

The Guide to Owning Heart Pine:
A Rare American Treasure



GOODWIN
Heart Pine Company

Some Beginning Words

The information provided in this booklet is just the beginning of what you need to know about fine wood floors. Since we do not know all of the special conditions in your home, it is not possible to meet all of your information needs here.

Due to the vast amount of technical considerations for installing a wood floor, we recommend consulting a wood flooring professional. Goodwin Heart Pine would be glad to help locate someone in your area.

If we can help with additional information needs, we are glad to do so. Please tell us about your experiences so we can pass them along to future Heart Pine owners. We truly appreciate your interest in Heart Pine and Heart Cypress.



INTRODUCTION

Retrieving the Past	1
Listening to Mother Nature	2
<i>Why choose wood floors?</i>	

HEART PINE HISTORY

Heart Pine: A Rare American Treasure	3
A Walk Through Time	5
Growing-Oh-So-Great	6
Planting for the Future	7
<i>Restoring The Longleaf for future generations</i>	

INSTALLING AND FINISHING

This Way to the Finish	10
<i>Nine installation and finishing essentials</i>	
The Inside Story on Site Conditions	12
<i>Getting down the installation basics</i>	
Finishing Heart Pine has Never Been Easier	16
<i>Our step-by-step suggestions for finishing Heart Pine</i>	

MAINTENANCE AND FLOOR RESTORATION

Keeping Your Floors Looking Beautiful	21
<i>Simple steps to preventive maintenance</i>	
Reviving Your Floors' Finish	22
<i>When it's time to renew your finish</i>	

MANUFACTURING AND ORDERING

Time-tested Standards	24
<i>How we manufacture your Heart Pine</i>	
Ordering is Simple	26
<i>Your choice of grade and grain patterns</i>	
There's More Than the Floor	28
<i>Mouldings, trim, and stair parts</i>	

FOR MORE INFORMATION

Square Feet • Board Feet • Linear Feet	29
<i>How to make sense of these measurements</i>	
Specifications of Goodwin Heart Pine	31
Mechanical Properties of Heart Pine and Heart Cypress	32
References	33

Retrieving The Past

This guide is written for everyone who loves beautiful wood, especially Heart Pine. Once you hear the story behind Heart Pine, you will want to know more. It is not only old and in limited supply, but Heart Pine is also one of the most beautiful and distinctive woods you will ever see.

Sadly, clear-cutting of Longleaf Pine forests in the late 1800s has made this magnificent wood quite rare. Today Heart Pine is available only in limited quantities - either by salvaging timbers from old buildings, cutting down the few old trees left, or like we do it... by retrieving the logs, lost a century ago, from riverbeds.

While we make our living recovering and preparing this resource before it is lost forever, we are also actively working with Heart Pine specialists throughout the country to encourage the reforestation of Longleaf Pine. This slow growing tree takes several hundred years to mature, so now is the time for us to plant for future generations.

Everything we do at Goodwin Heart Pine is concerned with making sure you enjoy your experience with our products. Please do not hesitate to call me or any of my staff at (800) 336-3118 if we can be of assistance.

Enjoy!

George Goodwin
Owner



George Goodwin is involved in every stage of our business. He may not pull every log out, but he does personally saw, dry and inspect every board milled at Goodwin Heart Pine Company.

Why choose wood floors

Mother Nature is truly our greatest artist. It could be argued that wood is her most practical, yet beautiful, building material. Wood has an infinite variety of grain, texture and color that is warm and adaptable to decorating trends. Wood floors provide the perfect background for your cherished possessions, both antique and contemporary. Each board is a natural work of art.

More important are the practical benefits wood floors offer:

1. Wood floors will last the life of your home. Carpet and vinyl must be replaced from time to time, and stone or tile show wear more readily than wood. When your wood floor's finish finally shows wear you can easily recoat the finish to restore its original beauty, or you can give the floor a completely different look with another type of finish.
2. An intelligent investment, the purchase and maintenance of a wood floor is normally one-half the cost of lifetime carpet care and replacement.

3. Wood is a natural insulator composed of microscopic hollow cells that create thousands of tiny air pockets. Just one inch of wood equals the insulating qualities of fifteen inches of concrete, so your house stays warmer in winter and cooler in summer.

4. Wood flooring is a healthier alternative. It is the choice floor covering for those who suffer from allergies. The flexibility of wood makes it one of the best choices for your spine and legs, particularly when compared to tile or stone.

In summary, wood flooring provides:

- A wise investment
- Long-lasting elegance
- Comfortable living
- Adaptation to new decor
- Natural insulation
- Easy maintenance
- The best choice for your health!

Southern rivers are wide and slow moving. Rafts made of logs were the surest method of transport. Sometimes a serious bend in the river could require using ropes to snub off the trees and avoid a collision with the river banks.



Characteristics of Heart Pine (Longleaf Pine or *Pinus Palustris*)

Red tones: light rose to deep burgundy in color

Durability: heartwood lasts for centuries

Beauty: famous for variety of grain patterns

Hardness: comparable to Red or White Oak

Rarity: a greater percentage loss than the wetlands

Everywhere you look in the Southeast you will see pine trees. As you observe these trees more closely, one tree begins to separate itself from the others. You have to look closely because these trees are rare.

Its needles are long, flowing and emerald green. The cones it bears have a rich, coffee-bean color. As the tree matures, its tall, slender elegance gives it a

majestic look suggesting an aura of royalty. This tree is known as the Longleaf Pine, or to those who know its wood, Heart Pine.

Of the original 85-95 million acres of Longleaf Pine forest, less than 10,000 acres of original growth forests remain today. These trees once dominated the entire landscape of the Southeastern coastal United States.

Because of its beauty and durability, Heart Pine was declared the "King's wood" for shipbuilding when America was first colonized. Heart Pine was steadily logged as settlers moved southward into the Florida peninsula.

After the Civil War, logging reached its height as large tracts of land were cleared to the Suwannee and other Southeastern rivers. Prior to 1900, rivers were the primary means of transporting logs. Trees were hand-felled by axe and then dragged to the river by oxen. There they were fashioned into rafts and floated downstream to sawmills. The heaviest, most dense logs often came loose and sank to the river bottom.

Precious Heart Pine was extremely popular in the 1800s and was used in the construction of fine Victorian homes, hotels and palaces throughout the world. Factories and warehouses were almost always framed with thick Heart Pine timbers because of their virtually indestructible strength. Many still stand today.

When forest management finally began around 1915, it was too late to save original growth Heart Pine. Already, more than 200 billion board feet had been timbered leaving less than one percent of the great virgin forests spread out over small, isolated stands. *It takes up to 500 years for Heart Pine to mature and the forest environment had changed so drastically that reforestation was not considered feasible.*

River-recovered Heart Pine is not only antique and original growth, it has never been used before and does not have the nail holes found in salvage lumber.



Log rafts on the Apalachicola River, 1895. Probably a few hundred yards downstream there are rapids and shallow areas with rocks protruding or just under the surface.

Today, Heart Pine is available in limited quantities, either through salvaging timbers from old buildings or reclamation from southern riverbeds. Since the River-Recovered logs have never been used before, they render the most pristine wood available. Our aesthetically inclined customers appreciate the history of Heart Pine as well as its rarity and beauty. Discriminating buyers increasingly choose Heart Pine for their projects. Following are a few reasons:

Heart Pine provides a lifetime investment

When you install Heart Pine you are making an investment that will endure throughout time. You can find Heart Pine floors in good condition in homes of 100 years or older. Heart Pine increases the resale value of your home, an important consideration for a mobile society.

River-Recovered Heart Pine helps to recycle and preserve the Earth's resources

If you want fine lumber, but can not bear the thought of sacrificing trees, take heart. Goodwin Heart Pine is supplying lumber cut at least 100 years ago--without cutting down a single tree. Replacing loggers' outfits with wet suits, the Goodwin Heart Pine team combs riverbeds of the south, recovering logs of Longleaf Pine that are perfectly preserved by the cool waters and lack of oxygen. Because the

logs are retrieved by hand instead of dredged by machinery, river bottoms and the aquatic life remain undisturbed.

Heart Pine is famous for its beauty and rarity

Heart Pine is among the world's richest and most beautiful wood. Once used as structural lumber as well as in all other facets of construction for its hardness and strength, Heart Pine is quite limited in availability today. Cherished throughout American history for its gorgeous red color, Heart Pine boasts three distinct grain patterns:

- Select: a blend of quartersawn and plainsawn, no two boards are alike.
- Vertical: quartersawn, a pin-striped grain pattern, with more consistency.
- Curly: highly figured, only one log out of a 100 displays this grain



Bagdad Land Lumber, Pensacola, Florida, circa 1917. Bagdad was one of the largest Heart Pine lumber companies in existence during its heyday.

The Endangered Longleaf Pine Forests

Considerable research has gone into uncovering the history of the Longleaf Pine tree and its Heart Pine wood. Much of the information here comes from Tall Timbers Research Station, a non-profit ecological organization.

The old-growth Longleaf Pine found by the settlers made an excellent all-purpose timber. The tall, straight trunks made superb masts for sailing ships and structural timbers that were rot and bug resistant and, for their weight, as strong as steel. Four-fifths of the houses in Florida, Georgia, Alabama, and the Carolinas were made of Longleaf Pine. Later in the 19th century, as industrial America began to flex its muscles, it was Longleaf that provided joists for the new factories and timber for bridges, warehouses, railroad cars, and wharves.

Longleaf was also valuable for another reason. It was heavily saturated with a gummy resin which was the raw material used in the making of naval stores: tar, pitch, spirits of turpentine, and rosin. Turpentine was used to thin paints and coat children's cuts. Farmers made medicines for their

Domestic animals with it. Rosin, the residue of the turpentine process, was used in soap making, weatherproofing, and shoe polish. You could not go anywhere in the piney woods of 150 years ago without running into naval stores activity.

By the early 1890s, turpentine and logging had laid waste to massive portions of the Longleaf forests.

Gifford Pinchot, Theodore Roosevelt's chief forester, said that the solution was "a complete protection from fires." Though well-intentioned, this prescription doomed the remaining Longleaf forests. Longleaf had developed natural protection from fire, and it was frequent fire, occurring naturally in the Longleaf belt, that had beaten back the Loblolly Pines and kept the Scrub Oaks at bay.

In later years, the timber industry actively preferred the fast-growing Loblollies--transforming the eastern landscape forever. The forests were still green, still coniferous in many places, but this was a replacement forest with a lower quality timber that bore no resemblance to what had grown before.

The best known "virgin" Longleaf forest grows near Tallahassee, Florida. Tall Timbers Research Station control-burns the 250 acres of forest every two or three years, and as a result the rolling landscape is kept open and airy. Ecologists throughout the Southeast make pilgrimages to the forest to glimpse one of only two or three Longleaf stands in pre-settlement condition.



This special shipment at the Alger-Sullivan Lumber Company in Century, Fla., featured beams averaging 48 lineal feet and 570 board feet per piece. The timbers were 12'x12' to 16'x16'.

Before the Europeans arrived in the New World, Longleaf Pine was the principal tree species found on upland soils of the Southeastern Coastal Plain. At least 75 million acres of Longleaf forests were reported. Longleaf covered 41 percent of the entire land mass of the deep South East.

Longleaf dominated the landscape more than any other tree. Instead of growing upward right away as most saplings do, Longleaf seedlings "sit" flat on the ground in what is termed the grass stage for periods of three to fifteen years. During this time the young tree grows a long, heavy taproot to store food and help it shoot rapidly upward when it does grow. When it does decide to race skyward, the tree delays putting out branches. This "jumping upward" is a strategy for surviving in an area of frequent summer lightning fires because it minimizes the time the tree's growing tip is vulnerable.

John and William Bartram, early botanists, described Longleaf in its grass stage. So sunny and open were the Longleaf forests that he often compared them with parks and meadows. In 1791, Bartram wrote, "We find ourselves on the entrance of a vast plain... mostly a forest of the great long-leaved pine, the earth covered with grass, interspersed with an infinite variety of herbaceous plants, and embellished with extensive savannas, always green, sparkling with ponds of water...."

A century later John Muir wrote, "The seedlings, five or six years old, are very striking objects to one from the North, consisting, as they do, of the straight, leafless stem, arching and spreading like a palm. Children fancy that they resemble brooms"

Fire is a necessary cohort to the Longleaf. The low burning flames caused by the frequent lightning storms in the south burn back the young hardwoods that would otherwise dominate. The fires also prepare the ground so the Longleaf seeds can grow. The Longleaf times its seed production by the fire cycle, and the seeds time their growth to fire. In pre-settlement times the only barriers to these natural fires were wetlands. In those days, broad Longleaf forests stretched out for thousands of miles. Fires in these areas are reported to have burned for weeks, slowly moving over most of the pinelands in their paths.

Longleaf is one of the few southern pines that masts, which means that in certain years all the trees in an area produce cones and seeds in much greater quantities than in average years. If seed production is low in most years, the population of seed predators would be low. Then, when the mast year comes, the trees produce far more seeds than the animals can eat. If the tree masts during years of high fire probability, the chance is also greater that seeds will fall on a fire-prepared seedbed.

A letter to everyone who loves beautiful wood:

"Longleaf Pine Management," first written in 1983 by USDA foresters Roger Dennington and Robert Farrar, Jr., begins with, "Many foresters have the misconception that longleaf cannot be planted successfully." Today, in 2001, forestry management groups encourage landowners to plant Longleaf.

Timber companies, such as T. R. Miller of Brewton, Alabama, cite the economics of growing Longleaf as the reason they have replaced Slash Pine with Longleaf in recent years. Longleaf is more resistant to diseases and pests than any other pine, and although it takes longer to mature, its wood products are higher quality and bring greater prices.

According to Dantz Frazer of F & W Forestry Services: "Longleaf stands produce excellent wood products and also offer a diverse wildlife habitat utilized by many mammals, birds, and reptiles. Along with the wood products and wildlife habitat, mature longleaf stands are the most aesthetically pleasing of the pine species. Landowners must be shown that management for longleaf can be economically beneficial and that this type of forest can offer much more than just money."

Preservation of the few remaining fragments of the Longleaf forest and its ecosystem is much less certain than the tree's future. Once the dominant forest system in the South, the Longleaf Pine was described in the *Natural Areas Journal*, October 1989, by conservation biologist Reed Noss as, "One of the most endangered ecosystems in the world."

Last year, Roger Dennington told us, "The remaining Longleaf forest is in trouble. We are still losing 140,000 acres a year. It's time for increased action in both the political and educational arenas. We should explore organizing to preserve the remaining natural Longleaf areas. A forest is more than the trees."

What Roger Dennington was referring to is the biodiversity supported by the combination of Longleaf Pine and a wiregrass understory. Together these two plant species foster one of the most

Herbaceous floras on earth, and 191 rare plants have been identified in the longleaf-wiregrass forest ecosystem. This forest also promotes a rich fauna, an abundance of wildlife distinctive to the region. Sherman's fox squirrel, the endangered red-cockaded woodpecker, and the gopher tortoise are among the vanishing longleaf animal specialists, all of which need at least 90 year-old trees to make their home. The red-cockaded woodpecker excavates nests only in aging longleaf pines. The gopher tortoise, a keystone animal species of longleaf pine-wiregrass communities, has been documented to house some 362 other species of commensal invertebrates and vertebrates in its burrows. These are compelling reasons to consider the preservation of the longleaf forest ecosystem as a whole.

Longleaf is more dependent upon the wiregrass than vice versa. Longleaf pines convert local lightning strikes into ground fires, but it is the dense wiregrass ground cover that lets forest fires move steadily over whole landscapes. The fire burns away the invading hardwoods while leaving the longleaf trees unharmed. Longleaf's

thick bark flakes during and after a fire protecting the tree. The terminal bud of a young longleaf in the "grass stage" is protected from fire by its long needles. The burned forest understory exposes rich mineral soil, which is required for Longleaf seeds to germinate. The wiregrass itself will begin to turn green again in just a few days, but if artificially disturbed as happens with mechanical tilling, it grows back very slowly if at all.

In order to reverse the negative trends for the Longleaf forests we must:

- first, establish biodiversity as the land management paradigm where its is still possible to preserve the remaining native

longleaf forests,

- and perpetuate native forest conditions with Summer controlled burns.
- Then we can integrate the harvesting of timber products into the new forest management perspective and manage the forest as a whole ecosystem.

The Association for the Restoration of Longleaf Pine is founded with these goals in mind and is "dedicated to the conservation and restoration of one of America's great natural resources." Foresters, land owners, conservationists, plant ecologists, biologists, and preservationists alike want to see the trends reversed for the Longleaf pine. The interests of one group can create opposing

Mr. John Loughridge, his son Earl and their families sit beside the logging operation of the Weaver Loughridge Lumber Company in Florida, 1910.



views of how Longleaf should be managed. Some of the current conflicts include:

- **Should we leave "standing snags" or standing dead trees?** Research by Dr. Sharon Hermann, Tall Timbers Plant Ecologist, suggests that they may aid in the protection of juvenile longleaf trees in the path of fire and therefore increase regeneration. Some want them removed, however, to improve the appearance of the forest.
- **What happens to Longleaf regeneration when wiregrass is removed?** This was sometimes done by tilling the soil instead of burning prior to planting longleaf. It may also be thought to improve hunting.
- **Are the nutrients lost to Longleaf pine straw baling being replaced?** Unfortunately, the forest floor in some areas has been raked to resemble a dirt parking lot, with no attempt made to leave any straw or replace the lost nitrogen and minerals.

Because its operation is independent from the profit of managing forests, the Association can promote cooperative solutions to these and other issues among those whose livelihood depends directly on Longleaf Pine.

A long-term research project of the Association is data collection and analysis of information from river-recovered logs. The growth ring patterns in these old-growth logs tell how Longleaf responded to weather changes and conditions over hundreds of years in the area where the logs were recovered from the river. This is a source of data that is not available any other way. The information may be particularly meaningful since those who plant Longleaf today will not be alive to see the mature forests that may flourish once again.

Sincerely,

Carol Goodwin,
President

The Association sponsors a quarterly newsletter featuring all segments of the Heart Pine industry: demonstration growing projects, the latest in forestry research and conservation efforts for Longleaf, as well as how Heart Pine manufacturers are trying to conserve supplies of original growth wood. You can even "Adopt a Baby Longleaf." For more information about how you can participate in the preservation of Longleaf forests and help restore Longleaf Pine for future generations contact:

The Association for the Restoration
of Longleaf Pine, Inc.
106 SW 109th Place
Micanopy, FL 32667
(352) 466-0090

Okay, so you have made the decision to install Heart Pine and you are ready to go. Some suggestions we feel might come in handy throughout the process are included in the remainder of this section of the guide. The following nine essential steps will help you prepare:

1. Relative humidity established

Relative humidity in the dwelling should be stabilized at 40-60 percent. Be sure the drywall and sub-floor of the house are dry prior to installation. If the newly installed floor absorbs moisture from its surroundings it will expand and compress, but it will not decompress to the full dimension once the site dries.

2. Construction site ready

All concrete, plaster and mortar projects should be seasoned at least 60 days before delivery of flooring materials. Always test concrete for moisture regardless of how long it has been poured. Check basements and crawl spaces to be sure they have good cross-ventilation. Wood floors require 1 1/2 square feet of ventilation per 100 square feet of floor. Surface drainage should direct rainfall or excessive moisture away from the structure. Keep sprinklers from spraying on the house around wood floors.

3. Acclimation time allowed

Acclimate flooring to the site before it is installed by stacking it with good ventilation between the boards. Ideal acclimation time is two to four weeks, with a seven to ten day minimum. Air temperature and humidity conditions that will exist throughout the life of the structure should be established well before the flooring arrives and left on during the entire acclimation time.

4. Moisture content monitored

Check moisture content with a high quality,



This circa 1900 photo tells of a well-organized, hard working bunch of loggers. Special thanks to the Florida archives for the use of the photos in this manual.

accurate moisture meter. The floor should measure 8 to 14 percent in most conditions and the floor and subfloor should be no more than 4 percent difference at installa-

tion. However, the moisture content of the floor should match the relative humidity of the environment in which it will be installed. If your indoor living areas are outside the range of 8 to 14 percent, you may want to consider special measures: additional acclimation time, a vapor barrier, or perhaps a humidifier or dehumidifier.

5. Subfloor is sound and dry

If flooring is to be installed over a joist system, 3/4" exterior grade plywood makes a good subfloor (be sure it is dry). Or you can use 6" or wider planks for a subfloor. When flooring is installed over concrete, check for wetness by taping down a square yard of plastic for 72 hours to see if condensation forms. Once dry, you can install a joist system or just a grid of pressure-treated lumber (screed system) over the concrete. A sound subfloor is the crux of a sturdy floor.

6. Plan the layout before you install

Maintain a 3/4" gap around the edge of the room. Never "zero-fit" the floor boards to the room. The floor must be able to expand in all directions without any pressure. Plan the layout before you begin to allow for out-of-square rooms.

7. Sand: first level, then smooth

The first "cut" (sanding) is to level the floor. Use a drum sander with coarse-grit (20-36) paper. Fill any nail or peg holes and sand again using medium-grit (50 to 80). Check

for any more blemishes and fill them before the final sanding with fine-grit (100-120) paper. Scrap the corners and hard to reach places, then hand sand them to blend with the rest of the floor. Sweep and vacuum the floor, walls, ceiling, shelves, and sills thoroughly. Finally, wipe the floor clean of any remaining dust with tack rags.

8. Finish recommendations

The preferred floor finish for Heart Pine is a water-based urethane. New water-based finishes are better for the environment, durable, fast drying, and easy to clean-up. This finish is particularly easy to recoat once the floor receives some wear. Simply remove all the shine from the floor with a used 100-grit screen and reapply one or two coats. Drying time is often listed as four hours, but experienced floor finishers recommend at least 24 hours (or more) between each coat.

9. Maintenance

Caring for a water-based urethane floor finish is easy. Simply damp (not wet) mop or vacuum frequently and use the finish manufacturer's recommended urethane cleaner for regular cleaning. Of course, the best way to care for your wood floor is to exercise preventive maintenance. Use dirt-trapping mats at exterior doors and fabric-faced glides on furniture legs, and avoid high heels and sharp objects as much as possible.

We understand that the necessary site conditions for wood flooring installation are sometimes tough to enforce. Construction may still be under way and doorways may be propped open as workers go in and out. This is further complicated by the fact that floor installation is one of the last steps, just when everyone is most anxious to be done.



Franklin County Lumber Company was one of 14 sawmills owned by Florida's Governor and President of the Trade Export Commission, George Drew.

To ensure a lifetime of beautiful wood flooring, plan ahead for the time to:

1. prepare site conditions before floor delivery
2. acclimate the floor inside the site conditions.

Here's the rest of the story on site conditions and how to avoid future problems:

First of all, Heart Pine, like any wood, is a natural product. It is made up of tiny cells which take on or give off water with moisture in the air, and will therefore shrink or expand somewhat with changes in relative humidity. The humidity levels inside a building will vary with heating or air conditioning seasons. As the humidity varies the dimensions of floor boards and any wood products will also change slightly. Here's how to best preserve your floor and all fine wood.

Turn the thermostat to your typical setting about three weeks before the flooring is due to arrive with all outside doors and windows in place. This will help to stabilize humidity levels between 40% and 60%, and establish an ambient temperature of between 50 degrees and 90 degrees

Fahrenheit. It's ideal to maintain these humidity and temperature conditions as much of the time as possible throughout the life of the building.

During the heating season, however, some buildings may need a humidifier to maintain a healthy humidity level and prevent excess shrinking of the building materials. Here's an example of how inside humidity is affected by the seasons. Say it is 20 degrees outside with an outside relative humidity of 60% and an inside temperature of 72 degrees. When the outside air is exchanged into the inside of the house and warmed to 72 degrees, *the relative humidity inside drops to 20%*! If the amount of heating causes unusually dry conditions, use a humidifier in conjunction with the heating device. Too much moisture can cause problems too. Beware of leaving a house closed up with the air conditioning off during summer months when excess humidity may get trapped inside the house.

Season all concrete, mortar, and plaster areas a minimum of 60 days. You can check if concrete is dry by using a few drops of phenylthaleine (available at most

drugstores). Or you can use a vapor barrier test. Tape a 3' x 3' piece of 6 millimeter poly-film securely to the slab. Allow this barrier to remain secured for 72 hours, then remove and check for moisture under the film.

Check that crawl spaces are dry and well cross-ventilated. Even an old house can have moisture in the slab or water under the house. All that is required for these conditions to occur is for dirt to be piled up around the slab for landscaping or for the ground under the house to be lower than the ground around the house.

Remember to direct rainfall or excessive moisture away from the structure with surface drainage. Good drainage is a 3" or greater slope per every 10 feet. Build up the ground level under the house so that it is higher than ground level around the outside of the foundation.

If you do have the potential for moisture intrusion from underneath the flooring, the treatment may be as simple as a layer of plastic taped under the building or between the slab and subfloor. Tape the plastic anywhere there are seams. Be sure not to pierce this vapor barrier with nails or staples when installing the floor.

There are many, many solutions to moisture intrusion depending on the type of construction and area of the country.

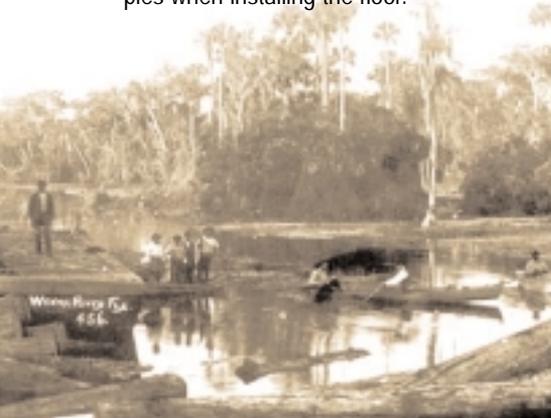
For example, some of the oldest houses in southern Florida were built without any subfloor to provide maximum circulation for the floor. This is an extreme example and requires the best drainage and planning. We do not recommend it, but it serves to demonstrate the diversity of options that are available if you investigate the natural construction techniques for your location.

The subfloor: your floor's foundation

Nearly all squeaks and cracks can be directly traced to an inadequate subfloor. A plank subfloor should be at least 6" wide boards installed diagonally to the joists. When installing a plywood subfloor, 3/4" exterior grade is recommended if your finished flooring is 3/4" thick. Align the edges with the joists for strength and stagger adjacent rows four feet. You can even cut the plywood into 4' squares to create a smaller area over which each panel can move. Nail every six inches along each joist with 8D or larger nails. You can use adhesive before nailing to further reduce movement and possible squeaks.

If you choose to put in a sleeper (or screed) system over a concrete slab, dry pressure treated 2x4s are preferred. These should be 18" to 4' in length and staggered on centers with an air gap on all overlap joints. Lay them perpendicular to the direc-

Logs on the Wekiva River Florida, circa 1890. The gentleman rowing the canoe was likely the supervisor of this loading dock to the sawmill. The Wekiva has many winding bends.



tion of the finished flooring and secure them with T-nails staggered side-to-side 4" to 6" apart.

Leave expansion joints of at least 1/8 inch between each panel, section, or board of the subfloor. Research has shown that two or three years after the floor is installed the subfloor will measure 2-3% higher moisture content than the floor. The subfloor has less access to heating and air conditioning than the floor, and will expand slightly from the additional moisture.

Use a 6' to 10' straightedge to check the subfloor for high areas, and sand any high spot so the subfloor is as flat as possible. Next put down 30 pound felt paper carefully butt-edged, not overlapped. The felt reduces the chance of squeaks and helps circulation around the floor boards.

When delivering wood flooring to the site, do not unload in the rain, drizzle, snow, or extremely moist weather. Once inside, it is best to acclimate the flooring for a minimum of 7 to 10 days, but it could take much longer depending on the site.

While the wood is acclimating, it should be stacked so that air can circulate around each board. Use a good quality moisture meter to check your floor. Be sure the floor and subfloor are within 4% of each other at installation. If there is a variation of more than 3-4% in the moisture content of the more dense boards from the lighter boards, this is one sign that the floor may not be fully acclimated.

Take time to plan the layout of your floor so that the last few boards don't have to accommodate all of the difference for an

out of square room. You can often hide any differences in dimensions around the room by allowing for them in the expansion air gaps around the edges of the room. Or you may be able to hide a tapered floor board under a counter or along a wall that is not immediately noticeable when you first walk into the room.

Consider any special treatments such as "framing" doorways, fireplaces, masonry, or other protrusions into the room with wider boards and decorative effects. You can turn decorative boards perpendicular to the floor, screw and peg them, and join them at the corners with a 45 degree angle instead of a butt joint.

Select several straight boards for the first and last few rows. Some boards are naturally more crooked than others, and you can pull them into place easily when working in the middle of the room. The simplest way to get a crooked board into place before nailing is to drive a screwdriver into the subfloor for leverage. However, it's easier to work with a straight board while you're pulling up near the wall.

Lay the floor perpendicular to the joists if possible. If you decide to lay it parallel to the joists you'll need an especially strong subfloor. Small marks at the base of the wall help locate the joists during installation. Stagger flooring during installation so that the end joints are at least 4" to 6", or farther, apart in any direction.

It is not necessary to end-match Heart Pine. Oak is often end-matched because the average board is only 2-4' long. A Heart Pine floor usually averages 6-10' boards. There will be some shorter pieces, but

these can be mixed in or used at the walls.

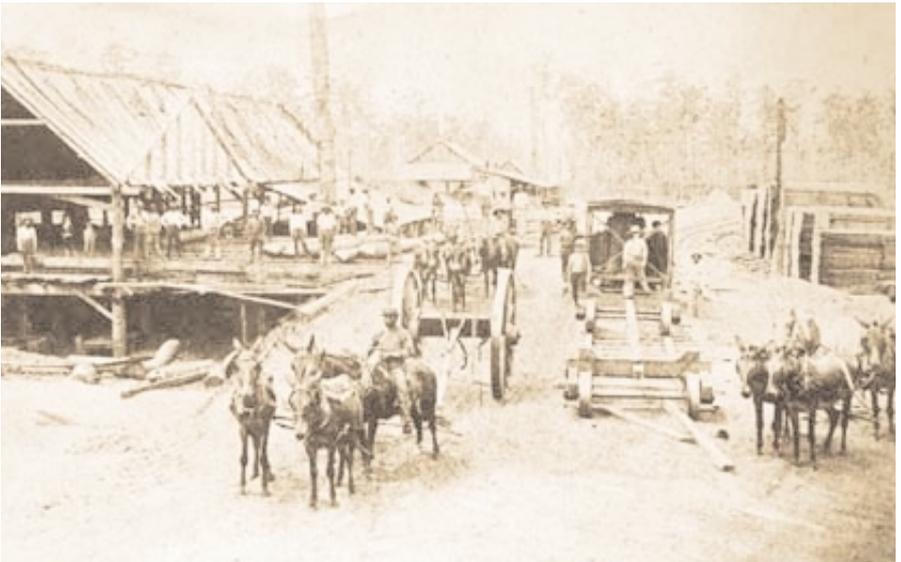
Many professionals suggest that installation begin in the middle of the room. Flooring expands in the direction of the tongue, so any movement as humidity levels change will be from the center out instead of across the entire width of the floor. Use a center spline between the two facing grooves of the center boards. Others suggest that you install from one wall to the other, left to right if you are right handed. All agree that power nailers are faster and diminish the chance of hammer marks on the floor.

Always maintain a 1/2" to 3/4" air gap around all walls or protrusions. The floor must be allowed to expand without any pressure. You can cover the gaps easily

with base and matching shoe molding. Base and shoe molding is usually nailed to the wall instead of the floor. Leave room for a business card (a very slight air gap) to slide on top of the floor and under the molding. Undercut door jambs for flooring to slide under.

Finishing normally begins about 7-14 days after installation. This gives enough time for the installed floor to react to the environment. Slight cracks and any raised edges that are going to develop will have done so by then, and you can fill and sand them for the best possible appearance. Longer periods of exposure may subject the bare wood to job-site abuse and moisture.

Now you can sit back and enjoy your investment in wood flooring.



E. Baird and Brothers Saw and Planing Mills is located 15 miles from Goodwin Heart Pine today. The county was the supply site for many of the largest Heart Pine mills throughout north central Florida.

For starters, Heart Pine is naturally hard and dense, and the new polyurethane finishes offers increased protection wherever you install your wood floor. But there is a lot of technical know-how needed for polyurethane or any other hardwood floor finish. The finish industry is evolving rapidly to meet strict new regulations and the increase in demand for wood floors. If you have further questions, telephone numbers, books, and articles are listed in the back of this guide, all of which provide more detailed information.

Sanding Heart Pine

Just like site conditions are to installation, good sanding techniques are critical in finishing. If the sander leaves swirls or grooves these will become more noticeable once the finish is applied.

The first step is to level the floor. Heart Pine requires that you use a lower grit sandpaper than softer woods. Start with at least #2 (50 grit) or even # 2 1/2 (36 grit) for the leveling step. Do not be timid about using lots of sand paper.

Floor finishers are specialized, expensive equipment, and the job takes at least a couple of different machines. A drum sander is used to level the floor, and a disc sander to "screen" (or lightly sand) between each coat. You might want an edger, a small floor sander that lets you get close to walls, or you can sand these hard to reach areas by hand. A professional floor finisher will have all of these machines, or you may be able to rent them from your local hardware store.

Sanding creates a lot of dust. Wear a respirator, ear plugs, and shoes that do not

hold dust in the soles or leave scuff marks.

Seal off doorways, vents, and built-ins by taping plastic over them. Just before sanding remember to check for loose boards or squeaks and repair them with screws from underneath the subfloor or nail through the floor into the joists. Set any nails at least 1/16" deep and fill the holes with wood putty.



This sawmill on the Ocklawaha River, shown in the early 1900s, produced much of the Heart Pine used to build factories and houses in surrounding towns.

Operating a drum sander takes some practice. The machine is heavy but has to be moved along with a relatively "light" touch. If held in place for even a few seconds it will leave a dent in the floor. Sand in rows in the direction that the floor runs from left to right across the room. The drum sander takes a slightly deeper cut on the left side to allow you to feather the edge on the right side as you move over to the next row.

Turn on the machine and move forward as you lower the drum to the floor so it does not dent the starting spot. You do not have to bear down at all. About one foot away

from the wall lift up. Put the machine down again as you begin to move it backward over the same row. When you reach the spot where you started, lift up and move over 2–4" for each succeeding row.

You will not be able to get close to the wall behind you, so plan to start a few feet away from the back wall and sand to within a foot or so of the wall in front of you. Then turn around and sand the few feet remaining to the other wall, again starting from right to left. Take care to feather over the line where you reversed directions. Use an edger to get the area that the drum sander could not reach at walls and under counters. You may need to use a hand scraper and hand sanding block for some areas.

After the first sanding, sweep well and change to medium grit (60-80) paper and sand again. You may choose to use a filler

between sandings, usually used when refinishing old floors. If you defects that you want to cover there are some good latex fillers available. Use fine grit (100-120) sand paper for the final sanding.

As soon as you have completely sanded the floor to a level surface, vacuum thoroughly and then wipe it with tack rags. Be sure to get all the dust from not only the floor and out of the corners, but also off window sills and mouldings. Remember to clean out any vents as well. This will prevent sawdust from falling into the finish and becoming a permanent part of your floor.

"Wash" the floor with a rag or mop that has been dampened with mineral spirits. This is an important step for Heart Pine. It removes any oils or resins from the surface of the wood that might prevent the finish from adhering properly. The mineral spirits will dry within a few hours, unless applied too generously.

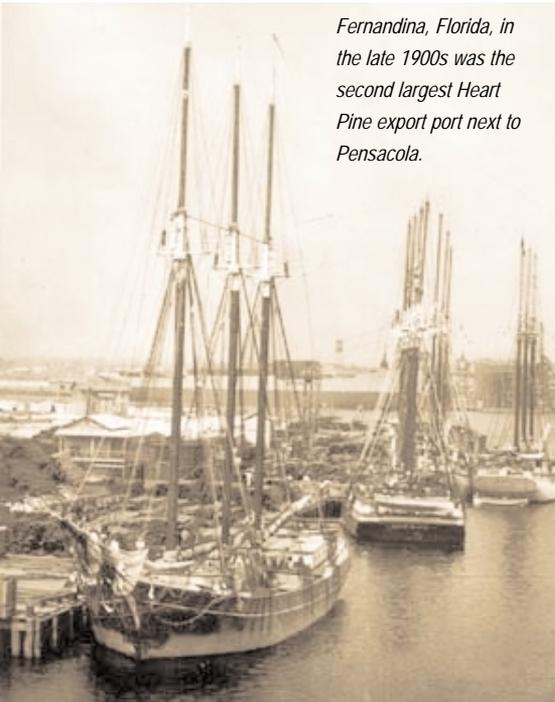
How to Apply the Finish

People generally prefer the natural look of finishes applied in the home over a factory baked-on finish, and most fine wood floors are sanded and finished on-site. For best results, finish the floor after the wall coverings are in place and painting is complete, except for a final touch-up coat of paint on your base molding.

Some Supplies to Have On-hand

Penetrating oil-based sealers can be applied by hand with a rag, a brush, or a lambs wool applicator. Surface finishes are usually applied by applicator, or by brush in small areas.

Between coats of surface finishes you will



Fernandina, Florida, in the late 1900s was the second largest Heart Pine export port next to Pensacola.

need an abrasive nylon screen, fiber buffing pad, or steel wool to lightly sand the previous coat and help the next one adhere. Do not use steel wool if you are using a water-based finish. The steel fibers will rust and discolor the finish. If you use brushes, clean them only with water or mineral spirits. The distillates in some brush cleaners can slow the drying process.

Use a vacuum cleaner after each sanding or screening. For large areas, clean vacuum bags frequently to avoid returning any dust to the floor. You might even try wearing paper surgical booties over your shoes to avoid tracking dust.

Rags with mineral spirits or water are also useful to clean up sweat, dust, dirt, or oil if any drips on the floor while you are applying the finish.

A Penetrating Sealer for the First Coat

We recommend that the first coat be an oil-based sealer to help bring out the red tones for which Heart Pine is so famous. The oil-based sealer is a penetrating finish and soaks into the wood, unlike surface finishes such as water-based or moisture-cured polyurethane. The real beauty of the wood can be brought out right away by one coat of the sealer.

Heart Pine is renowned for its unique color and beauty. Many Heart Pine lovers model the late Frank Lloyd Wright who said, *"I like wood left alone, for the sake of wood."* Stains may actually muddle the wood's strong grain patterns. However, if your project has special needs you can get the sealers in wood stain colors.

The finish is applied in parallel strips across the room with the direction of the flooring. Always maintain a wet edge and use a single gliding stroke along the length of your strip, "feathering" into the previous wet area. Work toward the light so that you can see your work, but do not worry about retouching missed areas if the finish has already begun to skim over. The next coat will fill in these areas.

Make sure your floor is completely dry before you apply the second coat since the sealer soaks into the Heart Pine. We suggest thinning it with 1/4 to 1/3 Mineral Spirits to give it maximum penetration. It has been our experience that this coat may take longer to dry than the finish manufacturer's directions. We often find that it takes at least 24 hours for this sealer coat to dry. One customer says, "We think the labels should read, 'dries in four hours unless you live in Florida where it takes two days.'"

If you are in a hurry use a moisture meter to see if the floor has returned to its pre-finish moisture content. Or, check for a thumbprint by pressing your thumb firmly



Naval stores operation in West Florida during the late 1920s. The turpentine is being extracted from an old growth Longleaf Pine stand in what is now Eglin Field near Fort Walton Beach.



A steam log skidder used to load railroad cars in Escambia County, Florida 1910. The steam engine allowed the forest to be clear cut much more quickly.

against the floor (see Don Bolinger's book, *Hardwood Floors*, available through *Fine Homebuilding* magazine).

Use A Surface Finish After the First Coat

You have lots of choices for the second coat of finish. Water-based is increasingly popular. It offers quick-drying time, takes little maintenance, and is simple to recoat when wear eventually begins to show. Moisture-cured and oil-modified finishes are still used a lot today, even in this low VOC (volatile organic compound) age. For a simple but soft finish just wax on top of the sealer.

We generally recommend water-based urethanes because they are safe, durable, fast-drying, and offer good protection for your floor. Water-based products are being continually improved to decrease their VOC contents and increase their durability. A water-based urethane used on Heart Pine over an oil-based sealer applied in thin coats is a very pretty finish. It looks similar to an "oiled" or hand-rubbed finish. Some woodworkers may hate to admit this, but many know it is true and use this to their advantage.

After the first and between each succeeding coat of finish, use a floor buffer fitted with a used 100-120 grit "screen" (rub two together if you do not have a used one) or hand sand small areas. You will have to hand sand corners and edges. Lightly sand the "top" off the finish.

You do not want to sand into the finish, and one or two passes over the floor is usually enough. All that is necessary is to take the shine off the finish to help the next coat adhere to the one before it. If the finish does not "powder" while you are sanding, it is probably not dry. Vacuum the floor and any sills and base boards. Tack the floor again, then let it dry completely, and start your next coat.

- *Here is a hint for the best possible adherence from coat to coat. Many polyurethanes are so hard that they do not even adhere well to themselves. The high-gloss adheres best, so even if you want a satin finish use high-gloss for all except the last coat. Then use satin as your final coat and you will get the low-gloss (or semi-gloss) finish that you want with maximum adherence.*
- *Yes, you can apply as many coats of polyurethane as you want. Usually two or three coats is enough,, but we have had people ask if they can use several coats. Just remember to let each new coat dry a little longer than the previous one.*
- *It is important not to wax a wood floor that has a surface finish (water-based or moisture-cured). If wax is used on these finishes, it prevents the ability to simply retouch the floor (screen or lightly sand to remove the shine and recoat it). If you*

wax on top of a surface finish you must sand the floor completely back to bare wood before recoating.

Which Finish to Use?

Water-based (or water-borne) urethane is a good choice for the environmentalist and is the easiest to apply. Water-based is only slightly less hard than moisture-cure, and is less likely to leave drying lines during application.

Moisture-cure urethane is the hardest and most protective finish, but it requires the most skill to apply. Generally, it is not suggested for use by the non-professional.

Traditional oil-modified polyurethane finishes are used today, though they will be regulated out of use in the future. Wax is generally applied on top of this finish.

Use a penetrating oil sealer for a natural but soft finish. Buff the floor with steel wool between each coat, and then wax over the sealer. This finish may be the correct choice for some projects, but it requires extra maintenance and offers less protection.

There are completely natural finish products available for people with chemical sensitivities or for those who want to use totally non-toxic products. Organizations specializing in the most healthful and ecological building materials are noted at the back of this booklet.

Special Floor Finishing Needs

If you are restoring a historic building, you may choose varnish to match an old finish. We discuss varnishes in the section on "Reviving the Finish." We can also provide

you with reprints of Old House Journal articles about historic finishes.

You might want to know about finishes for porch or outdoor floors... or how to sand a parquet floor... or even how to "pickle" your floor. There are many topics, and we can only mention the basics in this short booklet. Do not hesitate to call with questions. We will try to provide other references.

There are many companies that make excellent finish products, a few are listed in the back of this guide. No matter which finish manufacturer you choose, follow their directions carefully. These products are improving rapidly as are the ecological standards they are required to meet.

Let us know if we can provide reprints of flooring manufacturer's association guides on finishing to further assist you.

What is not here.

We do not mention white floors nor do we discuss finishes which contain formaldehyde in this guide. These finishes are frequently used and many professionals have a great deal of experience with them. If you need to know about them, we can recommend sources.

Timber rafts on the Ocklawaha in July of 1901



A wood floor is one of the best investments you have ever made. With proper care, it will stay beautiful and last a lifetime.

How do you keep your floors as beautiful as the day they were installed or refinished? Follow these easy steps and you will have beautiful floors that always look their best. Here are some basic rules that apply to all types of finishes.

With these simple steps your Heart Pine floor will give you lasting beauty and enjoyment.

1. Keep out the dirt.

Dirt and grit are any floor's enemy, whether carpet, tile, or hardwoods.

- Use dirt-trapping mats outside all exterior doors.
- Throw rugs or small carpets just inside entrances are also helpful.
- Sweep, vacuum with a brush attachment, or mop regularly as needed.
- Do not use a household dust treatment. Your floor may become slick or it may dull the finish.

2. Prevent damage.

Steps to avoid scratches or dents in the floor.

- Use felt or fabric-faced glides on the legs of your furniture.
- If you need casters, non-marking rubber is the best type.
- Keep high heels in good repair and replace protective shoe heel caps, exposed steel support rods in high heels will dent even concrete.
- Move area rugs occasionally and shade large west-facing windows.

3. When you clean.

Cleaning is different depending on the finish that you chose.

- Do not use wax over a surface finish (water-borne or moisture-cure).
- You can damp mop a surface finished floor with a minimum of water or cleaner.
- Finish manufacturers often have a cleaner that is made for their finish.
- Wipe up spills quickly. Standing liquid can harm the wood and finish.
- Waxing too much is a common mistake. It can decrease luster. Buff your floor before you re wax and see if that returns the luster.

Log rafts were the safest and least expensive method of transport until the end of the 19th century. They were usually 15 to 20 logs wide and 20 sections long. Loggers lived on these rafts for weeks at a time on their way downstream.





Florida Railway used portable camp cars for lumber offices. Often railways were run into the forest and then pulled up when the forest was cut down.

There are many types of floor finishes and different finishes may have been used in different rooms, so the type of care you need may vary. Your builder, realtor, or flooring professional might be able to tell you about your floor finish. Try to get the brand names of the finishing products and the name of the manufacturer if you can. Keep information about your finish in your files to help you determine the proper floor care products. Here are some things you need to know about the restoring various types of finishes.

Surface Finishes

This includes the polyurethane family. These finishes require the least effort to maintain.

For general cleaning, use the manufacturer's recommended product or just add 1/4 cup of white vinegar to one quart of warm water. Dip a clean cloth or sponge mop and wring nearly dry. Clean the floor and wipe dry with a towel as you go.

Buff to restore luster. When luster does not return in traffic areas such as doorways, kitchen sink, stove area, or hallways, the floor may require recoating. Consult your wood floor contractor, or you may

attempt to extend the life of your finish by applying a compatible aerosol finish to areas that show wear.

NEVER WAX a surface finish. In most cases, wax will be slippery. Once waxed, the floor can not be merely recoated to rejuvenate the finish, but will have to be completely sanded down to raw wood before you can refinish.

Waxed Finishes

Normally these include: oil-modified urethane finishes, a sealer coat with wax over the finish, or possibly a stain with wax.

When the floor looks dull, buff first to see if that will restore the luster before re-waxing. When areas of heavy use no longer respond to buffing, wax only those areas, and buff the floor to an even luster.

When the whole floor needs attention, clean and wax with a liquid wax and cleaner specifically for wood floors. If your wood is stained, select the type that also contains stain. You can be sure if the can says, 'Contains Petroleum distillate' or 'Naphtha,' that it is specifically for wood floors. Follow the instructions on the label, being certain

to apply evenly and wipe up any excess as you go. Let dry. Buff to the desired luster. Depending upon traffic, the floor should only need complete rewaxing once a year.

Historic Floor Finishes

If your goals are to restore the floor to its original finish, or to use the products of prior eras consider the following choices:

The historic floor finishes were all surface finishes that are rarely used today and do not have the moisture-resistant characteristics of modern surface finishes. You should never damp mop a varnish, shellac, or lacquer finish. Floors finished with varnish, shellac or lacquer should be cleaned periodically with mineral spirits.

Shellac was used prior to the 1850s, but it is much too soft for a finish and it spots easily whenever a drop of water is spilled. Shellac was considered by many, however, to add to the beauty of a floor, primarily because of the warm orange color that its impurities gave to the finish.

Varnish came next, but it's also soft and it takes a long time to dry. Varnish can take weeks or even months to dry completely. It is still used today, however, on some historic floors. Spar varnish gives a high-gloss finish, tung oil a semi-gloss, and satin tung oil a low-gloss finish.

Polyurethanes came next after varnishes. You can't really draw a line between varnishes and polyurethanes. They are all products developed from resins. Early varnish was made from natural oils, then came man-made alkyd varnish, and finally polyurethanes which are synthetic resin varnishes with drying agents added.

If you want a natural looking finish and you also need to provide protection for your historic floor, take heart! Water-borne polyurethane when used on Heart Pine over an oil-based sealer and applied in thin coats, can look similar to a natural oil or varnish finish.

Restoring without refinishing

When all else fails, or you acquire a disaster floor, you can work with a type of product called 'renovator.' Renovator is a special class of products made by several of the finish manufacturers to help restore old floors. They do not contain any waxes and can clean off residue that may be left from oil soaps and waxy dusting compounds. These products will rejuvenate and "leave the wood with the natural glow of the original finish," according to one manufacturer.

Renovator is for floors finished with penetrating floor products (not surface finishes). It is specially formulated to clean, restore and reseal hardwood floors, terrazzo, concrete or unglazed terra cotta tile without requiring that they be sanded first. Renovator works by softening a thin layer of the finish coating and simultaneously cleans the surface and replaces the softened layer with additional sealer.

Paint thinner (careful - it is flammable) and fine steel wool may work to partly restore old floors. Do not use the steel wool dry - work in a puddle of the thinner and wipe the floor clean as you go. After the floor is dry, apply paste wax - clear or with a stain, either liquid or solid. When using solid paste wax, wrap a 'wad' of wax in a cloth and apply a thin even coat. The warmth of your hand and the rubbing friction melts the wax. Buff to a luster.

While other companies provide resawn lumber from wood salvaged from old buildings, we put on our wet suits and retrieve, by hand, the logs that never made it to the downstream sawmills of the 1700s and 1800s. This wood is not only antique, it is also one of the most beautiful, durable and distinctive hardwoods you will ever see. There are many advantages to our River-recovered Heart Pine. Among them:

Our logs have been preserved by the cool water and lack of oxygen. This means the heavy, dense is in perfect condition, full of pizzazz and rich in color. Previously used wood doesn't have the "life" of riverbed wood.

Our wood is unspoiled by saws, nails and the ravages of time and use. Many logs still have the V-bottom where they were cut by axe more than 100 years ago.

We are the only mill able to provide Curly Heart Pine (also known as Rosemary Pine). The Curly consists of a rare and distinctive grain pattern, similar to a burl'd grain. One out of approximately every 100 heart pine logs contains some curly grain.

Because we have the original log, we can mill heart pine in custom dimensions for your restoration needs, as well as match existing patterns.

Our stair treads are solid plank to give you a more beautiful stair. Since we have the original log we can get enough 12" wide by 5/4" thick material of clear grade to offer you this benefit.

We exceed the strict grading standards for heart pine, last published by the Southern Pine Inspection Bureau (SPIB) in 1924.



Men from the Wilson Lumber Company, 1910, measure the girth of a giant cypress tree. Notches will be cut 3 to 6 feet up the tree and boards inserted in the notches to allow cutting down the tree.

Only natural defects exist in our logs and these are removed as the lumber is sawn and milled. Our standards, from production to delivery, are the highest possible. A customer once told us that we act like every board is going in our own home. This com-

mitment to excellence shows in the little things we do such as:

Our flooring fit is tight to help installation and eliminate squeaks. We make sure the flooring edge under the tongue and groove is slightly eased to allow the floor to "breathe" properly.

We use "flooring match", with the tongue and groove off center. We select the best face and give you more wood on the top for nailing and for extra sandings during the floor's life of 100 plus years.

Your order is trimmed of all waste material. Unlike others, we do not mark and leave defects in the floor boards for you to cut out. We cut them out for you.

In the final grading step we trim one end of each floor board in an effort to assist installation. The floor is also separated into lengths for packing and all horizontal "shake" is removed to ensure that you get no flooring splinters.

Our mouldings are architecturally drawn and are designed to classic proportions to provide you with a variety of choices to complete the most beautiful surroundings possible.

We stock stair parts: treads, risers and hand rails, as well as base, shoe, casing and chair mouldings. If you do not see the pattern of your choice, please send us a sample or drawing. We can often match your pattern.

"Ya see that ring
right there?...That
means this fella
survived a another
bad forest fire
that year."



1. There are many grain patterns and grades from which you can choose:

Select – a blend of quartersawn and plainsawn, like fingerprints, no two boards are alike.

Select Clear – if your project calls for no knots or only the occasional pin knot (½" or less).

Vertical – quartersawn, a pin-striped grain pattern and more consistent in appearance.

Curly – a figured, burl grain, the rarest of all.

2. Once you have selected your grain pattern, several "finish" (milling) options are available for various uses:

- *Flooring Match:*
 - more wood on the top face
 - allows air circulation between each board
- *Center Match:*
 - the tongue and groove are in the center
 - may be required in restoration projects.
- *Beading:*
 - adds interest on ceilings and paneling
 - wainscot, double/ single for an older look
- *V-joint:*
 - a bevel above the tongue and groove
 - improves the appearance of paneling
- *Natural edges (fitches):*
 - most often for mantles or counter tops
 - available for paneling and siding

The supplies of this rich lumber are limited and our production quality demands that we follow every step in the manufac-

turing process. We stock some of the most popular widths and may be able to fill your order within one to two weeks. The standard production schedule, however, from air-dried lumber to finished flooring is four to five weeks.

After you confirm your order, your lumber is dried in our modern dehumidification dry kiln. After at least 15 days in the kiln and the moisture content is correct at 6 to 8 percent, the lumber is allowed to readjust slowly from 130-140 degrees Fahrenheit to minimize shrinkage in the final product. Your Heart Pine Lumber is again regraded as it is planed.

We have freight discounts, usually at least 35%, available from several common carrier's that we pass along to you. We secure the least costly transportation, wherever you are located.

Packaging is done with care by hand. We band flooring bunks every 18" at no additional charge and we wrap larger packages entirely in cardboard. (*Cardboard provides more protection than plastic and is a better choice for the environment*). We load the orders ourselves onto the front of the carriers' trucks to help ensure that your order reaches you in excellent condition.

We are always willing to provide as much information as we can to meet your needs. We will work closely with you, your architect and designer, your contractor, or the flooring installer of your choice. The entire staff at Goodwin Heart Pine is concerned with helping ensure that your Heart Pine floor is one of lasting beauty.

Our mouldings are drawn to classic proportions. However, if you don't see what you need here, just mail or fax the pattern of your choice. If we don't already have a knife to match your pattern, it may even be possible to have a knife ground especially for you.

Hand Rails



Hand Rail
2-3/8" x 2-1/2"



Banister Rail
2-5/8" x 2-7/8"



Porch Rail
1-3/8" x 2-1/4"



Massive Hand Rail
2-1/2" x 3-1/4"



Combination
Hand/Porch Rail
2-1/2" x 3-7/8"

Chair Rail



Double Edge
3/4" x 2-5/8"
4/4" x 2-5/8"



Ribbon
3/4" x 2-7/8"

Moulding



Panel Moulding
7/8" x 1-9/16"



Picture Frame
Moulding
3/4" x 1-3/4"



Picture Moulding
3/4" x 1-3/4"



Reeded Moulding
13/16" x 3-1/2"

Stair Mouldings



Stair Tread
Return Moulding
1" x 1-1/2"



Bull Nose Trim
3/4" x 5-1/2"
3/4" x 3-1/2"

Casings



Step Crown
3/4" x 3-1/2"



Pinched Crown
3/4" x 3-1/2"



Colonial Crown
13/16" x 2-1/2"

Classic Design



Shoe
3/4" x 1/2"



Quarter Round
3/4" x 3/4"



Cove
3/4" x 3/4"

Crown Mouldings



Cove Crown
3/4" x 3-1/2"



Step Crown
3/4" x 3-1/2"
3/4" x 5-1/2"

Bases



Open Base
3/4" x 5-1/2"
3/4" x 3-1/2"



Beaded Base
3/4" x 5-1/2"
3/4" x 3-1/2"

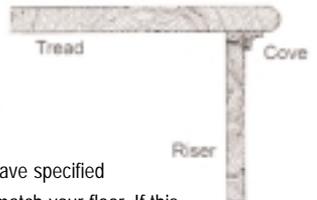


Bead Cap
3/4" x 2-1/2"
3/4" x 3-1/2"
3/4" x 5-1/2"
3/4" x 7-1/4"

Tread Assembly



Roseette
4/4" x 4"



Your architect may have specified molding and trim to match your floor. If this has not already been done for you, just describe your building plans and we will gladly ask our designer consultant to suggest the perfect floor "complements."

You probably know by now that flooring, lumber, and trim is manufactured and sold using any of several different measurements. Usually, flooring is sold in square feet, lumber is sold in board feet, and trim (molding and stair parts) is sold in linear feet.

Square Feet (SF)

This is the amount of lumber required to cover one square foot of floor or wall space, without any consideration for the thickness of the wood.

[Square feet = width x length of floor]

We use the "finished width" of your flooring or paneling to figure square feet. Wood which is 4" wide in rough form has a 3 1/8" finished face width. This allows 7/8" for the tongue & groove. Some of the other standard flooring finished face widths are: 6" rough yields a 5 1/8" face when finished, and 8" rough yields a 7" face when finished.

Board Feet (BF)

A board foot is the volume of wood which covers 12" x 12" and is 1" thick. Usually only lumber is sold in board feet, but a manufacturer must always use this measure when computing the cost of producing a wood product.

[BF = rough width x rough thickness / 12"]

Board feet is conceptually the most difficult of these measures, but it is the only true measure for comparing one quantity of lumber with another quantity of lumber of a different dimension.

Linear Feet (LF)

The simplest of measurements, this is just the length of any given piece of flooring, paneling, lumber, or trim. This measurement does not take into consideration the "dimensions" (width or thickness) of the wood. We use this measurement when we pull from our inventory to prepare your order.

[Linear feet = length]

An example requiring all of the measurements is computing the lumber required for a "pattern" floor. If you want a 4"/6"/8" pattern, you normally want equal linear feet of all three widths. However, the square feet and board feet will be different for each width. Here is how to figure this pattern for a 15' x 15' room.:

1. Compute the total square footage of the floor surface to be covered.

$$(15' \times 15') = 225 \text{ SF}$$

2. Compute the "pattern coverage factor" (PCF) by dividing the sum of the finished widths by the sum of the rough widths.

$$(3.125" + 5.125" + 7") / (4" + 6" + 8") = .847 \text{ PCF}$$

3. Compute the total board feet for your entire floor (all widths) by dividing the square feet by the PFC.

$$225 \text{ SF} / .847 \text{ PCF} = 266 \text{ BF}$$

4. Compute the board feet per "pattern width". This is the board feet contained in one linear foot of each of the three widths side-by-side.

$$4" + 6" + 8" / 12" = 1.5 \text{ BF per pattern width}$$

5. Compute the linear feet required for each width. Do this by dividing the total board feet by the board feet per pattern width.

$$266 \text{ BF} / 1.5 \text{ BF} = 177 \text{ LF of each width}$$

6. Figure the board feet for each individual width.

$$177 \text{ LF of } 1" \times 4" = (177 \times 4" / 12") = 59 \text{ BF}$$

$$177 \text{ LF of } 1" \times 6" = (177 \times 6" / 12") = 88.5 \text{ BF}$$

$$177 \text{ LF of } 1" \times 8" = (177 \times 8" / 12") = 118 \text{ BF}$$

7. Figure the square feet for each individual width.

$$59 \text{ BF of } 3 \text{ } 1/8" \text{ face} = (59 \times 3.125" / 4") = 46 \text{ SF}$$

$$88.5 \text{ BF of } 5 \text{ } 1/8" \text{ face} =$$

$$(88.5 \times 5.125" / 6") = 76 \text{ SF}$$

$$118 \text{ BF of } 7" \text{ face} = (118 \times 7" / 8") = 103 \text{ SF}$$

That's it! *Thank goodness we do all the figuring for you. We will work with you to determine if any extra should be allowed to install around fireplaces, bay windows, or unusual angles. The end result of all our calculations is the shipment of 100% totally useable lumber to you.*



The best Heart Pine grew right next to the Cypress swamps alongside the rivers. Once this forest was cut loggers had to go deeper into the forest and use wagons to drag out the cut logs.

Abbreviations:

- BF = Board Feet
- CF = Coverage Factor
- LF = Linear Feet
- NET = Net, finished/surfaced dimension
- NOM = Nominal, rough/original dimension
- SF = Square Feet
- S2E = Surfaced two sides, one edge
- S2S = Surfaced two sides
- S4S = Surfaced four sides
- T&G = Tongue and Groove
- V-jt = Tongue and Groove plus a V-joint for paneling

Standard Flooring/ Paneling Dimensions:

NOM	NET
1 x 3	3/4 x 2 1/4"
1 x 4	3/4 x 3 1/4"
1 x 6	3/4 x 5 1/4"
1 x 8	3/4 x 7"
1 x 10	3/4 x 9"
1 x 12	3/4 x 10 7/8"
1 x 14	3/4 x 12 7/8"

Standard Lumber Dimensions:

NOM	NET
1 x 3	3/4 x 2 1/2"
1 x 4	3/4 x 3 1/2"
1 x 6	3/4 x 5 1/2"
1 x 8	3/4 x 7 1/4"
1 x 10	3/4 x 9 1/4"
1 x 12	3/4 x 11 1/8"
1 x 14	3/4 x 13 1/8"

Standard Thickness:

NOM	NET
4/4	3/4"
5/4	4/4"
6/4	5/4"
8/4	1 1/2"
10/4	2"
12/4	2 1/2"
14/4	3"

Conversion from Square Feet (sf) to Board Feet (BF):

Formulas: $SF / CF = BF$ or $BF \times CF =$

SFCoverage Factors (CF):

1x 3	.75
1x 4	.8125
1x 6	.875
1x 8	.875
1x10	.9
1x12	.9063
1x14	.9196

Conversion from Board Feet (BF) to Linear Feet (LF):

Formulas: $BF / CF = LF$ or $LF \times CF =$

BFCoverage Factors:

1x 3	.25
1x 4	.333
1x 6	.5
1x 8	.667
1x10	.833
1x12	1.0
1x14	1.167

	Heart Cypress Bald Cypress (<i>Taxodium distichum</i>)		Heart Pine Longleaf Pine (<i>Pinus Palustris</i>)	
Specific gravity	.42 to .46		.54 to .59	
Modulus of Rupture (kilopascals)	46,000	73,000	59,000	100,000
Modulus of Elasticity (kilopascals)	8,100	9,000	11,000	13,700
Work to Maximum Load (kilojoules per cu. m.)	46	57	61	81
Impact Bending (height of drop causing complete failure [Mm.])	640	610	890	860
Compression Parallel to Grain (maximum crushing strength [kilopascals])	24,700	43,900	29,800	58,400
Compression Perpendicular to Grain (fiber stress at proportional limit [kilopascals])	2,800	5,000	3,300	6,600
Shear Parallel to Grain (maximum shearing strength [kilopascals])	5,600	6,900	7,200	10,400
Tension Perpendicular to Grain (maximum tensile strength [kilopascals])	2,100	1,900	2,300	3,200
Side Hardness (load perpendicular to grain [newtons])	1,700	2,300	2,600	3,900

There are many places to receive additional information, several of which are listed on these two pages. Call us if you do not see what you need.

Associations

National Wood Flooring Association

(NWFA)

11046 Manchester Road

St. Louis, MO 63122

(800) 422-4556

Consumer Awareness Program

Question Line

(900) 646-WOOD(9663)

Provides training seminars and workshops for all segments of the wood flooring industry. Coordinates among manufacturers, distributors, and installers for the benefit of the consumer.

National Oak Flooring Manufacturers Association

(NOFMA)

P.O. Box 3009

Memphis, TN 38173-0009

(901) 526-5016

Sets standards and promotes the hardwood flooring industry.

Maple Flooring Manufacturers Association

(MFMA)

60 Revere Drive, Suite 500

Northbrook, IL 60062

(708) 480-9138

Provides technical information about maple floors and about finishes for all wood floors.

Articles

Calls us for articles (like those listed here), or let us ask an expert your questions:

1. **Fixing Hardwood Floors, How to remove and replace tongue & groove floorboards,** *Old-House Journal, (Interiors Conference Issue), 2/93*
2. **Floor Finish Options, Old-House Journal,** *(Interiors Conference Issue), 2/93*
3. **Hardwood: The Health Floor,** *Hardwood Floors, 8/90*
4. **Laying a Plank Floor,** *The Taunton Press (Fine Homebuilding), 1/91*
5. **Q&A: Hardwood Solutions,** *Hardwood Floors*, every issue, here's a sample:
 - restoring water-damaged floors
 - the greenhouse effect and hardwood
 - refinishing an existing wood floor
6. **Repairing Antique Floors,** *Old-House Journal, (Interiors Conference Issue), 2/93*
7. **State of the Wood Flooring Industry,** *Hardwood Floors, 4/92*
8. **Strip Flooring Kinks, Repair Tips for Tongue-and-Groove Floors,** *Old-House Journal, 3/93*
9. **Structural Repair Under an Old Floor,** *Old-House Journal, 3/92*
10. **Those ?*X!!*?# Cracks,** *Old-House Journal, 11/90*
11. **Wood's a Natural in the Kitchen,** *Hardwood Floors, 6/91*
12. **Hitting on Porch Decks,** *Old-House Journal, 6/93*

Books and Pamphlets

Here are a few of the helpful books on wood floors, stairs, and paneling. If these are not in your library, call us for where to purchase them:

1. **Bollinger Don. Hardwood Floors: Laying, sanding and finishing**, *The Taunton Press (a Fine Homebuilding Book)* (1990)
2. **Bollinger Don, Floors, Walls, and Stairs**, *The Taunton Press (a Fine Homebuilding Book)* (1990)
3. **Installing Hardwood Floors and Finishing Hardwood Floors**, *NOFMA* (2000)

Flooring Finish Manufacturers

(these are just some, call for complete list)

Absolute Coatings

38 Portman Road
New Rochelle, NY 10801
914/636-0700

Basic Coatings

2124 Valley Drive PO Box 677
Des Moines, IA 50303
800/247-5471

BonaKemi USA

14805 E. Moncrieff Place
Aurora, CO 80011-1207
303/371-1411
Fax: 303/371-6958

Dura Seal - Minwax Co.

1704 Woodstock Blvd, #1201

Arlington, TX 76006
817/226-1587

Glitsa American

327 S. Kenyon Street
Seattle, WA 98108
800/527-8111

Harco Chemical Coatings

208 Dupont Street
Brooklyn, NY 11222
800/445-3777

McGrevor Coatings

1701 Utica Avenue
Brooklyn, NY 11234
800/922-9981

The Natural Choice

1365 Ruffina Circle
Santa Fe, NM 87501
505/438-3448

Professional Coatings

27010
Cabot, AR 72023
800/962-0344

Waterlox Coatings

9808 Meech Avenue
Cleveland, OH 44105
800/321-0377