Standard log-length processed was eight-feet and target size board was 1-in. by 6-in. This was then resawn to 7/16-in. It usually took 16 to 20 eight-foot logs to make about 1,000 ft. of lumber.

Gary said juniper was harder to cut than incense cedar; "burley growth" patterns caused the headrig to "snake". But proper saw sharpening, RPMs, and sufficient water solved 80% of the problem. Juniper logs also required more passes with the head rig to square

them up, and often had to be turned four and five times on the saw carriage to minimize sap/heartwood mixtures in the same board.

Up to 40-50% of a log went into the hog bin, according to Gary. Overall, he guessed that 50- 60% might be lost during primary breakdown and another 30-40% during secondary processing. Gary thought you would be lucky to get 40% yield out of a juniper log.

Gary air-dried lumber before putting it into a small kiln he constructed. Seven to nine stickers were used per eight-foot board, with the outside stickers at each end. He protected lumber from the sun to prevent yellowing. Moisture content was usually 20-30% before being put into the kiln. More lumber was dried in the spring and fall, when it was not so hot.

Kiln schedules probably did not exceed 130-140⁰ F normally, and recycled moisture was sprayed back into the kiln. Target moisture content was 10-12%. If logs had been laying around for awhile, kiln temperatures were raised to 150⁰ F to kill "bugs".

Gary said they made a lot of different products. The "mainstay" turned out to be decorative paneling, which was T/G, end-matched, and generally three to five inches in width, random length. His main customer was Simpson Lumber. He sold it by the box, 32 sq. ft. per box. Wholesale price was \$18/box for juniper and \$15/box for incense cedar.

Other juniper products included: Tables, chairs, gun cabinets, display panels, coffee table slabs, and fireplace mantle slabs.

Gary also did some laminating. He would take half-inch thick by about two-inch wide cull boards, put enough of them together to make four- to six-inch wide blocks, and then would re- saw the blocks to make counter-tops and other products.

Gary now owns a farm/ranch operation outside of Prineville, as well as a trucking business. His juniper products are still owned with pride by many people, and if the word "juniper" is brought up in a conversation, you often hear people say: "There was this guy in Prineville...."

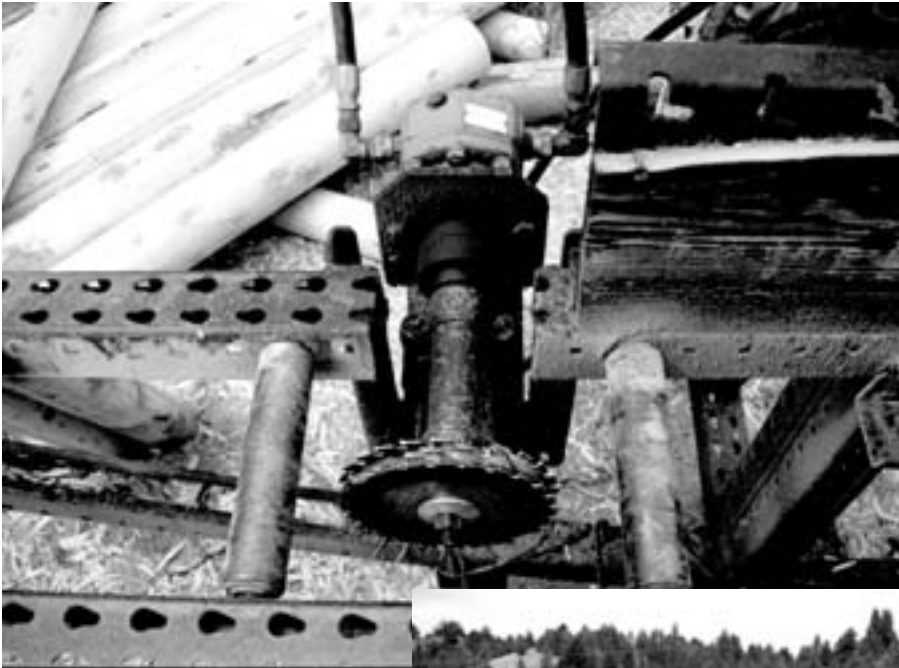
3. From the Summer 1996 issue of *Western Juniper Newsletter*.

GREEN GOLD



Above left, processor cuts concave surface which will butt the adjoining log. Right, the cut-off saw cuts log to desired length. Below left, view of notch used in joining logs at 90-degree angles as shown at right. Without a doubt, these are "custom-built" logs. The Mortimores do not do actual home construction, just the manufacture of logs for that construction. This site is some few miles northwest of the wide spot in the road known as Twickenham. Very country, very beautiful environment in which to work.





Cuter (two saw blades) that makes the insulation groove in the logs. This cuter sits on the opposite side of the work area from the lathe side.

Looking back at the operation. The log trimmer is on the right and the finishing side to the left. The raw logs are moved by machinery to where you see them on the ground at right of the machinery. They are hoisted by power winch to the height of the trimmer where they are attached to the movable part of the trimmer. That part slowly moved towards the camera as the operator adjusts the mechanism containing the cutting heads.

